

Not all that glitters is gold. Often have you heard that told.

Shakespeare: *The Merchant of Venice*.

1.1 CONTEXT AND PREMISES

1.1.1 The Benchmarking of Default Prospects Remains Deeply Rooted in Business Analysis

There is not in this country . . . a central point at which all companies are required to present annual statements of their affairs. It is not uncommon for leading companies to publish no reports whatsoever. Some make them unwillingly, with no design to convey information upon the subjects to which they relate. Results that are full and explicit are accessible only to a small number of parties interested. Fewer still have the means of comparing results for consecutive years, without which it is impossible to form a correct opinion as to the manner in which the work has been conducted or of its present or prospective value.¹

Henry Varnum Poor rendered the description above in 1860. He was editor of *The American Railroad Journal*. The country was the United States. The audience was a group of London-based investors being asked to fund infrastructure growth in the United States without a hint of the risks involved.

Poor's purpose was to alert investors to the need to be informed about default risks involved in lending money. Many of the London-based investors lost vast amounts of money when railroad and canal companies that they financed went bankrupt – as any investor today loses on average 65% of the face value of a bond when it defaults.² Henry Poor went on to say that:

what is wanted is a work which shall embody . . . a statement of the organization and condition of all our companies, and at the same time present a history of their operations from year to year which would necessarily reflect the character of their management, the extent and value of their business, and supply abundant illustrations with which to compare similar enterprises that might be made the subject of investigation and inquiry.³

¹ O'Neill, L.C., President and Chief Rating Officer - Standard & Poor's, 1999. Building the new global framework for risk analysis, Remarks to Professional bankers association at World Bank Headquarters in Washington, D.C., March 26, 1–5, page 2.

² Cantor, R., Hamilton, D.T., Ou, S., and Varma, P., 2004. Default and recovery rates of corporate bond issuers: A statistical review of Moody's ratings performance, 1920–2003, *Special Comment: Moody's Investors Service*, January, Report 80989, 1–40.

³ O'Neill, L.C., President and Chief Rating Officer – Standard & Poor's, 1999. Building the new global framework for risk analysis, Remarks to Professional bankers association at World Bank Headquarters in Washington, D.C., March 26, 1–5, page 2.

Three types of businesses emerged in the 19th century to publish reports that enabled investors to make better-educated investment decisions and to, directly or indirectly, pressure obligors to respect their obligations – the specialized financial press, credit reporting agencies, and investment bankers. One of the first specialized business publications on record was *The American Railroad Journal*, which was started in 1832. Henry Poor transformed it into a publication for investors in railroads when he became its editor in 1849.⁴ To fill the gap he had identified, Poor eventually created his own firm. It embarked upon collecting operating and financial statistics on US railroad companies. The company started publishing the results annually in 1868 as the *Manual of the Railroads of the United States*.⁵ One of the first credit reporting agencies, founded in 1841, was The Mercantile Agency. Through a network of agents, it gathered information on the business standing and creditworthiness of businesses all over the US, and sold its service to subscribers.⁶ The merchant banker was of course the consummate insider, insisting that securities issuers provide all relevant information related to company operations on an ongoing basis, sometimes insisting on being on the board for that purpose.⁷ One of their hallmarks was also that they ‘vouched for the securities they sponsored’, as had already happened in 1835–1845 when the debts of several American States had been restructured.⁸

The foundations of these businesses lay in their grasp of the issuer’s business in its competitive environment, so credit analysis originated as business analysis.⁹ It focused strongly on the quality of the portfolio of opportunities that companies were actually pursuing, on the success with which management was pursuing them, on the ability to respect the debt obligations that the companies had incurred to finance their development, and on the character of the management to be willing to honor them. These businesses formed the information infrastructure in which the bond markets expanded in the 19th century. The fact that business reporting and financial statements are vastly better today in many parts of the world than they were in 1860 is in no small part due to the activities of these 19th-century businesses, which predated the CRAs.

In 1909, John Moody initiated agency bond ratings in the US, marking the expansion of business analysis to include credit risk analysis for rating purposes. Originally, this only covered the bonded debt of the US railroad companies.¹⁰ The purpose of the analysis became more targeted toward rating an issuer’s relative credit quality, but the foundations of the ratings continued to focus on the issuer’s business fundamentals.

⁴ Sylla, R., 2002. An historical primer on the business of credit ratings, in *Ratings, Rating Agencies and the Global Financial System*, edited by Levich, R., Majnoni, G., and Reinhart, C. Boston: Kluwer, 19–40, page 25.

⁵ This was the ancestor of the rating agency Standard & Poor’s formed in 1941: Sylla, R., 2002. An historical primer on the business of credit ratings, in *Ratings, Rating Agencies and the Global Financial System*, edited by Levich, R., Majnoni, G., and Reinhart, C. Boston: Kluwer, 19–40, page 26.

⁶ Sylla, R., 2002. An historical primer on the business of credit ratings, in *Ratings, Rating Agencies and the Global Financial System*, edited by Levich, R., Majnoni, G., and Reinhart, C. Boston: Kluwer, 19–40, page 24: the Agency became R.G. Dun & Bradstreet in 1859 and its paying subscribers grew to 40 000 in the 1880s, its reports covering more than a million businesses.

⁷ Sylla, R., 2002. An historical primer on the business of credit ratings, in *Ratings, Rating Agencies and the Global Financial System*, edited by Levich, R., Majnoni, G., and Reinhart, C. Boston: Kluwer, 19–40, page 26.

⁸ See, Chernow, R., 1990. *The House of Morgan: An American Banking Dynasty and the Rise of Modern Finance*, Touchstone, New York, 1–812, pages 3–5.

⁹ Some defend a credit analysis approach that does not get distracted from soft issues such as the borrower’s corporate strategy, the forces that drive competition in its industry, the capability of management to run the business, etc. Several of our colleagues and friends, board members and successful entrepreneurs – support that view because they don’t want a CRA to tell them how to run their business.

¹⁰ Sylla, R., 2002. An historical primer on the business of credit ratings, in *Ratings, Rating Agencies and the Global Financial System*, edited by Levich, R., Majnoni, G., and Reinhart, C. Boston: Kluwer, 19–40, page 23.

Rating actions in the automobile industry highlight the extent to which ratings continue to focus on business fundamentals. As an example, consider S&P's December 12, 2005, downgrade of General Motors (GM) corporate credit to B, affecting \$285 billion. Exhibit 1.1 reproduces the action announcement *in extenso*. Summing it up, note how S&P refers at length to GM's business position as the key driver of the downgrade. S&P emphasizes the point by going out of its way to remind investors that GM's liquidity position and borrowing capacity give it substantial staying power. But that power is limited by GM's ability to generate positive free cash flow (FCF), and that ability is currently impaired due to the difficulties in turning around the performance of GM's North American automotive operations. S&P explains that GM suffers from meaningful market share erosion related to a marked deterioration of its product mix, despite concerted efforts to improve the appeal of its product offerings. S&P also refers to the aging of GM's SUV models. Credit rating is, and remains, thus deeply rooted in business analysis. No spreadsheet ratings can replace this.

Exhibit 1.1 S&P Research Update: General Motors Corp. Corporate Credit Rating cut to 'B'; Off Credit Watch; Outlook Negative (December 12, 2005)

Credit Rating: B/Negative/B-3

Rationale

On December 12, 2005, Standard & Poor's Ratings Services lowered its corporate credit rating on General Motors Corp. (GM) to 'B' from 'BB-' and its short-term rating to 'B-3' from 'B-2' and removed them from Credit Watch, where they were placed on October 3, 2005, with negative implications. The outlook is negative. (The 'BB/B-1' ratings on General Motors Acceptance Corp. [GMAC] and the 'BBB-/A-3' ratings on Residential Capital Corp. [ResCap] remain on Credit Watch with developing implications, reflecting the potential that GM could sell a controlling interest in GMAC to a highly rated financial institution.) Consolidated debt outstanding totaled \$285 billion at September 30, 2005.

The downgrade reflects our increased skepticism about GM's ability to turn around the performance of its North American automotive operations. If recent trends persist, GM could ultimately need to restructure its obligations (including its debt and contractual obligations), despite its currently substantial liquidity and management's statements that it has no intention of filing for bankruptcy.

GM has suffered meaningful market share erosion in the US this year, despite prior concerted efforts to improve the appeal of its product offerings. At the same time, the company has experienced marked deterioration of its product mix, given precipitous weakening of sales of its midsize and large SUVs, products that had been highly disproportionate contributors to GM's earnings. This product mix deterioration has partly reflected the aging of GM's SUV models, but with SUV demand having plummeted industry wide, particularly during the second half of 2005, it is now dubious whether GM's new models, set to be introduced over the next year, can be counted on to help to restore the company's North American operations to profitability.

In addition, GM is paring the product scope of its brands. The company has also announced recently that it will be undertaking yet another significant round of production capacity cuts and workforce rationalization. But the benefits of such measures could be undermined unless its market share stabilizes without the company's resorting again to ruinous price discounting.

One recent positive development for GM has been the negotiation of an agreement with the United Auto Workers providing for reduced health care costs. Yet, this agreement (which is pending court

approval) will only partly address the competitive disadvantage posed by GM's health care burden. Moreover, cash savings would only be realized beginning in 2008 because GM has agreed to make \$2 billion of contributions to a newly formed VEBA trust during 2006 and 2007. It remains to be seen whether GM will be able to garner further meaningful concessions in its 2007 labor negotiations.

This year has witnessed a stunning collapse of GM's financial performance compared with 2004 and initial expectations for 2005. In light of results through the first nine months of 2005, we believe that the full-year net loss of GM's North American operations could approach a massive \$5 billion (before substantial impairment and restructuring charges) and that the company's consolidated net loss could total about \$3 billion (before special items). With nine-month 2005 cash outflow from automotive operations a negative \$6.6 billion (after capital expenditures, but excluding GMAC), we expect full-year 2005 negative cash flow from automotive operations to be substantial. GMAC's cash generation has only partly mitigated the effect of these losses on GM's liquidity.

Deterioration of GM's credit quality has limited GMAC's funding capabilities. On October 17, 2005, GM announced that it was considering selling a controlling interest in GMAC to restore the latter's investment-grade rating. GM recently indicated that it is holding talks with potential investors. As we have stated previously, we view an investment-grade rating for GMAC as feasible if GM sells a majority stake in GMAC to a highly rated financial institution that has a long-range strategic commitment to the automotive finance sector. Even then, GMAC still would be exposed to risks stemming from its role as a provider of funding support to GM's dealers and retail customers. However, we believe a strategic majority owner would cause GMAC to adopt a defensive underwriting posture by curtailing its funding support of GM's business if that business were perceived to pose heightened risks to GMAC.

One key factor in achieving an investment-grade rating would be our conclusions about the extent to which financial support should be attributed to the strategic partner. We will continue to monitor GM's progress in this process and the potential for rating separation; however, if the timeframe for a transaction gets pushed out, or if there is further deterioration at GM, GMAC's rating could be lowered, perhaps to the same level as GM's. Ultimately, in the absence of a transaction that will significantly limit GM's ownership control over GMAC, the latter's ratings would be equalized again with GM's.

The ratings on ResCap are two notches above GMAC's, its direct parent, reflecting ResCap's ability to operate its mortgage businesses separately from GMAC's auto finance business, from which ResCap is partially insulated by financial covenants and governance provisions. However, we continue to link the ratings on ResCap with those on GMAC because of the latter's full ownership of ResCap. Consequently, should the ratings on GMAC be lowered, the ratings on ResCap would likewise be lowered by the same amount. Or, if the ratings on GMAC are raised, as explained above, ResCap's ratings also could be raised.

Short-Term Credit Factors

GM's short-term rating is 'B-3'; GMAC's rating is 'B-1.' GM's fundamental challenges are short- and long-term in nature. The rapid erosion in GM's near-term performance prospects points up its high operating leverage and the relative lack of predictability of near-term earnings and cash flow. Still, GM should not have any difficulty accommodating near-term cash requirements for the following reasons:

- GM has a large liquidity position; cash, marketable securities, and \$4.1 billion of readily available assets in its VEBA trust (which it could use to meet certain near-term benefit costs, thereby freeing up other cash) totaled \$19.2 billion at September 30, 2005 (excluding GMAC), compared with loans payable in the 12 months starting September 30 of \$1.5 billion.
- As of September 30, 2005, GM had unrestricted access to a \$5.6 billion committed bank credit facility expiring in June 2008, \$700 million in committed credit facilities with various maturities,

and uncommitted lines of credit of \$1.2 billion. We are not aware of any financial covenants that appear problematic.

- GM could save some cash by cutting the common dividend.
- Under current regulations, GM faces neither ERISA-mandated pension fund contributions through this decade nor the need to make contributions to avoid Pension Benefit Guaranty Corp. variable-rate premiums. Its principal US pension plans are overfunded for financial reporting purposes. However, under certain pending legislative proposals, the size of GM's pension liability could increase for ERISA purposes.
- Given the intense competitive pressures the company faces, GM has little leeway to curtail capital expenditures, which are budgeted at \$8 billion for 2005.
- GM has virtually no material individual, non-strategic, parent-level assets left that it could divest, excluding GMAC and its assets.

GM's liquidity could be bolstered by the sale of a portion of its ownership stake in GMAC, and we would expect sale proceeds to represent adequate compensation for the related loss of GMAC earnings and dividends. We assume that GM would retain such proceeds as cash or equivalents, or use them to reduce debt or debt-like liabilities. On the other hand, owing to GMAC's enhanced independence, we believe there is increased risk that, in certain circumstances, GMAC could curtail its funding support of GM's marketing operations, precipitating potential problems for GM.

For GMAC, the key element of its financial flexibility is its ability to use securitization and whole-loan sales as funding channels, and we believe the ABS and nascent whole-loan markets are now accommodating issuance by GMAC in the near term without materially affecting market pricing, but this remains a risk factor.

Consistent with the practices of its finance company peers, GMAC relies heavily on short-term debt, albeit less so than historically. As of September 30, 2005, GMAC's short-term debt totaled \$85 billion (including current maturities of long-term debt and on-balance-sheet securitizations, but not including maturing off-balance-sheet securitizations). GMAC's unsecured bond spreads have been extraordinarily volatile and wide. Given current capital market conditions, GMAC is highly unlikely to issue any significant public term debt in the near term. Between likely persisting market jitters and the size limitations of the high-yield market, it is uncertain whether and to what extent GMAC will be able to access the public unsecured debt market economically.

GMAC's managed automotive loan and lease asset composition is highly liquid, given that about half of its total gross receivables is due within one year and that a substantial portion of receivables is typically repaid before contractual maturity dates. However, we take only limited comfort from this because GMAC is constrained in its ability to reduce the size of its automotive portfolio, given its need to support GM's marketing efforts.

Several factors support GMAC's liquidity:

- As a first line of defence, GMAC has a large cash position – \$24.3 billion at September 30, 2005 (including certain marketable securities with maturities greater than 90 days).
- GMAC also has substantial bank credit facilities. As of September 30, 2005, it had about \$49 billion of bank lines in addition to auto whole-loan capacity and conduit capacity, not all of which were committed lines. Of the \$7.4 billion facility, \$3.0 billion expires in June 2006 and \$4.4 billion in June 2008. We are not aware of any rating-related triggers that will impede GMAC from accessing the committed facilities in the wake of the recent downgrades. There is a maximum leverage covenant of consolidated unsecured debt to total stockholders' equity of 11.0 to 1.0. At September 30, GMAC's actual leverage under the covenant was 7.3 to 1.0. The \$7.4 billion facility was established largely for backup purposes, and we believe GMAC would be loathe to borrow under it except as a last resort.
- Most of GMAC's unsecured automotive debt issues and borrowing arrangements include an identical, fairly strict negative pledge covenant. Subject to certain exceptions, the granting of any

material security interest (other than through securitizations) would cause all unsecured automotive debt to become secured.

GMAC uses the ABS market extensively. The company can securitize almost all of its major asset types. GMAC securitizes automotive retail and wholesale loans and retail leases through various markets and in different countries. In its mortgage business, it also securitizes retail and commercial mortgage loans, commercial mortgage securities, and real estate investment trust debt. Retail automotive loans in general are highly regarded in the ABS market because they are secured, carry low prepayment risk, and are of relatively short duration. GMAC's retail automotive loans are particularly high quality, given the company's relatively conservative and consistent underwriting standards. GMAC securitizes its automotive finance assets through public and private term debt issuances and through committed, multiseller bank conduit programs and asset-backed commercial paper programs. Even amid the turmoil surrounding GMAC in recent months, credit spreads on GMAC public term securitizations have barely changed.

Apart from ABS financing, GMAC also uses the whole-loan market, selling portfolios of automotive retail receivables and mortgage loans to third-party purchasers, with GMAC remaining the servicer but not retaining any ownership interest in the loans otherwise. The mortgage whole-loan market is large and liquid and has existed for many years. The automotive whole-loan market has grown only in the past several years – fortuitous timing for GMAC. Through September 30, 2005, GMAC had completed automotive whole-loan transactions totaling \$9 billion. The company has agreements under which certain third parties have committed to purchase up to \$1 billion of auto loans from GMAC within a stipulated period. In addition, GMAC has established a \$55 billion, five-year arrangement to sell auto finance loans (with GMAC remaining the servicer) of up to \$10 billion annually. And in December 2005, GMAC announced a similar five-year purchase agreement for up to \$20 billion with another financial institution.

ResCap is a non-captive finance company. We assume GMAC would divest its stake in ResCap in a distress scenario. In fact, GM has publicly expressed its intention to explore alternatives with respect to ResCap. ResCap has completed a \$4 billion private offering and a \$1.25 billion public deal and used some of the proceeds to repay intracompany debt owed to GMAC. In July, ResCap closed on \$3.55 billion of bank facilities, further relieving GMAC of the burden of funding ResCap.

In conjunction with the pending sale of 60% of the commercial mortgage unit, this unit is expected to raise third-party financing to repay all intercompany loans to GMAC. This will slightly enhance GMAC's liquidity and, as with ResCap, relieve GMAC of the burden of funding the commercial mortgage unit. If GMAC experienced heightened financial pressures, we believe it could sell the remaining 40% of its mortgage operations outright. Likewise, it could also divest at least some of the business lines in its insurance operations. We do not wish to give an estimate of the potential proceeds, but they could be substantial.

Outlook

The rating outlook on GM is negative. Prospects for GM's automotive operations are clouded. The ratings could be lowered further if we came to expect that GM's substantial cash outflow would continue beyond the next few quarters due to further setbacks, whether GM-specific or stemming from market conditions. Even though the concern over the situation at GM's bankrupt lead supplier, Delphi Corp., was the primary factor behind the rating downgrade of October 10, 2005, events at Delphi could precipitate a further review if GM were to experience severe Delphi-related operational disruptions or if GM agreed to fund a substantial portion of Delphi's restructuring costs. GM's rating could also be jeopardized if the company were to distribute to shareholders a meaningful portion of proceeds generated from the sale of a controlling interest in GMAC.

GM would need to reverse its current financial and operational trends, and sustain such a reversal, before we would revise its outlook to stable.

Ratings List

General Motors Corp.

To From

Ratings Lowered and Removed from Credit Watch Corporate credit rating B/Negative/B-3 BB-/Watch Neg/B-2

Short-term rating B-3 Watch Neg/B-2

Ratings Remaining on Credit Watch

General Motors Acceptance Corp.

Corporate credit rating BB/Watch Dev/B-1

Residential Capital Corp.

Corporate credit rating BBB-/Watch Dev/A-3

Complete ratings information is available to subscribers of RatingsDirect, Standard & Poor's web-based credit analysis system, at www.ratingsdirect.com. All ratings affected by this rating action can be found on Standard & Poor's public website at www.standardandpoors.com; under Credit Ratings in the left navigation bar, select Find a Rating, then Credit Ratings Search.

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The point of a rating is to benchmark default likelihoods. This is the core activity of a CRA, to scale the default prospects of issues and the likely losses of issuers and, to varying degrees, investors in the event of a default. These benchmarking and scaling actions can only be properly understood in the context of an industry and the life of a company. Since both of these continuously undergo or initiate changes, ratings aim at moving targets.

To be of use to investors, the performance of the ratings is of paramount importance. What is this performance of ratings? Ratings are like quality grades about an obligor's prospects in carrying out its financial obligations. Significant changes in these prospects rarely move like a random walk time series, going up, staying put, or falling down from one moment to

the other in arbitrary sequences. Thus ratings must show sufficient stability to be pertinent. But these prospects do change and some obligors are more prone than others to fail on their obligations. Ratings must reflect this. To be useful, ratings must thus demonstrate a sufficient degree of accuracy in predicting the likelihood of such failures. Between the two desired rating qualities of stability and accuracy, there exists unfortunately an unavoidable trade-off. A fast real-time on-line nano information processing engine could possibly very well follow on its heels the real day-to-day micro changes in default prospects of an issuer. It could trace them like a cardiogram. It may even produce precise accuracy about small day-to-day changes in default prospects. But it would probably be a schizophrenic graph. Periods of an emotional and unstable random walk of successive minute changes would be separated by moments of sudden discontinuities – small or large – or cliffs reflecting actual changes in insights and thinking about the default prospect. Of course, what the investors really expect from ratings is to catch these discontinuities. Even better, they would like ratings to reflect so much thinking and insights that they anticipate these shifts sufficiently ahead of actual occurrence to become alerted of likely material upcoming risk shifting by the issuer. Investors want rating changes to reflect the cliffs; they do not expect ratings to reflect minute-to-minute changes in prospects. They can get these in any case from all sorts of market prices for issuer securities that are continuously traded. From ratings, investors expect more stability, disregarding the more or less random, albeit accurate, minor day-to-day changes.

To gauge the performance of a rating one needs to determine if it offers the best trade-off between accuracy and stability. This is the trade-off that reflects, for a given degree of stability, the maximum achievable accuracy or, conversely, that reflects, for a given degree of accuracy, maximum stability. Of course, depending on the reference point for one or the other, there may be many such points. Economists call the connection between these many points an efficient frontier and they recognize that different users of ratings may want to be on different points of the frontier. That is, different users of ratings may value accuracy more than stability, and vice versa. In conclusion, to be a performing rating, it has to lie on that efficient frontier. A performing rating system should offer sufficient points on the frontier to suit the needs of a diverse group of investors with different accuracy/stability trade-offs.¹¹

An early analysis described corporate bond quality and investor experience by shedding light on the following questions that this book also addresses.¹² What does performance mean? How do ratings size up future bond risks and returns, relative to the grades that they assign ex ante and relative to the grades that other participants, such as bond buyers and sellers, assign as shown in credit spreads? How well do they perform in the short term as opposed to the lifetime of a bond? Do rating changes reveal a lot to the market or are they market followers? What in fact do agency ratings intend *vis-à-vis* market ratings? What are the particular ways in which CRAs reach their ratings and what sets them apart from market ratings? Dealing with these questions also, this book highlights that CRAs conduct their work in a world of varying degrees of information asymmetry between bond investors and issuers.

¹¹ For an excellent more technical discussion of these insights, see Cantor, R., and Mann, C., 2006. Analyzing the tradeoff between ratings accuracy and stability, *Special Comment: Moody's Investors Service*, September, Report 99100, 1–8.

¹² Hickman, W.B., 1958. *Corporate Bond Quality and Investors Experience*, Princeton University Press, New Jersey, 1–536.

1.1.2 Credit Ratings Play a Unique Role in Overcoming Information Asymmetries on the Information Exchanges

Securities markets, for which ratings are produced, are really information exchanges. About 20 years ago, shortly after the Boesky affair, M. Phellan, then chairman of the NYSE, argued to the MBA Corporate Finance class at Insead that the name of the stock exchange ought to be changed to information exchange. Today, it is a truism that securities markets are actually information markets. The paradigm of the informational efficiency of these markets has been one of the more powerful and useful inventions of modern finance. Yet the degree, extent, conditions, and consequences of that efficiency remain controversial. Credit ratings compete for attention in one of the most efficient information markets, and few would question that.

The niche that ratings occupy is called ‘information asymmetry.’ One of the most critical impediments to investor rights is their ignorance of what goes on in a company, i.e. the information asymmetry between outside investors and insiders who control company operations. This is the context in which CRAs operate and where they add economic value. With ratings, CRAs aim to remedy the information shortage for fixed income investors.

Why, with all the regulations in place, do investors suffer from information asymmetry and lack valuable knowledge about the company? Would legislated full transparency not be sufficient to close the gap? Full transparency could mean:

- imposing prompt disclosure of material price-sensitive facts;
- making the full managerial line responsible for the completeness and accuracy of financial statements;
- increasing the level of detail of financial statements (including, among other critical information, the compensation paid to individual board members);
- eliminating conflicts of interest between the auditing and advisory businesses of audit firms;
- putting the audit committee in charge of the external auditors, etc.

The truth is that insiders always know more than outsiders, however transparent the management of the company. Companies are not cubic feet of lumber, barrels of oil, or pork bellies whose substance and quality one can readily inspect and measure. They are extremely complex, continuously adapting organisms whose competitive advantages are based on unique knowledge and proprietary information that cannot, and should not, be communicated to outsiders. The information gap can never be fully bridged.

So can outside investors ever know enough if insiders always know more? Consider the case of large shareholders. Through the board, they have better access than creditors to company-specific data in normal times. As the residual claimant, they have stronger incentives than creditors to mine the data to acquire valuable information. Hence, one can reasonably expect that shareholders know more than bondholders.

Evidence shows that general shareholders know less than insiders.¹³ Consider the graph in Figure 1.1. It shows the cumulative daily abnormal returns of shares that are legitimately traded by insiders at date 0. The graph covers data of about three million legitimate inside trades over a thirty year period. The dotted line shows returns when insiders purchase at date 0, whereas the solid line shows returns when insiders sell at date 0.

¹³ See the seminal contribution of Seyhun, H.N., 1986. Insiders’ profits, costs of trading, and market efficiency, *Journal of Financial Economics*, Vol. 16, 189–212.

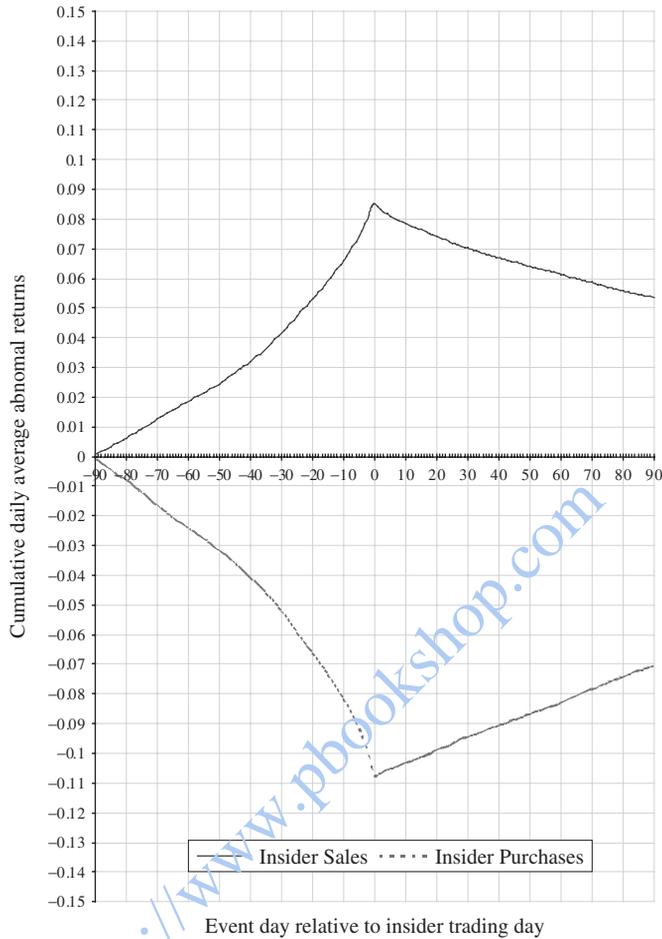


Figure 1.1 Abnormal stock returns to legitimate insider trades around 3015624 stock trades by insiders during 1/1975–12/2005, relative to equally weighted index.

Source: Seyhun, H.N., 1986, Insiders’ profits, costs of trading, and market efficiency, *Journal of Financial Economics*, June, Vol. 16, No. 2, 189–212, page 197, Fig. 1 (updated).

Insiders act upon their superior information. They buy upon irrational bad market news and vice versa on irrational exuberance. Interpret the dotted line as one depicting companies that pursue unusually profitable complex proprietary strategies that outsiders only gradually come to understand. There is, suddenly, bad news: the company doesn’t hit quarterly consensus EPS estimates, or an analyst writes a bad story, or there is a business accident. Collapse. But insiders believe that the bad news is merely transient or, if lasting, that its impact is immaterial. They cannot communicate this, since either the market would not believe them after the bad news, or they would have to give away significant proprietary information to demonstrate their credibility, thus putting the interest of their shareholders at stake (it is hard indeed to share valuable secrets with shareholders without competitors getting hold of them as well). But insiders have the right to legitimately trade on their beliefs that the market is negatively overreacting. They buy. After a while, the market recognizes that they were right. It positively adjusts and rewards the insiders with 4.3% abnormal

returns. The solid line depicts the converse story. For this competitive company, nothing special happens, investors get normal returns for the risk taken. Then, suddenly, the company gets on the radar, and extensive purchases take place . . . for no real good reason. The insiders know this and, consequently, sell. After a while, the market comes back to its senses. It rewards the insider for having sold: they can buy back their original stake at a 2.2% discount.

In conclusion, outsiders and, in particular, creditors ride on the insiders. There is always going to be an information gap that only insiders can bridge. Outsiders have no means of ever knowing what goes on within the company. Insiders believe that they detect market mispricing and act upon it, usually correctly, as shown by their average profits. Along the way, they help long-term outside shareholders to reap fair risk–reward returns. What does that mean in terms of our concerns regarding the information position of outsiders? It means that insiders always outsmart outsiders. This being the case for inside shareholders *vis-à-vis* outside shareholders, it is *a fortiori* the case *vis-à-vis* bondholders and creditors generally.

Moral hazard puts creditors especially at the mercy of information asymmetry about what insiders are up to. Think about it in the following way. Making a risky loan is like lending at the risk-free rate and getting a price discount for the poor-quality grade of the loan due to its default risk. Fischer Black and others have demonstrated that the value of that discount is equal to the value of a put option on the firm assets with the face value of the debt as the exercise price; i.e. if the value of the assets is below the amount due at the due date, the lender has to accept only the value of this asset in payment. So, making a risky loan is like buying a riskless government bond and shorting that put option.¹⁴ The upside of this deal is limited.

For equity, however, it is the other way around – the upside of equity is unlimited. In fact, holding equity is like holding a call option on the firm's assets with the face value of the debt of the firm as the exercise price. The shareholder gets all the upside, provided the debt is paid when it is due. Now, to see where the devil of moral hazard is hidden, consider a firm that starts increasing the idiosyncratic risk of its business and the total riskiness of its business increases over and above the riskiness that was expected at the time of its latest bond issue. There is no change in the systematic component of the risk, which is the only one that is priced to determine the enterprise value. But asset total volatility has increased. As a result, the value of the put and of the call on the assets both increase. Of course, there is a little difference in detail. For the bondholder who is short the put, the value of his stake declines. For the shareholder who is long the call, the value of his stake increases. With the increase in volatility, the likelihood that the bond will default increases without a corresponding increase in the upside, whereas for the shareholder, the likelihood of hitting a real upside increases, without a corresponding increase in the downside. The essential moral hazard in debt is thus the perverse incentive of the shareholder to surreptitiously increase business risk once the debt has been issued, thereby shifting value from the bondholders to himself.

From a fixed income investor standpoint, moral hazard is one type of exposure to event risk. Event risk is 'a deliberate change of the risk parameters of an issuer, a change that results in an immediate benefit to equity investors at the expense of fixed income investors.'¹⁵ Examples of event risk include leveraged buyouts, leveraged breakup bids, or a borrower itself substantially changing its risk characteristics through a balance sheet restructuring. The last is the moral hazard type of event risk in corporate debt.

¹⁴ Nowadays, holders of many of these risky bonds can buy that put option 'back' from credit risk insurers in the credit derivatives swap (CDS) market.

¹⁵ Working group of investment institutions ('Gang of 26'), 2003. Improving market standards in the Sterling and Euro Fixed Income Credit markets, Proposals Paper, October, 1–8, page 2.

Exhibit 1.2 Worldwide storage of original information

Storage medium	2002 terabytes: upper estimate	1999–2000 terabytes: upper estimate	% Change: upper estimates
Paper	1 634	1 200	36%
Film	420 254	431 690	–3%
Magnetic	4 999 230	2 779 760	80%
Optical	103	81	28%
Total	5 421 221	3 212 731	69%

Sources: Lyman, P. and Varian, H.R., How Much Information? 2003. Reproduced with permission; and Mauboussin, M.J., 2006, *More Than You Know: Finding Financial Wisdom in Unconventional Places*, Columbia University Press, New York, 1–268.

Moral hazard is also very pervasive in the structured finance segment, although it is a couple of layers further away from the rating agency. In structured finance the moral hazard would be the perverse incentive of the borrower, such as a mortgage holder, to make risky bets to increase its potential upside as equity holder, while having only limited liability. Moreover, there is also moral hazard when originators and/or arrangers exert low effort on the due diligence on the assets being structured, or fail to disclose relevant information. It is useful to highlight that in the structured finance segment there is no auditing of the underlying assets and that no party has clearly its reputation at stake for disclosing the due diligence on these assets. Both the rating of a corporate bond and that of a structured finance transaction, even if a large part of the latter consists in rating-to-a-model, essentially should bridge the asymmetric information between the ultimate insiders and outsiders.

In this world of information asymmetries, how serious is the danger that excess information about issuers will create scarcity of attention to ratings? Bond investors nowadays appear to be confronted with an information glut rather than with a shortage. As a measure of the glut, consider the worldwide storage of original information in Exhibit 1.2.¹⁶ What original information, if any, can credit ratings add to a world like that and in which in which hedge funds use high-tech filters to harvest market gossip with automated systems that ‘trawl’ through more than 40 million internet sources – from blogs to regulatory filings.¹⁷ Or in a hypothetical brave new world in which issuers will have switched from quarterly standard accounts to on-line real-time customized reporting of upstream information about income and assets?¹⁸ How original and proprietary is the bit of information that casts a forward-looking opinion about a binary event: default or non-default? Such a forward-looking opinion is something quite abstract, non-committing, even when cast in numbers. It is intangible, transient, maybe even fungible.

So what value do ratings add to whatever information is already embedded in security prices? Just bear in mind that rated issues are often securities traded on some of the more competitive securities markets that exist. The rating may very well stick to an asset, but this asset is continuously ground through one of the most powerful information mills of the world: the security markets. What is there left of the rating once the markets have

¹⁶ A terabyte is one trillion bytes.

¹⁷ Scholtes, S., 2006. Hedge funds to use high-tech filter to harvest market gossip, *Financial Times*, September 21, page 1.

¹⁸ BDO International, Deloitte, Ernst&Young, Grant Thornton International, KPMG International, and PricewaterhouseCoopers International Limited, 2006. Global capital markets and the global economy: a vision from the CEOs of the International Audit Networks, November, 1–24, pages 15–18.

processed all available information to set the price of a bond? This question is particularly relevant now that theoretical models, numerical methods, databases, inferential techniques, and computing power are all at work to extract an issuer's default probability from freely available observables. These probabilities are called market-implied ratings (MIRs). Even some legislators have called these more 'reliable' than fundamental credit ratings.

Of course, while such endorsement makes these MIRs more legitimate, it doesn't make them more reliable.

Information asymmetries will persist because one can never fully move from the outside to the inside. Insiders will always be ahead of the crowd, and will always know more than outsiders. And forceful analysis and arguments exist for the case that new and growing gaps will emerge in increasingly diverse and unconventional places.¹⁹ The space for traditional ratings to occupy may in fact expand, rather than contract. It will be up to the CRAs to keep focusing their work and their output on bridging the information gaps between insiders and outsiders, and so avoid disappearing into oblivion. But market participants will only pay attention to traditional fundamental ratings if they offer something unique. And if corporate bond issuers are expected to continue to pay a fee for a rating that will be ground away a few seconds after trading starts, that uniqueness has to be valuable. Where is that value in a world of excess information that is freely embedded in market prices? It is in the space where there is information about default prospects that is not embedded in market prices.²⁰

Credit ratings will thus specialize in resolving information asymmetries between issuer and creditor. As long as fundamental ratings are anchored in information asymmetries, they are in a unique spot. Secondary markets will continue to pay attention to them in a different way to how they view MIRs, because fundamental ratings add to markets, whereas MIRs express the markets. In fact, in turbulent times MIRs may very well express market excesses, whereas fundamental ratings are in a strong position to dampen them. How will the relationship between CRA ratings and MIR ratings of the same securities evolve? It is sufficient to spend a few hours browsing the websites of on-line real-time market price providers, the CRAs, risk management solution providers, investment banks, asset management firms, bond market information aggregators, news agencies, and other information distributors to observe that both of these ratings are part of the same world. Will they fuse or further split apart? One cannot isolate CRAs from the market, MIRs, and competing fixed income information providers. Increasingly, CRAs are integrating MIRs into their analysis in order to sharpen their focus and deepen their insight at the margin of information uniqueness that is their *raison d'être*.

1.1.3 Under the Spotlight as Unique Infomediaries, the CRAs became Strictly Regulated

Poor's words are as relevant today as they were 140 years ago. They are a good description of the state of financial affairs in Thailand prior to the Asian economic crisis of 1997, Russia prior to the 1998 crisis, and several US and European large public companies, as became clear after the Internet bubble burst in 2000. They even relate well to the information vacuum

¹⁹ See Mauboussin, M.J., 2006. *More Than You Know: Finding Financial Wisdom in Unconventional Places*, Columbia University Press, New York, 1–268.

²⁰ See Halov, N., and Heider F., 2006. Capital structure, risk and asymmetric information, NYU Stern School of Business and European Central Bank Working Paper, April 15, 1–58, page 27: 'the adverse selection cost of debt is irrelevant for firms that have any rating, and vice versa, suggesting that ratings appear to bridge the information gap between firms and outside investors about risk.'

concerning the quality of many mortgages and mortgage backed securities, as appeared in the subprime mortgage crisis. Many of these companies and assets suffered from similar deficiencies that Poor saw in his day and that legislative changes across OECD countries are attempting to remedy since then.

But now, the role of the CRAs has expanded significantly. When the bond markets started displacing commercial banks and official lending agencies as primary sources of credit to industry and to institutional borrowers, both domestically and internationally, there was a vacuum. Who was going to do the credit risk due diligence on all these bonds that were increasingly offered to the capital markets in lieu of credits granted by commercial banks? Not the credit analysts at the commercial banks, because the bond market was substituting for the credit-granting activities of commercial banks. These banks were not the primary lenders through these bond instruments. They would purchase some corporate bonds in the primary and secondary markets, but were not granting the credit and incurring the cost of the credit analysis as they had previously when deciding on a long-term investment credit for a corporation. Who filled the vacuum? It was the credit analysts at the CRAs. They became real intermediaries between issuers (originators of information), and investors (users of information). The major CRAs thus came to play an increasingly important and influential role in capital markets. Today, they are the credit risk compass for the asset allocation of institutional investors as private capital moves freely around the world in search of the best trade-off between risk and return.

However, as the activities of CRAs expanded, so did their exposure, on both sides of the investment equation. Since 1997, the CRAs have been caught in the middle, or worse, between the hammer and the anvil, in several highly visible instances. Issuers sometimes claim that it is the rating action that affects their creditworthiness and reputation, rather than the underlying conditions that led to the action. Bond investors sometimes believe that somehow CRAs possess a crystal ball about an issuer's future or that issuers are unable to hide anything from them. So different stakeholders in the level, timeliness and predictive accuracy of a rating and its changes tend to become very angry at CRAs when they are perceived to be making mistakes. And since 1998 the CRAs have been going through a difficult period of significant controversy.

The major CRAs have been strongly criticized for failing to raise the alarm ahead of credit crises. They were accused of failing to spot the Asian crisis that broke out on July 2, 1997. S&P rated Korea investment grade until December 21, 1997, and Indonesia until December 30. Were the CRAs 'caught with their pants down,' as a *Euromoney* article title suggested?²¹ More recently, investors and opinion leaders have criticized CRAs for failing to spot the Enron, WorldCom, and Parmalat collapses. Moody's and S&P rated Enron investment grade until November 27, 2001 – six days before it declared bankruptcy. Similarly for Worldcom, which Moody's rated investment grade until May 8, 2002 and S&P until May 9, about two months before it declared bankruptcy. And S&P rated Parmalat SpA investment grade until 18 days before it declared bankruptcy on December 27, 2003. Finally, in July 2007, the rating agencies massively downgraded residential mortgage backed securities that had been issued just a year earlier, because of origination issues such as aggressive residential mortgage loan underwriting. But, of course, ratings require the full and honest participation of the debt issuer. And the CRAs have pointed out that these collapsed issuers repeatedly misled them.²²

²¹ See Irvine, S., 1998. Caught with their pants down?, *Euromoney*, 345, January, 51–53.

²² See, for example, the Standard & Poor's press release of December 19, 2003. Parmalat Finanziaria, Parmalat cut to D on missed payment of put option, ratings withdrawn, stating 'Continued lack of access to reliable information

Alternatively, issuers complained that CRAs were too harsh on them. Obligors accused them of creating the bad weather, rather than being just the weathermen. According to the *Wall Street Journal Europe*, Alcatel SA Chief Serge Tchuruk likened the agencies to ‘pyromaniac firemen,’ while Vivendi Universal SA CEO Jean-René Fourtou called them ‘the executioner.’ And France Telecom SA’s former CEO, Michel Bon, said an ‘unjustified’ downgrade by Moody’s helped to initiate a debt crisis that cost him his job.²³

As a result, most interest groups with stakes in rating actions mobilized. They scrutinized the CRAs or had regulators and legislators scrutinize them, and possibly muzzle them, asking questions such as: ‘Are issuers faced with too many agencies keen to charge them fees or with not enough of them to have bargaining power?’ The Committee of European Securities Regulators (CESR), International Monetary Fund (IMF), the International Organization of Securities Commissions (IOSCO), the Securities and Exchange Commission (SEC), and the US Senate, to name the major ones, conducted investigations, hearings, and made proposals for reform from 2003 through today, leading so far to the Credit Rating Agency Reform Act of 2006 in the US. The CRAs individually engaged alongside industry associations of major users such as the Bond Market Association (BMA) and the International Group of Treasury Associations (IGTA).²⁴

Regulators have demonstrated a particular eagerness to have a say in agency credit ratings. It should be no surprise. They feel responsible for the quality of the information that is available to investors and are for the soundness of the financial sector. They worry occasionally about possible biases in ratings, because typically agencies earn their revenues from the fees that rated issuers pay to be rated. Alternatively, the speed of adjustment of ratings to changing issuer conditions causes concern. Sometimes they are afraid that downgrades that are too prompt make things worse for the debtor, and therefore also for the investor. Sometimes the regulators complain that agencies are too slow in downgrading, particularly so when hindsight makes it easy to predict a default that has already occurred.

However, whatever the regulators’ complaints about rating agencies, they use them. A major international regulatory lobby, the Basel Committee on Banking Supervision, under the auspices of the Bank for International Settlements (BIS), assigned credit ratings a central role in its revised framework for bank capital measurement and capital standards, announced in June 2004. Accordingly, the equity capital that banks must have will be based upon the credit risk of their assets as measured, among others, by CRA credit ratings of these assets.²⁵ In addition, many critics of CRAs rely on them to provide objective information to facilitate investment decisions – for instance, pension funds, which base their investment criteria on bond ratings.

on the group’s exact financial position, . . . left Standard & Poor’s with no other option than to withdraw all of the ratings on Parmalat and related entities.’

²³ Delaney, K.J., 2002. France Inc. is fuming at top rating agencies – Anger over downgrades is sign of new accountability; ‘Search for a Scapegoat,’ *The Wall Street Journal Europe*, November 20.

²⁴ CRAs themselves don’t have an industry association out of respect to antitrust legislation in the US.

²⁵ This will become the case as national bank prudential regulatory authorities enact in their own jurisdictions the revised framework on the international convergence of capital measurement and capital standards of the Basel Committee on Banking Supervision at the Bank for International Settlements. Central bank governors and the heads of bank supervisory authorities in the Group of Ten (G10) countries endorsed this new capital adequacy framework commonly known as Basel II on June 26, 2004. See Basel Committee on Banking Supervision, 2004. *International Convergence of Capital Measurement and Capital Standards: A Revised Framework*, Bank for International Settlements, Basel, June, 1–251.

Publicly available data suggests that the CRA business is generally extraordinarily profitable, growing fast and highly concentrated, which prompts another host of questions. Is this the competitive result of significant and sustainable competitive advantages? Are the reputational and network barriers that a new entrant has to overcome so high that an oligopoly is not only unavoidable but also more efficient than any other industry organization? Or are there many artificial barriers to entry in this industry that ought to be abolished? Do agencies possess unreasonable pricing power? Are the recent profit results of major CRAs just transient, the consequence of the demand for ratings expanding at a speed far in excess of supply? Or is there a structural misalignment between the public interest role that agencies play through the many regulatory uses of the CRAs' product – and in consequence the demand for it – and the private shareholders' interest in the conduct of their business? These are complicated questions that deserve careful analysis before answering, and hence meticulous observation and realistic explanation of how the CRAs actually work. The CRA industry is in fact naturally concentrated. Incumbents compete with intensive rivalry against each other. Contesting new entrants make gallant attempts to break in. The US Credit Agency Reform Act of 2006 strictly regulated the agencies' conduct while simultaneously removing some artificial regulatory hurdles for entering the industry.

Ill-prepared for the spotlight, the CRAs are now living in it. There is little doubt that the rating process has played a major role in inducing companies and countries to become more transparent in their dealings with investors, and that the credit rating industry review process since 2003 is inciting the CRAs themselves to become ever more transparent, diligent, and deontological in their own work. But the technological and industrial environment of this work has become ever more challenging.

To sum up, we discuss CRAs and their credit ratings in the context of traditional business analysis, the moral hazard incentives of shareholders, sovereigns or originators, and the re-invigorated *modus operandi* of the CRAs following the 2003–2006 industry review. We have decided not to treat the structured finance segment as a wholly separate part in the book, but we rather insist on its main specificities relative to the more traditional rating segments. Structured finance ratings have been in many headlines the last year but we found that the fundamental issues were really recurring ones such as conflicts of interest, due diligence, disclosure, transparency, investor communication, timeliness and accuracy. Three basic insights guide us. The CRAs' core activity is benchmarking default prospects in a world of ever-lasting, and expanding, information asymmetries. The bizarre CRA industry is extremely interesting because it combines intensive rivalry with high concentration, and public service with the private pursuit of profit. Finally, notwithstanding the current financial crisis, the trend of capital markets penetrating more deeply and broadly into all economies worldwide continues, the role of CRAs is bound to expand and evolve and, correspondingly, to be challenged.

The book hopes to stimulate the reader's own thinking about CRAs and credit ratings. We try to combine breadth of perspective, substantiation of arguments, and depth in reflection – without mathematics. We cover the role of credit ratings in the economy, the industry organization of the ratings agency business and how to get to a rating. We guide the reader through what credit ratings really are, how credit rating agencies actually work, and why this whole activity is in fact relevant through the following chapter steps.

1.2 BOOK CHAPTERS

The book is organized in three parts: Credit Rating Foundations (A), Credit Rating Analysis (B), and The Credit Rating Business (C). Credit Rating Foundations explains in three chapters what credit ratings are, reviews how broad and diverse their applications are, and describes how an issuer obtains and maintains a credit rating.

Chapter 2 reviews what value credit ratings add in a world of corporate defaults, what scales they use, and how to interpret them. It explores the notion that ratings are opinions, not statements of fact, and reviews how CRAs ensure honesty and diligence in their own processes. We also discuss the things that a CRA is not – an auditor or a fraud detective.

Chapter 3, on the application of credit ratings, explains how important it is for borrowers and investors that ratings reduce information asymmetries between them. It notes the success of CRAs through the wide use of ratings by prescribers such as private contractors, trustees, boards of directors, corporate finance advisers, underwriters, brokers, and regulators, none of whom is a principal in any rating action.

Chapter 4 describes how to obtain and maintain a credit rating. We discuss the rating process and the players involved, and how the eventual rating decision is made. The actions following a rating decision are described, and the increasing importance of monitoring and communication is explored. Legal liability, confidentiality, and the cost of obtaining a rating are also discussed.

Part (B), Credit Rating Analysis, begins in **Chapter 5** with a study of France Telecom and the company's credit ratings between 1995 and 2004, when it went from sovereign status to near speculative grade and then back up to investment grade. The case study covers the rating actions, the business climate in which France Telecom was operating and impact on management. The case study is used to illustrate how rating actions and inactions interact with the market, offer a forward-looking perspective, and provide a degree of anticipation akin to the traditional perspective of bank credit committees. The France Telecom story shows the importance of analyzing fundamental default risk and the prospects of recovery in case of default.

Chapter 6, on Credit Analysis, deals mostly with corporate issuer analysis. It starts with reviewing the principles, methodologies, and approaches underlying fundamental credit analysis. It also explains how to extract default probabilities from market prices, explains both approaches, and clarifies how they are different and complementary. The chapter concludes with a brief review of the essentials of special sector ratings, including sovereigns, financial strength, and structured finance instruments.

Chapter 7, on Credit Rating Performance, addresses the questions of their accuracy, and how rating actions and inactions interact with the market. How accurate are ratings in predicting actual defaults and in avoiding false predictions of defaults that never occur? What do ratings and ratings changes add to the pricing of securities? How rationally and diligently did the CRAs act during periods of crisis?

Part (C), the Credit Rating Business, analyses in **Chapter 8** the credit rating industry – where it comes from, its main characteristics, how the main players compete, and the results it produces for issuers, investors, and shareholders.

Chapter 9, the regulatory oversight of the industry, covers first the regulatory uses of ratings and next the regulation of the industry. This entails both industry structure issues

and conduct of business issues. We first discuss the self-regulatory approach – ‘comply with the consensual code of conduct or explain why you don’t’ – of the EU, so far, and next the administrative oversight approach of the SECs rule to implement the Credit Rating Agency Reform Act of 2006 in the US.

We conclude in **Chapter 10** by giving our perspective on the value that rating agencies add for issuers, investors, and CRA shareholders. We also offer our view of the challenges they face, before sharing some final thoughts.

The structured finance vignettes throughout this book provide descriptions of various aspects of structured finance to the reader. SPVs (Vignette 1), the supply of and the demand for SFI (Vignettes 2 and 3), Taganka Car loan (Vignette 4), synthetic CDOs (Vignette 5), the rating process for SFI (Vignette 6), structured finance ratings and spreads (Vignette 7), and the stability of SFI credit ratings (Vignette 8).

1.3 SUPPORTING MATERIALS

We complement the text in many chapters by providing Exhibits, Tables, and Figures. As often as possible we try to refer to the original dataset, when it is difficult to access or compute we refer to data from intermediary sources.

We used a multiplicity of sources as references.

Credit Rating Agency Documents

There are two broad types of CRA documents: rating actions and others. We refer to rating actions as the agency public documents referencing and describing any new rating, rating or rating outlook change or affirmation after a review. The rating actions that are quoted or commented on in the main text, are referred to only in the footnotes and by the agency name, document title and date. For parsimony, we omit them from the list of references at the end of the book.

Among others, CRAs produce abundant periodic reports. These cover how they produce ratings and the various methods used in doing so; how well these ratings perform; and how they run their organizations. In addition, they publish occasional concept papers and policy statements. When deciding how to reference all of these, we bore in mind the interest of the reader and the differential treatments across CRAs of the identification of the authors of the periodic reports. We choose as the most logical and useful solution for the reader to always mention just the company name for the periodic reports and also the authors name for occasional concept papers and policy statements.

Interest Group Documents and Interviews

We benefitted from the extensive CRA industry review that took place in 2003–2006 and 2007–2008. We learned a lot about CRAs from hours and hours of field interviews and discussion with the different stakeholders: issuers, investors, CRAs themselves, bankers, risk managers, and regulators.

Economic Research

Great minds in economics have devoted at one point of their academic or professional career some of their talent to solve some important problems dealing with credit rating agencies and their ratings. Our purpose in this book is not to compete with these, but to pay them tribute. Their vast contributions, for which we are grateful, enabled us to write the synthesis expressed in this book. We recognize this by making extensive use of selective referencing. Our references are illustrative, but in no way exhaustive. We apologize beforehand to the many contributors to the issues that we discuss. If their work has not been cited, it is for reasons of parsimony or simply our ignorance. We cite many quotes and research findings in the book, but it is always done to support or illustrate the points that we make in our narrative, not to demonstrate anything. We focus on rigor in explaining intuition, not in deriving proofs that mathematics allows. We make one important exception concerning the kernel of our book that accurate ratings resolve adverse selection and moral hazard problems between bond issuers and investors. This point is so central that we provide illustrative proofs of it in a special annex to **Chapter 3**. By necessity, our narrative becomes occasionally quite verbose without supporting analytical derivations. It is mostly in this circumstance that we appeal to the authority of notorious contributors to our subject. All errors in doing so are ours. We did our best at never misconstruing someone else's point. If we failed occasionally, we express our regrets and ask our apologies to be accepted. To alleviate the text in order to be reader friendly, we omit to cite their names in the narrative and do so only in footnotes and the list of references.

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