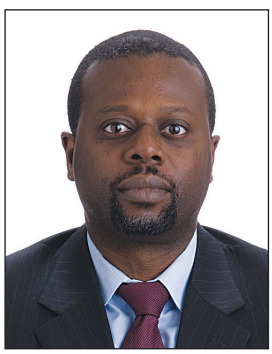
Managing the Risk of Credit Rating Downgrades: Lessons for Investors from Recent Crises



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INTRODUCTION

The unfolding debt crisis in the Euro zone and the US subprime crisis show that investors face a number of risks from credit rating downgrades. Indeed, rating downgrades can lead to large market losses, fire sales, and drying up of liquidity as well as having knock-on effects on a number of systemically important market participants, either through legislation, regulations and supervisory policies, or contractual arrangements and investment practice.

Furthermore, unanticipated and abrupt credit rating downgrades are quite common. Prior to the subprime and the Euro zone debt crisis, there has been about one such event every three years in the past twenty-two years. These include the downgrades of a number of Asian countries in 1998 and of large corporates such as Enron, Parmalat, the California utilities, WorldCom, Global Crossing, and AT&T Canada.

The question at stake is: how can investors identify, measure, and manage the risk of credit rating downgrades? To address this question, the paper draws lessons for investors from the current Greek debt crisis and the US subprime crisis as well as the Asian crisis and demonstrates the different mechanisms through which credit rating downgrades can lead to investment losses. It then suggests a framework which investors can use to address such risks.

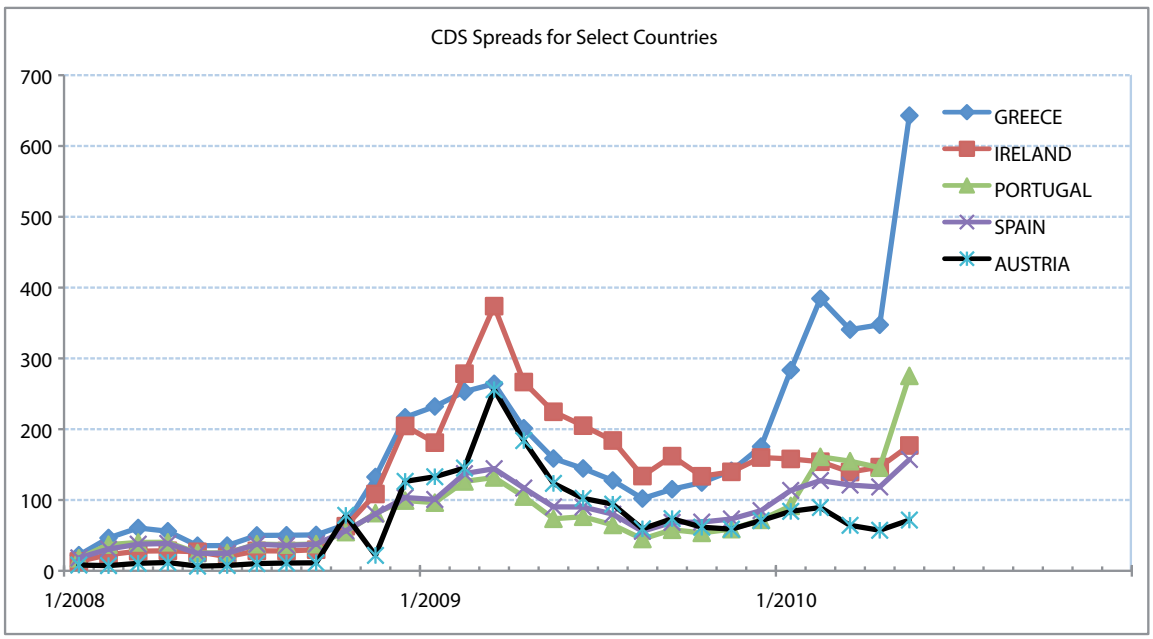
The rest of the paper is organized as follows. First, the paper uses recent developments in the euro area to discuss how downgrades can (i) increase borrowing costs and reduce access to capital markets, (ii) disrupt the functioning of money markets as ratings-based collateral rules are triggered by rating downgrades (iii) have spillover effects from sovereign debt to other asset classes. The paper also uses the recent US subprime debt crisis to illustrate that downgrades can lead to (iv) a drying up of liquidity, (v) collateral calls through ratings-based triggers; and (vi) market losses through ratings-based investment mandates. Second, following the insights of Turnbull (2009) and Sy (2009), the paper suggests that investors and risk managers ask themselves the following five questions with a focus on problem areas: (i) What criteria do credit rating agencies use to assign ratings? (ii) What methodology do credit rating agencies use? (iii) What data do credit rating agencies use? (iv) What use is a rating? (v) What are the systemic effects of credit ratings?

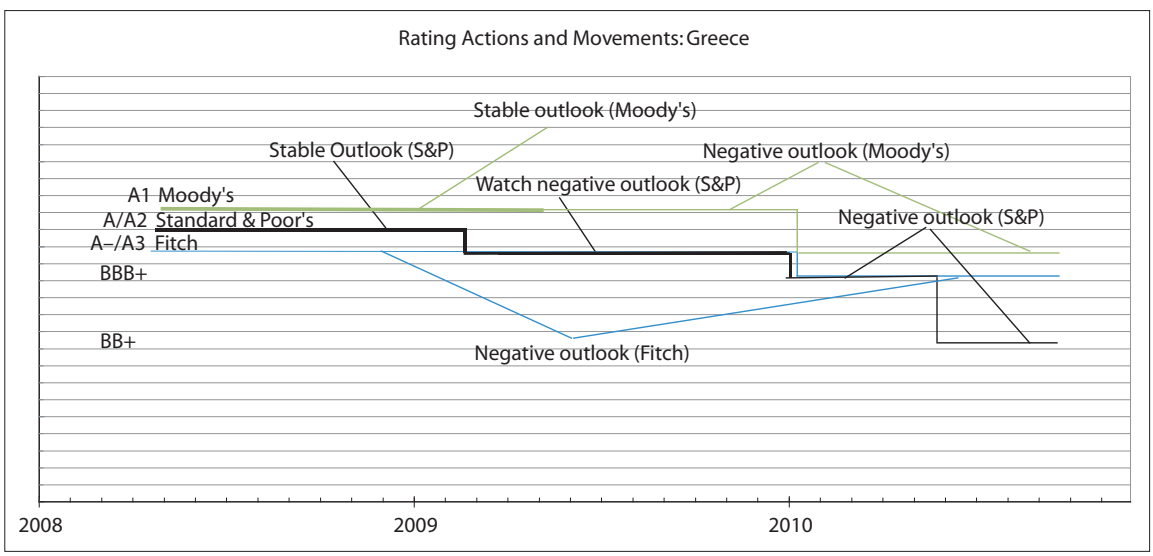
I. LESSONS FOR INVESTORS AND RISK MANAGERS FROM PREVIOUS CRISES

1.1 Credit Rating Downgrades, Cost of Borrowing, and Market Access

The most immediate effect of a credit rating downgrade is the increase in the rated issuer's borrowing cost and a possible reduced access to capital markets. A credit downgrade reflects the rating agency's revision of its opinion on the probability of default (and/or expected loss) of the rated debt. The associated increase in credit risk typically increases the cost of borrowing and renders accessing debt markets more difficult. The increased number of advanced economies' sovereign credit rating downgrades and the behavior of sovereign credit default swap spreads—the cost of buying default protection against a country—are particularly telling in this regard (Figure 1).

FIGURE 1
CDS Spreads for Selected European Countries and Greek Credit Ratings





Rating agencies' reassessment of the outlook for Greek public finances led to the downgrade of Greece's sovereign debt at the end of 2009, triggering an increase in its bond yield and credit default swap spreads[2]. The market's belief that the Greek budget deficit for 2009 would be significantly higher than expected, led to further rating downgrades of Greece's government debt by all three major rating agencies, starting in December 2009 (to BBB+ for Fitch and S&P and A2 for Moody's).

In addition, negative outlooks indicated that rating agencies were ready to downgrade Greece's debt again in the future. Greece's cost of borrowing increased significantly as five-year CDS premia (the cost of insuring against a default by the Greek government) widened to more than 200 basis points. Although market access was not initially compromised as the Greek government successfully placed Euro 8 billion in January 2010 at 380 basis points above German government bonds and 30 basis points above similar outstanding Greek government bonds, subsequent developments showed that markets would be closed to Greece. By end-April 2010, Greece's bond yield spreads over German bunds widened to about 800 basis points as its credit rating was downgraded to speculative grade or junk rating. With further downgrades taking the country deeper into junk bond territory, Greek five year CDS spreads have increased by a total of 1,139 basis points from July 2008 to April 2011.

1.2 Credit Rating Downgrades and Spillover Effects

As in the Asian crisis, sovereign credit rating downgrades were not limited to one country but affected other countries in the same region. Following Greece's downgrade, spreads of Euro zone countries with large fiscal deficits, especially Portugal and Spain and other members of the so-called GIIPS (Greece, Ireland, Iceland, Portugal, and Spain) also widened. Market access was denied to Portugal in early February 2010 as it was not able to auction a small government debt issue. By April 2010, Portuguese spreads reached their highest level since 1997 following a downgrade to A– from A+ while spreads for Spain increased as S&P downgraded its credit rating to AA.

As the Euro weakened, spillover effects were not confined to sovereign debt. On March 24, 2010 the euro tumbled to a 10-month low. The fall of the common European currency occurred on the eve of a Euro zone leaders' summit on a possible rescue package for Greece, and after Fitch Ratings announced it had downgraded Portugal's credit rating from AA to AA–. The downgrade most certainly raised concerns about market overshooting and increased borrowing costs not only in Portugal but also in other European countries. A closer scrutiny of the functioning of financial markets shows, however, that Euro zone sovereign credit ratings downgrades have triggered a chain of events that goes beyond increases in government borrowing costs and a weaker Euro when other markets were affected. European banking stocks declined along with global equity prices while corporate credit spreads widened.

A recent empirical study by Arezki et al. (2011) examines the spillover effects of sovereign rating news across European countries and financial markets during 2007–2010. It finds that sovereign rating downgrades have statistically and economically significant spillover effects across both countries and financial institutions. Those spillover effects depend on the type of rating announcements, on the source country experiencing the downgrade and on the rating agency from which the announcements originate. However, the paper also finds evidence that some rating announcements such as rating downgrades near speculative grade (e.g. downgrade of Greece to BBB+ from A– by Fitch on December 8, 2009) have a systematic spillover effect across Euro zone countries under consideration. Rating-based triggers used in banking regulation, CDS contracts, and investment mandates may help explain these results.

1.3 Credit Rating Downgrades and Banks' Capital Requirements

Greece's sovereign downgrade was a key driver of the subsequent downgrades of Greek banks. On March 31, 2010, Moody's downgraded the credit ratings of five Greek banks, citing the impact of the austerity plan and of a possible recession on banks' income statements and balance sheets. The rating agencies maintained a negative outlook on these banks, which indicates that future downgrades are possible. Equity prices for major Greek banks declined by almost 20 percent in one week, prompting Greek regulators to proscribe short-selling.

Exposure to Greek, Portuguese, and Spanish sovereign risk seems to have been the main driver of the fall in equity and bond prices for banks in Greece, Portugal,

and Spain while also affecting other euro area banks. Using BIS data, Gyntelberg and Hördahl (2010) note that euro area banks are markedly more exposed than non-euro area institutions to the public sector debt of these countries. Banks in Greece, Portugal, and Spain are the most affected.

Rating-based capital adequacy rules can magnify the impact of downgrades on the banks' sovereign exposure. Under the 2004 Basel Committee on Banking Supervision's (BCBS) new capital adequacy framework (Basel II), banks can use ratings assigned by recognized credit rating agencies to determine credit risk weights for many of their institutional credit exposures. The objective of Pillar 1 of the Basel II accord is to align a bank's minimum capital requirements more closely to its risk of economic loss. To do so, bank capital is made more sensitive to such risk by requiring higher (lower) levels of capital for borrowers with higher (lower) credit risk, and vice versa. Under the "standardized approach," banks that engage in less complex forms of lending and credit underwriting, and have simpler control structures, may use external measures of credit risk to assess the credit quality of their borrowers for regulatory capital purposes. At the end of 2010 the foundations of a new Basel accord (Basel III) have been laid[3], however its main focus is on improving the quality and quantity of banks' capital and liquidity buffers. In contrast, the US Dodd-Frank Act and the Financial Stability Board (FSB, 2010) are seeking alternatives to the use of credit rating agencies in supervision and regulation.

1.4 Credit Rating Downgrades and Collateral Rules in the Money Markets

A typically-overlooked consequence of Euro zone sovereign downgrades relates to collateral rules in the Euro zone money markets, which are based on credit ratings. Although such collateral rules do not exist in Asia and the US, they provide an interesting illustration of the (mis)use of credit ratings and their systemic importance.

Gyntelberg and Hördahl (2010) note that one concern was that Greek banks—which, according to rating agencies and analysts, depended more on ECB funding than institutions in other countries did—would not be able to post Greek government bonds as collateral in the ECB's refinancing operations. The possible loss of this funding source for Greek banks pushed up CDS premia and yield spreads on Greek government debt even further, as it increased the perceived financial risks of holding government bonds.

Under the Eurosystem Credit Assessment Framework (ECAF), there are specific rules governing the quality of the Government bonds that banks can use as collateral in exchange for funding. To be eligible for collateral, securities have to be assigned a credit rating above a pre-set minimum of BBB–. As a result, banks cannot obtain funding for collateral with a rating lower than the minimum. In contrast, the higher the rating, the lower the haircut banks will pay.

Following S&P's downgrade of Greece to BB+ on April 27, 2010, one notch below BBB– and the announcement by Moody's that it may further downgrade Greece's A3 rating, the ECB suspended its minimum credit rating threshold in early May[4], for an indefinite period. This decision helped banks in Greece and other Eurozone countries retain the use of Greek government bonds as collateral to obtain funding. It also helped avoid systemic consequences in the Euro zone money markets, as such markets are typically the cornerstone of any financial markets and a key source of interbank liquidity.

1.5 Credit Rating Downgrades and Liquidity

The US crisis highlights how ratings downgrades can lead to the rapid drying up of liquidity. The winding up of several structured investment vehicles (SIVs) in the US, following credit rating downgrades, is an example of this mechanism at work. Typically, senior notes of structured investment vehicles (SIVs) were highly rated. Such ratings were based on the existence of preset triggers for the value of the asset, which when pressed would lead to the SIV being wound up so as to protect senior note holders.

As credit rating agencies made multiple-level downgrades of subprime mortgage backed structured products, investors lost confidence in the ratings of a wider range of structured assets. In August 2007, money market investors in asset-backed commercial paper (ABCP) refused to roll over investments in bank-sponsored conduits and SIVs backed by structured products. As multiple sponsoring banks moved to fund liquidity commitments to ABCPs and SIVs, they sought to build up liquid resources and became unwilling to provide term liquidity to others. This led to a severe contraction of activity in the term interbank market and a substantial rise in term premia in the US and European markets, as well as dislocation in a number of related short-term financial markets (see The Joint Forum, 2008).

In this instance, banks' behavior exacerbated the effects of credit rating downgrades. For instance, the overreliance of major banks on short-term funding such as ABCP added to the banks' vulnerability to sudden liquidity shortage. Moreover, the top tranches of structured products proved to be highly illiquid, resulting in severe losses as the banks were unable to sell these assets during the crisis. Should the banks have depended less on short-term borrowings and established liquidity reserves prior to the financial crisis, the effects of credit downgrading could have been far less devastating.

1.6 Credit Rating Downgrades and Collateral Calls

The US crisis also highlights how actual or anticipated ratings downgrades can lead to collateral calls, with devastating effects on market participants such as insurers like AIG. Credit derivative product companies typically need an AAA rating to avoid posting collateral upon marked-to-market changes in their derivatives positions. Credit rating downgrades require such companies, as per their derivatives contract, to post more collateral. Furthermore, collateral calls can occur if the issuer of the underlying securities is itself downgraded. This is illustrated by the threat of a CRA to downgrade AIG in September 2008, which led to multiple collateral calls, increased liquidity stress, and falling market confidence.[5, 6]

Before the US crisis, risk management practice had not paid enough attention to issues related to collateral. It is now clear that investors and risk managers should estimate the probability of a collateral call and the additional amount of collateral necessary in the event of a rating downgrade (Turnbull, 2009). Since the conditions triggering collateral calls are typically based on credit ratings falling below a pre-set threshold, it is important to identify such ratings-based rules.

1.7 Credit Rating Downgrades and Investment Mandates

Developments during the recent US crisis illustrate the risk of credit ratings in investment mandates. During the US crisis, monoline insurers, who insure against the risk of a bond or other security defaulting, were also on the verge of being downgraded by all major rating agencies as losses in the mortgage markets mounted, with potentially large negative spillover effects on many securities. The downgrade of monoline insurers would have led to a loss of AAA-insurance for hundreds of municipal bonds, corporate bonds, and structured products, resulting in a sweeping rating downgrade across financial instruments with a face value of $2.4 trillion and a subsequent sell-off of these securities (Brunnermeier, 2008).

Such rating downgrades would have triggered a huge sell-off of these assets by money market funds. Money market funds pledge never to "break the buck"—that is, they promise to maintain the value of every dollar invested and hence demand that underwriters of assets agree to buy back the assets if needed. However, this buy-back guarantee is conditional on the underlying assets being AAA-rated. The bankruptcy of Lehman Brothers in September 2008 caused one large money-market fund, (Reserve Primary Fund), to "break the buck," leading to a run on money-market funds.

Government intervention was needed to avoid the cascading effects of rating downgrades. About $500bn had been pulled out of prime money-market funds, a significant part of the $3.45tn mutual fund industry, in the aftermath of Lehman's bankruptcy. To stop the run, the US Treasury temporarily offered to guarantee existing investors' deposits at money-market funds as of September 2008. More than 1,900 funds chose to participate in the Treasury's voluntary program. The US Treasury also called for a strengthening of the SEC regulations of money market mutual funds to reduce their credit and liquidity risk. The Investment Company Institute (ICI) is also recommending that funds increase their minimum holdings of liquid assets.

The examples above illustrate a number of issues that have direct and indirect implications for investors and risk managers. A legitimate and nontrivial question is, however: what should investors do?

II. WHAT SHOULD INVESTORS AND RISK MANAGERS DO?

To answer the question of what investors and risk managers should do, we follow Turnbull (2009) who suggests that they ask themselves the following four questions: (i) What criteria do credit rating agencies use? (ii) What methodology do credit rating agencies use? (iii) What data do credit rating agencies use? (iv) What use is a rating? We have added a fifth question which goes beyond credit rating agencies to ask: (v) What are the systemic effects of credit ratings?

2.1 What Criteria Do Credit Rating Agencies Use?

Credit ratings are credit rating agencies' opinions on the creditworthiness of issuers on an ongoing basis, and the likelihood that debt will be repaid in a timely manner.

Firstly, rating agencies focus on default events. For instance, Moody's defines a sovereign issuer to be in default when one or more of the following conditions are met:

- There is a *missed or delayed disbursement of interest and/or principal*, even if the delayed payment is made within the grace period, if any;
- A *distressed exchange* occurs, when
  - the issuer offers bondholders a new security or package of securities that amount to diminished financial obligations such as new debt instruments with a lower coupon or par value; or
  - the exchange had the apparent purpose of helping the borrower avoid a more serious incidence of default (such as a missed interest or principal payment).

Similarly, Standard and Poor's defines default as the failure of an obligor to make a principal or interest payment on the due date (or within the specified grace period) contained in the original terms of the debt issue. The agency notes that

- For local and foreign currency bonds, notes, and bills, each issuer's debt is considered to be in default either when the *scheduled debt service is not paid* on the due date, or when an *exchange offer of new debt contains less favorable terms* than the original issue; and
- For bank loans, when either the scheduled debt service is not paid on the due date or a rescheduling of principal and/or interest is agreed to by creditors at less-favorable terms than the original loan. Such rescheduling agreements covering short and long-term bank debt are considered defaults even where, for legal, or regulatory reasons, creditors deem a forced rollover or principal to be voluntary.[7]

In addition, many rescheduled sovereign bank loans are ultimately cancelled at a discount on their original face value. Typical deals have included exchange offers (such as those linked to the issuance of Brady bonds), debt/equity swaps related to government privatization programs, and/or buybacks for cash. Standard and Poor's considers such transactions to be defaults because they contain terms less favorable than the original obligation.

Secondly, a rating scheme is an ordinal ranking. For instance, a AAA-rated sovereign debt has less credit risk than a similar instrument with an AA rating. The US crisis has shown that rating agencies use the same credit risk metric for all instruments although structured products have very different downgrade dynamics. Rating agencies use similar letter-grade scales (AAA to C or Aaa to C) to rank the relative default risk of all long-term, fixed-income securities, including structured credit products. However, structured credit products have significantly more abrupt downgrade dynamics than the products discussed above. Using the same rating scale for structured products leads to an underestimation of systemic risk as structured products have downgrade dynamics which are different than those of corporate or sovereign bonds. Unlike corporate and sovereign bonds, structured products are option-like instruments. Using a rating scale similar to those of corporate bonds leads to incorrect use of a "linear" function to estimate a non-linear function embedded in the option[8].

Thirdly, ratings are not intended to predict the precise timing of when a given borrower might default but rather to "look through the cycle." Ratings are, in principle, changed only when the rating agency believes an issuer has experienced what are likely to be enduring changes in fundamental creditworthiness. Even though an issuer might experience a change in its financial performance as a result of an adjustment in the macroeconomic environment, its rating may be maintained if it is likely that previous financial conditions will be restored during the next phase of the cycle. Credit ratings are, in theory, less volatile than "point-in-time" ratings, such as those obtained from bond or equity prices, which may capture transitory market expectations and volatile risk premiums. Instead ratings are based on some form of average rating over a time horizon, to give a "through the cycle" assignment.

It is important for investors and risk managers to recognize that a credit rating does not capture market risk but rather one aspect of credit risk. The value of a debt portfolio may decrease even if its credit rating does not change. More importantly, the value of a debt portfolio may decrease due to a worsening of its creditworthiness without any change in the credit rating. As noted in Turnbull (2009), a rating overestimates creditworthiness in bad times and underestimates it in good times. This is because for any rating, there is a range of credit assessment values within that rating, and worsening credit worthiness within this range can occur without a change in rating. Moreover, as ratings "look

through the cycle," a rating is comparable to a time average of the creditworthiness of a debt portfolio over a certain time horizon.

2.2 What Methodology Do Credit Rating Agencies Use to Assign a Rating?

Deficiencies in the models used by credit rating agencies to rate structured products increased systemic risk. Duffie (2008) stressed that default correlation was the weakest link in the risk measurement and pricing of structured products. Existing models could lead to a dramatic loss of liquidity in the event of a sudden failure of a large specialty investor or a surprise cluster of corporate defaults. This was also true for specialists in CDOs, which were ill equipped to measure the risks and compute fair valuation of tranches sensitive to default correlation. Brunnermeier (2008) notes that investors in an AAA-rated tranche of a CDO combined with a CDS had reasons to believe that the investment had low risk because the probability of the CDS counterparty defaulting was considered to be small. An early warning signal of problems to come was given in May 2005, following the rating downgrade of GM from investment grade to speculative grade. This event showed the ineffectiveness of the delta hedging of tranches and limitations in using Gaussian copula (Duffie, 2008).

Problems in the rating methodology of structured products are comparable to some extent to those of value-at-risk models (VaR). Four categories of problem with VaR have been identified[9] recently: (i) risk measures were often estimated using relatively short observation periods. As a result, they introduced significant procylicality, with periods of low observed risk driving down measures of future prospective risk; (ii) the use of normal instead of fat-tail distributions underestimates the chances of low probability high impact events; (iii) there has been a failure to account for systemic risk; and more fundamentally (iv) there has been a failure to distinguish risk and uncertainty with the associated over-reliance on past distribution patterns to make inferences on future patterns.

Following the Asian crisis, credit rating agencies revised their sovereign rating methodology. In particular, rating agencies expressed the need to place more emphasis on a country's balance sheet mismatches, including the strength of its banking system and its corporate sector. Credit rating agencies realized the need to focus more on the risks associated with reliance on short-term debt for otherwise creditworthy countries; the identity and creditworthiness of a country's short-term borrowers; a greater appreciation of the risks posed by a weak banking system (including the contingent liabilities for the authorities should they have to restructure and recapitalize weak banks); identification and consideration of the likely behavior of foreign short-term creditors; and increased sensitivity to the risk that a financial crisis in a country may be contagious for its neighbors.

Regarding possible strategies for investors, Turnbull (2009), for instance, recommends that investors and risk managers identify: (i) the factors that affect the creditworthiness of the rated instrument and match this list against the factors that have been considered in the rating assessment; (ii) examine the assumptions underlying the models and their robustness; and (iii) acquire knowledge of the market, and in the case of new financial instruments, seek professional advice.

2.3 What Data Do Credit Rating Agencies Use?

Credit rating agencies insist that their analysis is largely dependent on the quality of information provided to them. For instance, the largest rating downgrades during the Asian crisis occurred following the revelation of what the credit rating agencies regarded as significant new information. Major rating reviews were triggered by the reports on the size of the Bank of Thailand's forward exchange position, the extent of the Bank of Korea's placement of its foreign exchange reserves in offshore Korean banks and the emergence of widespread political disturbances in Indonesia. In the case of Enron and WorldCom, credit rating agencies also stressed that they do not conduct formal audits of rated companies or search for fraud.

More recently, doubts about Greece's budget have contributed to the downgrade of its debt while it appeared during the US crisis that rating agencies did not pay enough attention to the quality of the data from originators.

A key tool for risk managers is the probability distribution of the value of a portfolio of assets at some future specified horizon. Since distributional assumptions depend on the nature of the data, Turnbull (2009) poses the following questions: Is a long time series necessary for estimation? What assumptions are made about the stationary nature of the coefficients? Is there enough empirical evidence to justify the assumed distributional

assumptions? For new instruments, data limitations may result in risk managers relying on professional judgment in specifying assumptions with respect to the probabilities of default, default dependence, and recovery rates when trying to assess the creditworthiness of a structure.

2.4 What Use is a Rating?

The US crisis raised concerns about the meaning of credit ratings to different types of investors, in particular the type of risk that ratings measure. The Turner Review (2009) notes that a greater proportion of structured products was held not by end investors intending to hold to maturity (and therefore interested only in the probability of default), but by investing vehicles (such as SIVs and mutual funds) performing maturity transformation. Some of these investors seem to have assumed quite wrongly that a rating carried an inference of liquidity and market stability, rather than solely of credit risk.

The Bank of England (2008) has reached a similar conclusion and adds that the search for yield may have encouraged these perceptions, with investors looking for assets with the highest returns for a given rating category, thereby failing to recognize fully that these higher returns were providing compensation for some additional risks. Inferring characteristics other than credit risk from ratings is particularly problematic for structured finance products.

The Joint Forum (2009) recommends that investment and risk management frameworks should not rely on ratings inappropriately. They should recognize the uncertainty that surrounds ratings, and differentiate products according to their risk characteristics. As a result of investors' reliance on ratings, there have been calls for the use of a differentiated scale for structured products. For instance, the IMF (2008) notes that credit rating agencies should provide investors with more analytical information regarding potential rating volatility. This recommendation is based on the observation that, by design, structured products can suffer more severe, multiple-notch downgrades than corporate or sovereign bonds. The additional analytic information, which could take the form of a score or index, would provide investors with a quantification of the increased downgrade risk.

In spite of all the issues raised above, institutional investors and regulators relied on the ratings of structured credit products; on the whole ratings seemed to be indispensable to the functioning of credit markets. In a survey of investors by the CFA Institute (2009), 60 percent of respondents find that credit ratings are not valid or useful in making investment decisions. Yet, about half of the respondents disagree with steps to deemphasize reliance on credit ratings in investment decisions.

If credit ratings are used, it is important that all stakeholders be fully aware of their limitations. This not only includes risk managers, but also senior management and traders.

2.5 What Are the Systemic Effects of Credit Ratings?

Investors and risk managers should assess the systemic effects of credit ratings as they may increase systemic risk and may be pro-cyclical, helping fuel investments in "good times" and accelerating market losses in "bad times." Credit rating agencies can increase systemic risk through unanticipated and abrupt downgrades. They may also increase procylicality. Such events can lead to large market losses, fire sales and a dry up of liquidity, and have knock-on effects on a number of systemically important market participants, either through contractual arrangements or investment practice. The systemic risk stemming from credit rating agencies is higher for structured products markets than for corporate and sovereign bond markets.

Although, conflicts of interests and informational issues are key to understanding why such rating events occur, it is critical to identify the different facets of risks in a "rated market," how they can lead to systemic crises, and how to measure and manage them. For instance, it is important to assess how the use of credit ratings arising from legislation, regulations, supervisory policies or market practice can increase systemic risk. Such an approach will require an analysis at both micro and macro level, include all market participants and take a global approach. The determinants of the supply and demand for "rated assets," especially in "good times" and the implications of unanticipated abrupt downgrades in "bad times" has to be assessed carefully.

Such an approach requires an assessment of the systemic effects of rating downgrades. Key questions include: (i) the type of institutions and markets which would be affected by downgrades, whether directly or indirectly, and how systemic and interconnected these linkages are; (ii) the consequences for financial

markets and the economy in terms of market losses, liquidity shortages, loss of access to credit, and reduced liquidity; (iii) the factors that can increase downgrade risk, including idiosyncratic and systemic ones; (iv) the measurement of systemic downgrade risk; and (v) the management of downgrade risk at the systemic level through increased capital requirements or liquidity buffers, or other means.

Sy (2009) proposes the use of "ratings maps," (see Figures 2 and 3), to identify the different channels through which rating downgrades can lead to systemic risk.

FIGURE 2

"Ratings Map": The Systemic Risk of Credit Rating Downgrades (Bust Cycle)

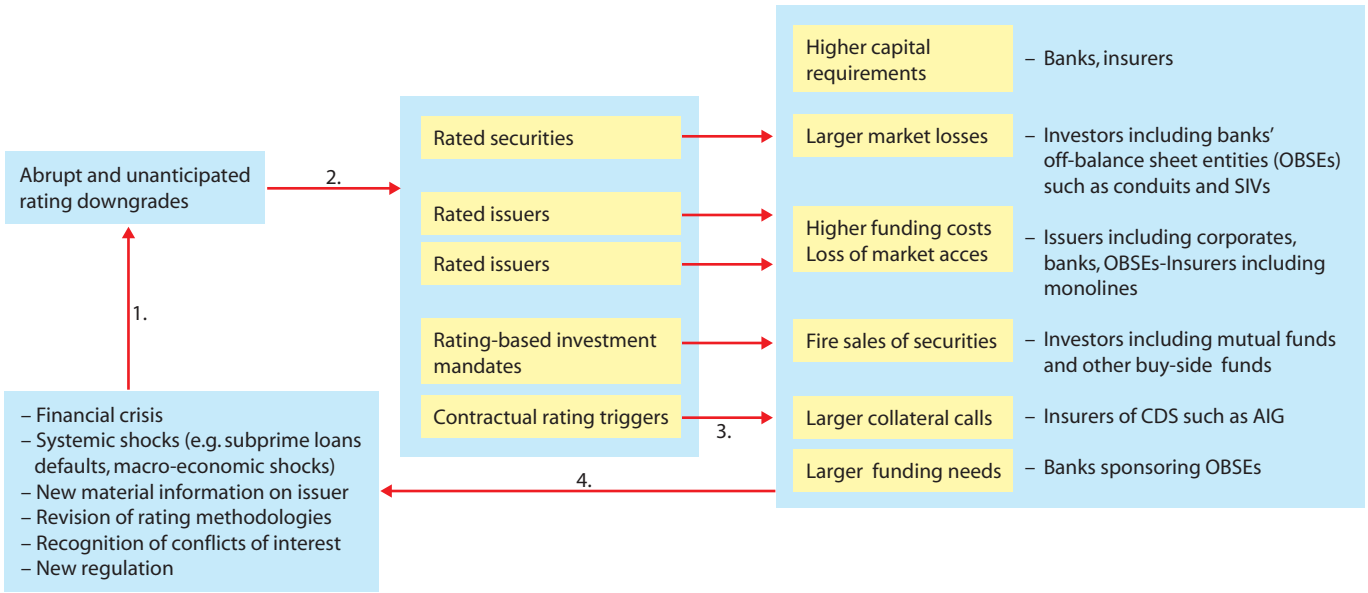
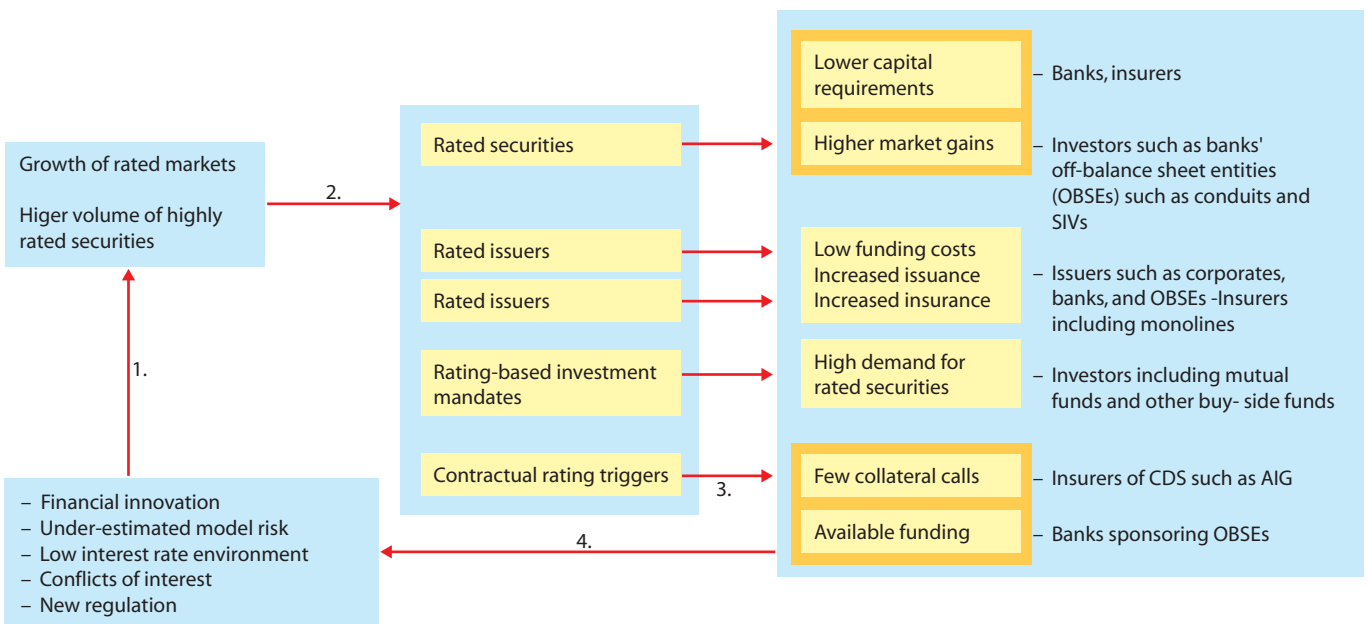


FIGURE 3

"Ratings Map": The Systemic Risk of Credit Rating Downgrades (Boom Cycle)



In the crisis, defaults on subprime loans led to abrupt and unanticipated rating downgrades of a number of rated securities, issuers, and bond insurers (channel 1). These downgrades, in turn, resulted in larger market losses by investors, including banks' off-balance sheet entities (OBSEs) such as conduits and SIVs (channels 2 and 3). They also led to larger funding needs from banks sponsoring these OBSEs and larger collateral calls from insurers in the CDS markets such as AIG. Some of these channels, such as rating triggers, were also present in the market disruptions following the fall of Enron and WorldCom. An additional problem with rating downgrades is that they may be pro-cyclical as first round effects can lead to further downgrades (channel 4).

Given the procyclicality of ratings, questions will also need to be asked in "good times", i.e. during boom cycles. Credit ratings can encourage the growth of the rated market where rated securities are transacted. This growth can also be accompanied by a higher volume of highly rated securities. This "rating inflation" was a key development prior to the current crisis and policymakers will need to get a full grasp of its determinants (Skreta and Veldkamp, 2009). Questions need to be asked about market participants' incentives and the methodology used to justify substantially larger volumes of highly rated securities.

III. CONCLUDING REMARKS

Credit rating downgrades can have serious consequences not only for investors but also for the stability of the financial system. It is therefore important for investors, risk managers and their management, and regulators to fully understand what type of risk credit ratings attempt to capture, the methodology and the data credit rating agencies use, and the systemic effects of credit ratings.

Previous debt crises offer a number of lessons for investors and risk managers on the risks associated with credit rating downgrades. Credit ratings do not capture market risk but only one type of credit risk as assessed by credit rating agencies. Developments in the Euro zone following the downgrade of Greece in December 2009 show that downgrades can increase a debtor's borrowing costs and reduce access to capital markets, disrupt the functioning of money markets through ratings-based collateral rules, and have spillover effects from sovereign debt to other asset classes, including banking stocks. Lessons that can be gleaned from the US subprime crisis are that downgrades can lead to a dry up of liquidity as special investment vehicles (SIVs) could not rollover their asset-backed commercial papers (ABCPs); ratings-based triggers in CDS contracts can lead to collateral calls as experienced by AIG; and ratings-based investment mandates such as those used by money market mutual funds can be the cause of market losses. Finally, the debate on how best to regulate credit rating agencies, brought up both micro- and macro-prudential considerations.

This paper suggests that investors and risk managers should ask themselves five questions with a focus on problem areas: (i) What criteria do credit rating agencies use? (ii) What methodology do credit rating agencies use? (iii) What data do credit rating agencies use? (iv) What use is a rating? (v) What are the systemic effects of credit ratings? However, at least two challenges remain for investors and risk managers. Firstly, even if risk managers appropriately identify the risks from ratings downgrades, it is important that managerial incentives are designed so as to act upon such information. This is no trivial task, especially in times when profits are high. Secondly, rapid financial innovation puts investors and risk managers in uncharted territory as a new methodology is used and new financial instruments are marketed in illiquid markets with little history.

Until recently, credit rating agencies have been lightly regulated. The recent financial crises have, however, prompted a wave of regulatory reform, especially in the European Union and the US. New regulation focuses on micro-prudential issues and aims to reduce conflicts of interest and increase transparency and competition. Policymakers are also reviewing the appropriateness of using credit ratings in the regulation of financial markets.[10] Although one important objective of regulation is to protect them, investors should understand the consequences that regulatory reform can have on the management of the risk of credit rating downgrades. Caveat Emptor!

Notes

[1] IMF. The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management. The author thanks two anonymous referees for useful comments and suggestions.

[2] See Gyntelberg and Hördahl (2010) for a review of developments in the Euro zone's sovereign debt markets.

[3] See proposals by the Basel Committee on Banking.

[4] Previously, on March 25, 2010, the European Central Bank announced that it would delay its plans to raise by

the end of this year the minimum credit rating required for assets provided as collateral by Euro zone banks (from BBB– to A–). The ECB's decision not to tighten collateral rules reduced the risk of Greek as well as other Euro zone banks becoming ineligible to use their holding of Greek government securities as collateral, if the country's sovereign credit rating was downgraded below the minimum required by Euro zone rules.

[5] As of May 2009, the US government held about 80 percent of AIG's assets and had injected about $70 billion into the company through the $700 billion Troubled Asset Relief Program (TARP).

[6] Some market participants argue, however, that the collapse of AIG may instead be attributable the refusal by a number of key market participants to pay AIG for some intraday transactions.

[7] For central bank currency, a default occurs when notes are converted into new currency of less-than-equivalent face value.

[8] A senior CDO tranche is effectively "a short call option" on the cash flow performance of the underlying collateral pool. Duffie (2008) notes that the market value of a senior tranche therefore decreases with (risk-neutral) default correlation. The value of the equity price, which resembles a call option on the collateral pool cash flows, increases with default correlation. There is no clear effect of optionality, however, for the valuation of intermediate tranches. Each of the intermediate tranches has given up an option to the tranches below it in priority and has taken an option from the tranches above it. The over-collateralization of a tranche is the principal amount of debt below it. With sufficient over-collateralization, the option given to the lower tranches dominates, but it is the other way around for sufficiently low levels of over-collateralization.

[9] See the Turner Review (2009) and Andrew Haldane, "Why Banks Failed the Stress Tests," February 2009, for problems with VaR.

[10] The Financial Stability Board (FSB, 2010) presents a number of principles for reducing reliance on credit ratings.

References

Arezki, R., B. Candelon, and A.N.R. Sy, (2011), "Sovereign Rating News and Financial Markets Spillovers: Evidence from the European Debt Crisis," IMF, WP/11/68 and No. 3411, CESifo Working Paper Series.

Bank of England, (2007), "Financial Stability Report," Issue No. 22.

Brunnermeier, M., (2009), "Deciphering the Liquidity and Credit Crunch 2007–08," Journal of Economic Perspectives, 23, pp. 77–100.

CFA Institute, (2009), "Member Poll on Credit Rating Agencies," CFA Centre for Financial Market Integrity.

Committee on the Global Financial System, 2005, "The Role of Ratings in Structured Finance: Issues and Implications," Report submitted by a Working Group established by the Committee on the Global Financial System, BIS.

Duffie, D., (2008), "Innovations in Credit Risk Transfer: Implications for Financial Stability," BIS Working Paper No. 255, Basel.

Gyntelberg J., and P. Hördahl, (2010), "Overview: Sovereign Risk Jolts Markets," BIS Quarterly Review, Basel.

IMF, (2008), "Containing Systemic Risks and Restoring Financial Soundness," Global Financial Stability Report, World Economic and Financial Surveys.

Joint Forum on Credit Risk Transfer, (2008), "Credit Risk Transfer: Developments from 2005 to 2007," The Joint Forum Consultative Document, BIS.

Joint Forum, (2009), "Stocktaking on the Use of Credit Ratings," Basel Committee on Banking Supervision, BIS.

Skreta, V., and L. Veldkamp, (2009), "Rating Shopping and Asset Complexity: A Theory of Ratings Inflation," mimeo, NYU, in Journal of Monetary Economics, 56, pp. 678–695.

Sy, A.N.R., 2009, "The Systemic Regulation of Credit Rating Agencies and Rated Markets," World Economics, 10, pp. 69–108.

Turnbull, S., (2009), "Measuring and Managing Risk in Innovative Financial Instruments," Journal of Credit Risk, 5, pp. 87–114.