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How the Proposed Basel Guidelines on Rating-Agency Assessments Would Affect Developing Countries

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The Basel Committee has proposed linking capital asset requirements for banks to the banks' private sector ratings. Doing so would reduce the capital requirements for banks that lend prudently in high-income countries; the same incentives would not apply in developing countries.



Summary findings

Using historical data on sovereign and individual borrowers, Ferri, Liu, and Majnoni assess the potential impact on non-high-income countries of linking capital asset requirements for banks to private sector ratings, as the Basel Committee has proposed.

They show that linking banks' capital asset requirements to external ratings would have undesirable effects for developing countries.

First, ratings of banks and corporations in developing countries are less common, so capital asset requirements would be practically insensitive to improvements in the quality of assets — widening the gap between banks of equal financial strength in higher- and lower-income countries.

Second, bank and corporate ratings in developing countries (unlike their counterparts in high-income countries) are strongly linked to the sovereign ratings for the country — and appear to be strongly related (asymmetrically) to changes in the sovereign ratings. A

sovereign downgrading would bring greater changes in capital allocations than an upgrading, and would call for larger capital requirements at the very time access to capital markets was more difficult.

Under the new guidelines, capital requirements in developing countries would thus be exposed to the cyclical swings associated with the revision of sovereign ratings in recent crises.

Ultimately, linking banks' capital asset requirements to private sector ratings would reduce the credit available to non-high-income countries and make it more costly, limiting economic activity. Bank capital needs in developing countries would be more volatile than those in high-income countries.

These findings suggest that the Basel Committee should reassess the role it proposes assigning to external ratings, to minimize the detrimental impact of the regulatory use of such ratings on developing countries.

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**HOW THE PROPOSED BASEL GUIDELINES ON RATING-AGENCY
ASSESSMENTS WOULD AFFECT DEVELOPING COUNTRIES**

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Introduction

The release for public comments in June 1999 of the new Basel Committee proposal on bank Capital Asset Requirements (CARs) has ignited a lively discussion on whether and how the orientation taken by the Committee should be revised. Part of the criticism questions the role that the proposal assigns to external ratings. Specifically, according to the proposal, CARs on assets vis-à-vis high-rated agents would be much lower than CARs on assets vis-à-vis low-rated and non-rated agents. This would be a desirable step towards enhancing bank efficiency in allocating loans if credit ratings displayed a homogeneous quality across markets and borrowers. Unfortunately, whereas credit rating agencies have a longer record in assessing the health of banks and corporations in the USA and some other developed countries, their experience with sovereign and private sector ratings in NHICs¹ is often limited to the last decade, which is likely to affect the quality of ratings.²

In this paper we provide evidence that linking bank CARs to external ratings would, from the perspective of less developed financial systems, introduce modest improvements at the cost of substantial distortions. Volatility of banks' capital requirements in poorer countries would be increased and the cost of capital for the best institutions of those countries would be higher than for peer institutions from more developed economies. In turn, this would negatively affect the availability and cost of credit in NHICs. The damage would stem from three distinct effects. The first effect is mundane in nature: as ratings are by far less widespread for banks and corporations in NHICs, bank CARs would not decrease (or increase) in these countries according to the risk exposure of individual corporations, as opposed to what would happen for high-income countries (HICs). The second effect stems from the fact that, based on the historical experience, NHICs have experienced downgradings of their sovereign ratings which a number of recent studies have labeled as "excessive".³ Since the sovereign rating is generally the pivot of all the other country's ratings –determining *de facto* a ceiling for the private sector– this entails a generalized negative impact on the country's bank CARs. The third effect depends on the fact that bank and corporate ratings in NHICs are more tightly linked to sovereign rating changes, introducing an element of asymmetry between the treatment of bank CARs in HICs and NHICs.

From these perspective, our findings suggest a reassessment of the role assigned to external ratings in the new Basel Committee proposal, with a view to minimizing the detrimental impact that the regulatory use of external ratings could have for NHICs. A modest reassessment could be to grant banks a time frame to phase-in the new rules long enough to allow for a substantial increase in the number of rated banks and corporations

¹ Non-high-income countries include high middle-income, middle-income, and low-income countries as categorized by the World Bank.

² IMF (1999) provides an extensive discussion of a) the problems faced in assessing the accuracy of ratings in developing economies; b) the changes in the analytical methodology used by credit rating agencies during the recent crises.

³ See among others, Ferri, Liu and Stiglitz (1999) and Monfort and Mulder (2000). See Cantor and Packer (1994, 1996) for early analyses of rating agencies' behavior. See also Kuhner (1999) and Partnoy (1999) for additional critical discussion of rating agencies' assessments.

located in developing countries and to allow time for rating agencies to stabilize the quality of their assessments. A more radical step would be to abandon altogether, for the time being, external ratings as determinants of bank CARs in NHICs. An intermediate revision would be to recognize that ratings cannot be considered a “sufficient” statistic for assessing the quality of sovereign and corporate borrowers in countries which lack transparent institutional setting as it is the case for most NHICs.⁴ In these cases they should therefore be integrated by additional sources of information in order to prevent regulatory induced distortions.

The paper is structured as follows. In Section 2, we describe the geographical distribution of sovereign and private ratings throughout the globe. This substantiates the claim that private sector ratings are heavily concentrated in (some) HICs. Using the geographical distribution of private sector ratings and their levels, Section 3 simulates the impact of the new proposed regulation on bank CARs in different countries. In Section 4, we provide some descriptive evidence of the asymmetric impact of ratings in East Asian crisis countries, in the aftermath of the crisis. Following the economic recovery in 1999, sovereign ratings were promptly brought back to investment-grade, while the revision of corporate ratings has been considerably more conservative. More systematically, the econometric analysis in Section 5 contrasts the experience of corporate ratings in HICs and NHICs, providing an empirical measure of the higher sensitivity to sovereign downgrading displayed by banks and non bank corporates in NHICs. In Section 6, drawing on the previous results, we offer some illustrative examples of how the proposed revision of the capital accord could have affected bank capital requirements for those NHICs which have suffered a sovereign downgrading. Section 7 concludes stressing the policy implications of our findings.

2. The geographical distribution of ratings

The geographical coverage of rated firms has greatly increased in the last two decades together with the progressive globalization of goods and financial markets. This development is the consequence of both the greater scope of coverage of the larger international rating agencies (S&P, Moody’s, Fitch-IBCA) and of a more active presence of nationally based rating agencies.

In this paper we shall focus on the role of international rating agencies, whose assessments are more easily comparable on a homogeneous basis and which provide a more transparent –if not exclusive– benchmark for regulatory purposes. An example of the development in the scope of coverage by large international rating agencies is provided by the increase in the number of foreign currency sovereign ratings provided by Standard and Poors, which has gone from only 11 countries twenty years ago to 25 in 1989 and to 80 in 1999. The expansion of the number of rated firms has followed that of the sovereign ratings. At the end of 1999, only 6 countries, among those who had an S&P sovereign rating, did not have any individual firm rating.

⁴ The interpretation of bank ratings as a sufficient statistics is supported by the following excerpts from Moody’s (1999a, p.9): “Paraphrasing Friedrich von Hayek, who famously saw the beauty of the market in the fact that it assimilates information by reducing it to a single price, we can suggest that the beauty of a rating is that it assimilates credit information and analysis into a symbol.”

The number of rated firms per country, computed as the average number of firms who held a foreign or domestic currency rating from S&P and Moody's in the second half of 1999, shows that the scope of coverage for banks is substantially similar to that of the total of rated firms. In both cases Africa, Central America, Central Asia and the Middle East show the lowest density of coverage. Most developing countries show the lowest degree of concentration of rated firms, exception made for fast growing economies as Korea and Indonesia and for large countries as China, Brazil, Argentina and Chile.

In what follows, we conventionally convert the equivalent Moody's and S&P alphanumeric rating scale into the numeric scale as reported in Table 1.

The progressive extension of the rating coverage also seems to be closely associated with the level of economic development and the rate of economic growth. Are the number of rated firms and the level of their ratings positively associated with their country's income level? In order to shed some light on this issue, we have grouped the countries with at least one rated firm in four categories according to their income level: G10 countries, High income non-G10 countries, Upper-middle income countries and Low-middle income countries. Table 2 shows the number of rated institutions—banks and non-banking firms alike—and the median rating for each of the four categories as reported by S&P. It appears that the total number of rated firms declines sharply in countries of low income. The reduction of rated firms is particularly steep when it comes to non-banks. The number of rated firms in G10 countries is 24 times higher than that of firms located in the lowest income group, as opposed to a GDP level eight times larger. The number of rated banks is instead only five times larger. The median rating of the four categories shows that the first two groups of high-income countries (G10 and non-G10) are solidly positioned above the level of investment grade (55 in the numeric scale), while both the middle and lower income groups are below the level of investment grade. An analogous situation can be found for non-banks as well. Though the values of median ratings do not exhibit a decreasing, monotonic pattern, they are generally lower for firms in NHICs than for firms in high-income countries. This finding will be explored in more detail in the next sections of the paper.

Are firms' ratings closely associated with sovereign ratings? What is the role of income levels in this relationship? Figure 1, which plots the distribution of sovereign and firms' ratings for the four income groups of countries previously defined, sheds some light on these two questions. The correlation between firms' and sovereign ratings is almost non-existent for G10 countries. However, it becomes increasingly tighter for the other three groups of countries as the income level decreases. Furthermore, G10 countries display a very clear bimodal distribution of firms' ratings, as a result of two different distributions for firms in the banking sector and outside the banking sector: the former group of firms displays a maximum below the investment grade level while the latter group is much more concentrated towards higher ratings. In contrast, the behavior of the three remaining groups of countries demonstrates that there is a closer correlation between firms' and sovereign ratings, that ratings for both banks and non-banks exhibit a similar pattern and that average ratings decrease with the level of income.

Overall, this brief overview of the worldwide distribution of sovereign and firm ratings shows that US based rating agencies, in spite of the very rapid growth of their

international activities in the last decade, have devoted most of their efforts to relatively more developed economies, where marginal and fixed costs associated to the coverage of additional firms are lower and/or where the demand for ratings is higher. Second, the attainment of a worldwide scope of coverage is a very recent phenomenon, providing rating agencies with too limited a sample for comprehensive assessments of their accuracy in non-G10 countries. Third, rating agencies tend to concentrate initially on the banking sector and only subsequently move to the non-bank sector of the economy. Finally, firms' ratings follow more closely sovereign ratings as the income level decreases. While these outcomes may be fully consistent with rational assessments of credit risk in economies with large information costs and unstable institutional structures, they also point to potential shortcomings in the use of ratings for regulatory purposes. In the Sections below, we shall try to characterize with greater detail some of these shortcomings and to assess their implication on the design of bank capital regulation.

3. From the distribution of ratings to that of capital requirements

As reported in Table 3, the rule relating higher capital requirements to lower rating categories is not a monotone one and differs for banks and non-banks. The distribution of capital requirements, which is implicit in the Basel proposal, is therefore not an obvious outcome of the distribution of ratings, which we have just reviewed. In order to derive the distribution of changes in capital requirements implied in the transition from the present system to the proposed one, we have simulated the effect on the regulatory capital of a bank which would lend to the rated firms located in any single country. The exercise—based on the ratings provided by S&P—simulates the capital requirements that banks would have faced, had the proposed revision of the Capital Accord come into force in the month of November 1999. We then compare the outcome of the simulation with the current capital requirements as defined by the 1988 Capital Accord.

The 1988 regulation imposed different capital requirements according to: 1) the nature of the borrower—bank versus non-bank; 2) the location of the borrower—OECD vs. non-OECD country; 3) the maturity of the loan—less than or more than one year. To compare the 1988 regulation with the new Basel proposal effectively, we focus on the differential impact of the proposed new regulation according to the geographical location of the borrower, its economic sector (bank versus non-bank), and the maturity of loans.

Figure 2A shows the differential capital requirements for all the rated non-bank corporations located in the four previously described groups of countries. Given the nature of the current regulation, which defines a specific regulatory treatment for OECD countries, we have modified the composition of the first two groups along the partition of OECD vs. non-OECD countries instead of that G10 vs. non-G10 countries.

For non-bank corporations, which start all from an 8 per cent requirement, there are three possible outcomes: a decrease of 6.4 percentage points, no change, an increase of 4 percentage points. In our sample, the number of high rated corporations (better than AA), which will allow a lower capital requirement and will accordingly face a lower cost of bank credit, is equal to 581 OECD based firms and to only 15 non-OECD based firms, located in the high income category. Accordingly, no firm belonging to the two lower

income categories would experience a reduction in its borrowing costs. Among OECD based corporations, about four fifths would see no change in the capital banks have to set aside against loans to them. The same is true for the vast majority of the two intermediate groups of countries. However, more than one third of rated firms located in the lower income category would instead face a steep increase. As a result, the average increase of capital that banks would be required to set aside for lending to an OECD corporation would be reduced by 1 percentage point while that required for lending to a corporation based in the poorer group of countries would increase by 1.5 percentage points. This average level, though, may hide the marginal impact on different groups of borrowers (Figure 2A, section b). Differential capital requirements associated with different ratings may reach 10.4 percentage points, with potentially relevant effect on the direction of bank capital flows.

Regarding banks we use a base reference of a common capital requirement of 1.6 per cent on all loans made to other banks, following the notion that foreign borrowing of non-OECD banks from OECD banks has mostly been concentrated in the short end of the maturity spectrum. As for the newly proposed rules, we have concentrated on the case in which bank capital weights are referred to individual bank ratings (option 2 of the Basel Consultative paper) and not to the sovereign rating of the country where the bank is incorporated (option 1 of the Consultative paper). The differential impact of the two options is very limited and does not add new elements to our exercise.

Given these assumptions, the new rules would imply that, differently from the non-bank case, four possible outcomes could prevail: no change, increases of 2.4, 6.4, and 10.4 percentage points. The median value of the increase in capital requirements for loans to OECD banks is equal to 2.4 percentage points, while that for loans to non-OECD banks is equal to 6.4 percentage points. On average, capital requirements would increase by 2 percentage points for OECD banks and up to more than 6 percentage points for banks of poorer countries (Figure 2B, section b). For the sake of completeness, we report also the impact on average capital requirements of long-term lending to non-OECD banks, which was assigned an 8 per cent weight in the 1988 Accord. Even in this case, lending to lower income countries' banks would imply increased capital requirements. As for non-banks, foreign controlled subsidiaries of highly rated firms, which are assigned the rating of their holding company or can borrow from it, might face capital requirements on their borrowing which could differ up to 10.4 percentage points from those of domestic banks.

Of course the increase in capital requirements discussed so far would give rise to an equivalent demand for new capital only in the case in which national regulations were fully aligned to the 1988 Capital Accord and did not already incorporate stricter requirements. From this perspective, our estimates could be seen as a ceiling to the amount of new capital required. At the same time, it could be argued that national requirements may very well be revised upward in order to maintain a more restrictive stance at the national level.

Although it impossible to assess the welfare implications of the external rating procedure for defining minimum bank capital ratios without incorporating additional elements into the analysis, we can already see that less developed economies are likely to

suffer from a substantial increase in their borrowing cost.⁵ Even in the case in which this increase is generated by the desirable removal of previous subsidization schemes, it appears important to devote particular attention to the phasing-in process of any regulatory change in the domain of minimum bank capital ratios. Such caution is needed in order to avoid undesired systemic implications, which could increase rather than reduce the fragility of banking systems.

More generally, all other things being equal, any risk-related criterion for the definition of minimum capital ratios would substantially decrease the cost of credit for internationally diversified firms and could result in an increase in the share of credit to the domestic sector provided by internationally diversified firms. Although the equilibrium allocation should arguably benefit from the removal of an implicit subsidization scheme to the riskiest firms in the market, the potential consequences of a large reallocation of credit flows among different categories of financial intermediaries would need to be analyzed carefully.

4. A tale from the 1997-98 crises: downgrading sovereigns, banks and corporations

The experience of sovereign and private sector ratings in emerging economies in 1997-98 may provide an example in which the revision of ratings could have had some undesired macroeconomic consequences had it been related to banks minimum capital requirements. Indeed, the East Asian crisis and the other crises that hit emerging economies during 1997-98 induced markets and rating agencies to a delayed and large set of revisions of their assessment on crisis countries. Ratings were sharply downgraded for sovereigns. The astounding downgrading is depicted in the rating-transition Figure 3. Based on Moody's data for a large set of countries,⁶ Figure 3 reports on the x axis 1996 (pre-crisis) sovereign ratings and on the y axis the relative 1998 (peak-of-the-crisis) ratings. The rating-transition graph can be read as follows. Figure 3 is divided into different regions by three lines: the 45° continuous line contrasts 1996 with 1998 ratings; the vertical dotted line separates below-investment-grade from above-investment-grade ratings for 1996; the horizontal dotted line separates below-investment-grade from above-investment-grade ratings for 1998. Points lying below the 45° line identify those countries suffering a downgrading between 1996 and 1998; points lying on the 45° line refer to those countries whose rating did not change; points above the 45° line identify those countries whose rating improved between 1996 and 1998. In addition, the horizontal and vertical dotted lines divide the graph into four quadrants. Points in the Northwest quadrant identify countries holding above-investment-grade ratings in both 1996 and 1998. Points in the Southeast quadrant identify countries holding below-investment-grade ratings in both 1996 and 1998. Points in the Southwest quadrant

⁵ The limited number of rated firms in NHICs and the fact that those firms are likely to have easier access to non-bank sources of financing does not weaken our conclusions. Bank regulators, in fact, will not put at a disadvantage rated firms, which are likely to have lower risk profiles. They, instead, are expected to extend the higher capital requirements of rated firms to non-rated concerns as well.

⁶ Specifically, for each of the two years, we consider the year-minimum sovereign rating for the following 31 countries: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Denmark, Finland, France, Germany, India, Indonesia, Japan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Philippines, Singapore, Sweden, Switzerland, Thailand, UK, USA, Venezuela.

identify countries holding above-investment-grade ratings in 1996 and switching to below-investment-grade in 1998. Points in the Northeast quadrant identify countries holding below-investment-grade ratings in 1996 and switching to above-investment-grade in 1998.

The distinction between above-investment-grade and below-investment-grade (or speculative-grade) ratings is very important: besides affecting the cost at which issuers can borrow, ratings determine also the amount of the supply of funds. Specifically, statutes and regulations often forbid institutional investors to invest in assets carrying ratings below a certain level (Dale and Thomas, 1991): these assets are referred to as “below-investment-grade” or “speculative” assets. Thus, when an issuer receives a rating below-investment-grade, the number of potential investors significantly shrinks. In practice, such issuer will no longer face the demand from all investors. If the legal restriction becomes binding for institutional investors, our below-investment-grade issuer will have to rely only on the small fraction of investors to which such restriction does not apply.

A few facts stand out clear from Figure 3. Besides the downgradings of Brazil and Venezuela (in Latin America) and that of India, the sharpest downgradings affected the East Asian crisis countries: Indonesia, Korea and Thailand fell below investment grade and Malaysia came close to the threshold. Various papers have claimed that rating agencies behaved procyclically,⁷ downgrading these countries’ sovereign ratings excessively with respect to their underlying fundamentals.

Downgradings were extensive not only for sovereigns but they amply affected the respective banking systems. This was an outcome to be expected if one considers that currency and banking crises tend to coincide in emerging economies (Kaminsky and Reinarth, 1999). However, the extent to which bank ratings dropped is astounding: the bank rating-transition Figure 4 shows this. Specifically, the dramatic fall brought below investment grade ratings for Korea, Malaysia and Thailand and worsened greatly those for Indonesia as well.⁸

It was perhaps less easy to predict that (non-bank) corporate ratings would be severely downgraded as well. Yet, this is the evidence we gather from the non-bank rating-transition Figure 5.⁹ Corporate downgradings were sharpest in Indonesia, but they were sufficient to bring the average corporation below-investment-grade also in Korea and in Thailand.

Finally, it is worth noticing that sovereign ratings did show some upward revision in 1999, as soon as recovery started for East Asian crisis countries (Figure 6A), consistently with the hypothesis that the 1997-98 downgradings were excessive. This, however, did not translate equally rapidly in a relief for these countries’ corporations (Figure 6B). Both the Korean and Thai sovereign ratings were brought back to

⁷ See, among the others, Ferri, Liu, and Stiglitz (1999); Monfort, and Mulder (2000).

⁸ Specifically, for each of the two years, we consider the year-minimum average-bank rating for the following 15 countries: Argentina, Brazil, Canada, China, Colombia, Denmark, Indonesia, Japan, Korea, Malaysia, Mexico, Philippines, Singapore, Sweden, Thailand.

⁹ Specifically, for each of the two years, we consider the year-minimum average-non-bank rating for the 31 countries included in Figure 3.

investment grade in 1999, but this did not materialize as quickly for Korean and Thai corporations.

The main messages we derive from the descriptive evidence we just showed are that, in emerging economies, private sector ratings seem to greatly depend on the pattern of sovereign ratings. To the extent that sovereign ratings are procyclical, this directly entails that perverse swings in the cost of capital to the private sector will be amplified. This will be even more so should ratings be built into bank CARs, according to the new Basel proposal. Drawing these conclusions on the basis of descriptive analysis only is however improper. It is now time to turn to the econometric analysis to ascertain whether and to what extent private sector ratings show excess sensitivity to sovereign ratings in emerging economies.

5. The pattern of sovereign and individual ratings

We adopt an error correction model (ECM) in the spirit of Harvey (1981) and Hendry (1995). The error correction specification of the model allows us to capture not only the short-term dynamics of the relationship between private sector and sovereign ratings but also the long-term structure of such relation. The model that we estimate has the following specification:

$$1) \quad \Delta Rating_{i,t} = \alpha + \beta \Delta SovRating_{i,t} + \gamma Rating_{i,t-1} + \delta SovRating_{i,t-1} + Dummies + \varepsilon_{it}$$

where $Rating_{i,t}$ is the private rating of firm i at time t ; $SovRating_{i,t}$ is the sovereign rating in firm i 's country at time t , α is the constant term, $|\beta| < 1$ and ε is the error term. Changes in the variables are indicated by Δ . The coefficient of the long-term relationship is given by $-\delta/\gamma$. The short-term (or immediate) impact of the sovereign rating on the individual firm rating is β . In order to investigate the impact of sovereign up- and down-grading on individual firms in particular groups of countries, we also include a dummy for HICs. Other dummies include industry dummies.

The econometric approach we follow consists of estimating two panels of individual firm ratings—referred respectively as banks and non-banks—by examining their dependence on their countries' sovereign ratings over the period 1990-99.¹⁰ The reason we opt to keep the bank ratings separate from the non-bank ratings has to do with the special role banking systems have come to play in emerging economies' crises. Namely, as stressed by Kaminsky and Reinhart (1999), in emerging economies, currency/balance of payments and banking crises tend to be "twin crises", in the sense that a banking crisis may trigger a currency crisis and vice-versa. Accordingly, particularly in the case of downgradings, we may well expect a strong relationship between sovereign and bank ratings, whereas, a priori, we should be agnostic on whether there is a strong link between sovereign and non-bank ratings. Several motivations for a close relationship between individual banks and sovereign ratings are also described in

¹⁰ The linear rule used to attribute numerical equivalents to ratings is likely to underestimate the strength of the relationship between rating changes at lower levels of ratings. An alternative non linear rule, based on the level of credit spreads associated to different levels of ratings, would highlight a stronger correlation between sovereign and non sovereign rating changes in NHICs, thus strengthening our findings.

Moody's (1999a, 1999b) methodology for assessing bank credit risk in emerging markets.¹¹

The two panels are unbalanced because not all firms have a rating for each year. The ratings we use are those attributed by Moody's. The basic statistics of the two panels are reported in Table 4. For each year, we attribute to each firm the minimum rating held during that year. In addition, in order to ascertain whether the hypothesized excess sensitivity of emerging economies' private sector ratings to changes in sovereign ratings is asymmetric, we dichotomize firm rating changes into positive (upgradings) and negative (downgradings). Our a priori is that the excess sensitivity might be stronger for negative than for positive changes.

5.1 The case of non-bank corporations

The non-bank corporation panel contains observations referring to 980 rated firms—rated in one or more years over 1990-99—from 40 countries.¹² Tables 4 and 5 describe the composition of the sample in 1999, when we observe a rating for 895 of the 980 firms. Country-wise, 84.5 per cent of the firms are based in high-income countries. Sector-wise, approximately one third of the firms are utilities (oil; electric; telecom; water). The median rating is substantially higher in high-income countries (65 against 40); in low-income countries median firm ratings are closer to their respective sovereign ratings (40 to 52.5 against 65 to 100 for high-income countries). Median firm ratings are higher for most utilities and automotive firms; they are lower for firms in the metal industry and in the service sector.

Table 6 reports the results of five different specifications of the panel regression.¹³ The first specification is the base one. Results show that non-bank ratings for firm i at time t are negatively related to rating changes for firm i at time $t-1$ (RATING(T-1)) and are strongly positively related to sovereign rating changes at time t (Δ SOVEREIGN).¹⁴

¹¹ The relationship between sovereign ratings and ratings on domestic denominated instruments should be looser than that for foreign currency denominated instruments (Moody's, 1999). No relationship should instead exist between Moody's Financial Strength Ratings –assessing the firm's stand-alone financial strength – and sovereign ratings. Our empirical analysis will be devoted to assess the relationship between sovereign ratings and ratings on long term bank deposits and debt issues of non-bank corporations.

¹² Specifically, we consider the year-minimum sovereign rating for: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Finland, France, Germany, Greece, India, Indonesia, Ireland, Japan, Kazakhstan, Korea, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Panama, Philippines, Poland, Portugal, Russia, Singapore, Spain, Sweden, Switzerland, Thailand, UK, USA, Venezuela.

¹³ All the regressions are run by OLS with random effects using RATS. The 18 dummies controlling for sector effects are not reported for convenience: they are generally not significant and omitting them doesn't qualitatively alter regression results. The fourth and fifth columns report the same specification as the second and third columns, respectively, the only change being that the specific effect is singled out for HICs instead than for NHICs.

¹⁴ We must point out that SOVEREIGN(T-1) is non-significant in the non-bank panel. This suggests that, in our sample, we cannot identify a long-term relation between firm and sovereign ratings, although a short-term relation is still identified. As we will see below, this contrasts with what we find for the bank panel. Although we don't have a fully satisfactory explanation for this lack of a long-term relation between firm and sovereign ratings, we detect that the paucity of observations for NHICs' firms is more pronounced

Furthermore, the negative and significant coefficient of the dummy for NHICs (NONHINCM_DUMMY) suggests that rating changes are generally smaller in size in these countries. Nevertheless, since these countries' rating levels are lower than for high-income countries, smaller-sized rating changes may still be larger in relative terms for non-high-income countries (NHICs).

The second specification adds the new variable $\text{NONHINCM} \cdot \Delta\text{SOVEREIGN}$, in order to check whether sensitivity to sovereign rating changes is larger for firms in NHICs. Results strongly support our priors: $\Delta\text{SOVEREIGN}$ is no longer significant while $\text{NONHINCM} \cdot \Delta\text{SOVEREIGN}$ is significant and its positive coefficient is larger in size than the coefficient for $\Delta\text{SOVEREIGN}$ in the first specification (0.50 against 0.45). We interpret this as evidence that non-bank rating changes are sensitive to sovereign rating changes in NHICs but not in high-income countries.

The third specification includes the additional variable $\text{NONHINCM} \cdot \Delta\text{SOVEREIGN} \cdot \text{DOWNSOV}$, i.e. the variable singling out only sovereign downgradings for NHICs.¹⁵ This is meant to check whether firm ratings in NHICs are more sensitive to sovereign downgradings than to sovereign upgradings. Results are quite telling. On the one hand, $\text{NONHINCM} \cdot \Delta\text{SOVEREIGN}$ becomes almost non-significant, its sign changes, and its coefficient shrinks (-0.14 in lieu of 0.50). On the other hand, $\text{NONHINCM} \cdot \Delta\text{SOVEREIGN} \cdot \text{DOWNSOV}$ is significant and its coefficient is even larger than the one for $\text{NONHINCM} \cdot \Delta\text{SOVEREIGN}$ in the second specification (0.83 against 0.50). The fact that the R^2 sizably increases indicates that this final specification improves on the previous one. This suggests that the excess sensitivity to sovereign rating changes is ample but it is by and large limited to sovereign downgradings in NHICs. In practice, a 10-point—or two notches—sovereign downgrading translates into a 6.9 point downgrading for NHICs' firms whereas it does not systematically affect non-bank ratings in high-income countries.

Finally, the specification of equations (2) and (3) are replicated for HICs. Their estimation shows the absence of short and long term relationships between sovereign and private sector ratings both in the upgrading and in the downgrading episodes.

in the non-bank panel than in the bank panel. This possibly precludes identification of the long-term relation in the non-bank panel.

¹⁵ To be sure, in our sample, most downgradings refer to NHICs. However, there are also downgradings for HICs: e.g. Canada was downgraded in both 1994 and 1995, Denmark and Finland were downgraded in 1992, Japan was downgraded in 1998, New Zealand was downgraded in 1998, Sweden was downgraded in 1991, 1993 and 1995.

5.2 The case of banks

In order to highlight the difference between bank and non-bank ratings, we replicate the previous set of estimates also for banks. Although, in a large number of cases, bank deposit ratings are a mechanical reflection of sovereign ratings, it is useful to verify to what extent this rule applies in equal measure to HICs and NHICs. The bank panel contains observations referring to Moody's long term bank deposits ratings for 959 banks from 57 countries. Country-wise, 73.4 per cent of the banks are based in high-income countries holding a median rating equal to 80.4 (or just above A1), which compares with 44.5 (or just below Ba2) for rated banks in NHICs. This entails that bank ratings are generally higher than non-bank ones in both high-income and NHICs.

Table 7 reports the results for the same five specifications of the panel regression¹⁶ used for non-banks. The results of the first specification show that rating changes for bank i at time t are negatively related to the rating of bank i at time $t-1$ (RATING(T-1)); they are strongly positively related to sovereign rating changes at time t (Δ SOVEREIGN) and they also depend positively on the level of sovereign ratings at time $t-1$ (SOVEREIGN(T-1)).¹⁷ As in the non-bank panel, the negative and significant coefficient of the dummy for NHICs (NONHINCM DUMMY) suggests that rating changes are generally smaller in their absolute size—but not necessarily in relative terms—in these countries.

Similar to the results obtained for non-banks, the second specification adds the new variable NONHINCM* Δ SOVEREIGN, in order to check whether sensitivity to sovereign rating changes is larger for banks in NHICs. Results are interesting. Although Δ SOVEREIGN is still significant, its coefficient drops from 0.80 to 0.28, while NONHINCM* Δ SOVEREIGN is significant and exhibits a large coefficient (0.65). This implies that bank rating changes are sensitive to sovereign rating changes in both high and NHICs but the sensitivity in the former countries is much smaller than in the latter countries (0.28 against 0.93).

In full conformity with the non-bank panel, the third specification includes the additional variable NONHINCM* Δ SOVEREIGN*DOWNSOV, i.e. the variable singling out only sovereign downgradings for NHICs. Although the results differ with respect to the non-bank panel, in qualitative terms they point to the same direction. First, Δ SOVEREIGN is still significant, and its coefficient doesn't change substantially with respect to the second specification (0.27 instead of 0.28). Second, NONHINCM* Δ SOVEREIGN is still significant too but its coefficient drops from 0.65 to 0.48. Third, NONHINCM* Δ SOVEREIGN*DOWNSOV is significant and its coefficient

¹⁶ Specifically, we consider the year-minimum rating for the banks of the following 57 countries: Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, Jordan, Kazakhstan, Korea, Lebanon, Luxembourg, Malaysia, Malta, Mauritius, Mexico, Morocco, Netherlands, Norway, Oman, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Romania, Russia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan, Thailand, Tunisia, Turkey, UK, USA.

¹⁷ As noted above, here we can identify a long-term relation between bank and sovereign ratings, which is equal to 1 in the first specification, to 0.83 in the second, and to 0.67 in the third.

is sizable (0.21). Finally, equations (4) and (5) replicate the above specifications for high-income countries as well.

These results may be interpreted as follows. Bank ratings are a function of sovereign ratings both in high and in NHICs. Nevertheless, ratings of NHICs' banks exhibit higher short term sensitivity to changes in their sovereign ratings, and such sensitivity is noticeably asymmetric: namely, it is larger for sovereign downgradings than for sovereign upgradings. In practice, a 10-point—or two notches—sovereign rating change translates into a 2.7 point rating change for high-income countries' banks and into a 7.5 point rating change for NHICs' banks. In addition, a 10-point sovereign rating downgrading would imply a 9.6 point downgrading for NHICs' banks, as opposed to 5.6 point for HICs.

While the observed dynamics of rating changes may be the hardly avoidable consequence of the informational constraints with which rating agencies are confronted in their activity, we claim that it is important to avoid that such dynamics could induce undesired pro-cyclical patterns on bank capital requirements. More so when this feature may be a peculiar feature of less developed economies.

6. The simulated impact on the CARs of crisis countries

Using the coefficients estimated above, it is possible to offer an appraisal of how national banking systems would be affected by sovereign downgradings, should the newly proposed weights apply. It would be presumptuous to claim that our simulations provide a precise estimation of the impact of sovereign downgradings on the availability and the cost of capital in the countries we analyze. Sovereign downgradings, in fact, happen along with significant changes in the way countries are perceived by markets and there may be several channels through which such changes affect international investors' attitudes towards affected countries. Nevertheless, we deem it illustrative to present some simulations based on the application of our previous findings to actual cases of sovereign downgradings materialized in recent years.

The approach we adopt runs as follows. First, we identify a number of countries, which experienced a sovereign downgrading in recent years. These include six NHICs (Brazil, Colombia, India, Korea, Malaysia, and Mexico) for both the bank and the non-bank simulation, together with five high-income countries (Canada, Finland, Japan, New Zealand, and Sweden) for the non-bank simulation and four high-income countries (Finland, Italy, Japan, and Sweden) for the bank simulation. Second, we define two different simulations based on the estimated impact of the sovereign downgrading on banks and on non-banks. The spirit of the former simulation is that, due to their sensitivity to sovereign rating changes, the country's banks will also be downgraded. In turn, when this implies a higher weighting of interbank exposures vis-à-vis these banks, other domestic or international banks lending to them will have to step up their CARs and the downgraded country's banks will likely experience a worsening in the availability and/or cost of interbank credit. The second simulation assesses how the affected country's bank CARs would change with the sovereign downgrading under the

hypothesis that domestic banks were lending just to the domestic non-bank corporations for which we observe a rating in the pre-crisis year.¹⁸

In practice, we use the estimated values of the coefficients linking sovereign downgradings to bank and non-bank downgradings—respectively from Tables 6 and 7—separately for high-income and NHICs. We then multiply these values by the entity of the observed sovereign downgrading. The resulting downgrading is applied to the pre-crisis individual bank and non-bank ratings in the affected country. Depending on whether or not this implied downgrading leads to a change of CAR weight class for some of the domestic rated banks or non-banks, implied CARs will increase or stay the same. Of course, given the size of the estimated coefficients, our a priori is that implied CARs will more likely increase in NHICs.

The results of the bank downgrading simulation are shown in Figures 7A and 7B, depicting, respectively, the case for non-high-income and high-income countries. Figure 7A shows that interbank CARs would have stayed constant at 8 per cent in the case of the three downgradings—each by two notches, or 10 points in the numeric scale—of Colombia, India, and Mexico. On the contrary, interbank CARs would have increased substantially in the two-notch downgrading of Brazil (from 8 to 12 per cent), in the four-notch downgrading of Malaysia (from 1.6 to 4 per cent), and in the six-notch downgrading of Korea (from 2.8 to 7.3 per cent). Figure 7B detects no change for any of the high-income downgradings: interbank CARs stay put at 1.6 per cent in all four cases.

Figures 8A and 8B—respectively for non-high-income and high-income countries—depict how non-bank downgradings would have affected domestic banks' CARs. Contrary to the case of the interbank CARs, in this simulation domestic bank CARs increase also for most high-income countries: they remain constant at 1.8 per cent in the downgrade of New Zealand, but they increase from 3.3 to 3.8 per cent for Canada, from 2.4 to 3.2 per cent for Finland, from 3.7 to 4.1 per cent for Japan, and from 2.8 to 3.1 per cent for Sweden (Figure 8B). Nevertheless, even in this case, CAR increases are by far more pronounced for NHICs (Figure 8A). The only exception is Mexico, whose bank CARs increase from 7.3 to 8 per cent. Brazil increases from 7.4 to 8.9 per cent; Colombia from 7 to 10 per cent; India and Malaysia double, respectively, from 4 to 8 per cent and from 1.6 to 4 per cent; Korea triples from 1.9 to 5.7 per cent.

All in all, these illustrative simulations may offer a simple device to assess the impact on bank capital requirements of different regulatory schemes, without using the individual ratings but simply making use of the observed patterns of sovereign ratings and of the level of national income. In addition, given the limited number of available individual ratings for NHICs, we can provide estimates of the impact which could be expected from the perspective increase in the number of rated entities. In our case we have shown that a sovereign downgrading has little or no impact at all for bank CARs in high-income countries, whereas it induces ample swings for bank CARs in NHICs¹⁹. In turn, this implies that the new Basel proposal would exacerbate the volatility of bank

¹⁸ In order to simplify our computations, we make the further assumption that domestic bank loans are uniformly distributed among these rated corporations.

¹⁹ For the case at hand the same result could have been obtained – with a loss of generality – computing the observed changes of individual ratings for every single country.

CARs in emerging economies. Considering the direct impact of increased bank CARs and the additional institutional feature that emerging economies' banks would need to tap less developed financial markets to raise the needed capital, the new Basel proposal could considerably worsen the availability and cost of credit to these countries' private sector.

In turn, even a temporary worsening in their access to bank credit could have a negative impact on corporate sectors in emerging economies—e.g. amplifying corporate bankruptcies and holding corporate production constrained below potential. This would provoke a depletion of organizational capacity in emerging economies' corporate sectors with potential long-lasting detrimental consequences for these economies' recovery Greenwald and Stiglitz (1993).

7. Conclusions

In this paper historical data on sovereigns and individual borrowers ratings are used to examine what would be the effect on less developed countries of the introduction of a link between bank Capital Asset Requirements and external ratings, as contemplated in the new Basel proposal.

We find that the Basel proposal would increase the volatility of capital needs of banks in NHICs versus high-income countries' banks. In fact, bank and corporate ratings in NHICs appear to be strongly related and in an asymmetric way to changes in sovereign ratings. A sovereign downgrading would, for instance, imply larger changes in capital allocations than an upgrading and would call for larger capital requirements at the very time in which access to capital markets is more difficult. In addition, the lack of a widespread use of ratings for banks and corporations in NHICs would not provide an effective incentive to adopt more sound risk assessments on the part of banks. In fact, while good banks in HICs would see their capital requirements reduced as a consequence of a prudent lending behavior, their peers in NHICs would not draw an equivalent benefit from an analogous attitude.

As a result of these empirical findings, especially in the case of NHICs, we encourage the adoption of an integrated approach, in which the use of rating agencies' assessments for the definition of capital requirements is supplemented by a larger set of regulatory tools.

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Table 1: Moody's and S&P alphanumeric ratings conversion into numeric values

<i>MOODY'S</i>	<i>S&P</i>	<i>NUMERIC EQUIVALENT</i>
Aaa	AAA	100
Aa1	AA+	95
Aa2	AA	90
Aa3	AA-	85
A1	A+	80
A2	A	75
A3	A-	70
Baa1	BBB+	65
Baa2	BBB	60
Baa3	BBB-	55
Ba1	BB+	50
Ba2	BB	45
Ba3	BB-	40
B1	B+	35
B2	B	30
B3	B-	25
Caa1	From CCC+ to CCC-	20
Caa2	CC	15
Caa3	C	10
Caa	D	5

Table 2: S&P's scope of coverage and median rating by income category groups¹⁾

	<i>Number of rated firms</i>		<i>Median grade</i>	
	<i>Banks</i>	<i>Non Banks</i>	<i>Banks</i>	<i>Non Banks</i>
G10	478	3712	80	60
High Income non G10	131	343	75	70
Upper Middle Income	104	196	45	45
Low Middle Income	91	82	45	35

¹⁾ Figures refer to S&P scope of coverage and ratings based on the November 1999 CD Rom.

Table 3: The newly proposed weights for bank capital asset requirements

<i>Rating Level</i>			<i>Proposed Risk Weight</i>			
<i>S&P</i>	<i>Moody's</i>	<i>Moody's numeric</i>	<i>Sovereign</i>	<i>Interbank Loans</i>		
				<i>Option I (1)</i>	<i>Option II (2) (3)</i>	<i>Corporate</i>
AAA to AA-	Aaa to Aa3	100 \geq R \geq 85	0%	20%	20%	20%
A+ to A-	A1 to A3	85 $>$ R \geq 70	20%	50%	20%	20%
BBB+ to BBB-	Baa1 to Ba1	70 $>$ R \geq 50	50%	100%	50%	50%
BB+ to B-	Ba1 to B3	50 $>$ R \geq 25	100%	100%	100%	100%
Below B-	Below B3	25 $>$ R	150%	150%	150%	150%
Unrated	Unrated		100%	100%	100%	100%
1988 Accord	OECD		0%	20%	20%	100%
	Non-OECD		100%	100%	20% (4)	100%

- (1) Risk weighting based on the weighting of the sovereign of the country in which the bank is incorporated
- (2) Risk weighting based on assessment of individual bank, which is assumed here to be the highest possible.
The risk weight is 50% for unrated banks unless capped by the sovereign rate.
- (3) For short-term claims the risk weight of the individual bank is one category more favorable.
The proposed accord defines short-term as six months maximum.
- (4) Short-term loans. The 1988 Accord defines short-term as one year maximum.

Table 4: Description of the 1999 bank and non-bank samples with median ratings ¹⁾

	<i>Number (&%) of rated firms</i>		<i>Median grade</i>		<i>Sovereign</i>
	<i>Banks</i>	<i>Non Banks</i>	<i>Banks</i>	<i>Non Banks</i>	<i>Rating</i>
Australia	11 (1.1%)	36 (4.0%)	77	75	95
Austria	7 (0.7%)	4 (0.4%)	86	80	100
Belgium	7 (0.7%)	7 (0.8%)	85	80	95
Canada	10 (1.0%)	99 (11.0%)	85	60	92.5
Denmark	4 (0.4%)	3 (0.3%)	80	85	97.5
Finland	6 (0.6%)	8 (0.9%)	78	62.5	100
France	88 (9.2%)	31 (3.4%)	84	70	100
Germany	38 (4.0%)	13 (1.5%)	92	80	100
Greece	9 (0.9%)	5 (0.6%)	61	35	75
Iceland	2 (0.2%)	n. a.	70	n. a.	92.5
Ireland	7 (0.7%)	4 (0.4%)	79	20	100
Italy	27 (2.8%)	n. a.	76	n. a.	85
Japan	59 (6.2%)	138 (15.3%)	72	60	95
Luxembourg	6 (0.6%)	6 (0.7%)	85	75	100
Netherlands	8 (0.8%)	108 (12.0%)	93	70	100
New Zealand	n. a.	10 (1.1%)	n. a.	90	95
Norway	4 (0.4%)	8 (0.8%)	73	90	100
Portugal	5 (0.5%)	2 (0.2%)	72	92.5	90
Singapore	6 (0.6%)	6 (0.7%)	80	72.5	97.5
Spain	21 (2.2%)	6 (0.7%)	83	80	90
Sweden	8 (0.8%)	15 (1.7%)	83	70	92.5
Switzerland	9 (0.9%)	7 (0.7%)	91	90	100
UK	27 (2.8%)	140 (15.5%)	84	70	100
USA	335 (34.9%)	106 (11.7%)	80	65	100
Total high-income countries	704 (73.4%)	762 (85.0%)	80.4	65	100
Argentina	13 (1.4%)	27 (3.0%)	36	40	40
Brazil	28 (2.9%)	14 (1.6%)	25	30	25
Chile	11 (1.1%)	14 (1.6%)	63	65	72.5
China	15 (1.6%)	2 (0.2%)	60	55	70
Colombia	6 (0.6%)	2 (0.2%)	47	25	52.5
Czech Republic	6 (0.6%)	1 (0.1%)	60	65	72.5
Ecuador	2 (0.2%)	n. a.	22	n. a.	25
Egypt	7 (0.7%)	n. a.	45	n. a.	57.5
Estonia	3 (0.3%)	n. a.	54	n. a.	72.5
Hungary	6 (0.6%)	n. a.	52	n. a.	65
India	8 (0.8%)	3 (0.3%)	46	45	45
Indonesia	12 (1.3%)	8 (0.8%)	30	20	25
Jordan	3 (0.3%)	n. a.	35	n. a.	40
Kazakhstan	3 (0.3%)	1 (0.1%)	31	35	35
Korea	18 (1.9%)	8 (0.8%)	48	50	60
Lebanon	4 (0.4%)	n. a.	30	n. a.	35
Malaysia	5 (0.5%)	3 (0.3%)	59	55	55
Malta	2 (0.2%)	n. a.	72	n. a.	70
Mauritius	1 (0.1%)	n. a.	60	n. a.	67.5
Mexico	10 (1.0%)	28 (3.1%)	40	35	52.5
Morocco	4 (0.4%)	n. a.	45	n. a.	50
Oman	4 (0.4%)	n. a.	55	n. a.	60
Pakistan	4 (0.4%)	n. a.	16	n. a.	20
Panama	3 (0.3%)	2 (0.2%)	53	42.5	50
Peru	4 (0.4%)	n. a.	32	n. a.	47.5
Philippines	n. a.	8 (0.8%)	n. a.	47.5	52.5
Poland	8 (0.8%)	1 (0.1%)	48	55	65
Romania	4 (0.4%)	n. a.	26	n. a.	22.5
Russia	12 (1.3%)	2 (0.2%)	19	10	5
Slovak Republic	3 (0.3%)	n. a.	47	n. a.	55
Slovenia	2 (0.2%)	n. a.	55	n. a.	77.5
Taiwan	10 (1.0%)	n. a.	72	n. a.	85
Thailand	10 (1.0%)	6 (0.7%)	47	50	57.5
Tunisia	8 (0.8%)	n. a.	50	n. a.	60
Turkey	16 (1.7%)	n. a.	32	n. a.	35
Venezuela	n. a.	3 (0.3%)	n. a.	30	25
Total non-high-income countries	255 (26.6%)	133 (15.0%)	44.5	40	52.5
Grand Total	959 (100.0%)	895 (100.0%)	...	65	95

¹⁾ Data are derived from Moody's public database. Ratings are converted to numeric according to the conversion scale in Table 1.

Table 5: Description of the 1999 non-bank sample by sector with median ratings ¹⁾

	<i>Number (& %) of rated firms</i>	<i>Median grade</i>
Oil	93 (10.4%)	70
Electric	116 (13.0%)	70
Telecom	83 (9.3%)	45
Water	9 (1.0%)	80
Trading, Retail & Consumers Products	37 (4.1%)	60
TV, Telephone, Electronics & Electrical Equipment	84 (9.4%)	65
Construction, Real Estate, Building Materials & Cement	33 (3.7%)	55
Agriculture	4 (0.4%)	62.5
Automotive, Tires, Transports, Aerospace, Shipping, Machinery & Mechanical Components	79 (8.8%)	70
Metals, Mining, Shipyards, Containers, Steel & Railroads	55 (6.1%)	55
Hotels, Casinos, Entertainment, Amusements, Motion Pictures, Records, Advertising, Media, Jewelry & Broadcasting	25 (2.8%)	45
Restaurants, Food, Drinks, Brewery, Sugar & Tobacco	78 (8.7%)	65
Finance, Diversified & Miscellaneous	59 (6.6%)	65
Textiles, Apparel & Shoes	10 (1.1%)	55
Chemicals, Plastics, Paper, Pharmaceuticals & Drugs	89 (9.9%)	60
Health equipment, Help Supply Services, Office Systems, Environment, Research Development Labs, Hospitals & Hospital Supplies	15 (1.7%)	60
Printing, Publishing, Glass, Photo & Optical Products	23 (2.6%)	60
Sovereign Guaranteed	3 (0.3%)	85
Grand Total	895 (100.0%)	65

¹⁾ Data are derived from Moody's public database. Ratings are converted to numeric according to the conversion scale proposed in Table 1.

Table 6: Regression results on non-banks

	<i>Equation (1)</i>	<i>Equation (2)</i>	<i>Equation (3)</i>	<i>Equation (4)</i>	<i>Equation (5)</i>
Dependent variable	Δ RATING	Δ RATING	Δ RATING	Δ RATING	Δ RATING
Regressors					
CONSTANT (α)	1.97 (.85)	3.7 (1.7)***	3.7 (1.67)***	1.12 (.6)	1.22 (.6)
RATING(T-1) (γ)	-.03 (-3.5)*	-.03 (-3.2)*	-.03 (-4.0)*	-.03 (-3.2)*	-.03 (-3.25)*
Δ SOVEREIGN(β)	.45 (20.4)*	.02 (.39)	.02 (.5)	.52 (22.5)*	.52 (22.5)*
SOVEREIGN(T-1) (δ)	-.004 (.4)	-.02 (1.5)	-.01 (-1.2)	-.02 (-1.5)	-.02 (-1.6)
NONHINCM* Δ SOVEREIGN		.50 (8.3)*	-.14 (1.8)***		
NONHINCM* Δ SOVEREIGN* DOWNSOV			.83 (12.1)*		
NONHINCM DUMMY	-1.93 (-2.8)*	-2.57 (-3.8)*	-.34 (-.5)		
HINCM* Δ SOVEREIGN				-.50 (-8.3)*	-.52 (-6.9)*
HINCM* Δ SOVEREIGN*DOW NSOV					.08 (.7)
HINCM DUMMY				2.57 (3.8)*	2.64 (3.9)*
R ²	.29	.32	.40	.33	.33
LONG-TERM EQUILIBRIUM - δ/γ	-.13	-.67	-.33	-.67	-.33

Note: t statistics reported in parentheses. *, **, *** indicate 1%, 5%, 10% statistical significance levels, respectively.

Δ RATING: First difference of individual firm rating.

RATING(T-1): Lagged individual firm rating.

Δ SOVEREIGN: First difference of sovereign rating.

SOVEREIGN(T-1): Lagged sovereign rating.

NONHINCM: Non-High-Income country dummy.

DOWNSOV: Sovereign downgrading dummy.

HINCM: High-income country dummy.

Table 7: Regression results on banks

	<i>Equation (1)</i>	<i>Equation (2)</i>	<i>Equation (3)</i>	<i>Equation (4)</i>	<i>Equation (5)</i>
Dependent variable	Δ RATING	Δ RATING	Δ RATING	Δ RATING	Δ RATING
Regressors					
CONSTANT (α)	.87 (.46)	.51 (.75)	.67 (.97)	-1.04 (-2.6)*	-.70 (-1.8)***
RATING(T-1) (γ)	-.08 (-13.4)*	-.06 (-11.6)*	-.06 (-11.4)*	-.06 (-11.6)*	-.06 (-11.2)*
Δ SOVEREIGN(β)	.80 (49.3)*	.28 (7.4)*	.27 (7.4)*	.92 (53.9)*	.92 (54.3)*
SOVEREIGN(T-1) (δ)	.08 (9.0)*	.05 (5.8)*	.04 (5.5)*	.05 (5.8)*	.04 (4.7)*
NONHINCM* Δ SOVEREIGN		.65 (15.7)*	.48 (7.7)*		
NONHINCM* Δ SOVEREIGN*D OWNSOV			.21 (3.6)*		
NONHINCM DUMMY	-3.0 (-1.6)***	-1.5 (-4.1)*	-1.2 (-3.2)*		
HINCM* Δ SOVEREIGN				-64 (-15.7)*	-76 (-16.04)*
HINCM* Δ SOVEREIGN*DOWN SOV					.4 (4.7)*
HINCM DUMMY	-2.38 (-1.27)			1.44 (3.9)*	1.86 (5.0)*
R ²	.41	.45	.45	.45	.46
LONG-TERM EQUILIBRIUM	1*	.83*	.67*	.83*	.63*
$-\delta/\gamma$					

Note: t statistics reported in parentheses. *, **, *** indicate 1%, 5%, 10% statistical significance levels, respectively.

Δ RATING: First difference of individual firm rating.

RATING(T-1): Lagged individual firm rating.

Δ SOVEREIGN: First difference of sovereign rating.

SOVEREIGN(T-1): Lagged sovereign rating.

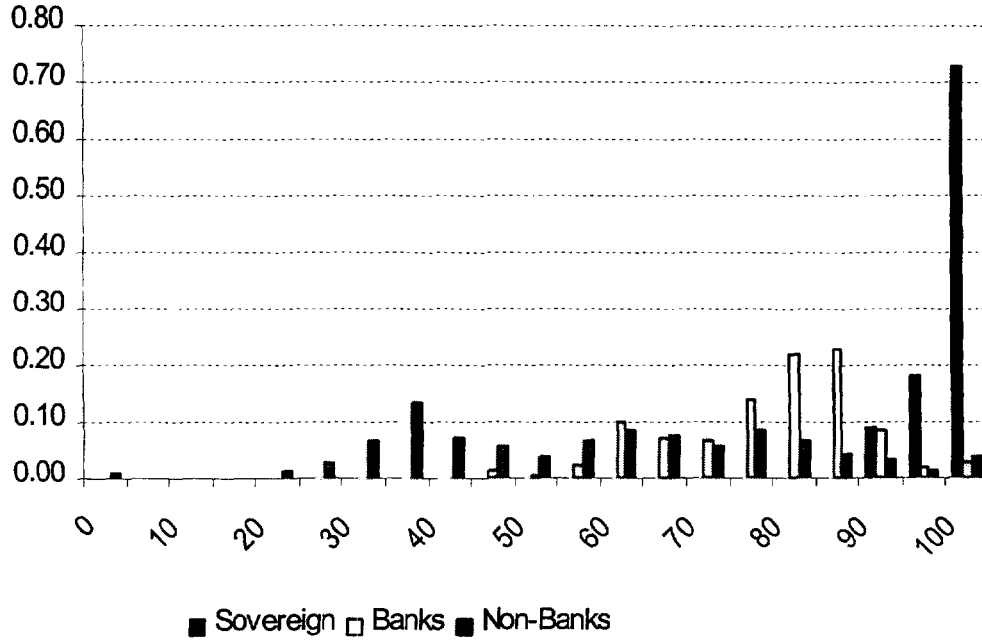
NONHINCM: Non-High-Income country dummy.

DOWNSOV: Sovereign downgrading dummy.

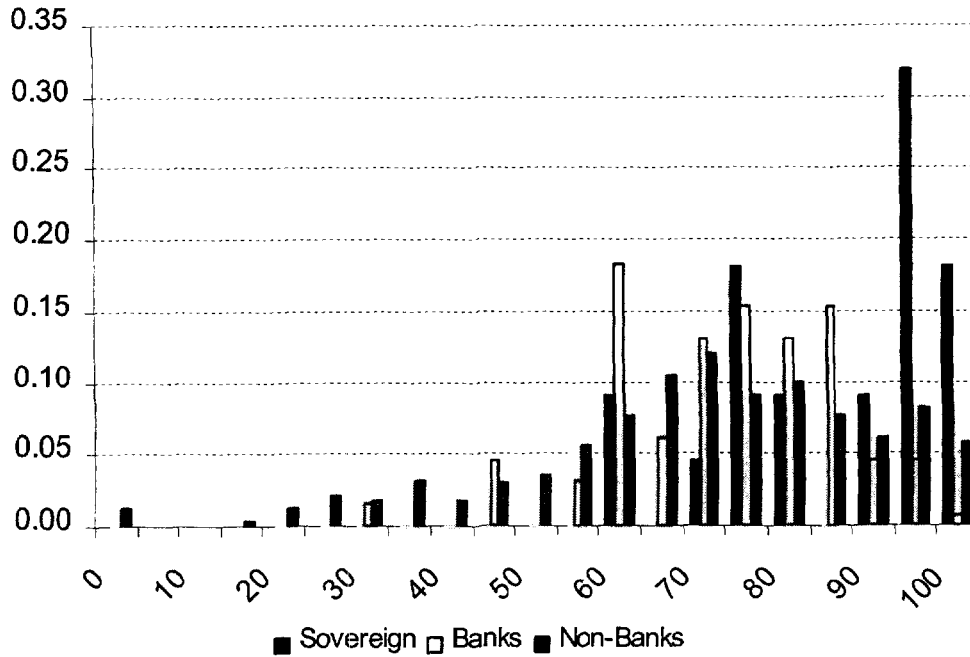
HINCM: High-income country dummy.

Figure 1: Relative rating distribution

Section a. G10



Section b. High Income Non G10



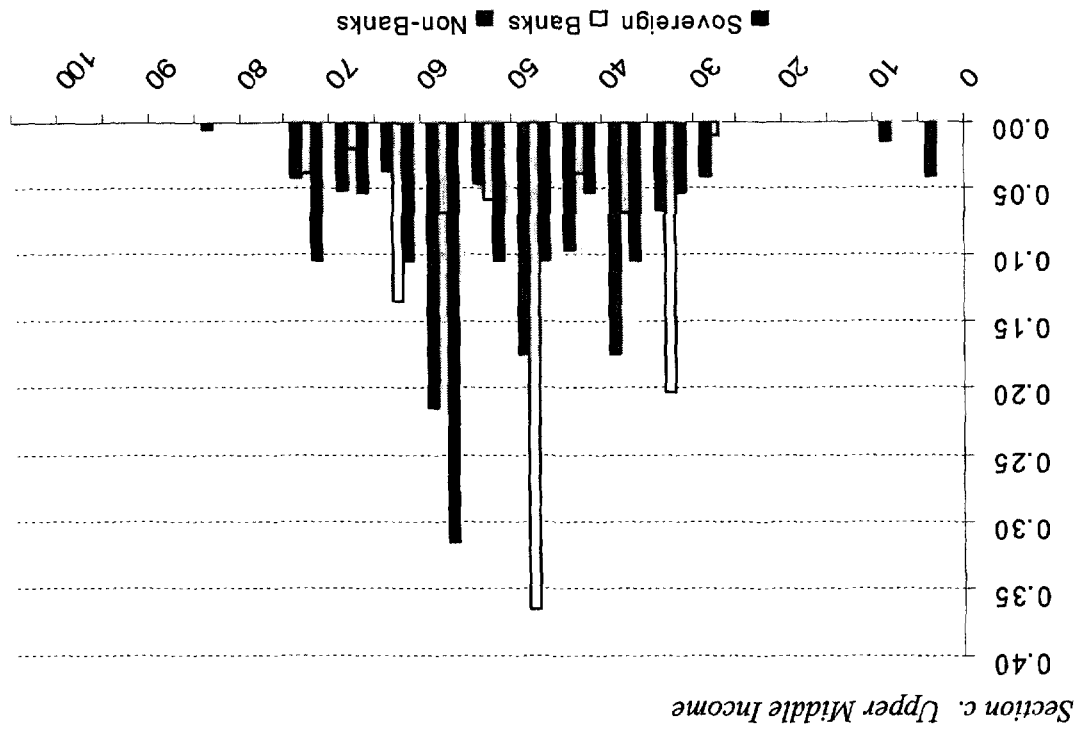
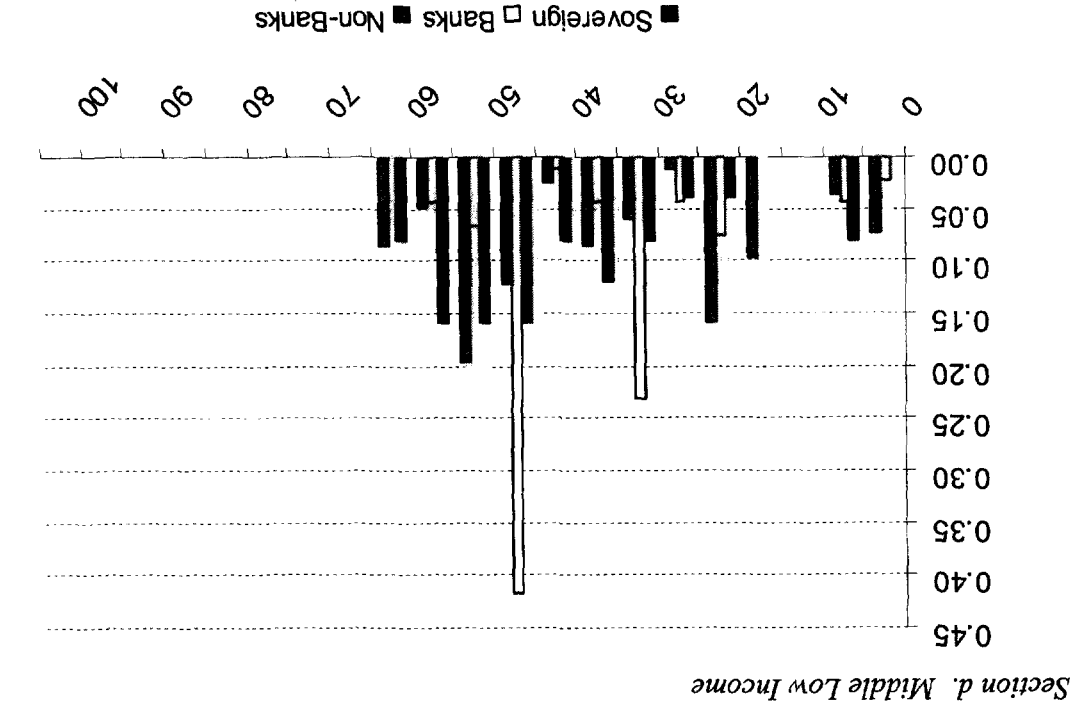
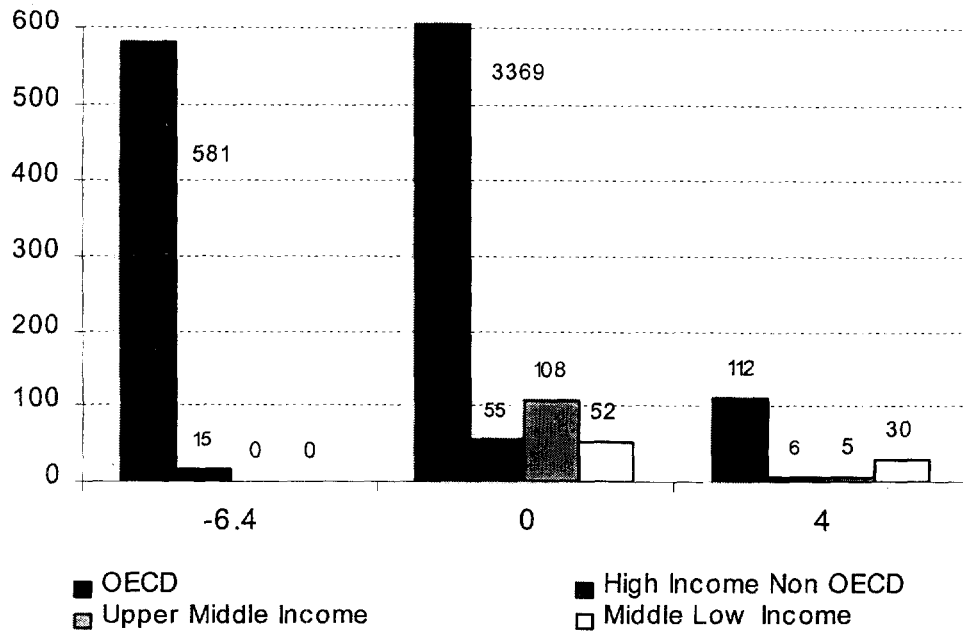


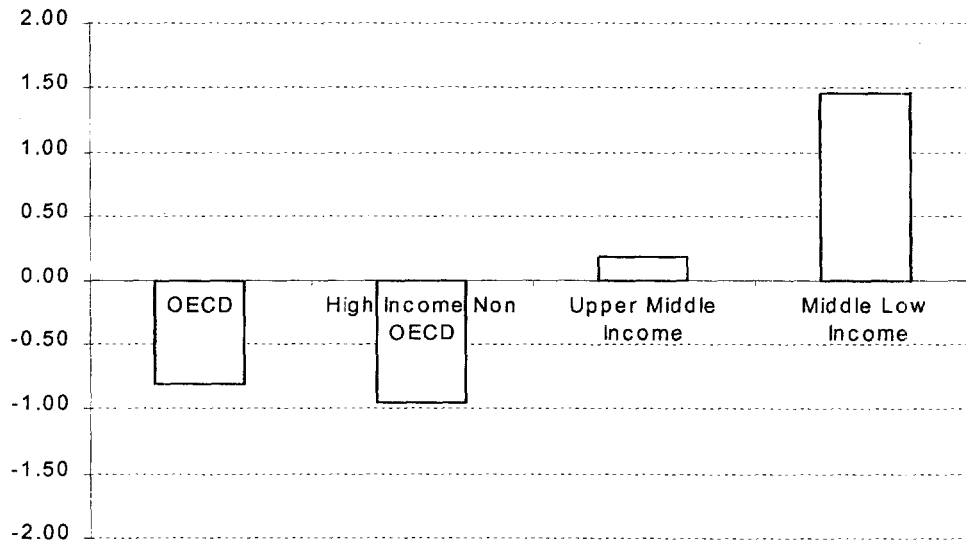
Figure 1: Relative rating distribution

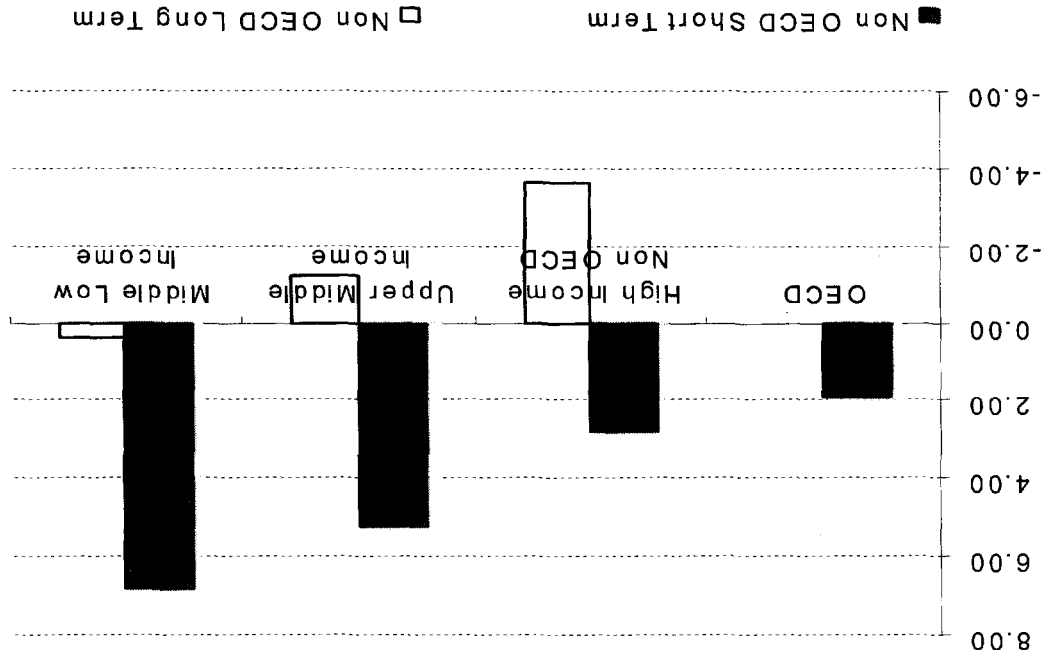
Figure 2A: Capital adequacy ratio change for non bank loans

Section a. Distribution of CAR change for non banks loans



Section b. Average CAR change for non bank loans





Section b. Average CAR change for bank loans

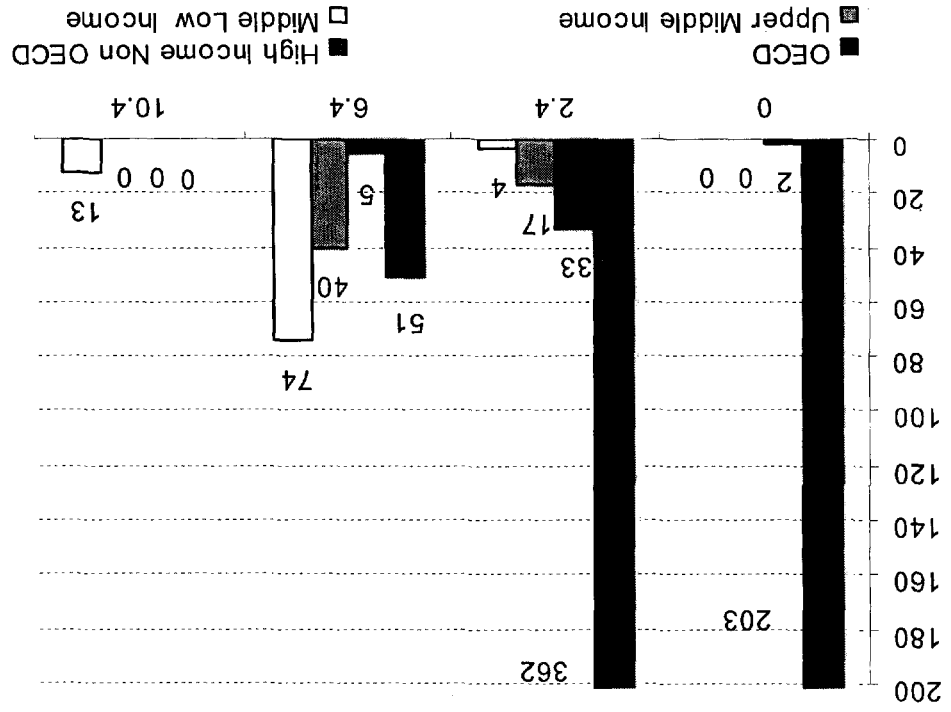


Figure 2B: Capital adequacy ratio change for bank loans
 Section a. Distribution of CAR change for bank loans

Figure 3:

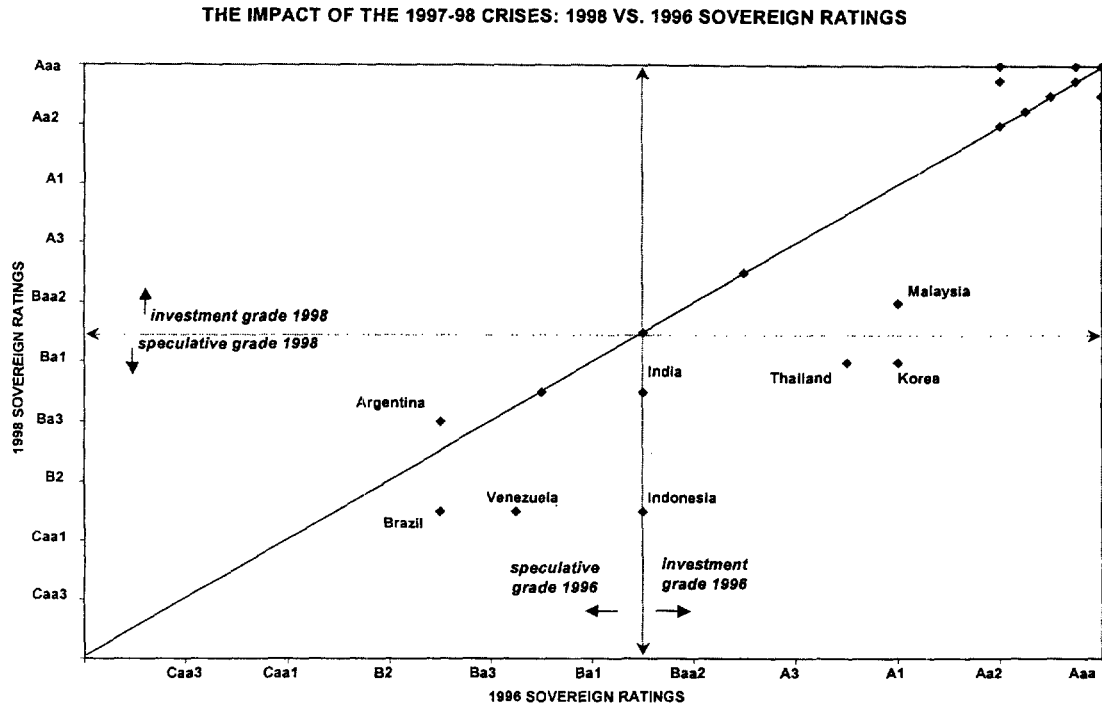


Figure 4:

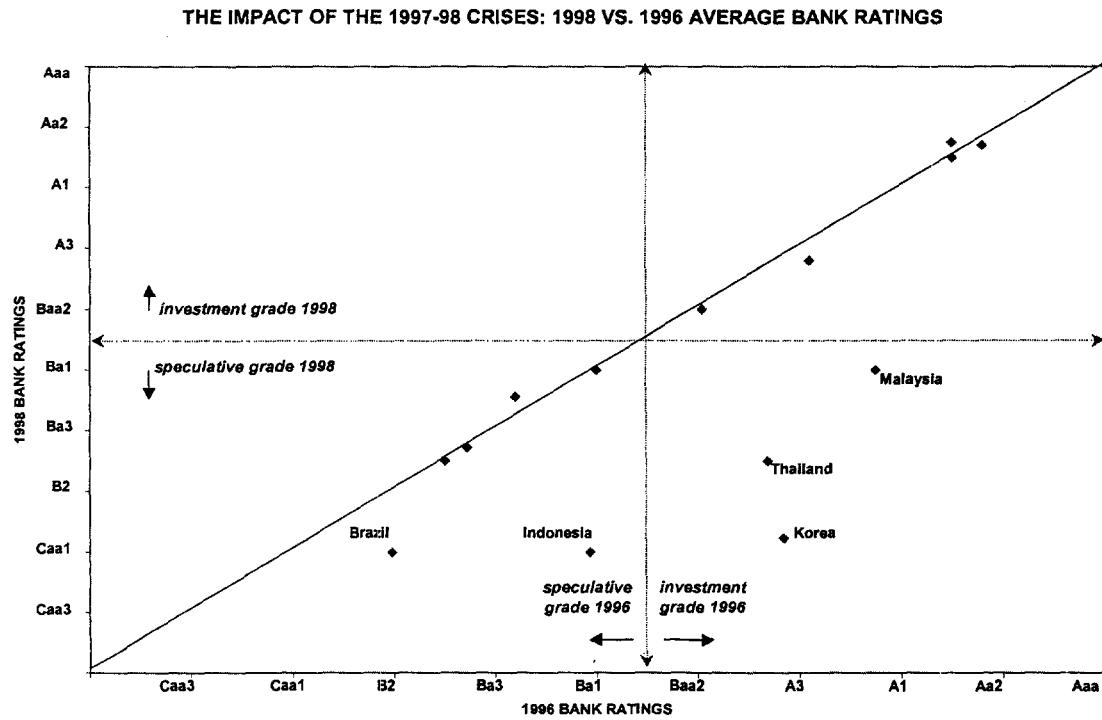


Figure 5:

THE IMPACT OF THE 1997-98 CRISES: 1998 VS. 1996 AVERAGE NON-BANK RATINGS

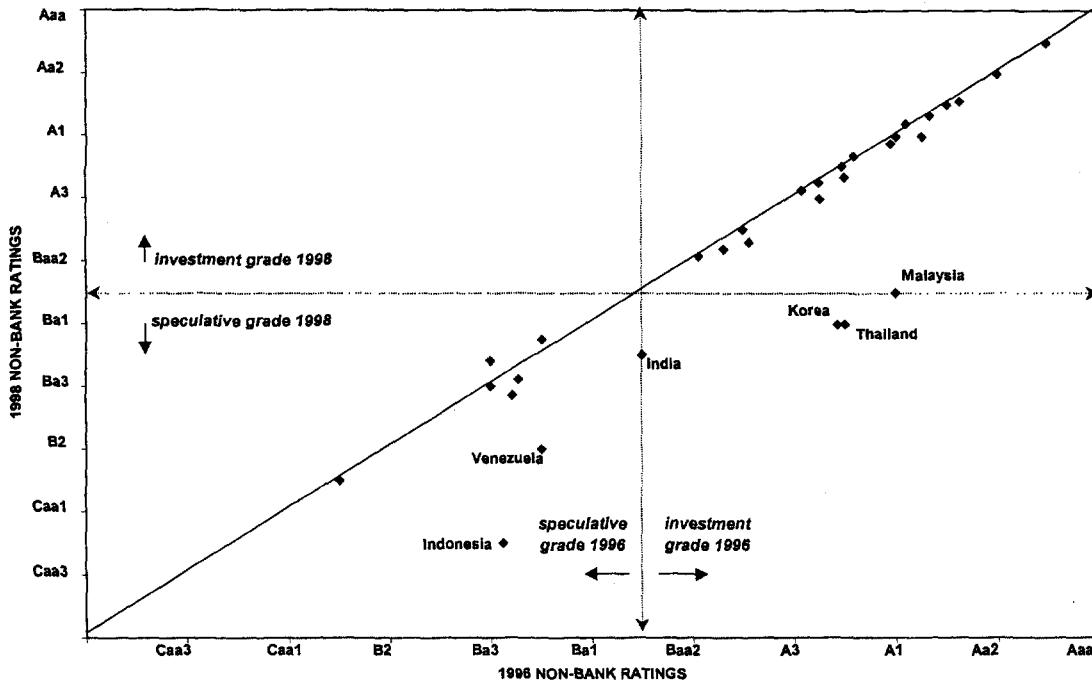


Figure 6A:

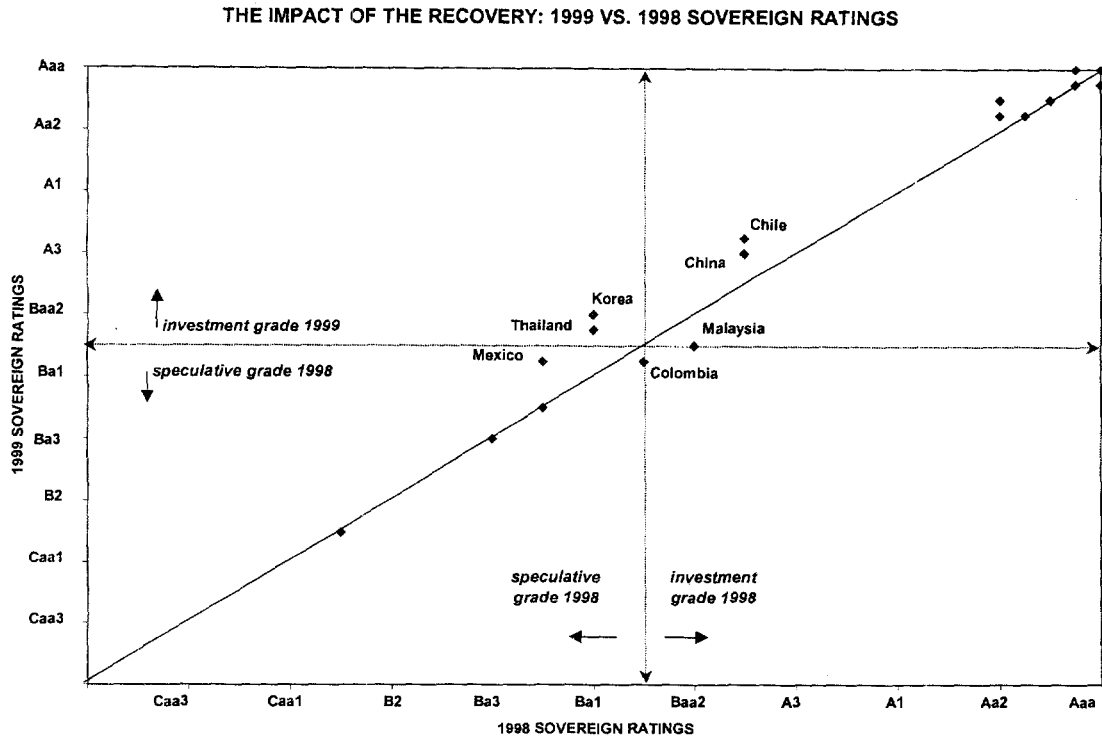


Figure 6B:

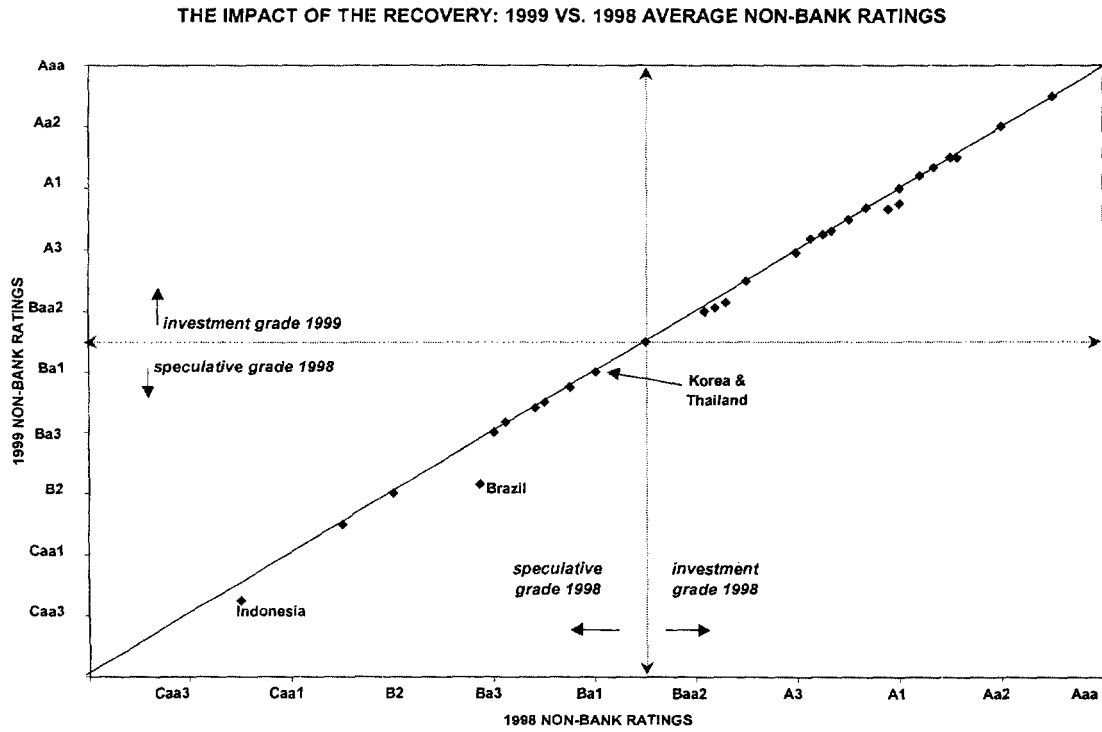


Figure 7A:

SIMULATED NEW BASLE BANK CARs AGAINST LOANS TO RATED BANKS IN SIX DOWNGRADED EMERGING ECONOMIES

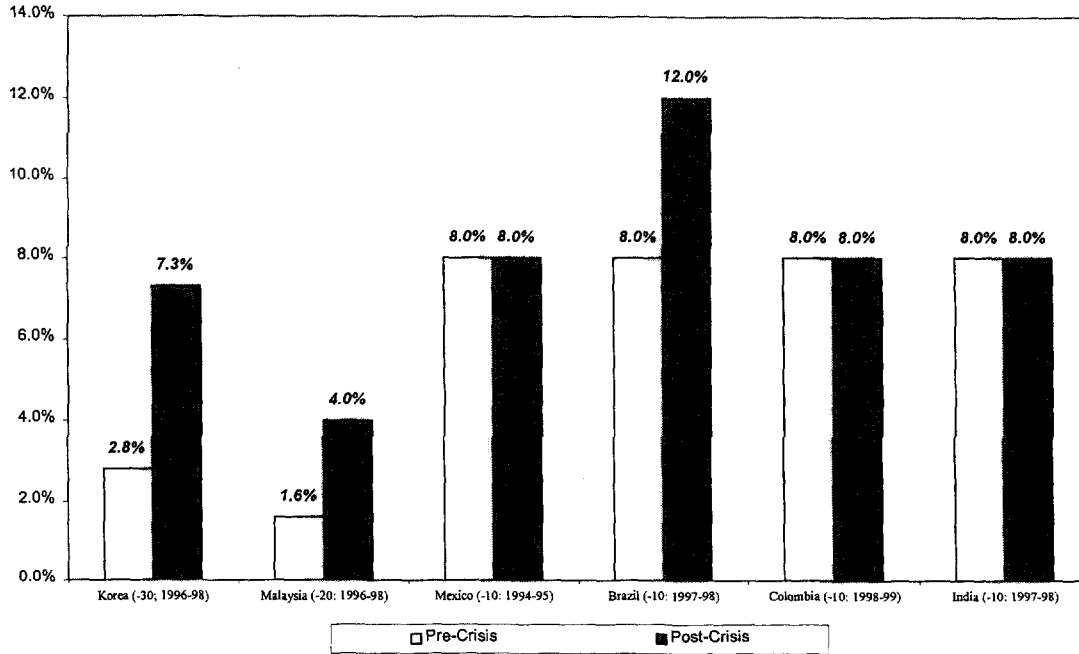


Figure 7B:

SIMULATED NEW BASLE CARs AGAINST LOANS TO RATED BANKS IN FOUR DOWNGRADED HIGH INCOME OECD COUNTRIES

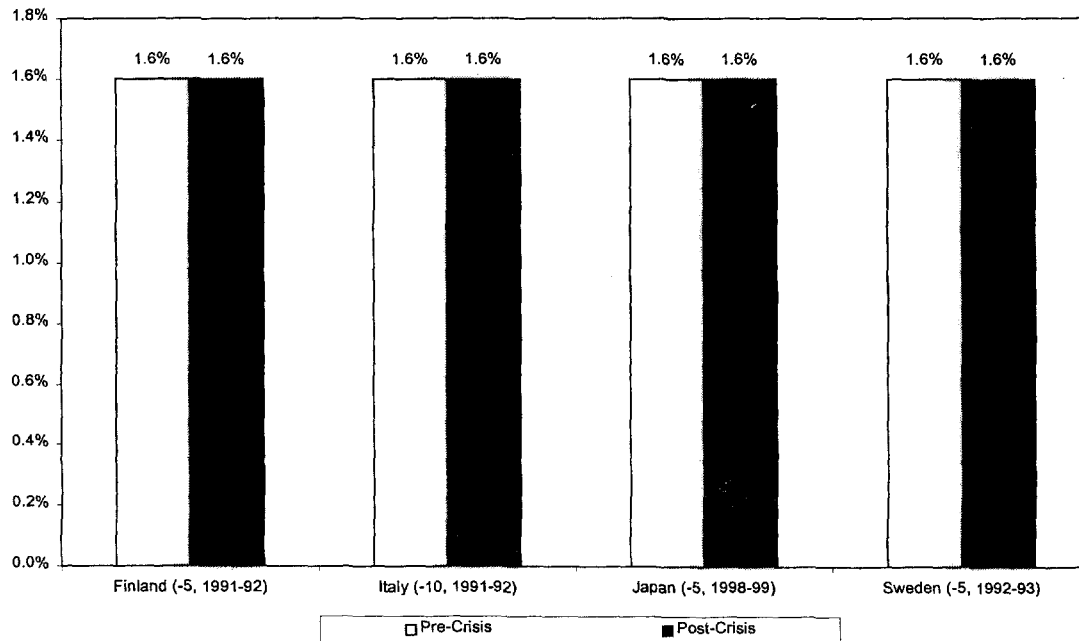


Figure 8A:

**SIMULATED NEW BASLE BANK CARs AGAINST LOANS TO RATED COMPANIES IN SIX
DOWNGRADED EMERGING ECONOMIES**

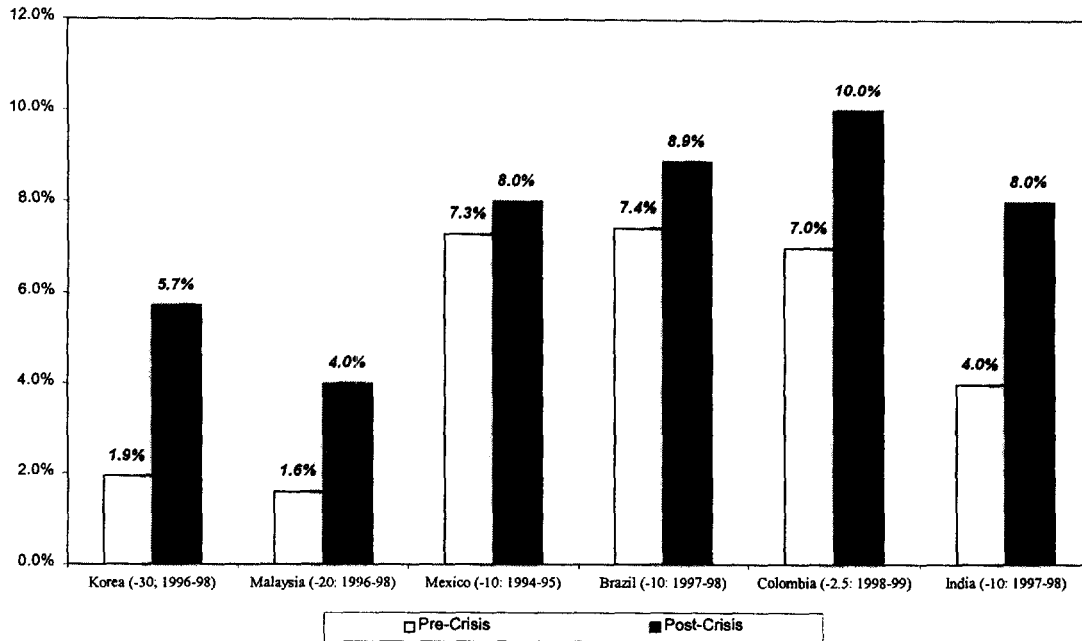
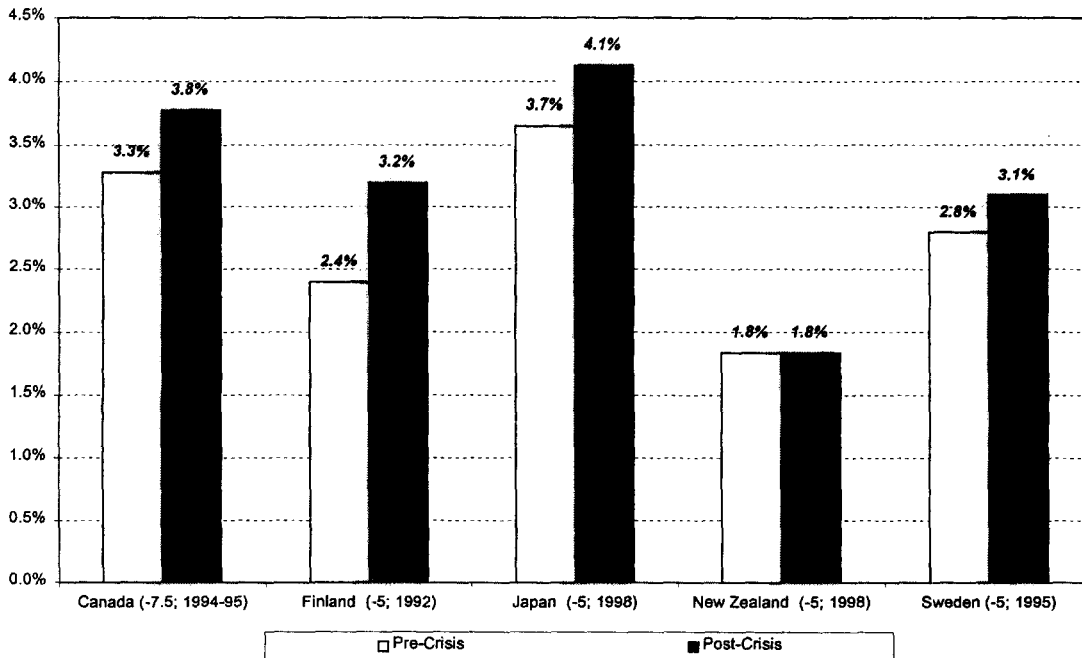


Figure 8B:

**SIMULATED NEW BASLE BANK CARs AGAINST LOANS TO RATED COMPANIES IN FIVE
DOWNGRADED HIGH-INCOME ECONOMIES**



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