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# Implications of Basel II for Latin America

Andrew Powell
Universidad Torcuato Di Tella

**Miñones 2177, C1428ATG Buenos Aires • Tel: 4784.0080 interno 181 y 4787.9394 • Web site: www.utdt.edu/departamentos/empresarial/cif/cif.htm**

# Implications of Basel II for Latin America[1]

Andrew Powell

Universidsad Torcuato Di Tella, Buenos Aires

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Abstract

Despite delays, Basel II remains set to be finalized this year with implementation in Basel Committee countries by the end of 2006. How will this agreement between a set of G10+ countries affect emerging economies? Two implications are considered here for countries in Latin America. First, earlier papers have suggested that implementation in G10+ may affect the cost of capital and may introduce pro-cyclicality. The analysis presented indicates that these concerns may be exaggerated depending on the value of critical parameters. Second, Latin America may choose to implement the new agreement locally. Five country characteristics are detailed that might serve as a guide to govern whether and if so how Basel II should be implemented. Moreover, a simpler Centralized Rating Based (CRB) approach to enhance provisioning is proposed as an initial or transition step for the region. Finally, a number of largely unresolved, cross-border issues are discussed.

Key Words: Basel Accord, Banking Regulation, International Lending.
JEL Codes: F34, G28, F33.

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## I. Introduction

Basel II, the new Accord regarding bank capital to be finalized during 2004 for implementation in Basel Committee Countries before the end of 2006, will affect all countries in two distinct ways[2]. First, to the extent that the new standards are binding on banks (or relax previously binding standards), they will affect the cost of capital and hence economic growth and welfare across the globe. Second, while no country is legally obliged to implement the Accord locally, more than 100 countries claim to have implemented Basel I and it is likely that many will consider implementing Basel II. Basel II introduces several alternatives and whether, and if so how, emerging countries should implement Basel II remains an open question.

It is argued below that Latin America falls between two stools. The so-called Standardized Approach, that uses the ratings of private agencies, may give little in terms of linking capital to risk given the low degree of corporate rating penetration in the region. On the other hand the Internal Rating Based approach, that allows banks to develop their own rating scales and rating methodology, looks complex and difficult to monitor given the current pattern of Basel Core Principle for Effective Banking Supervision compliance. The proposal here is then for the use of a Centralized Rating Based (CRB) approach, perhaps to enhance provisioning, as a transitional step to IRB.

Many emerging economies have foreign banks from Basel Committee countries operating in their jurisdictions. These are precisely the internationally active banks that will be implementing the more advanced approaches of Basel II on a worldwide, consolidated basis. While cross-border issues were already present under Basel I, Basel II will heighten them and many remain, as yet, unresolved.

In this paper, I first try to give an idea of the effect of Basel II on the cost of capital for countries in Latin America – section 2. In contrast to several previous papers the headline result is that Basel II may have no effect on the cost of capital for most emerging countries, except those with the lowest credit ratings. This result is however critically dependent on the mapping between credit ratings and default probabilities employed. Subject to the same qualification, no additional pro-cyclicality may be introduced. Section 3 is devoted to whether and how emerging countries

[2] See Basel Committee for Banking Supervision (1988) and (2003a) for the old and the proposed new Accord. These, together with literally hundreds of comments are available on www.bis.org.

may wish to implement Basel II locally. I introduce five country characteristics that might assist countries considering implementing the new agreement[3]. Section 4 discusses the Centralized Rating Based idea. Section 5 discusses a set of important cross border issues still to be resolved and section 6 concludes.

## 2. Basel II: On the Cost of Capital for Emerging Countries

A set of earlier papers considered the effect of Basel II on emerging countries' cost of capital[4]. These papers all employed the following "cost and return" of funds equation. This assumes that banks are risk neutral, that the market for lending to emerging country sovereigns is perfectly competitive and that banks make a specified required return on capital:

$$r(1-k_1)+(r+c)k_1=(r+s_1)(1-p)-lp \qquad (1)$$

where $r$ is the risk free (say Libor) interest rate, $c$ is the cost of capital expressed as a spread, $k_1$ is the current percentage of the loan financed by capital, $s_1$ is the current lending spread, $p$ is the probability that the loan will be defaulted on and $l$ is the loss given default expressed as a percentage of the loan amount[5]. There is an implicit assumption that deposits are insured at no cost to the bank and hence depositors do not require a premium over the risk free rate.

Consider what would happen to spreads if the portion of the loan financed by bank capital were to change. Suppose that $k_2$ is the new portion of the loan financed by capital and $s_2$ is the new spread, rewriting the same equation but replacing $s_1$ by $s_2$ and $k_1$ by $k_2$, and then subtracting equation (1), we can solve for the implied required change in spread as:

$$(s_2-s_1)=\frac{c\ (k_2-k_1)}{(1-p)} \qquad (2)$$

There are various ways to use this approach to estimate the effect of Basel II on spreads depending on which variables in equation (2) are taken as endogenous, and say calculated from market prices, and which are considered as exogenous. Previous work has assumed that Basel I and Basel II both bind, and hence that $k_1$ and $k_2$ are exogenous. This surely

[3] Sections 3 and 4 draw on

[4] See Deutsche Bank (2001), Reisen (2001), Griffiths Jones (2001), Powell (2002) and Weder and Wedow (2002).

[5] See Repullo and Suarez (2004) for the formal derivation of such an equation may come from given a fully elaborated equilibrium loan-pricing model.

overestimates the effect of Basel II on spreads. In this paper I take the initial capital, $k_1$, as endogenous and calculate it from equation 1 using an estimate of the current market spread as $s_1$. The relevant equation for $k_1$ is then:

$$k_1 = \frac{(r + s_1)(1 - p) - lp - r}{c} \qquad (3)$$

The rationale for endogenizing capital in this way is that, assuming a competitive market and risk neutrality, this "economic capital" would give the minimum leverage ratio that would make lending to that particular sovereign viable at the market spread.

Suppose now Basel II implied an increase in required capital due to the new regulations. Then we can calculate, using equation 2, the required increase in the spread such that banks would be willing to lend to that sovereign. With endogenous "economic capital", the following logical possibilities must be taken into account considering the effect of Basel II on spreads:

A) Basel I and Basel II do not bind and hence Basel II has no effect.

B) Basel I does not bind but Basel II does bind and hence Basel II will increase spreads.

C) Basel I and Basel II both bind and hence Basel II has an effect on spreads - either to increase or decrease[6].

D) Basel I binds but Basel II does not and hence Basel II will decrease spreads.

The potential effect of Basel II is then calculated in the following steps:

1. A selection of countries in Latin America for which Emerging Market Bond Index (EMBI) spreads and (Standard & Poor's) ratings are available is chosen[7].

[6] It should be noted that if Basel I binds then this implies that Basel I banks should not find it economically viable to lend to that sovereign. The calculated change in spread is then interpreted as the change in spread that would make it economically viable for Basel II regulated banks to lend to that sovereign and not necessarily the change in spread that would actually occur.

[7] We exclude Argentina that is classified as SD – selected default.

2. The average sovereign EMBI bond spread over 2003 is taken for each country if that country had the same rating over the period. Otherwise, the EMBI spread is used for the period in 2003 for which the rating at the end of that year is appropriate[8].

3. "Economic capital" is then calculated using a default probability consistent with the country rating. The mapping from credit rating to default probability employed is a 12-month Standard and Poor's mapping. An LGD of 45% is employed (as that assumed in Basel II's Foundation IRB approach), a risk rate of 4% and a required rate of return of 18%[9].

4. The calculated "economic capital" is then compared to Basel I and Basel II (Standardized and IRB) capital requirements to consider which alternative A) to D) listed above is relevant.
    a. Basel II's standardized approach is calculated using the relevant capital charge for the sovereign given the rating and Basel's Consultative Paper Number 3, paragraph 27 (page 7).
    b. Using the same mapping as in step 3, the Basel II Foundation IRB required capital ratio is calculated using the curve as stated in the Basel Consultative Paper Number 3, paragraph 241 (page 50).

5. If relevant, the effect on the spread is then calculated using Equation (2) above and using the relevant endogenous capital as $k_1$ and the relevant Basel II capital requirement as $k_2$[10].

**Table 1: Effect of Basel II on Bank Capital and Spreads**
(Using 1 Year S&P Default Probabilities)

| | | | | | Capital Requirements | | Implied Spread Changes | |
|---|---|---|---|---|---|---|---|---|
| Country | Rating | Default Probability | Average Spread | Endogenous Capital | Basel II Standardized | Basel II IRB | Basel II Standardized | Basel II IRB |
| Chile | A- | 0.05% | 1.00% | 8.0% | 4.0% | 1.6% | -0.2% | -0.2% |
| Mexico | BBB | 0.22% | 2.43% | 16.6% | 4.0% | 3.8% | 0.0% | 0.0% |
| Colombia | BB | 0.94% | 5.09% | 32.7% | 8.0% | 7.6% | 0.0% | 0.0% |
| Panama | BB | 0.94% | 3.73% | 23.1% | 8.0% | 7.6% | 0.0% | 0.0% |
| Peru | BB- | 1.33% | 4.27% | 25.4% | 8.0% | 8.7% | 0.0% | 0.0% |
| Brazil | B+ | 2.91% | 8.33% | 47.6% | 8.0% | 11.5% | 0.0% | 0.0% |
| Venezuela | B- | 10.32% | 7.19% | 10.0% | 8.0% | 20.3% | 0.0% | 2.1% |
| Ecuador | CCC+ | 21.32% | 11.84% | 8.0% | 12.0% | 29.0% | 0.9% | 4.8% |

[8] The results are not very sensitive to the value of the risk free rate - see discussion below.
[9] The sensitivity of the results to these assumptions is discussed below.
[10] In the case of Chile we find Basel I binds but not Basel II so $k_1$ is Basel I's 8% and $k_2$ is the endogenous capital.

The results are presented in Table 1 for a selection of countries in Latin America. The bottom line is that in most cases neither Basel I nor Basel II bind and hence Basel II will have no effects[11]! Only for the two countries in the sample with the lowest credit rating (Venezuela and Ecuador) will the Basel II, IRB approach result in higher spreads. In the case of Venezuela Basel I is found not to bind but Basel II IRB does bind and for Ecuador both Basel I and Basel II bind. It may seem counter-intuitive that Basel I only binds for these high risk countries. But the rationale is that in the cases of countries with higher ratings (Mexico and Colombia etc), the spreads are high relative to the assumed default probabilities. Hence it is "economic" in these cases to lend with lower leverage – with more capital. The effect of Basel II would be an increase in spreads of 210 and 480 basis points, if Venezuela and Ecuador respectively wished to borrow from Basel II regulated banks. The case of Chile is also of interest. Here, for the parameters employed, Basel I binds but Basel II will not bind and so spreads will be reduced – by some 20 basis points[12].

Comparing these results to previous results in the literature, Reisen (2001) and Griffith-Jones (2001) both suggest that that the effects of Basel II will be significantly larger. These authors assume Basel I and Basel II both bind ($k_1$ and $k_2$ exogenous) and use equation (1) to solve for an endogenous cost of capital, $c$. This results in very high estimates of $c$ and (hence) very significant effects for Basel II IRB through equation (2). Powell (2002) also assumes Basel I and Basel II both bind but also that the cost of capital is exogenous. This reduces the effect of Basel II although the effects are still quite significant especially for the IRB approach. However, there is a potential inconsistency between the assumed cost of capital and the market spread. Weder and Wedow (2002) updates the Powell (2002) estimates for the new "flatter" IRB curves and consequently finds the effect of Basel II to be somewhat reduced. Moreover, these authors also conduct an empirical analysis that leads them to conclude that Basel I may not bind when it comes to lending to emerging country sovereigns backing up the approach taken here.

However, the results presented are naturally dependent on the various assumptions employed. However, the results are not particularly sensitive

[11] As Weder and Wedow (2002) remark, this appears to be consistent with the views of some "insiders" of the Basel II process and discussion.

[12] The EMBI spread for Chile is the EMBI global spread which trended down over 2003 ending the year at less than the 1% spread level used here. For a spread of 1.15% given Chile's A- rating and the S&P 12 month default probabilities the endogenous capital is exactly equal to Basel I's 8%.

to the assumption on the required rate of return on capital or on the riskless rate. Reducing the required return to 15% implies smaller increases in spreads given IRB for Venezuela (to 1.3%) and Ecuador (4%) and that Basel I no longer binds for Chile and so eradicating Chile's 30 basis point gain. For all other countries there is, as before, no effect. Increasing the required rate of return on capital to 21% increases the effect of IRB for Venezuela and Ecuador (to 2.8% and 5.6% respectively) and Chile's gain rises to 30 basis points. Again, there is no effect for the other countries. Altering the riskless rate in the region of 2% to 6% makes virtually no difference to the results – this range implies an effect of IRB on Venezuela of 2.07% to 2.09%.

Varying the loss given default in a reasonable range also does not affect the headline result – that for most countries Basel I nor Basel II will bind. Nor does it make any difference to Ecuador where both bind. For Venezuela where Basel I does not bind, this variable does matter and in quite non-linear fashion[13]. If the loss given default could be reduced to 35% then the effect of IRB is reduced from 210 to 60 basis points. If it is increased to 55% then the effect of IRB is increased to 2.5%. This implies that there may be significant gains to attempting to reduce the loss given default using credit risk mitigation techniques under IRB.

However, the results are quite sensitive to the assumed default probability mappings. Weder and Wedow (2002) present an interesting comparison of 12 month S&P, 12 month Moody's and 3 year S&P default probabilities[14]. These are all based on corporate default histories and hence there is uncertainty as to whether they are truly appropriate for considering sovereign risk. The problem is that the information on sovereign default is (fortuitously) very limited. However, Hu et al (2001) discusses the estimation of a rating transition probability matrix for sovereigns notwithstanding the limited data using a mixture of naïve rating transition experience, a probit model and a Bayesian system to update priors to ensure a smooth result.

The implied 12-month default probabilities from Hu et al (2001) are quite different to the 12 month S&P corporate default probabilities employed above and give much higher default probabilities especially for lower ratings. They are closer to the 3-year S&P estimates. Table 2 shows the results if the Hu et al (2001) default probabilities are employed. Now we

[13] It also matters for Chile where Basel II does not bind but the changes are quantitatively very small.
[14] See also Moody's Investor Services (1999) and (2000) and Standard and Poor's (2000) and (2002). Powell (2002) uses the mapping quoted in Jackson (2001) which gives results similar to the 12 month default probabilities.

find that Basel I and Basel II both bind for Peru, Brazil, Venezuela and Ecuador and we find required changes in spreads of 150, 550, 880 and 2009 basis points respectively for these countries!

**Table 1: Effect of Basel II on Bank Capital and Spreads**
(Using Perraudin et al Adjusted Default Probabilities)

| | | | | | Capital Requirements | | Implied Spread Changes | |
|---|---|---|---|---|---|---|---|---|
| Country | Rating | Default Probability | Average Spread | Endogenous Capital | Basel II Standardized | Basel II IRB | Basel II Standardized | Basel II IRB |
| **Chile** | A- | 0.0% | 1.00% | 17.4% | 4.0% | 0.0% | 0.0% | 0.0% |
| **Mexico** | BBB | 0.0% | 2.43% | 17.4% | 4.0% | 0.0% | 0.0% | 0.0% |
| **Colombia** | BB | 2.5% | 5.09% | 26.7% | 8.0% | 10.9% | 0.0% | 0.0% |
| **Panama** | BB | 2.5% | 3.73% | 17.3% | 8.0% | 10.9% | 0.0% | 0.0% |
| **Peru** | BB- | 6.4% | 4.27% | 8.0% | 8.0% | 16.0% | 0.0% | 1.5% |
| **Brazil** | B+ | 24.7% | 8.33% | 8.0% | 8.0% | 31.0% | 0.0% | 5.5% |
| **Venezuela** | B- | 39.8% | 7.19% | 8.0% | 8.0% | 37.4% | 0.0% | 8.8% |
| **Ecuador** | CCC+ | 69.3% | 11.84% | 8.0% | 12.0% | 43.6% | 2.3% | 20.9% |

Table 2 also lists the default probabilities and they do appear to get very high for the lower rated credits. Brazil for example, as a B+ risk, has a 25% default probability. To date, the very limited information that is available regarding low rated sovereigns and the scarce default experience implies that these estimates should probably be used with extreme caution. To give a better idea of the overall sensitivity of the results to the assumptions on this critical parameter, Table 3 presents some further results for different sovereign spreads and different assumed default probabilities. This table is created with Brazil in mind which had an average sovereign spread of 8.3% and standard deviation 2.6% over 2003 and the 12 month S&P and Hu et al default probabilities are 2.91% and 24.7% respectively. The 12-month Moody (corporate estimated) default probability is 3.4%.

**Table 3: Sensitivity Analysis Effect of Basel II IRB**

| | | Default Probability | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2.0%** | **5.0%** | **10.0%** | **15.0%** | **20.0%** | **25.0%** |
| | **2.0%** | **0.38%** | **1.19%** | **2.40%** | **3.51%** | **4.54%** | **5.6%** |
| | **4.0%** | 0.00% | **0.88%** | **2.40%** | **3.51%** | **4.54%** | **5.6%** |
| | **6.0%** | 0.00% | 0.00% | **2.40%** | **3.51%** | **4.54%** | **5.6%** |
| **Spread** | **8.0%** | 0.00% | 0.00% | **0.72%** | **3.51%** | **4.54%** | **5.6%** |
| | **10.0%** | 0.00% | 0.00% | 0.00% | **3.47%** | **4.54%** | **5.6%** |
| | **12.0%** | 0.00% | 0.00% | 0.00% | **0.89%** | **4.54%** | **5.6%** |
| | **14.0%** | 0.00% | 0.00% | 0.00% | 0.00% | **4.09%** | **5.6%** |

At the bottom left of the Table, with higher spreads and lower default probabilities, Basel I and Basel II do not bind. At the top right, both Basel

I and Basel II bind and then only the assumed default probability is important in determining the effect of Basel II - as that is used in the IRB capital requirement calculation[15]. Along the diagonal, Basel I does not bind but Basel II does bind, and then both the spread and the default probability are important in determining the effect of Basel II; as the spread determines the initial endogenous "economic capital".

As can be seen from the Table, while the base case for Brazil (a spread of 8.33% and a default probability of 2.91%) gives no effect of Basel II, a spread of 8% and a perceived default probability of 10% yields a 72 basis point effect and higher assumed default probabilities give higher effects up to the 560 basis point effect using the Hu et al probabilities. The 12-month corporate S&P default probabilities are probably too low whereas the Hu et al default probabilities look very high. The effect of Basel II for spreads from 6% to 12% and default probabilities 2% to 10%, ranges from zero to 240 basis points (roughly one standard deviation), and this appears a more realistic range[16].

***On Pro-Cyclicality and Circularity***

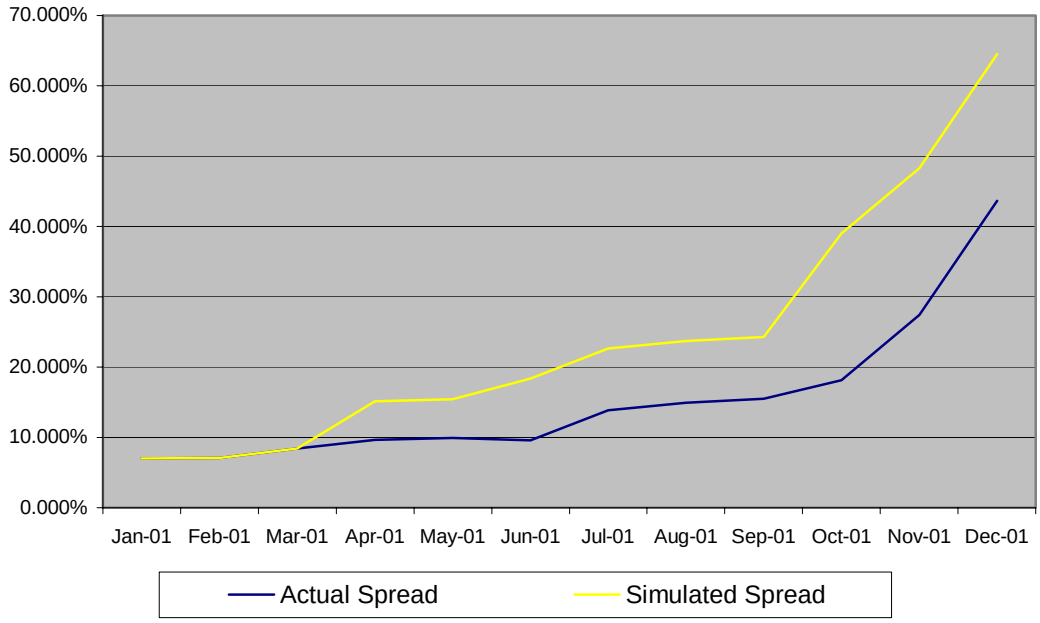
There has been much discussion regarding Basel II and pro-cyclicality. The above methodology can also shed some light on this issue. In the previous section we considered the rating and the spread of a country as a constant. In practice ratings and spreads change over time. Economic capital will then also change over time. The appropriate question is not then whether Basel II introduces pro-cyclicality but whether it increases it.

To shed light on this, using the same methodology we can consider what would have happened to the Argentine spread leading up to the Argentine crisis in 2001. In other words we calculate for each month on the basis of Argentina's spread and rating (and 12 month S&P default probabilities) at that time, the "economic capital", and test whether Basel II IRB would have been binding and implied an increase in capital. To cut to the conclusion, we find that neither Basel I nor Basel II IRB bind for the whole of 2001, so that Basel II implementation would have had no effect on required spreads for IRB banks to lend leading up to the Argentine crisis.

[15] As discussed previously, in this part of the table as Basel I binds banks may not find it profitable to lend at the current spread. The change in the spread should then be interpreted as the change required such that, under Basel II, banks would be willing to lend.

[16] Basel II also affects the cost of capital to private banks and non-financial corporations in emerging countries. Depending on the structure of bank lending, these effects may be more important in terms of a country's cost of capital than lending to the sovereign.

**Figure 1: Argentina: Simulated Spreads under Basel II (with Hu et al (2001) probabilities)**




However, once again if we take the Hu et al (2001) default probabilities we get very different results. Figure 1 plots the results in that case. In January, February and March 2001, spreads would have been unchanged. However, as Argentina was downgraded in April 2001 from BB- to B+, according to the Hu et al (2001) the default probability would have risen from 6.4% to 24.7% and while actual spreads rose to almost 10% they would have had to rise to 15% in order for Basel II IRB regulated banks to have continued lending. The difference between actual and simulated spreads (to ensure IRB banks would have lent) rises from about 5% to 9% as Argentina is downgraded again in June 2001. And this difference rises to almost 20% in October of the same year. Again, however, the Hu et al (2001) estimated default probability mappings should be viewed with caution. In particular the jump from 6.4% to 24.7% default probability on the downgrade from BB- to B+ appears considerable.

Perhaps of more concern than potential pro-cyclicality of Basel II is potential circularity. Argentina's ratings reflected perceptions of Argentina's access to international markets to roll over its debts. But access to international capital markets is also, to some extent determined, by a country's rating. The point is not that Argentina's problems were purely of a liquidity nature. However, the use of ratings may well introduce some measure of circularity. If the circularity is serious enough this might just spell the difference between being able to roll-over and buying time to adjust and a very costly default.

Although the quantitative effects are smaller, this is a real danger for the Standardized Approach. Given that there are so few international ratings agencies, the change in rating of one agency that moved a country from one

bucket to another, may have significant effects. Moreover, by the same token, there may also be a significant cost to one simply getting it wrong. The introduction of the ratings by export credit guarantee agencies and their publication is to be welcomed in this regard[17]. The more opinions there are, the better from this point of view.

An alternative would be to introduce a simplified IRB approach for sovereign credits whereby banks would simply be asked to use their own ratings but according to a standardized scale. An international body (as the OECD is doing for the export credit agency ratings, an obvious candidate being the BIS) could collect those ratings across Basel Committee countries and publicize the median ratings for countries and other statistics. This would increase the number of "opinions" still further and possibly lessen the concern, whether correct or not, that, official, export credit agency ratings may suffer from political pressures.

In this paper, and following much of the literature, I only consider changes in the cost of capital for international lending to Latin American sovereigns[18]. In practice, international banks lend more to banks and non-financial corporates than to sovereigns. The BIS consolidated banking statistics indicate that as of end Sept 2003, there were US$45.3bn in outstanding international claims on sovereigns in Latin America, US$37.8bn on banks and US$137bn on non financial corporates. Clearly the change in the overall "cost of capital" to the region will depend on the change in required capital for international lending to the private sector as well as to sovereigns. The above estimates should not be thought of as an estimate of the overall cost implications of Basel II - as such it may be a gross underestimate.

However, there remains considerable uncertainty regarding the change in the cost of capital for the private sector related to the cross border issues of Basel II as discussed below. The BIS statistics quoted are based on "international claims" defined as "cross-border" claims in any currency plus local claims in foreign currency. Total "international claims" as of September 2003 amount to US$223bn but then there are a reported US$245bn of "local claims" defined as claims of BIS consolidated reporting entities in local currency in the host country. Unfortunately, the sectoral breakdown between sovereign, bank and non-bank is only available for the international claims and not for the local claims. In the case of an international claim on a sovereign with a credit rating, it is

[17] These ratings are to be published on the OECD website, www.oecd.org
[18] Powell (2002) does attempt to estimate costs to banks and non banks private corporates but the methodology adopted is almost surely also an underestimate.

difficult to imagine that the home regulator would allow a different treatment of the risk in the consolidated global entity whether the claim be in the head office or, say, in a local subsidiary. However, in the case of claims on the private sector in local or possibility even in foreign currency this is still not clear. As discussed further below, a likely scenario is for the international bank to adopt IRB but the local subsidiary may not. These problems of implementation hamper a clean assessment of the important issue of potential changes in the cost of capital for the private sector. The overall change in the "cost of capital" for a country may be quite different to the calculations presented depending on a) the structure of lending to the country (sovereign, bank or non bank and cross border or local) b) if and how Basel II is implemented locally and how cross-border issues are resolved and c) the credit ratings (external or internal) of the relevant private sector entities.

To conclude this section, if standard (corporate) default probability mappings are used, Basel II will have little effect on Latin American economies but will only affect the cost of capital in the case of the countries with poorer ratings such as Venezuela and Ecuador. However, if recent estimated default probabilities for sovereigns are employed we get very different results and potentially quite significant effects. While the S&P default probabilities may be too low, the latter look very high and are estimated on sparse sovereign default histories and should be treated with caution. A more realistic sensitivity analysis gives either no effect for Basel II or an effect of up to a maximum 240 basis points (roughly one standard deviation of the EMBI spread) for Brazil, a B+ risk.

## 3 Implementing Basel II in Emerging Countries

The Basel Committee has acknowledged that developing countries will likely need more time to implement Basel II than the 2006 deadline. Moreover, recent statements by the IMF and the World Bank have suggested that, in terms of the on-going Financial Sector Assessment Program (FSAP), Basel II implementation will not be considered as a requisite[19]. Basel II itself includes various alternatives. In terms of underlying credit risk evaluation in Pillar 1 these include (i) the Standardized Simplified Approach, (ii) the Simplified Approach, (iii) the Foundation Internal Rating Based Approach and (iv) the Advanced Internal Rating Based Approach. There are then also different choices regarding (a) credit risk mitigation techniques, (b) securitization risk and (c) operations

[19] One view however is that many developing country supervisors will not wish to be considered as lagging behind this new "standard" and some country authorities may be concerned that the market may punish them for non-implementation even if the IFI's do not.

risk. Table 4 provides a brief details. Countries will then have to decide whether they stay on Basel I or, if they do move to Basel II, which of the many alternatives on offer, should be adopted.

***Table 4: Alternatives Under Basel II***

| *The Approaches* | *Basic Credit Risk Measurement Technique* | *Credit Risk Mitigation* | *Securitization Risks* | *Operational Risk* |
|---|---|---|---|---|
| **Simplified Standardized** | Export Credit Agencies (www.oecd.org, Trade Directorate, ECA page) | Simple: risk weight of collateral subsitutes that of claim. | SSA banks can only invest (cannot offer enhancements or liquidity facilities). Riskweight=100% | Basic Indicator: Capital=15% Gross Income |
| **Standardized Approach** | Export Credit Agencies or Credit Rating Agencies (eg: S&P, Moody's, Fitch) | Simple: (as above). Comprehensive: exposure amount reduced subject to claim and collateral haircuts. | Standardized: uses export credit agency ratings (only investing banks can use below BB+) | Basic Indicator. Or Standardized Approach where Bank Capital = weighted sum of gross income across activities |
| **IRB Foundation** | Banks' internal ratings for default probability and Basel II formula sets capital requirement (Loss Given Default 45% for Senior and 75% Subord). | Comprehensive, then LGD adjusted given reduction in exposure and capital requirement given by Basel formula | IRB Approach: Investing banks may use bank Ratings according to a standard scale. Originators may use Supervisory Formula | More sophisitcated banks will be expected to graduate to the Advanced Measurement Approach where capital requirement given by own risk measurement system. |
| **IRB Advanced** | Banks set internal rating (default probability), LGD Exposure At Default and Maturity. Capital requirement still given by Basel formula. | Own model determines LGD and EAD and capital requirement given by forumula | As IRB Foundation | As IRB Foundation |

I suggest here that five country characteristics may aid in this decision. I explain below the particular relevance of these characteristics[20]:

(i) The degree of Basel Core Principles, and hence Basel II Pillar 2, compliance.
(ii) The penetration of rating agencies and the operation of the rating market in general
(iii) The current level of bank capital and the feasibility of increases in bank capital ratios in the shorter term
(iv) The size of, or the strength of the desire to develop domestic capital markets.
(v) The availability of information and the degree of sophistication of banks and/or the supervisor in assessing and monitoring loan-loss provisioning.

The data on the IMF and World Bank completed FSAP's illustrate that many countries (including G10 but especially developing) are far from

[20] See also the discussion in Powell (2003).

being fully compliant with the Basel Core Principles for Effective Banking Supervision and, on average, developing countries lag their G10 counterparts[21]. Of particular concern is the lack of (i) effective consolidated supervision, (ii) supervisory independence, resources and authority and (iii) effective prompt corrective action. If supervisors lack resources and the basics of effective bank supervision, correcting this should be the first priority and more complex rules on capital requirements (Basel II Pillar 1) may well be counter productive. Basel II also introduces a significant change to the level of consolidation required for banking supervision – from the bank itself to its holding company. As many countries do not comply with more modest versions of consolidated supervision; these countries remain far from the spirit of the Basel II proposals.

However, full BCP compliance is too strict a precondition for moving to Basel II – after all many G10 countries are not Compliant with all the BCPs. In general a country should be BCP compliant to the degree required to implement the appropriate alternative chosen within the Basel II framework. As an example, if a supervisor does not have the resources (including data, information, technical competence, staffing and management) to consider whether the calibration of the Basel II Internal Rating Based Approach (IRB) is appropriate to that country, or to monitor effectively how banks would apply the IRB methodology, then a simpler alternative should most certainly be adopted.

Many developing countries will probably opt for the simpler Basel II approaches including the Simplified Standardized Approach (SSA) or possibly the Standardized Approach (SA). An important difference between the two is that the latter allows for the use of credit ratings from private agencies whereas the former only uses the ratings of official export credit guarantee agencies – that only cover sovereigns. However, the problem for many developing countries is that markets for credit ratings are shallow and hence the SSA nor the SA allows for much in terms of aligning capital requirements with risk.

Of course, adopting the SA may create incentives for such ratings' markets to develop but this brings its own dangers in terms of companies buying a good rating, provoking a "race to the bottom" in rating quality. A similar argument might be made for some G10 regional or smaller banks - and this might lie behind the recent decision of the US to keep many of its banks on Basel I. However, such banks are not likely to be "systemic" in a G10

[21] See World Bank (2002)

country. The situation in some developing countries is different – large parts of systemic banks' portfolios are largely unrated.

The second characteristic is then the state of the ratings market. For a country with no ratings market to speak of, the SA makes little sense. Such a country should stick with Basel I or adopt the SSA or, if it has reasonably high compliance with the BCP's, consider the Centralized Rating Based (CRB) approach discussed below as a potential precursor to Basel II's IRB. For a country with an active ratings market, the SA makes more sense.

Note that for a country adopting the SSA, or a country with a shallow market for ratings adopting the SA, Basel II will likely imply a sharp increase in bank capital requirements. This will especially be the case if the risk weight on mortgages is not dropped to 35% and no extra benefit is given to retail exposures and tighter rules are employed on lending to the sovereign. The source of the extra capital charge is for operational risk. For a country adopting IRB or the SA with a deep ratings' market the add-on for operational risk may be offset by lower capital charges for higher rated claims. However, for a developing country adopting SA or SSA this is unlikely to be the case. An increase in capital requirements may be no bad thing but a developing country considering adopting Basel II should consider carefully the current level of bank capital and the feasibility of increasing bank capital. This is then the third characteristic listed above.

Basel II also includes significant enhancements for the credit risk implications of securitization risk and for credit risk mitigation techniques. A country with a fairly inactive ratings market may still benefit from the use of ratings in these areas. For example, if a country has an active market for securitized claims (growing in importance in some countries currently), then those claims will most likely be rated and hence the Basel II standardized approach regarding securitization risk might be gainfully adopted. This may not seem to be too critical a feature. However, if a country wishes to develop capital markets, then ensuring banks have the right incentives to securitize claims is important. Basel II does a much better job here than Basel I.

A similar argument can be made for credit risk mitigation techniques. Here, Basel II makes significant enhancements and hence if markets using securities as collateral are important – or a country wishes to develop them – moving to Basel II may be appropriate. The fourth characteristic listed is then the importance of local capital markets and the strength of the desire to develop them.

The final characteristic suggested is the sophistication of the supervisor and banks in terms of provisioning rules, monitoring and control. The spirit of Basel II is to replace a set of *ad hoc* rules regarding capital requirements with a more robust estimate of credit risk reflecting Value at Risk. Value at Risk may be decomposed into Expected Loss and Unexpected Loss subject to a statistical tolerance value. Current theory has it that provisions should reflect Expected Loss whereas capital should reflect Unexpected Loss. For an Economist the appropriate level of provisioning and capital for credit risk then both come from the same probability distribution – they simply reflect different statistics of that same distribution.

Considering this more general approach, a supervisor that has advanced in terms of more forward looking provisioning rules has also advanced in terms of considering finer risk-based capital rules. In several countries in the region, supervisors have set up centralized databases to monitor the large debtors of the financial system and ensure that each lender knows the total debt outstanding of larger borrowers, and in some cases these databases have been expanded to cover most loans of the financial system and are used to monitor and control provisioning requirements. Miller (2003) presents a review of the design and the uses of these databases. While in most countries, such requirements are not forward looking but reflect arrears, if such a database is in place, the move to a more forward looking system for provisioning and capital is certainly made more feasible. For example, some countries have now incorporated a bank rating into these databases where that rating includes not only backward looking variables but also cash-flow type analyses.

The final characteristic is then the sophistication of the supervisor and banks in terms of information on provisioning and loan-losses. A supervisor that has regularly tracked loan-losses across banks and has developed monitoring tools such as transition probability matrices and simple credit scoring techniques to monitor provisioning rules is in a much better position to implement Basel II's IRB approach or the simpler Centralized Rating Based approach discussed below. Still, it is likely that the IRB or CRB will be appropriate only for the larger and more sophisticated banks. Indeed, for a country with a highly concentrated banking sector where a few large and more sophisticated banks control a large percentage of the sector, there are added benefits in moving to IRB or CRB at least for those banks.

In conclusion, the above 5 characteristics may provide some navigational aid for countries regarding the Basel standards. Countries that do not comply with many of the basic Basel Core Principles are probably advised

to stay with Basel I. However, if there is a wish to increase bank capital requirements then Basel II's Simplified Standardized Approach should be considered if the extra burden of supervising operational risk is feasible. Countries that have only a very shallow market for ratings will get very limited benefits from the Standardized Approach and should be advised that this will also lead to an increase in capital requirements. They should either stick with the Simplified Standardized Approach, or if they have developed sufficient supervisory capacity, consider Basel II's IRB or the CRB discussed below. However, countries that have deeper capital markets or the strong desire to develop them should reconsider the Standardized Approach for the enhancements to securitization risk and credit risk mitigation techniques. Finally, countries that have made advances in terms of forward looking provisioning rules and have the information and systems to control banks' provisioning practices are better placed to consider IRB or the simpler CRB approach detailed below.

## 4. A Centralized Rating Based Approach as a Transition to IRB[22]

To a large extent, Latin America lies between two stools when it comes to Basel II. On the one hand, most countries in the region have shallow markets for ratings such that the Standardized Approach yields little in terms of linking banks' capital with risk. On the other hand, the drawbacks of Basel I (repeated in the Simplified Standardized Approach) are well known, there is a desire to link capital more with risk, but many supervisors may feel that they are some way away from being able to implement and monitor effectively the IRB approach that gives greater autonomy to regulated institutions.

Due to these considerations, perhaps as a transitional tool, a methodology might be considered where the supervisor dictates a rating scale and asks banks to rate borrowers according to that centralized scale. Each rating would then correspond to a probability of default and, combined with other loan information, that rating would imply a capital charge. This system would have the drawback that each bank would be forced to use the same scale that may not then be the particular scale most appropriate to the borrowers of that bank. For example a bank specialized in a particular type of lending or a particular sector would not necessarily wish to use the same scale as a more general bank or one specialized in another business. The rating scale could be devised to be appropriate for the larger institutions so for countries with a more concentrated banking sector the costs would be minimized[23].

[22] See also the discussion in Powell (2002) and Powell (2003).
[23] A slightly more complex version could have a different centralized rating scale for different portfolios.

However, the great benefit of the approach is that the supervisor would be able to monitor and control banks' ratings and hence monitor and control their capital sufficiency in relation to risk much more effectively. In particular, the supervisor could very easily monitor banks' average ratings, banks' ratings for the same borrower, banks' ratings for the same type of borrower, banks' ratings for the same type of loan, banks' ratings in the same economic region etc. These kinds of comparisons combined with simple procedures for spotting outliers and keeping a track of the different banks' ratings of the main borrowers from the financial system are extremely valuable tools for a bank regulator. Naturally, for countries that had already developed a bank rating for the purposes of provisioning, this proposal would build very neatly indeed on those systems.

This methodology could not truly be called the IRB approach as "internal" in IRB is normally thought of as referring to the scale and not just the rating. However, the same type of minimum criteria as discussed in Basel II's IRB could be thought of as the minimum criteria for this system – for example in terms of the number of rating buckets and the history of information. Moreover, Basel II's IRB curve could be used to calculate the capital charge based on the centralized ratings and a mapping of those ratings to default probabilities. The centralization of the rating scale provides another advantage here as the mapping and the calibration of the curve could be then easily be checked on a bank by bank and on a system wide basis by the supervisor using actual loan data.

Furthermore, there is a simple way for a country to adopt a CRB approach and be fully compliant with Basel II at the same time. In particular, a country could adopt the Standardized Approach (SA) but still employ the CRB approach to calculate the total Value at Risk (after all, Basel II's IRB approach is currently calibrated to cover the whole Value at Risk). Then the difference between the total CRB calculated Value at Risk and the capital charge given by the Standardized Approach could be used as an estimate of the forward-looking provisioning requirement appropriate on that loan. Under the revisions to the Basel II proposals currently underway, it is understood this would then allow a country to be fully Basel II compliant and link banks' reserving policies closely to risk using the simpler CRB approach.

Finally the CRB approach could be used as a precursor to IRB. Once the CRB approach was working the supervisor could then work with banks to approve their own rating scales and rating methodology using the basic CRB approach as a reference tool.

## 5 On Cross Border Issues

As banking has become globalized and not just internationalized, cross-border regulatory and supervisory issues have grown[24]. While Basel II does not change the basic premises on which cross-border banking regulation has developed, it does create a set of interesting issues as noted in the recent "High Level Principles" – Basel Committee for Banking Supervision (2003b). This note makes clear that local host regulators may apply a different regulatory standard than home supervisors and banks, as they do today, may well be asked to satisfy the local regulations at the level of subsidiary or branch and the regulations of the home supervisor on a consolidated basis internationally[25].

As some countries will remain with Basel I, and Basel II contains several different alternatives, dual regulatory treatment is then likely to remain the normal state of affairs. And as an international bank may operate in many different locations, the organization may have to comply with multiple regulatory regimes. On the other hand, there is clearly an argument that calls for greater homogeneity of regulatory treatment and reduction in regulatory costs both for supervisors and for banks. In practice this is then likely to be something of a balancing act for home and host supervisors.

The issue for a host regulator is that the risk of the subsidiary is not necessarily the same as the risk of the international bank. The risks might be treated the same if the international bank gave a comprehensive and transparent guarantee to the subsidiary, but this is not normally the case. If there is no transparent and comprehensive guarantee and if the subsidiary is large for the host country then it is more likely that the local regulator will

[24] The BIS and others refer to internationalization as cross-border lending and globalization as banks setting up brick and mortar operations in multiple countries. There has been a marked increase in globalization in the 1990's.

[25] We do not dwell here on the differences between subsidiaries and branches but simply note that some developing countries allow one form or the other or both and some ask branches to have capital in the host country. This choice may depend largely on local bankruptcy legislation although this is an area where there appears to remain some legal uncertainties. See del Negro and Kay (2002) for an interesting discussion of the position of US banks in Argentina.

insist on rules that (i) ensure adequate protection to the local financial system and (ii) that the local regulator can understand, monitor and enforce.

However, at the same time an over-riding objective of Basel II should be to use the cross-border supervisory issues as a springboard for supervisory cooperation and where possible for knowledge transfer in order to enhance BCP compliance across the globe. Indeed greater cooperation and knowledge transfer is likely to lead to faster regulatory homogeneity. One simple idea is that whenever an on-site inspection is made of an international bank in a developing country, then the host supervisor should have the option to send its own staff to accompany that inspection. However, there are surely other modes of cooperation that can be developed and formalized to enhance knowledge transfer.

Many of the international banks operating in Latin America are the banks that are likely to be adopting the IRB approach on a global consolidated basis. Perhaps then of most interest is the case where the international bank adopts IRB and the local subsidiary, due to local regulations, must apply either Basel I or Basel II's Standardized Approach (SA).

In the interests of regulatory efficiency, and especially if the subsidiary is not too large compared to the international bank, there must be a good case for the home supervisor also to simply allow the international bank to use the SA – at the very least for local claims in local currency – to calculate the capital charge. Although this would raise some issues of consolidation and arbitrage, this might reduce regulatory costs without too much loss in terms of linking capital to risk[26].

In some cases, and particularly for the more sophisticated emerging economies, the host may allow an IRB approach for the subsidiaries of foreign banks. However, this does not necessarily mean that the regulatory treatment will be the same in the home and in the host country. Indeed it seems unlikely that the IRB curve is calibrated correctly for Latin American risks[27]. And several of the supervisory parameters for the Foundation Approach may need to be reconsidered – such as Loss Given Default and Exposure at Default

In the interests of regulatory efficiency, again the home supervisor might use the regulatory capital estimate of the host supervisor in calculating the

[26] An important aspect of the use of the SA is the question of which ratings should be used? Local regulators will no doubt employ the local currency ratings for domestic corporations. In this proposal the home supervisor should also accept these ratings, especially for local currency instruments.
[27] See Balzarotti, Castro and Powell (2003) for the case of Argentina.

total capital charge of the bank. Pillar 3 uses the concept of materiality to suggest what disclosures a bank should make regarding capital, and capital requirements, by subsidiary and by type of risk. If the home supervisor allows the bank to use the local regulations towards its home capital requirement then under Pillar 3, and the local regulators' rules, the bank would have to disclose the requirement and its actual level of capital.

However, in the case where the home supervisor does not allow the bank to use its local capital requirement for the purposes of the home supervisor, then the bank should certainly be asked to reveal the capital requirement of the subsidiary and the capital according to the rules of the home supervisor. In other words if a subsidiary in a developing country is large enough for a home country supervisor to insist that it adopt the same IRB procedure as the international bank, it should surely be considered as material under Pillar 3 and hence its capital requirement and capital disclosed under Pillar rules[28].

This argument is reinforced by noting that most foreign bank entry into developing countries has been effected through the purchase of domestic institutions and not through start-up. In turn this implies that valuable market information has been lost. Typically the domestic institution would have been quoted on the local stock market and would have other fixed liabilities outstanding such as bonds. Foreign purchase is typically associated with stock market de-listing and, depending on the bank and its own internal organization and funding strategy, local debt instruments may also cease to be issued or issued in much smaller quantities. This implies that the market prices of equity and debt are replaced by implicit guarantees from the parent (in the case that such guarantees are presumed to exist).

This reasoning begs the question of whether applying Pillar 3 to the subsidiary in each host country, whether material to the group or not, goes far enough. Indeed, a complementary strategy would be to ask the subsidiary to issue a certain quantity of subordinated debt locally. This would at least ensure that there was some market and hence price discovery on the risk of the subsidiary and hence some market assessment of the value of the parent's (normally implicit) guarantee[29].

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[28] Of course the host supervisor knowing that the subsidiary is complying with home regulator IRB rules may insist on the Pillar 3 disclosures as a condition of operating within its jurisdiction but it would appear better, especially from the standpoint of regulatory cooperation, if this position was agreed between home and host – I am grateful to Eric Rosengren for pointing this out.

[29] See Calomiris and Powell (2002) for a review of Argentina's experience implementing a "subordinated debt" regulation.

## 6 Conclusions

In this paper, the focus has been on two key issues regarding Basel II and Latin America. First, taking into account the fact that capital regulations may not be binding, the conclusion is that Basel II may not have a major effect on the cost of capital for sovereigns in the region except for the countries with the lowest credit ratings. As discussed however this result should not be extrapolated to the private sector depending on how certain cross border issues are resolved. The second conclusions is that the concern regarding pro-cyclicality may be exaggerated, as once again when a country's rating declines banks will already behave pro-cyclically independently of the regulations in force. These results are however conditional on the use of default probabilities that are calibrated on corporate default histories and the lack of sovereign default history implies that some caution should be attached to these results.

Second, the paper discussed the domestic implementation of Basel II in emerging countries. Five country characteristics are introduced that may act as a guide to whether countries should implement Basel II and if so, how. Moreover, it is argued that countries in Latin America may fall between two stools; the standardized approach will give little in terms of linking capital to risk whereas the IRB approach will be difficult to monitor given the state of supervision in the region. Given this situation, a Centralized Rating Based (CRB) approach is suggested. The idea is that banks rate borrowers according to a common or centralized rating scale. This would allow supervisors to monitor banks' ratings and capital adequacy much more effectively and would build nicely on current policies in several countries, to monitor and enforce provisioning rules. The CRB approach may be a useful precursor to IRB for countries that wish to link banks' reserving policies more closely to forward looking risk estimates but are some way away from IRB implementation.

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