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March 31, 2015

-VIA ELECTRONIC FILING-

Ms. Carlotta S. Stauffer
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallassee, FL 32399-0850

Re: Docket No. 150100-EI
Response to Desoto County Generating Company LLC's Objections to Florida Power & Light Company's 2015 Request for Proposals

Dear Ms. Stauffer:

Enclosed for filing on behalf of Florida Power & Light Company ("FPL") is FPL's Response to Desoto County Generating Company's Objections to FPL's 2015 Request for Proposals.

If you or your Staff have any questions regarding this transmittal, please contact me at (561) 304-5662.

Sincerely,

s/ William P. Cox
William P. Cox
Senior Attorney

WPC/msw

Enclosures

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

In re: Desoto County Generating Company, LLC's Objections to Florida Power & Light Company's 2015 Request for Proposals	Docket No. 150100-EI Filed: March 31, 2015

RESPONSE OF FLORIDA POWER & LIGHT COMPANY

Pursuant to Rule 25-22.082, Florida Administrative Code ("F.A.C."), Florida Power & Light Company ("FPL" or the "Company") is filing its responses to the objections filed on March 26, 2015, by DeSoto County Generating Company, LLC ("DeSoto") to FPL's March 16, 2015, Request for Proposals ("RFP"). FPL responds as follows.

INTRODUCTION

The Florida Public Service Commission ("Commission" or "FPSC") has received from DeSoto five objections to the terms of FPL's RFP. FPL is responding in this document to DeSoto's objections.

Before addressing the dubious "merits" of DeSoto's individual objections, three initial observations are warranted. First, the standard the Commission has set forth in Rule 25-22.082, Florida Administrative Code (hereinafter referred to as "the Bid Rule") for the RFP objection process is whether the RFP violates the Bid Rule. It is not whether the terms of the RFP are consistent with the RFP terms of another electric utility in or outside of Florida or with any other criterion that (a) has not been subjected to the rulemaking requirements and procedures of the Florida Administrative Procedure Act ("APA") and (b) is not included in any form in the Bid Rule. Second, the objections contain many unsupported assertions. If there was support for these unfounded assertions, Desoto should have provided it. In the absence of such support, Desoto's assertions should be viewed skeptically. Third, the objections request more relief than

the Commission contemplated providing when it adopted this process for addressing objections to an RFP. In considering the relief requested in this rule-created objections process under Rule 25-22.082(12), the Commission should recognize that it is not making a decision that determines parties' substantial interests under the requirements of Section 120.569, 120.57(1) or 120.57(2), Florida Statutes. It is simply offering guidance on the compliance of the terms of the RFP with the Bid Rule and is not authorized under the Bid Rule to grant any other relief.

Standard of Review

The portion of the Bid Rule that creates this RFP objection process is very specific as to appropriate objections:

> (12) A potential participant may file with the Commission objections to the RFP limited to specific allegations of violations of this rule within 10 days of the issuance of the RFP. The public utility may file a written response within 5 days. Within 30 days from the date of the objection, the Commission panel assigned shall determine whether the objection as stated would demonstrate that a rule violation has occurred, based on the written submission and oral argument by the objector and the public utility, without discovery or an evidentiary hearing. The RFP process will not be abated pending the resolution of such objections.

The only issue for resolution is whether the RFP terms violate the Bid Rule. The standard is not whether an RFP term violates or is inconsistent with the practices of other utilities or any other criterion not expressly provided for in the Bid Rule.

The Bid Rule was adopted to protect utility customers by creating a solicitation process that resulted in the utility's selection of the best and most cost-effective generating option that will meet a utility's reliability and performance requirements on behalf of the utility's customers. That is the purpose of the Bid Rule, nothing more. It was not designed to protect or promote the competitive interests of those who wish to sell power or generating facilities to a public utility, or

to advance any other purpose alleged by DeSoto.[1] The Commission simply wanted the utility to select the best and most cost-effective unit or source of power. The objections raised by DeSoto are a distortion of the Commission's Bid Rule and its underlying intent, clearly stated in the Bid Rule itself:

> (1) Scope and Intent. The intent of this rule is to provide the Commission information to evaluate a public utility's decision regarding the addition of generating capacity pursuant to Section 403.519, F.S. The use of a Request for Proposals (RFP) process is an appropriate means to ensure that a public utility's selection of a proposed generation addition is the most cost-effective alternative available.

DeSoto argues the terms of the RFP are unfair, anti-competitive, or otherwise unreasonable based on arguments that the terms at issue would restrict participation in the RFP. This is clearly not the case as discussed in greater detail below and as evidenced by the 40 current registrants to the RFP, with DeSoto being the only objector to the RFP's terms. DeSoto would have the Commission interpret the Bid Rule to protect its own interests rather than the interests of FPL's customers. In truth, DeSoto must become serious about competition and become competitive rather than resorting to essentially asking the Commission to rewrite the Bid Rule. FPL respectfully urges the Commission to reject this misinterpretation of the Bid Rule.

Introduction to FPL's Responses

The remainder of this document contains FPL's responses to the filed objections, which are primarily objections made to FPL's Minimum Requirements. These are mandatory requirements in the RFP, all of which FPL believes are necessary to protect FPL's customers. The Minimum Requirements of FPL's RFP are set forth at pages 12-34 of FPL's RFP. Four of

[1] Any use or attempted construct of the Bid Rule to promote or protect competitive interests of third party providers of electric power and energy is misplaced. Chapter 366, Florida Statutes, confers no such authority on the Commission; thus, the absence of any such provision in the Bid Rule is not surprising.

the Minimum Requirements have received some form of objection from DeSoto. In addition, DeSoto raises an objection regarding retirement and replacement of certain gas turbine units at FPL's Ft. Myers plant site, three years earlier than the 2019 date addressed by the RFP -- a contention that is baseless, misplaced, and which does not address a minimum requirement, evaluation criterion, or any other matter that is properly at issue in the RFP or this proceeding. FPL's responses to these objections follow in turn.

A. Sale of Existing or New (Turnkey) Units

FPL has required as a Minimum Requirement of its RFP that "FPL will not consider or evaluate proposals to sell a generating unit to FPL…." RFP at page 15. DeSoto has contested this Minimum Requirement, claiming it violates the Bid Rule because it is "unfair, unreasonable, anti-competitive, and contrary to the public interest." DeSoto Objections at 9.

DeSoto asserts that FPL should be forced to consider the sale of existing units as well as new third party units constructed on a turnkey basis. To the contrary, FPL appropriately decided against soliciting bids for the sale of existing and new generating units in this RFP. As a factual matter, DeSoto's contention that FPL should consider new turnkey projects is a "red herring." DeSoto is not proposing such a project, and no one else is contesting this point in the RFP. Regardless, constructing a power plant is a complex endeavor: one that can involve significant risks as to cost and schedule. FPL's track record is solid in constructing new state of the art combined cycle facilities on time and under budget. There is no compelling case at this time for FPL to place its trust in another developer for a new plant that FPL has the best experience and capability to build here in Florida and neither has anyone proposed any such opportunity. Second, and more to the point, however, DeSoto is not proposing a new plant, but an older unit that is not even currently in service.

The acquisition of existing plants in the context of an RFP such as is contemplated by the Bid Rule presents even more challenges. It is incontrovertible that reliability and performance are becoming increasingly important for FPL and its customers and for the state of Florida as a whole. Customers and their electric uses are increasingly more reliant upon the delivery of uninterrupted power; customers' expectations are greater than ever; and expectations and forecasted requirements for cleaner emissions profiles are increasing. Taking these and other considerations in account, it makes little practical sense to seek to meet FPL's needs through the acquisition of older and less efficient existing units.

FPL's customers would be disadvantaged by being served by older units, with higher heat rates (less efficiency), years of use ("more than a decade" according to Desoto), and likely deterioration. Such units likely have not been maintained in a way that would allow FPL to maximize its system reliability. In the case of DeSoto in particular, the unit has not even operated recently due to its inefficiency and high cost (which DeSoto euphemistically refers to as "lack of commercial interest") and currently is in inactive reserve status with the Florida Reliability Coordinating Council. See DeSoto Objections at 4-5.[2] FPL's unit will run as something close to a base load unit, which DeSoto's unit could not achieve from a performance standpoint. In the end, there are no negotiable contractual provisions in a Purchase and Sale Agreement for such a unit that could protect against performance better than will be achieved through a new, state of the art unit such as FPL's Next Planned Generating Unit ("NPGU").

DeSoto, however, is not restricted from proposing in this RFP to sell FPL capacity and energy under a purchase power agreement from DeSoto's facility to meet FPL's 2019 capacity need, as FPL confirmed by its response to question 12 posted on the RFP website prior to the

[2] These statements contrast sharply with DeSoto's other unsubstantiated claims of a "proven record of satisfactory performance" and having "operated the DeSoto Facility successfully, responsibly, and reliably in Florida for more than a decade." DeSoto Objections at 13.

filing of DeSoto's instant objection.[3] Interestingly, if DeSoto were to suggest that the purchase price for FPL to acquire the unit could be low enough to make it cost-effective for FPL and its customers, DeSoto could always write off enough of the asset to reach the same set of economics through a PPA as DeSoto implies could be obtained through an outright sale. DeSoto can propose such a solution and thus participate fully in this RFP.

The concerns and issues regarding the acquisition of existing or new units through the RFP process to meet FPL customer needs are addressed in more detail below.

1. The Risks FPL's Customers Face Associated With FPL Purchasing An Existing Unit Are Too Great To Ask Customers To Assume in the context of an RFP.

There are significant risks to FPL's customers associated with FPL purchasing an existing generating unit that FPL's customers are expected to rely upon for safe, reliable operations for many years, when that unit was built, operated, and maintained by other entities (or even if they propose that FPL operate the unit after the sale). These risks do not exist when FPL builds, maintains, and operates its unit. This does not mean that there may never be other reasons to acquire a third party generating asset; however, an acquisition through an RFP such as this to meet a substantial reliability need presents significant risks that outweigh any potential benefits, particularly in considering the one asset raised by this complaint.

First, FPL has little or no knowledge regarding existing generating units, built, operated, and maintained by others. For units that are expected to fill a signficant need and to be operated over a long period of time, this lack of direct knowledge translates into risk for FPL's customers. FPL knows its existing generating units, the maintenance that has been performed, the quality of maintenance that has been performed, how the units have been operated, and the performance parameters that have been achieved. FPL operates and maintains its existing units proactively,

[3] See attached Exhibit 1.

both on an individual unit basis and as part of the FPL system. FPL does not have such intimate direct knowledge with existing units built, operated, and maintained by others.

Indeed, no amount of due diligence could give FPL the same level of knowledge regarding the historic operation and maintenance of existing units built, operated, and maintained by others as compared to what FPL has with its own existing units. This is particularly important for units that are expected to meet customer needs over a lengthy period of time and with which FPL has had no direct experience with the unit's reliability. While thorough due diligence might allow FPL to reduce the risk of future problems and/or appropriately evaluate the costs associated with existing units built, maintained, and operated by others, such an endeavor does not easily lend itself to the typical RFP process that to date has worked very well for FPL customers. At a minimum, it would complicate and unduly lengthen the entire process. For instance, FPL's recent agreement to purchase the Cedar Bay facility was the result of many months of negotiations and extensive due diligence. The fact that the DeSoto unit (due to its inefficiency) has not operated recently and has been "mothballed" only serves to add to the uncertainty regarding what it would take to return the unit to service, as well as how such a period of inactivity would affect future operations. Even the availability of current or recent operating data could not eliminate all of the uncertainties discussed above; of course, the reality is that there are no such data.

Further, it is very difficult for FPL to assess in an RFP process the magnitude of a possible undetected environmental liability at the site of a generating unit that was built, operated and maintained, mothballed, and subsequently refurbished and returned to service (as would be the case with DeSoto) by others. Such environmental liability could be very large; and in a unit purchase circumstance, FPL and its customers would face a very large risk and potential cost that

could not be fully pursued and effectively quantified in a RFP process.

In contrast, FPL has proposed the acquisition of the Cedar Bay unit. This proposed acquisition was the culmination of almost a year of negotiation and investigation, including examination of hundreds of records and multiple site visits of experts as well as including unique provisions to reduce environmental risks, all on a unit which FPL had nineteen years of operating experience. Such necessary due diligence cannot be accommodated in an RFP process that has served FPL customers well over the years.

Finally, and perhaps most important, there are no existing units that can meet the operating characteristics and advantages of FPL's NPGU. FPL's NPGU is a state of the art facility with a lower heat rate and greater efficiency than virtually any existing combined cycle generating unit. FPL's NPGU will have a projected service life that is longer than virtually any remaining life of existing combined cycle generating units. FPL's NPGU will have manufacturers' warranties that protect FPL and its customers, but many existing units would not have such warranties or would have shorter warranties, providing less protection to customers. FPL's NPGU would have no prior operation or maintenance and would be subject from its inception to a sophisticated and proven maintenance and operational system. In contrast, existing units with potential multiple owners who operated the units to sell into the market and have not typically been operated as a fleet are unlikely to have the same operational history, unit integrity, and equivalent maintenance. All the advantages of FPL's NPGU over existing units, some of which may have operated for more than a decade, translate into disadvantages for existing units and risks for FPL's customers associated with the potential purchase of existing units.[4] Rather than compound the risks already being assessed in the non-economic evaluation,

[4] Even in the case of FPL's announced decision to purchase the Cedar Bay facility, FPL's strategy is take control of the facility, operate it as needed for a brief time, and ultimately retire it at a date earlier than it otherwise would have

FPL determined that the risk level associated with purchasing existing units warranted their removal from consideration.

2. There Is No Compelling Reason For FPL To Delegate To An Entity That Has No Responsibility To Provide Electric Service The Development And Construction Of A New Generating Unit to be Sold to FPL as a Turnkey Project.

A bidder selling a new unit to FPL would not have the same degree of motivation as FPL to ensure that the unit operates effectively during its entire operating life. It is FPL and only FPL that has the obligation to serve its customers. An essential part of providing that service is developing and contracting to construct new generating plants. FPL is very experienced in conducting competitive solicitations for equipment, materials, and services related to the construction of generating units to be operated and maintained by FPL, and in selecting the best suppliers to effectively serve FPL's customers. FPL's experience in power plant development and contracting associated with power plant development has served FPL's customers well. FPL has a long history of successfully developing new power plants, particularly gas-fired combined cycle units, on time and at or under budget.

Establishing relationships with suppliers and contractors is important not only in developing and building power plants, but also in negotiating and dealing with these same vendors over the course of the life of FPL's units. FPL's direct interaction with suppliers of equipment, materials, and services when developing and constructing power plants serves and protects FPL's customers well when FPL needs to return to such vendors for work after FPL has begun operating and maintaining its units. If FPL were to delegate the original development and construction of facilities to an entity that has no obligation to provide service, *i.e.*, purchase a new "turnkey" unit, then FPL would lose valuable relationships that are necessary to the

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been under the existing purchase contract in an effort to provide cost savings for FPL's customers. This RFP is specifically designed to solicit bids for long term capacity – a purpose for which an older, inefficient plant is not well suited.

successful operation and maintenance of units after they become part of FPL's system. There is simply no compelling reason to do so; moreover, this is not in any event the basis of DeSoto's proposal.

B. Replacement of Gas Turbine Units at FPL's Ft. Myers Plant Site

Citing FPL's resource plan found in Appendix E to the RFP at pages E-4 and E-5, DeSoto argues (without any analytical support or economic analysis) it would be more cost effective for FPL to purchase its facility in the Ft. Myers area than for FPL to replace its retired gas turbine (GT) units in Ft. Myers with a new combustion turbine (CT) unit. *See* DeSoto Objections at 11-12. DeSoto alleges the Bid Rule has been violated in the RFP because FPL will not consider its unit as an alternative to the Ft. Myers GT replacement described in Appendix E to the RFP and claims this is an unfair restriction on participation in the RFP process. *Id.*

DeSoto's contention misses the mark by a wide margin. In no way, shape, or form does this allegation represent a violation of the Bid Rule. The instant RFP addresses a 2019 FPL capacity need, which represents FPL's earliest and next capacity need. It does not address FPL's planned replacement of GT units in Ft. Myers, which is scheduled to be completed in 2016 and, importantly, does not represent a capacity need as suggested by DeSoto.[5] See DeSoto Objections at 9, 11-12. Simply put, the Ft. Myers GT replacement raised by DeSoto is not at issue in FPL's RFP for its 2019 capacity need. As noted above, DeSoto is not restricted from proposing in this RFP to sell FPL capacity and energy under a PPA from DeSoto's facility to meet FPL's 2019 capacity need.

Finally, the requested relief to direct FPL to "consider alternatives" to the GT

[5] The Existing GT Replacement project includes retirement of GT units at Lauderdale, Port Everglades, and Ft. Myers with CT replacements at Lauderdale and Ft. Myers. This project is scheduled to be completed in late 2016 and will result in a net capacity loss of only approximately 40 MW. See RFP, Appendix E, at E-4 –E-5. It creates no FPL capacity need in 2016. Even with the 2016 replacement, FPL meets its reliability criteria.

replacement in Ft. Myers is not relief that can be granted under the Bid Rule, given that the GT replacement is not the subject of the RFP. *See* DeSoto Objections at 12. Effectively, DeSoto is asking the Commission to amend the Bid Rule to cover units that clearly are not covered under the current language of the Bid Rule. Such relief in this limited proceeding would be a violation of the rulemaking provisions of the Florida Administrative Procedure Act. Rule 25-22.082(11), F.A.C. clearly states the purpose of the RFP objections process is to determine if an RFP term would constitute a violation of the Bid Rule. That is the only issue before the Commission and, accordingly, the requested relief to order FPL to consider alernatives to the proposed Ft. Myers GT replacement is not permissible under the instant RFP objection process.

C. Completion and Performance Security

As a Minimum Requirement, FPL has required entities submitting proposals to agree to the following Completion and Performance Security requirements:

Table 1 Security Milestone Schedule - New Unit

Event	Security Amount	Security Type
Execution of Purchase Agreement	$20,000/MW	Completion Security
FPSC and FERC Authorization Received	$185,000/MW	Completion Security
Commercial Operation	$200,000/MW	Performance Security

Table 2 Security Milestone Schedule - Existing Unit

Event	Security Amount	Security Type
Execution of Purchase Agreement	$20,000/MW	Completion Security
FPSC and FERC Authorization Received	$200,000/MW	Performance Security

RFP at 30.

DeSoto has objected to these minimum requirements, alleging that the Performance Security requirement of $200,000 per MW violates the Bid Rule because it is "unfair, unnecessary, and contrary to the public interest." *See* DeSoto Objections at 12-13. DeSoto's

position is based on two principal assertions: 1) its facility is an existing generating facility with an alleged proven and satisfactory performance record (which apparently includes having been mothballed for an extended period of time); and 2) FPL's own Standard Offer Contract requires Performance Security of $30,000 per MW. *Id.* at 13. Based on these assertions, DeSoto urges the Commission to order FPL to reduce the Performance Security amount for DeSoto and other existing facilities where the owner/operator can demonstrate a proven record of satisfactory performance.

DeSoto's arguments in this regard are unavailing. They misapprehend fundamental distinctions between the unregulated environment in which an Independent Power Producer's ("IPP's") project would be constructed, subsequently refurbished and returned to service after being mothballed (as in the case of DeSoto), and/or operated, and the regulated environment in which FPL's self-build option would be constructed and operated. Desoto's position also fails to acknowledge the present risks associated with the independent power industry that would be passed on to FPL's customers upon entering into a long-term purchased power agreement with a financially questionable entity, as well as the distinctions between such an agreement and FPL's standard offer contract.

DeSoto's position regarding the Completion and Performance Security conveniently ignores essential differences between the different regulatory regimes in which an IPP plant on the one hand and FPL's self-build option on the other hand would be constructed and operated. A public utility is cost-of-service regulated and has an obligation to provide reliable, cost effective electric service to all customers. An IPP such as DeSoto is unregulated as to reliability and has no regulatory "obligation to serve."

Because an entity selling power to FPL would not be subject to Commission regulatory oversight, one of FPL's primary considerations in drafting the RFP Security requirements and the Power Purchase Agreement ("PPA") Key Conditions attached to the RFP as Appendix B was protection of FPL's customers in the event of the supplier's failure to perform. Customers are protected from FPL's failure to perform by the Commission. However, entities that sign contracts to provide capacity and energy to FPL under a PPA are not subject to Commission regulation and oversight as to that wholesale activity. So, for customers to be protected, they must be protected by the terms of the contract, or not at all.

Only through specific provisions in the PPA can FPL ensure that an unregulated supplier will do "whatever it takes" to deliver on schedule and as proposed, such that FPL can fulfill its obligation to provide reliable, cost-effective electric service to customers. Contractual commitments alone, however, are not sufficient to protect the customer. There must be sufficient amounts of cash on hand to pay for replacement capacity and energy, on short notice, in what could be tight supply conditions. And in order for these contract provisions to have practical value and meaningful consequences, appropriate security amounts must be required of unregulated suppliers. That is the purpose of the Completion Security and the Performance Security.

At its essence, DeSoto's argument that Proposers should not be held to performance standards because it has an alleged (but totally undocumented) satisfactory track record operating its facility is an ill-concealed attempt to shift risks away from itself and its investors and onto FPL and its customers, without assuming the corresponding cost-of-service and reliability regulation. For example, if the utility builds a plant at a cost below that which was projected or operates the plant at performance levels better than were estimated, (as FPL did at Plants

Canaveral and Riviera Beach), customers capture that benefit. Conversely, if an IPP builds a plant at a lower cost than projected or, in the case of DeSoto, refurbishes and operates its generating unit better than planned, the IPP's shareholders capture that benefit. The IPP must accept the risks, costs, and obligations of operating as an IPP along with the benefits.

Throughout its objections, DeSoto has either ignored or failed to recognize how the three RFP provisions, Financial Viability (minimum debt rating), Completion and Performance Security provisions, and Step-In Rights,[6] work together in a balanced, non-redundant fashion to protect customers. The Completion and Performance Security provisions provide guarantees and cash equivalents that ensure that FPL's customers can be compensated for damages resulting from lack of completion and/or performance by the IPP developer. These requirements also provide meaningful incentives for the Proposer to perform under the PPA as promised. Failing adequacy of the Completion and Performance Security, *e.g.*, where money damages alone are not sufficient to ensure that the lights will remain on, Step-In Rights give FPL the right to protect customers by performing work that the Proposer is unable or unwilling to do. As discussed below at pages 19-23, the Financial Viability requirement, or minimum debt rating, is necessary to minimize the risk of bankruptcy by a Proposer, an event that carries its own set of costs and consequences for the purchasing utility and its customers, which may only be partially, if at all, addressed by the other security requirements and Step-In Rights, as discussed below.

What DeSoto wishes is for an existing IPP unit with an unsubstantiated track record to have the opportunity to be awarded the bid based upon a promised low price, yet having to post only a minimal level of security to secure its performance obligations. If the IPP is unable to

[6] "Step-In Rights" refer to an RFP requirement that would be part of a power purchase agreement (PPA) with a successful Proposer specifying FPL's right to enter upon and complete the licensing, permitting, construction, start-up, testing, and commissioning, or operate and maintain the generating unit, as applicable, as agent for the Proposer, upon Proposer's failure to satisfy any project milestone or failure to cure a default by the Proposer within the PPA's cure period. See RFP, Section IV.8.vi.

meet any of the project Milestones, FPL customers' sole protection would be for FPL to "Step In." If FPL were to exercise its Step-In Rights, FPL would be paid its costs by the IPP (a payment obligation itself secured by the Completion Security and the Performance Security), but the IPP would still be paid its Capacity and Energy Payments. In essence, the proposed Step-In Rights alone, without other meaningful security requirements, are tantamount to an invitation for a financially strapped IPP to arbitrage the difference between its costs and capabilities versus FPL's. This would provide the developer the option of using FPL's personnel, skills, experience, and financial strength to support its profits.

In short, the provisions cited protect FPL's customers by 1) making sure there are funds available to compensate them for extra costs caused by the Proposer's failure to meet its promises (Security provisions), 2) assuring them that FPL will see that the plant is completed and/or operated as promised (Step-In Rights), and 3) reducing the risk of the IPP going bankrupt after FPL and its customers agree to rely upon the IPP's commitment (Financial Viability).

Without foundation or support, other than a reference to FPL's current standard offer contract for purchase of capacity and energy from renewable generating facilities and small qualifying facilities with a design capacity of 100 kW or less, DeSoto summarily concludes that the levels of required Completion and Performance Security are excessive. As described in detail below, the levels of Completion and Performance Security for a proposal that may offer up to 1,650 MW of capacity needed to meet reliability criteria provide appropriate protection for FPL's customers given the current and foreseeable environment. In contrast, the Performance Security Amount provided in FPL's standard offer contract is not designed to protect the interests of FPL's customers for PPAs that address significant long-term capacity needs such as that addressed in the instant RFP.

The Completion Security protects customers from the failure of a Proposer to make timely delivery of the capacity and energy it has contracted to deliver and the associated loss of reliability and increased costs. The Completion Security protects customers in two distinct ways. First, it provides a significant financial motivation for the Proposer to finish its project on time and avoid forfeiture of the Completion Security. Second, in the event the Proposer fails to perform, then the Completion Security provides a significant, assured source of funds for FPL to be able to replace the undelivered capacity and energy without customers having to pay higher prices.

The Completion Security level required in this RFP ($185,000-200,000/MW) compares reasonably with the Completion Security requirement in FPL's last two RFPs. The Completion Security required in FPL's most recent RFP was $211,000-289,000/MW. The Completion Security in FPL's second most recent RFP was $319,000/MW. Neither of these amounts was protested. In 2003, FPL had yet another RFP which was protested. In that case, the amount of the Completion Security was $188,000/MW in 2002 dollars. The Commission concluded that the level of Completion Security (twelve years ago) was not inconsistent with the Bid Rule. *See* FPSC Docket No. 030884-EU.

As to the reasonableness of protecting against performance risk, the Commission should consider that lenders must necessarily assess risk**,** including potential performance risk, when providing financing for projects. If the risk of nonperformance is as minimal as potential Proposers have suggested to the Commission, then having to post Performance Security to protect against this minimal risk should not foreclose financing of projects. If the posting of this Performance Security makes a project non-financeable, it is either because the completion risk is so great or the Proposer is so financially risky that the addition of this performance risk makes

them too risky to finance. Customers need to be protected from both risks, and the Performance Security provision prevents shifting these risks to customers.

The Performance Security required in this RFP is the amount and form of security FPL believes is necessary to adequately protect FPL's customers. Similar to Completion Security, Performance Security is significantly lower than in the previous RFP. For a new unit, the amount of Performance Security per MW is slightly higher than the amount of Completion Security per MW to account for the fact that the cost to build and operate a power plant will increase over time.

Bidders would forfeit Performance Security for a material breach of the PPA (also secures any termination payment obligation). The Performance Security provision in the RFP was designed to protect customers from a developer failing to perform at any point during the term of the PPA. This failure to perform could manifest in a number of forms: failure to provide the contracted MW, failure to achieve the contracted heat rate, or failure to achieve contracted availability. In each instance, the result of such failure is that FPL will incur replacement power costs that it will attempt to pass to its customers.

The Commission oversees the performance of FPL's units on a regular basis and has a regular proceeding in which it reviews not only fuel and purchased power costs but also generating unit performance. There are no regulatory requirements in place to protect FPL customers from poor performance by a Proposer pursuant to its PPA. So, if customers are to be protected, they need protection through the provisions of the PPA contract. That is the purpose of the Performance Security provision in the PPA.

The risk of less-than-contracted performance extends over the life of the PPA, which could be as long as thirty years. Rather than require Proposers to post a security that would cover

the potential damages for poor performance for the life of the contract, FPL determined that taken together, FPL's Completion and Performance Security provisions adequately protect customers from completion and performance risks associated with purchasing power.

FPL has balanced the interest of Proposers by allowing the more credit-worthy developers to post reduced levels of cash. These security requirements may adversely affect the ability of a limited amount of less financially viable Proposers from being able to bid, but if it does, it is only because of their fundamental risk profiles, and it protects FPL's customers if such Proposers with unacceptable risk profiles are discouraged from submitting proposals.

For years, the Commission has heard from potential Proposers about just how successful they have been in constructing plants and how reliable and dependable their plants will be, and that adding such plants would enhance reliability of service and lower costs. If these plants turn out to be as advertised, then there will be little or no damages paid by such Proposers under either the Completion or Performance Security. However, if there is a significant failure to perform, the Completion and Performance Security will be in place to protect customers for the failure to perform.

DeSoto alleges that the levels of Completion and Performance Security are excessive relative to FPL's standard offer contract. See DeSoto Objections at 13. DeSoto fails either to comprehend or acknowledge that the standard offer contract is designed, pursuant to Section 366.91, Florida Statutes, specifically to encourage the development of renewable energy resources in Florida. The standard offer contract includes a large number of provisions, in addition to a Performance Security requirement, to meet this legislative objective. The security requirements in the RFP are designed to protect FPL's customers; the reduced security requirements in the standard offer contract provide less protection to FPL's customers but are

designed to encourage the development of renewable energy resources, a specific resource for which the Legislature has encouraged development. *See* Section 366.91, Florida Statutes. The standard offer contract security provision is not designed to provide a sufficient security guarantee to ensure that adequate resources are placed in service (as an alternative to FPL's 2019 NPGU) to meet FPL's load requirements for significant long-term capacity needs. Two entirely different objectives lead, not surprisingly, to different security requirements. DeSoto could reasonably avail itself of the standard offer security provision if its facility contributed to achieving the goals of the standard offer contract, *i.e.*, the development of new renewable energy resources in the state. DeSoto's facility, however, does not contribute to this goal, and DeSoto therefore cannot take advantage of provisions specifically designed to help achieve this goal.

In the end, the proper test of whether the level of Completion or Performance Security is fair is not what has been required in FPL's standard offer contract. The proper test is whether the security levels adequately protect FPL's customers.

FPL is unwilling to subject its customers to the risks of requiring too little security. Absent adequate amounts of a Completion and Performance Security, there is no certain mechanism that would enable FPL or the Commission to protect the customers. The Completion and Performance Security requirements in FPL's RFP do not protect FPL's customers from every conceivable risk or even the largest amount of potential costs they may be asked to pay for a Proposer's failure to perform, but they do provide a reasonable amount of protection.

D. <u>Financial Viability (Minimum Debt Rating for Bidders)</u>

FPL has specified as a Minimum Requirement that for proposals supported by newly built generation: the Proposer or the qualified guarantor of the Proposer "must have a senior unsecured debt rating of not less than 'BBB-' from Standard & Poor's or 'Baa3' from Moody's

Investors Service with a 'stable' outlook." See, RFP at 12. DeSoto has objected to this requirement, alleging that it is "anti-competitive and thus unfair" when coupled with the RFP's Completion and Performance Security requirements. DeSoto Objections at 13-14. DeSoto's position is based principally on the assertion that the requirement "could have the effect of foreclosing completely viable proposals" from consideration. *Id.* DeSoto's speculative arguments are unconvincing and are predicated in large measure on a misinterpretation (or a mischaracterization) of the RFP and the Financial Viability, or minimum senior unsecured debt rating, requirement.

FPL appropriately is insisting that all bidders or their guarantors have an investment grade senior unsecured debt rating. Rather than working "contrary to the best interests of FPL's customers" as DeSoto alleges, the investment grade rating requirement for projects that carry financing and construction completion risk is necessary to protect FPL customers. Inviting entities with non-investment grade, or junk bond, status to bid and potentially operate a power plant is, at best, an unreasonable proposition and, at worst, a very poor bet with potentially serious detrimental consequences for Florida and its electric consumers. This is a bet that FPL is unwilling to make on behalf of its customers.

Entities rated below 'BBB-' by S&P or 'Baa3' by Moody's have a historical five-year default rate of approximately 15.595%, substantially higher (more than thirteen (13) times higher) than the average default rate of 1.116% for higher rated entities.[7] Entities with rating below 'BBB-' by S&P or 'Baa3' by Moody's have non-investment grade ratings because they reflect higher risks to their investors. That risk should stay with their investors. Those business risks should not be transferred to or shared with FPL's customers.

[7] *Default and Recovery Rates of Corporate Bond Issuers*, Moody's Report, March 2015 (hereinafter "Moody's Report"). Exhibit 2 attached hereto.

DeSoto is incorrect in asserting that other security requirements of the RFP, if left in place, lessen the need for a minimum debt rating. The Completion Security, though intended to protect customers in the event of default, cannot possibly contemplate all circumstances and potential for loss to FPL's customers. Additionally, there is no way to know for sure that replacement power will be available when needed. Taking on the financing and construction, refurbishment, and safe, reliable operation of a power plant requires financial strength and flexibility. Below-grade investment entities simply have too little of either for FPL to have sufficient confidence in a proposal from such an entity.

The Minimum Debt Rating requirement minimizes the risk of having to deal with a bankrupt Proposer to meet the 2019 need. It helps avoid the associated detrimental consequences to customers. Indeed, should the Proposer go bankrupt, it may be expensive, time consuming, or impossible to enforce the Completion Security or Step-In Right provisions in a bankruptcy court. Given the bankruptcies over the last three years of at least six IPPs,[8] the concern is clearly justified, and the RFP's Financial Viability standard is warranted. Simply stated, FPL is looking for greater certainty that the plant will be financed and built on time or refurbished and returned to service (in the case of DeSoto) and in accordance with the terms of the PPA than would be presented by below-investment grade rated entities.

[8] These bankruptcies include the following IPPs: **Energy Future Holding (EFH)/TXU Energy Inc. (TXU) (2014)** ("Energy Future Holdings Files for Chapter 11 Bankruptcy", Star-Telegram at http://www.star-telegram.com/news/business/article3855518.html (viewed on March 30, 2015)); **Optim Energy, LLC (2014)** ("Bill Gates' Investment Optim Energy Files for Bankruptcy", Reuters at http://www.reuters.com/article/2014/02/12/optimenergy-bankruptcy-idUSL2N0LH14M20140212 (viewed on March 30, 2015)); **Edison Mission Energy (2013)** ("Edison Mission Energy Files for Bankruptcy Protection", Los Angeles Times at http://articles.latimes.com/2012/dec/18/business/la-fi-edison-mission-bankruptcy-20121218 (viewed on March 30, 2015)); **AES Eastern Energy, LP (2013)** ("AES Eastern Energy Files for Bankruptcy", Wall Street Journal at http://www.wsj.com/articles/SB10001424052970204720204577132960443385988 (viewed on March 30, 2015); **Dynegy, Inc.** (2012-2013) ("Dynegy Inc Filed for Bankruptcy; Will Merger with Unit", Reuters at http://www.reuters.com/article/2012/07/06/us-dynegyinc-bankruptcy-idUSBRE8650FI20120706 (viewed on March 30, 2015)); and **Bicent Power LLC (2012)** ("Bicent Holdings, Units File for Bankruptcy Protection", Chicago Tribune at http://articles.chicagotribune.com/2012-04-23/news/sns-rt-bicentholdingsl3e8fn8ws-20120423_1_bankruptcy-protection-lien-power-plant (viewed on March 30, 2015).

In its filing, DeSoto advocates abandoning the minimum unsecured debt rating requirement because of other security arrangements and contract rights, while at the same time urging the Commission to reduce significantly or eliminate the very same security arrangements. DeSoto Objections at 12-13. As noted above at pages 14-15, considering its objections as a whole, clearly DeSoto's intent is to have the Commission strip away all the protective measures of the RFP to the point that an IPP is trusted to timely and properly complete construction and/or operation of a major power plant. In effect, DeSoto would have FPL and its customers rely almost wholly on "step-in" rights in the event of bankruptcy or non-performance, including where the Proposer simply makes an economic decision to abandon the project.

Because Desoto carefully avoids discussing prior FPL RFPs where FPL has used minimum financial viability requirements to protect its customers, FPL would remind the Commission that such Minimum Requirements have been used repeatedly by FPL in the past. More importantly, the Commission has found that such minimum financial viability requirements are consistent with the Bid Rule. FPL has employed minimum financial viability requirements in its RFPs in 2007, 2005, and 2003. In the two most recent RFPs, the minimum financial viability criteria were not protested. In FPL's 2003 capacity RFP, FPL's minimum financial viability requirements were protested, and the Commission found no violation of the Bid Rule in that case. Docket No. 030844.

The construction and safe, reliable operation and maintenance of a power plant represent distinctly important decisions in terms of assuring the continued delivery of reliable and cost-effective electric service to customers. In such instances, the creditworthiness of Proposers must be seriously considered, in contrast to other instances involving smaller or less critical

transactions where Completion and Performance Security provisions alone might provide a sufficient level of protection and a minimum investment grade rating may not be warranted.

Further, the Completion and Performance Security amounts are capped at specific amounts that do not include consequential damages. These amounts are merely informed estimates of potential economic harm to FPL's customers for completion or performance failure. The credit rating level chosen by FPL was the maximum level of risk to which FPL felt its customers should be exposed for an undertaking as significant as the financing, construction, and/or operation of a power plant. FPL declines to expose its customers to an unreasonable level of risk associated with the financing, construction, and/or operation of a power plant by an entity with non-investment grade or junk bond status. Having the counterparty to a PPA be investment grade rated, or having an investment grade rated guarantor, is a necessary layer of protection for our customers.

E. <u>OEM Parts for Critical Components</u>

FPL has specified a minimum requirement that Bidders will be required to state (as part of their bids) that if selected, the bid unit will install and continue to use original equipment manufacturer ("OEM") parts for certain hot gas path ("HGP") components. RFP at 18, Appendix B at B-5. Any PPA executed with a winning bidder will specify the same commitment, and the OEM parts will be installed prior to the start of the term of the PPA. The selected Bidder will annually obtain from the OEM a certification that such OEM parts have been installed and maintained in accordance with OEM schedules. Failure to install and properly maintain such OEM parts, or to obtain OEM's annual certification, will place the selected Bidder in default, with 120 days to cure. If not cured, FPL may terminate the PPA and/or collect damages as specified in the PPA.

DeSoto objects that this OEM parts requirement violates the Bid Rule because it is unfair by imposing unnecessary costs on potential participants, allegedly even in the face of other parts suppliers' products performing better than OEM parts in some instances and PPA performance criteria that adequately protect FPL and its customers. *See* DeSoto Objections at 14-15.

First and foremost, the use of non-OEM parts for critical hot gas path components is not in the best interests of FPL's customers. The use of non-OEM parts for critical hot gas components presents real risks (both reliability and availability risks) to FPL's customers. It is because of this risk that FPL requires the use of OEM parts for critical hot gas path components for its own units. FPL is not protected against this real risk simply by employing a "money fix" through performance guarantees to ensure adequate performance for our customers, as important as that protection is. Our customers require a reliable system, which in FPL's current operating practice demands that OEM parts be used. FPL, as the operator of one of the largest fleets of combustion turbines in the country, is an authority on their safe and reliable operation.

In considering this minimum requirement, it is important to remember that under the Bid Rule proposals are compared to FPL's NPGU. FPL's NPGU will be held to the same exacting standard if it should be found to be FPL's best and most cost-effective option. Indeed, this requirement is applicable to all FPL generating units. So, it would be unfair and unduly discriminatory against FPL's NPGU or others proposals that envisioned using OEM replacement parts if a Bidder were able to propose using other, less reliable (and less expensive) parts. Simply stated, an OEM-parts requirement is needed for all units providing services to protect FPL's customers and help to ensure reliable delivery of power to FPL and its customers. It is not an onerous and commercially infeasible requirement. FPL meets it, and any surrogate hoping to serve FPL's customers should meet it for the benefit of FPL's customers.

Contrary to DeSoto's claim that the OEM requirement is unfair by requiring all – including FPL's NPGU – to use OEM parts, FPL is in fact establishing greater fairness among bids (a level playing field), and promoting reliability for the benefit of FPL's customers. If FPL were able to place a monetary value (that would be generally accepted) regarding the reliability increase of using OEM parts, then FPL could apply that monetary value as a penalty to those bidders that chose not to use OEM parts. Absent that, one way to effectively determine "lowest cost" to customers is to try to "equalize" as much of the non-quantifiable factors (such as the improved reliability value of OEM parts) by requiring all comply with the same requirements – in this instance, OEM parts. No bidder is disadvantaged in this regard relative to another.

The focus of the OEM parts requirement is to assure that FPL's customers are served reliably and economically. FPL strives to have a high level of reliability at the lowest reasonable cost. FPL does not want to "artificially" reduce cost by compromising reliability. Therefore, we believe FPL is avoiding in this RFP a situation where it is comparing a low cost/low reliability bid to FPL's (or another bidder's) high reliability alternative that assumes OEM parts.

Requiring certain critical OEM parts and maintaining those parts in accordance with OEMs' directives, have contributed to the very high level of reliability of FPL's generating units. It is very important – from FPL's customers' perspective – that any generating units that are relied on to contribute to serving our customers' needs under a PPA also achieve similarly high levels of reliability, which could be achieved, in part, by using and properly maintaining OEM parts in accordance with the OEM's specifications.

To the extent that the cost of purchasing and maintaining OEM parts is higher than that associated with secondary market parts, a bidder using such secondary market parts would, in effect, be seeking to obtain an economic advantage for its bid at the expense of our customers'

reliable service. That would be inappropriate both from the perspective of seeking an unfair cost advantage and because of the negative impact on customer reliability.

Importantly, the process utilized by non-OEM suppliers inherently incorporates design uncertainty due to the limited knowledge of the actual component design and the integrated machine design basis. The OEM components designs incorporate extensive and sophisticated static and dynamic system modeling and testing that verifies the design assumptions required to support component durability. The non-OEM suppliers do not have the depth of experience and resources to support the required analytical and verification testing to minimize operational risk and uncertainty. Because of the limited ability to verify the durability of the design, non-OEM component providers allow the equipment owner to assume the risk of both the individual component verification and integrated machine operation of re-engineered parts by operating them in their units. This verification methodology results in an elevated production risk and is unacceptable to the FPL fleet reliability.

There is an incontrovertible fact here, however. If bidders are required to use and properly maintain OEM parts, just as FPL does, then there is no issue regarding inappropriate cost advantages by those who may choose to use cheaper parts (at the expense of our customers' reliability), nor is there an issue regarding quantified evidence of how parts of different origins contribute to different levels of reliability. In other words, by requiring every bidder to use and properly maintain OEM parts, FPL has removed the OEM parts cost issue and the OEM parts reliability issue, as points of contention, and FPL has established a fair, level playing field for all parties to compete.

CONCLUSION

As demonstrated above, DeSoto's objections lack any merit. There is no basis, factual or legal, to provide any of the relief requested by DeSoto. FPL's RFP complies with the Commission's Bid Rule and in some cases goes beyond the requirements of the Bid Rule to the benefit of potential Proposers. Accordingly, the Commission should reject all of the objections on FPL's RFP filed by DeSoto.

Dated: March 31, 2015

Respectfully submitted,

By: */s/ William P. Cox*

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CERTIFICATE OF SERVICE
Docket No. 150100-EI

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by electronic service on this 31st day of March, 2015 to the following:

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EXHIBIT 1

2015 FPL Capacity RFP Questions and Answers

Date: 3 26 2015

1. **Would it be possible to get a definition on what FPL considers a "turnkey project" to be under the ineligible section in the presentation?**

A. For purposes of this RFP, FPL considers a "turnkey project" to be a proposal in which a 3rd party offers to build a new generating unit, then sell that generating unit to FPL on the Proposal Due Date.

2. **Please let me know if a copy of the attendance list will be posted online.**

A. A copy of the attendance list will not be posted on line.

3. **Is it possible to submit a bid for a portion of FPL's capacity need?**

A. Yes, as long as an otherwise eligible bid meets a minimum threshold of 50 MW of firm, dispatchable Summer capacity.

4. **Will FPL give additional credit, or special credit, for a renewable bid?**

A. No.

5. **Is there a minimum term length required?**

A. Yes. As stated in the RFP, the minimum term length for proposals is as follows:

- For a PPA that does not require a need determination, the minimum term is 5 years.
- For a PPA that does require a need determination, the minimum term is 10 years.
- For a natural gas tolling agreement, the minimum term length is 15 years.
- Also, there is a general maximum term length of 30 years.

6. **While coal is not permitted, would FPL consider a system sale that includes coal resources?**

A. Yes. As stated in the RFP document, although FPL will not consider a proposal that is based on a coal-fired individual generating unit, FPL will consider an otherwise eligible system sale proposal from a system that includes coal-fired generating units.

7. **Appendix A that presents FPL's 2014 Ten Year Site Plan appears to have some pages missing because the page numbers are not continuous. What information is not presented?**

A. **The only pages from the 2014 Ten Year Site Plan that are not presented are color maps for the various sites discussed in Chapter IV. These maps** were excluded because their inclusion would have increased the file size for this appendix to a point at which servers often have problems in opening the file. In addition, the maps themselves are not essential to understanding FPL's 2014 Ten Year Site Plan for purposes of preparing a proposal for FPL's capacity RFP.

8. **On page 12 of the main body of the RFP: Regarding financial viability, this seems to say that unless you are investment grade you are not eligible to bid. Is that correct? *(See Note 1 below)***

A. Under the Financial Viability Requirements of Proposers heading on page 12 of the main body of the RFP, the following is stated: *"For each proposal submitted pursuant to FPL's RFP, the Proposer or Qualified Guarantor of the Proposer must have a senior unsecured debt rating of no less than "BBB-" from Standard & Poor's, or "Baa3" from Moody's Investors Service with a "stable" outlook, and be able to satisfy the Completion and Performance Security requirements set forth in section 8 below."* An eligible proposal must meet both the unsecured debt rating and security requirements stated above.

9. **Section 14, page 18: Regarding the requirement for OEM parts for critical components, does that apply to existing units? If so, why? Can't this be handled through contractual terms instead of restricting bids? *(See Note 1 below)***

A. Yes, the requirement for OEM parts for critical components applies to existing units. As stated in Appendix C, page C-5: *"For proposals based on an existing generating unit, ...Proposers will be required – as part of their proposal – to explicitly state that, if selected, the proposed unit will install and continue to use OEM replacement parts for such components, and that OEM maintenance schedules will be observed."*

An answer to the second question regarding why this is a Minimum Requirement in FPL's RFP is not needed in order to submit an eligible proposal.

10. In looking at updates to FPL's Ten Year Site Plan, the planned combined cycle unit to meet your 2019 generation need seems to have increased in output. What does that increased capacity represent? *(See Note 1 below)*

A. In its 2014 Site Plan, FPL projected an unsited combined cycle (CC) unit being added in 2019 to meet a 2019 generation need. No decision regarding this resource addition was needed at the time FPL filed its 2014 Site Plan (*i.e.*, April 1, 2014). A year later, FPL has begun the process of deciding which generation option, its self-build CC unit or a PPA, is the best selection for 2019 by issuing this RFP. During the intervening year, FPL conducted analyses designed to identify its best self-build option. A variety of CC (and combustion turbine, CT) technologies of different sizes and performance characteristics was examined. The best self-build was identified as a 1,622 MW (Summer) CC and this unit is FPL's next planned generating unit (NPGU) for this RFP.

11. In the updated site plan that hasn't been published yet, have the existing GT replacements been approved yet? What is the status of those projects? *(See Note 1 below)*

A. FPL management has approved these projects, and the projects are underway and scheduled for completion by the end of 2016. FPL's 2015 Site Plan will provide more information regarding these projects. The 2015 Site Plan will be filed with the FPSC on April 1, 2015. Shortly thereafter, the 2015 Site Plan will be posted on this RFP website.

12. Does this RFP contemplate using energy from the several existing GT units in Florida, some in FPL territory, to meet some of the lost capacity from FPL's replacement of its GTs? *(See Note 1 below)*

A. Eligible proposals based on existing GT units in Florida may be proposed in response to this RFP to address FPL's 2019 generation need.

13. Is there still a contract with Southern scheduled to expire at the end of this year? *(See Note 1 below)*

A. Yes. The contract expires December 31, 2015.

14. What plans do you have in regards to the transmission import rights that will be opened up as a result of that contract expiring? *(See Note 1 below)*

A. Transmission import capability for the 2019 and beyond timeframe would need to be analyzed by FPL and other involved Transmission Providers for each specific resource that would be proposed in response to this RFP. For proposals with generation located outside of the FPL system, FPL will not accept any proposal that requires FPL to secure firm transmission service and any associated rights, as that is the responsibility of the Proposer. FPL will analyze transmission service requests in accordance with Open Access Transmission Tariff provisions, in order for the resources to be designated as an FPL Network Resource and serve FPL's need in 2019 and beyond.

15. In Section III, 19 on page 21, does the requirement for dual fuel capability for natural gas-fired proposals apply to only new units, or does it also apply to existing? *(See Note 1 below)*

A. The dual-fuel capability applies only to new natural gas-fired proposals.

Note 1: Questions 8 through 15 were posed orally over the phone in the RFP Pre-Bid Workshop on March 24th. Due to audio problems in the hotel room, it was difficult to clearly hear/understand the question. This question as written represents FPL's interpretation of the question that was posed. If this question is not an accurate representation of the actual question, FPL encourages the party who posed the question to submit another version of the question via e-mail to the RFP Contact Person.

EXHIBIT 2

MOODY'S INVESTORS SERVICE

SPECIAL COMMENT

Rate this Research

Annual Default Study: Corporate Default and Recovery Rates, 1920-2014

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Summary Rating Rationale

This report comprises Moody's 28th annual default study in which we update statistics on the default, loss, and rating transition experience of corporate bond and loan issuers for 2014, as well as for the historical period since 1920. This study covers financial institutions, non-financial corporates, and utilities which have long-term debt ratings. Briefly, we find that:

» Fifty-three Moody's-rated corporate issuers defaulted in 2014, down from 69 in 2013. In contrast, default volume was up in 2014 consisting of $41.4 billion in bonds and $27.5 billion in loans. In comparison, there were $37.6 billion of bonds and $17.9 billion of loans which defaulted in 2013.

» Defaults were recorded in a number of industries led by the Capital Industries, which registered 20 (or 38% of) defaults. Across regions, 31 of the defaulted issuers were from North America. The remaining defaults were from Europe, Latin America, Asia, and Africa. Measured by default volume, North America had the largest volume with $52.8 billion in defaulted bonds and loans.

» Moody's global speculative-grade default rate ended 2014 at 2.0%, down from 2013's year-end level of 3.0% and corresponding closely to our year-ago forecast of 2.3%. The default rate for all Moody's-rated corporate issuers closed at 1.0% at the end of 2014, also lower than the 1.4% level at year-end 2013, and again close to our year-ago forecast of 1.1%.

» Measured on a dollar volume basis, Moody's global speculative-grade bond default rate finished 2014 at 1.8%, up from 1.2% at the end of 2013. Among all Moody's-rated issuers, the volume-weighted default rate edged up to 0.4% in 2014 from 0.3% in 2013.

» Moody's global speculative-grade default rate forecasting model now predicts that the speculative-grade default rate will rise in 2015 and finish the year at 2.7%. The forecast, if realized, will be higher than 2014's closing level of 2.0% but well below the long-term average of 4.5% since 1983.

THIS REPORT WAS REPUBLISHED ON 16 MARCH 2015 WITH MINOR CHANGES IN DEFAUL RATES FOR GOVEERNMENT RELATED ISSUERS AND THOSE GROUPS WHICH INCLUDE SUCH ISSUERS.

» Following the recovery of the US and European economy, credit quality improved in 2014 with the number of upgrades slightly outpacing downgrades for the first time since the global financial crisis. However, it should be noted that about one fifth of 2014's upgrades were from the US utility sector driven by Moody's updated view on the reliability and credit supportiveness of US utility regulations. Excluding those utility upgrades, downgrades would have again outpaced upgrades in 2014, but there were still more upgrades and fewer downgrades in 2014 than in 2013.

» Measured by post-default trading prices, the average recovery rate for senior unsecured bonds was 43.3% in 2014, close to 2013's 43.8%.

Introduction

For the fifth consecutive year, corporate credit conditions have been quite benign. Despite a weak global economic recovery and significant geopolitical risks, healthy corporate fundamentals and a fertile primary market have helped to maintain a low corporate default rate in 2014. Indeed, many lower rated issuers were able to access the debt market with issuer-friendly terms and refinance their debt with longer-term maturities. Issuance of leveraged loans and high yield bonds remained strong in 2014.

Although defaults were relatively few last year, 2014 was not without issues. While high yield spreads steadily declined in the first six months, they trended higher in the second half, accompanied by increased volatility. Spreads widened for a number of reasons. First came the worry of Fed's QE withdrawal in July. This was followed by geopolitical concerns stemming from the escalation of the Russia-Ukraine conflict and an ongoing slowdown in China's economy, with particularly weak data last summer. Finally, the sharp decline in oil prices cooled down investor sentiment for risky assets.

Another notable characteristic of 2014 was the divergence in economic growth across regions. On the positive side, the US economy continued to improve, albeit weakly, with its GDP increasing by 2.4% in 2014[1] and the unemployment rate declining from 6.8% to 5.6%.[2] The economic recovery in Europe was at an even slower pace last year, dampened by country-specific structural challenges, ongoing muted global output and trade growth, and geopolitical tensions. More recently, the risk of a Greek exit from the euro has returned. Moreover, the impact of the unfolding deep recession in Russia on Europe is as yet uncertain. In Asia, China's GDP growth slowed while Japan's economy contracted in the second and third quarter. Though Japan's growth was positive in the fourth quarter, markets remain concerned about the fragility of its recovery.

Lackluster global growth has translated into expectations of further weakness in demand for oil in an already oversupplied market. Oil prices fell by nearly 50 percent in the second half of the year with West Texas Intermediate ending 2014 at a five-year low of $53 per barrel. Looking ahead, many investors wonder whether the slow economic growth and political volatility signal an end of the current benign credit cycle. With this question in mind, we've updated Moody's 28th Annual Default Study by documenting the default and recovery experience of corporate debt issuers for 2014 as well as for the historical period since 1920.[3] We also discuss Moody's default rate forecast for 2015 and review the performance of Moody's ratings.

1 See BEA's news release on Jan 30th 2015.

2 Per United States Department of Labor.

3 The analysis of default and rating transitions in this report is limited to Moody's-rated financial and non-financial corporate issuers, including utility companies. Consistent with prior year studies, this report's default and transition rate statistics only cover issuers that have Moody's-rated bonds and/or loans and default refers to debt default. Unless otherwise specified, ratings in this report are issuer level, senior unsecured equivalent ratings which are derived from Moody's Senior Rating Algorithm.

Defaults remained benign in 2014

Majority of defaults took place in Q2 and Q3

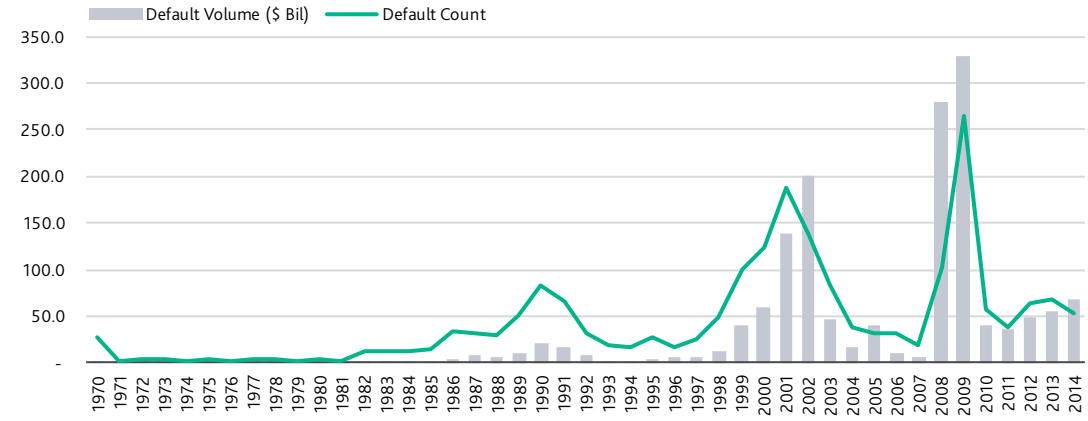
A low interest rate environment and accommodative monetary policies continued to provide sufficient liquidity to the market, allowing high yield borrowers to access debt markets at favorable terms. Worldwide, only 53 Moody's-rated corporate issuers defaulted in 2014, down from 69 in 2013 and slightly below our one-year ago forecast of 61 defaults. Most of the 2014 defaults were recorded in the second and third quarters when 38 companies defaulted, accounting for 72% of defaults for the whole year. In 2014, a total of $68.9 billion of debt went into default, which comprised $41.4 billion of bonds and $27.5 billion of loans. In comparison, the default volume was lower at $55.5 billion in 2013, consisting of $37.6 billion of bonds and $17.9 billion of loans. The largest default in 2014 was Energy Future Holdings Corp (EFH, formerly TXU) which filed for bankruptcy with several of its subsidiaries in April.[4] With approximately $40 billion of debt at default, EFH was the second largest defaulter in history among Moody's-rated non-financial corporations.[5]

From a geographic standpoint, 31 (or 58% of) defaulted issuers were from North America in 2014. Europe accounted for another 11 defaults and the remainder came from Latin America (five), Asia Pacific (five), and Africa (one). Compared to 2013, default counts decreased in North America , Europe and Latin America but increased in Asia Pacific and Africa. The most notable change was in Europe, where defaults fell more than 50% from 24 in 2013 to 11 in 2014. In terms of volume, defaulted debt totaled $68.9 billion in 2014, up from $55.5 billion a year prior. Of that, $52.8 billion was from North America, though as noted above $40 billion is attributable to just one corporate family (EFH); default volume was $7.9 billion in Europe. Outside of the corporate debt market (and hence outside the scope of this report), 2014 also recorded a sovereign default by the Argentine government as it failed to honor the coupon payments on Argentine foreign legislation bonds which were restructured in 2005 and 2010.

In terms of default types, last year's defaults were generally evenly distributed among distressed exchanges (36%), bankruptcies (34%), and payment defaults (30%). Exhibit 1 presents the annual default counts and defaulted debt volumes for the period 1970-2014.

EXHIBIT 1

Defaults remained benign in 2014



Source: Moody's Investors Service

[4] Oncor Electric Delivery Company LLC, which is 80% owned by EFH, was not part of the filing.

[5] The largest defaulter remains General Motors, which had roughly $50 billion of debt when it filed for bankruptcy in June 2009.

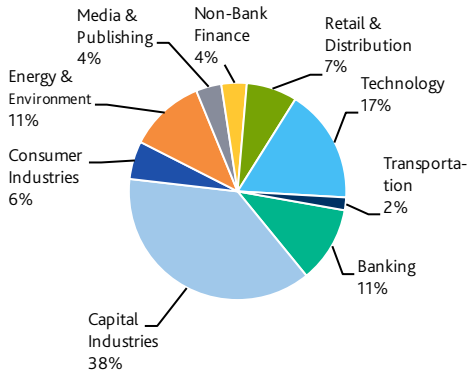
Most defaults came from Capital industries but Energy is the biggest contributor by volume

Of the 53 defaults last year, 38% were by issuers in the Capital Industries sector.[6] This was followed by issuers in the Technology sector, which contributed 17% of defaults in 2014. When measured by default volume, however, the Energy & Environment sector topped the list by accounting for more than half of the total defaulted volume. The next highest share of default volume came from the Capital Industries sector, which contributed 20% of defaulted debt. Exhibit 2 shows the distribution of 2014 defaults by broad industries.

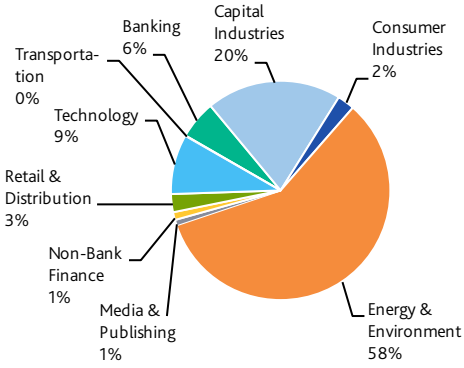
EXHIBIT 2

2014 Default counts and volumes by broad industry

Panel A Distribution of defaulted issuer counts



Panel B Distribution of default dollar volume



Source: Moody's Investors Service

Although the Capital Industries sector accounted for 38% of defaults last year, it was not the sector with the highest rate of default. That distinction belongs to the Technology industry, which had a 2.0% default rate in 2014 (see Exhibit 3).

EXHIBIT 3

Default rate highest in the Technology Sector

Broad Industry	Default Rates*
Banking	0.8%
Capital Industries	1.7%
Consumer Industries	0.5%
Energy & Environment	1.3%
Non-Bank Finance	0.4%
Media & Publishing	1.1%
Retail & Distribution	1.8%
Government Related Issuers	0.0%
Technology	2.0%
Transportation	0.7%
Utilities	0.0%

*Issuer-Weighted

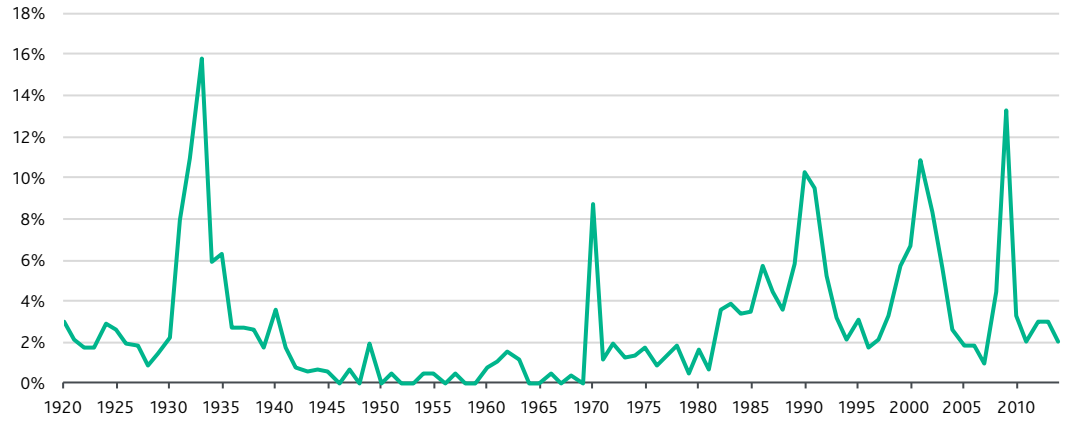
[6] The Capital Industries sector includes automotive, capital equipment, chemicals, plastics, & rubber, construction & building, containers, packaging, & glass, forest products & paper, metals & mining, and business service industries.

Speculative-grade default rate declined to 2.0%

As there were fewer defaults in 2014 than in 2013, the trailing twelve-month issuer-weighted default rate for all Moody's-rated issuers closed at 1.0% in 2014, down from 1.4% in 2013. Among speculative-grade issuers, the default rate also fell to 2.0% from 3.0% (see Exhibit 4). The recent default rate has remained low relative to the historical average of 4.5% since 1983. Measured on a dollar volume basis, Moody's speculative-grade corporate bond default rate rose to 1.8% in 2014 from 1.2% in 2013. The increase in the dollar-weighted bond default rate mainly stemmed from a few sizable defaults including Energy Future and Momentive Performance Materials.[7] For all of Moody's-rated issuers, the volume-weighted default rate edged higher to 0.4% in 2014 from 0.3% in 2013.

EXHIBIT 4

Global speculative-grade default rate declined in 2014



Source: Moody's Investors Service

Rating drift trended up during Q1-Q3 before dipping in Q4

Credit quality among Moody's-rated issuers improved in 2014 with the number of rating upgrades slightly outpacing downgrades for the first time since the global financial crisis. However, it should be noted that approximately one fifth of 2014's rating upgrades were from the US Utility sector in January, which resulted from Moody's updating its view on the reliability and credit supportiveness of US utility regulations.[8] Excluding those utility upgrades, rating downgrades would have again outpaced upgrades in 2014, but it would still be true that there were more upgrades and fewer downgrades in 2014 than in 2013.

Among the four quarters in 2014, credit quality, as measured by rating changes, showed an upward trend in the first three quarters[9] as indicated by the issuer-weighted quarterly rating drift (the percentage of upgrades minus that of downgrades).[10] In the fourth quarter however, rating drift turned negative reflecting geopolitical and economic concerns (see Exhibit 5).

7 Momentive Performance Materials had over $3 billion of debt when it filed for bankruptcy in April.

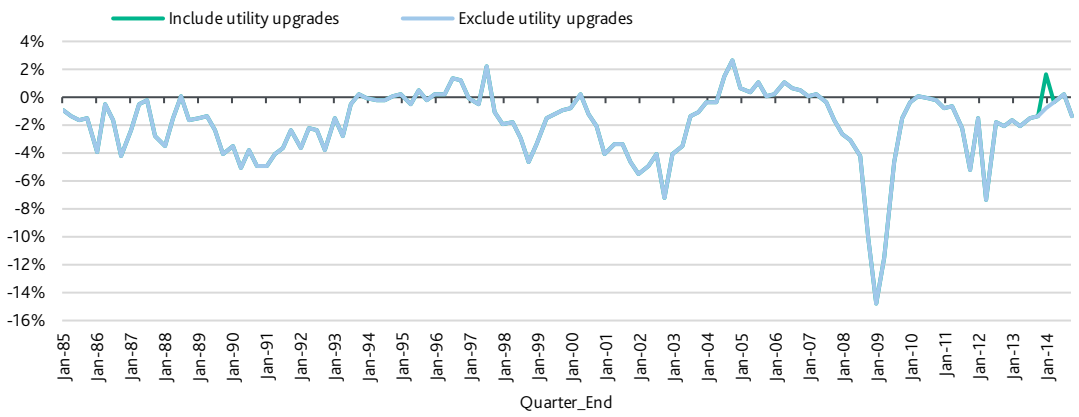
8 See Moody's Special Comment US utility sector upgrades driven by stable and transparent regulatory frameworks, Feb 2014.

9 Not counting those US Utility upgrades in January. First quarter's rating drift was 1.6% if we include those Utility upgrades.

10 Issuer-weighted measures which reflect the direction rather than magnitude of rating changes.

EXHIBIT 5

Rating drift dipped in Q4

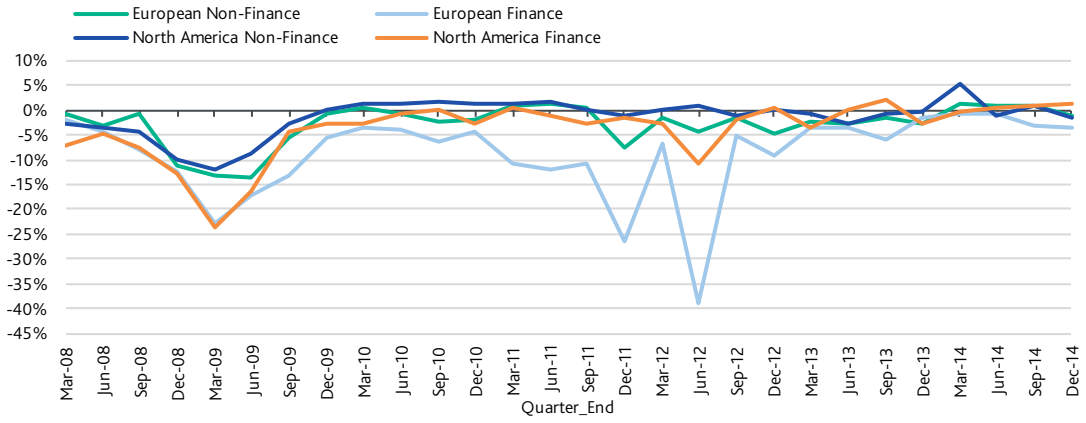


Source: Moody's Investors Service

Across regions and sectors, we find that the credit quality of European financial institutions began to deteriorate in the second half of 2014 after some stabilization in the first half. Nevertheless, the rating drift in the European financial sector in 2014, though still negative, was much improved over the double dips in 2011 and 2012. This can be seen in Exhibit 6, which shows the recent quarterly rating drifts by region and sector. Banks contributed the large majority of the downgrades among European financial institutions in 2014. In addition to deteriorated credit profiles, some of the European bank ratings were lowered following the downgrades of their corresponding sovereign ratings or Moody's reassessment of the likelihood of systemic support.

EXHIBIT 6

European financial institutions weakened in the second half



Source: Moody's Investors Service

2014's recovery rates broadly higher than their historical averages

In Exhibit 7, we present the average recovery rates for debt defaulted in the past two years and put them in context with the historical averages. Last year's recovery rates were for the most part correlated with the priority of claim in the capital structure, with a higher priority of claim enjoying a higher average rate of recovery. The only exception was that senior subordinated bonds recovered at a slightly higher rate of 46.9% relative to the senior unsecured bonds' 43.3%, though that senior subordinated average is based on

only four defaults (see Exhibit 19 for more details).[11] Exhibit 7 further shows that 2014's recoveries were mostly in line with their 2013 levels and higher compared to their long-term averages. For example, the average recovery rate for first lien loans was 78.4% in 2014 versus 66.6% for the period of 1982-2014, while the senior unsecured bond recovery rates averaged 43.3% last year, compared to the historical average of 37.4%.

EXHIBIT 7

Average corporate debt recovery rates measured by post-default trading prices

	Issuer-weighted			Volume-weighted		
Lien Position	2014	2013	1982-2014	2014	2013	1982-2014
1st Lien Bank Loan	78.4%	75.1%	66.6%	80.6%	67.7%	62.5%
2nd Lien Bank Loan*	10.5%	78.7%	31.8%	10.5%	69.2%	28.5%
Sr. Unsecured Bank Loan	n.a.	n.a.	47.1%	n.a.	n.a.	40.2%
Sr. Secured Bond	59.5%	59.8%	52.8%	76.5%	59.5%	52.4%
Sr. Unsecured Bond	43.3%	43.8%	37.4%	34.3%	29.2%	33.6%
Sr. Subordinated Bond*	46.9%	20.7%	31.1%	28.3%	26.6%	26.0%
Subordinated Bond**	38.8%	26.4%	31.4%	38.0%	33.7%	26.3%
Jr. Subordinated Bond	n.a.	n.a.	24.7%	n.a.	n.a.	17.1%

* The average recovery rates for 2014's and 2013's second lien bank loans and senior subordinated bonds were each based on fewer than five defaults.

** The average recovery rates for 2014's subordinated bonds were based on fewer than five defaults.

The above recovery data are based on trading prices at or post default.[12] An alternative recovery measure is based on ultimate recoveries, or the value creditors realize at the resolution of a default event. For example, for issuers filing for bankruptcy, the ultimate recovery is the present value of the cash and/or securities that the creditors actually receive when the issuer exits bankruptcy, typically 1-2 years following the initial default date.[13]

In Exhibit 8, we present data on ultimate recovery rates for North American non-financial companies included in Moody's Ultimate Recovery Database ("URD").[14] The average "firm-wide" recovery rate[15] for the five default resolutions was 65.4% in 2014 compared to 66.2% for the 20 companies which emerged from default in 2013. During both 2014 and 2013, the family recovery rate exceeded the historical average rate of 54.9%. The higher family recovery can be mostly attributed to the fact that out of the five default resolutions, four were pre-arranged bankruptcies, which have historically been characterized by higher family recovery rates than regular bankruptcies. In 2013, we observed a similar pattern, which featured 55% (or eleven) pre-packs of the entire sample of companies that emerged in that year. However, considering the small sample size of default resolutions in 2014, we cannot draw any statistical conclusions about an unusual nature of family recovery rates during this period.

[11] Average recovery rates of senior unsecured bonds and other debts can be based on different defaulters because some defaulters may have senior unsecured bonds and no other debts. Among those 2014 defaulters which have recovery estimates on both senior unsecured and senior subordinated bonds, the recovery estimates for the senior unsecured bonds are consistently higher than the senior subordinated bonds of the same issuers. Please see Exhibit 19 for more details.

[12] For distressed exchanges, we take trading prices at default. For other types of defaults, we take trading prices approximately one month after default.

[13] For details, see Moody's Special Comment Moody's Ultimate Recovery Database, April 2007.

[14] The analysis on ultimate recovery is provided by David Keisman and Julia Chursin. The data are from Moody's Ultimate Recovery Database which includes robust detailed recovery information for over 5,100 loans and bonds from more than 1,000 North American corporate defaulters since 1987.

[15] For a given issuer, the firm-wide recovery rate is the weighted-average recovery rate across all of the issuer's debts where the weights are the size of the debts.

EXHIBIT 8

Average corporate debt recovery rates measured by ultimate recoveries, 1987-2014

	Emergence Year			Default Year		
Lien Position	2014	2013	1987-2014	2014	2013	1987-2014
Loans*	81.0%	76.7%	80.2%	68.4%	76.6%	80.2%
Senior Secured Bonds**	57.1%	84.2%	63.0%	59.4%	56.9%	63.0%
Senior Unsecured Bonds***	44.6%	61.3%	48.8%	0.0%	34.4%	48.8%
Subordinated Bonds	0.0%	21.0%	28.2%	0.0%	21.0%	28.2%

* 2014 Loans' recovery rate is based on seven observations (by year of default) and 14 observations (by year of emergence).

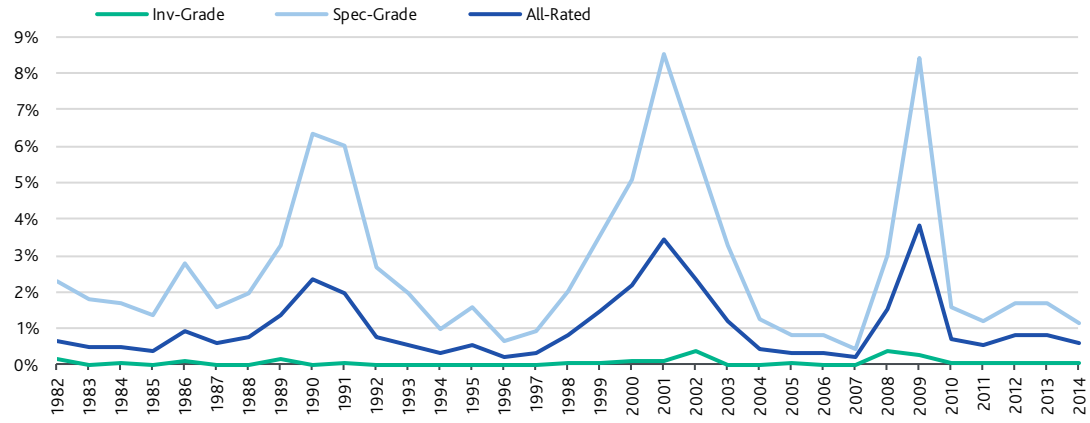
** Unusually high recoveries of 2013's Sr. Secured Bonds stem from a small sample of 17 observations, which were a part of only seven defaults (by year of emergence), with debt instruments from the American Airlines bankruptcy skewing the average recovery rate toward the higher side.

*** Average recovery rate of Sr. Unsecured Bonds which emerged in 2013 is impacted by a high proportion of American Airlines Sr. Unsecured Bonds (53% of the entire sample) , that recovered fully upon emergence from bankruptcy.

Moody's credit ratings are opinions of relative expected credit losses, which are a function of both the probability of default and severity of default ("LGD"). Exhibit 9 shows annual average credit loss rates from 1982 through 2014 for Moody's-rated corporate issuers. The chart indicates that the average credit loss rate among all Moody's-rated issuers declined to 0.6% in 2014 from 0.8% in 2013. To put this in historical perspective, the average annual credit loss rate for Moody's-rated issuers since 1982 is 1.0%.

EXHIBIT 9

Credit loss rates lower in 2014



Source: Moody's Investors Service

Default rate expected to rise modestly in 2015

At the beginning of 2014 Moody's default rate forecasting model ("Credit Transition Model" or "CTM") predicted that the global speculative-grade default rate would finish at 2.3% by the end of the year. The model's prediction turned out to be fairly close to the realized rate of 2.0%.[16]

Looking forward, CTM forecasts that the global speculative-grade default rate will rise modestly in 2015, ranging from 2.0% - 2.7% over the next 11 months (see the light blue line in Exhibit 10). The global rate is expected to finish 2015 at 2.7%, which if realized, will be higher than 2014's closing level of 2.0% but well below the 4.5% historical average. The upward pressure primarily stems from widening spreads,

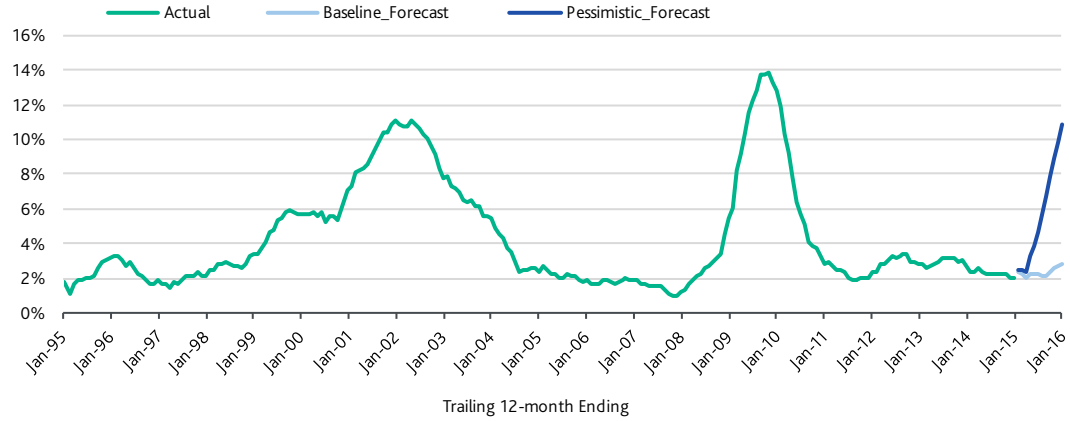
[16] See Moody's December Default Report, Jan 2014.

geopolitical concerns, lackluster economic growth outside of the US, and potential interest rate actions by the Fed. On the other hand, an improving US economy, together with healthy corporate earnings and manageable maturity profiles, should keep the default rate low by historical standards. In addition, monetary policy continues to be accommodative globally and market access for speculative-grade companies is expected to remain in place as investors continue to search for yield.

The above-mentioned 2.7% default rate projection, which implies approximately 76 defaults globally, is made under our baseline scenario. It assumes that the US unemployment rate will ease slightly from its current level of 5.6% to 5.2% by the fourth quarter of 2015 while the high yield spread will widen to 575 bps from 460 bps.[17]

EXHIBIT 10

Speculative-grade default rate expected to tick up in 2015



Source: Moody's Investors Service

While the recent drop in energy prices has raised concerns of rising default risk in the overall high yield market, we believe this should not lead to a spike in the near term default risk for Moody's speculative-grade universe.[18] Whereas Moody's Liquidity Stress Index indicates a sharp rise in the Energy sector to 9.6% as of mid-February from 4.5% in December, the non-energy LSI remained unchanged at 2.9% from January, which was a 19-month low.[19] Similarly, recent rating distribution and watchlist/outlook assignments show some heat among Oil & Gas companies, but there are no particular warning signs pointing to increased stress in the overall high yield market (see Exhibit 11). Although declining oil prices are deleterious for E&P and related companies, they represent a positive for consumer, transportation and a few materials-related industries. Overall, we believe lower oil prices will give the US and Indian economies a boost in the next two years, though they are unlikely to lift global growth significantly as headwinds from the euro area, China, Brazil, and Japan hold back economic activity.[20]

[17] These are option-adjusted, three-month moving averages.

[18] More discussion on the credit impact of lower oil prices on the energy and other sectors can be found at https://www.moodys.com/Pages/Credit-Impact-of-Lower-Oil-Prices.aspx

[19] See Moody's SGL Monitor - Liquidity Pressure Confined to Energy, February 2015.

[20] See Moody's Global Macro Outlook 2015-16 - Lower oil price fails to spur global growth, February 2015.

EXHIBIT 11

Recent rating distribution and watchlist/outlook assignments in the speculative-grade universe

Sector	As of	Share of Caa-C isusers within the SG universe	Share of Caa-C issuers on watch for downgrade or with negative outlook
Oil & Gas	Beginning of 2014	24.7%	17.0%
	Beginning of 2015	27.3%	18.5%
	Mid-Feb 2015	29.4%	28.6%
All Sectors	Beginning of 2014	27.1%	24.9%
	Beginning of 2015	29.3%	24.3%
	Mid-Feb 2015	29.6%	25.4%

Although our baseline scenario remains relatively benign, we acknowledge that there is risk associated with the economic conditions, in particular outside of the US. In Europe, for example, downside risks include policy uncertainty and reform fatigue which could lead investors to reassess the degree of risk in the region and result in a tightening in financing conditions; uncertainties from geopolitical developments in Ukraine, Russia, and the Middle East; negative effects on the Russian economy from declining oil prices; and a slowdown in the Chinese economy that would result in weaker demand for European exports. We cannot rule out the risk that the region falls back into recession. In our pessimistic scenario, the global economy will contract with the unemployment rate climbing to 9.7% and the high yield bond spread widening to 940 bps. In that case, the global high yield default rate is expected to rise to 9.9%, which will more than double the long-term average of 4.5% but still be well below the 2008-2009 peak of 13.9% (see the dark blue line in Exhibit 11).

Across industries, default rates for all of Moody's-rated issuers are expected to be highest in the Environmental sector in the US and in the Aerospace & Defense sector in Europe by the end of this year. Exhibit 12 shows the baseline one-year default rate forecasts across industries in both the US and Europe, sorted by the US rates in descending order.[21] In each region, the same economic assumptions are applied to all industries, so the only factors driving the different forecasted default rates are the underlying rating histories and current ratings of the issuers in those industries.

EXHIBIT 12

One-year corporate default rate forecasts by industry

Industry	US	Europe	Industry	US	Europe
Environmental Industries*	5.9%		Transportation: Cargo	1.3%	0.8%
Services: Consumer	4.3%	1.8%	Capital Equipment	1.2%	0.8%
Hotel, Gaming, & Leisure	3.8%	2.0%	Healthcare & Pharmaceuticals	1.2%	1.2%
Metals & Mining	3.6%	1.5%	High Tech Industries	1.2%	0.7%
Services: Business	3.0%	1.6%	Utilities: Oil & Gas	1.0%	0.5%
Consumer goods: Durable*	2.8%		Construction & Building	1.0%	1.2%
Retail	2.8%	2.0%	Chemicals, Plastics, & Rubber	0.9%	0.7%
Wholesale*	2.8%		Energy: Electricity*	0.8%	
Aerospace & Defense	2.7%	3.8%	Transportation: Consumer	0.6%	0.9%
Containers, Packaging, & Glass	2.5%	2.2%	Media: Diversified & Production*	0.5%	
Media: Advertising, Printing & Publishing	2.4%	1.2%	FIRE: Insurance	0.5%	2.1%

[21] The industry default rate forecasts include both investment-grade and speculative-grade issuers.

EXHIBIT 12

One-year corporate default rate forecasts by industry

Industry	US	Europe	Industry	US	Europe
Consumer goods: Non-durable*	2.4%		Forest Products & Paper*	0.4%	
Energy: Oil & Gas	2.0%	0.8%	FIRE: Real Estate	0.4%	1.2%
Beverage, Food, & Tobacco	1.7%	1.4%	Banking	0.4%	0.9%
FIRE: Finance	1.5%	0.6%	Sovereign & Public Finance	0.1%	0.1%
Media: Broadcasting & Subscription	1.4%	0.8%	Utilities: Electric	0.0%	0.2%
Telecommunications	1.3%	1.0%	Utilities: Water*		0.2%
Automotive	1.3%	0.6%			

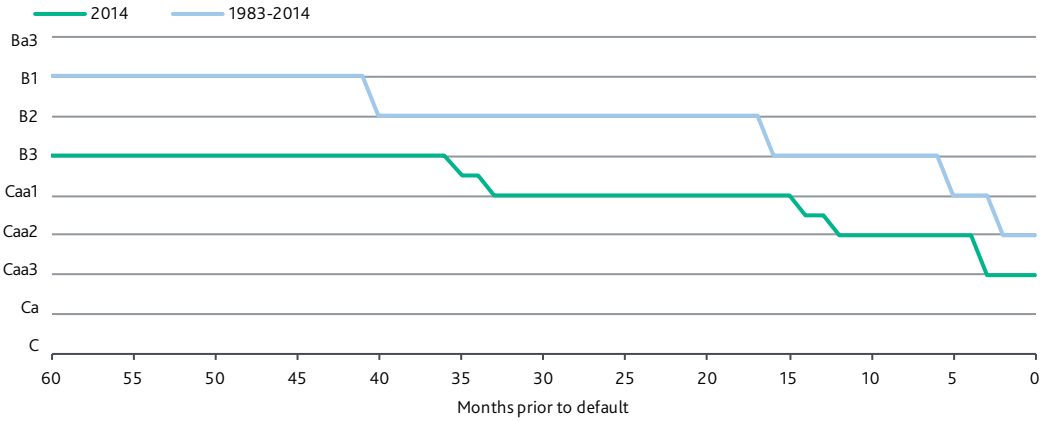
* Default rate forecasts are not reported in these sectors in either Europe or the US due to small sample size (fewer than ten issuers).

Rating accuracy metrics

Moody's ratings have historically proven to be effective predictors of default. This can be seen in Exhibit 13, which plots the median ratings of over 1,900 corporate issuers which defaulted from 1983 to 2014. The chart demonstrates that, historically, Moody's-rated issuers have been downgraded to the B1 level as early as five years prior to default. The comparable rating was lower at B3 among issuers which defaulted in 2014. The median rating one year prior to default for all defaulters in 2014 was Caa2, two notches lower than that rating measured over the entire period 1983-2014.

EXHIBIT 13

Median ratings prior to default, 2014 vs. long-term average



Source: Moody's Investors Service

The data in Exhibit 13 above demonstrate that Moody's corporate ratings are correlated with subsequent default experience. To further demonstrate the ability of ratings to separate issuers with low credit risk from those with high credit risk, we use the Average Position of defaults ("AP") to evaluate the accuracy of Moody's ordinal rating systems (see Exhibit 14).[22] AP measures the average position for defaulters with position defined as the percentage of issuers with higher or equal ratings. A greater AP indicates a more discriminatory rating system as there are more issuers rated higher than the defaulters, or equivalently that defaulters are generally found in lower rating categories. Exhibit 14 reveals that between 1983 and 2014, the Average Position of defaulters has been consistently high during the entire period, with an average of

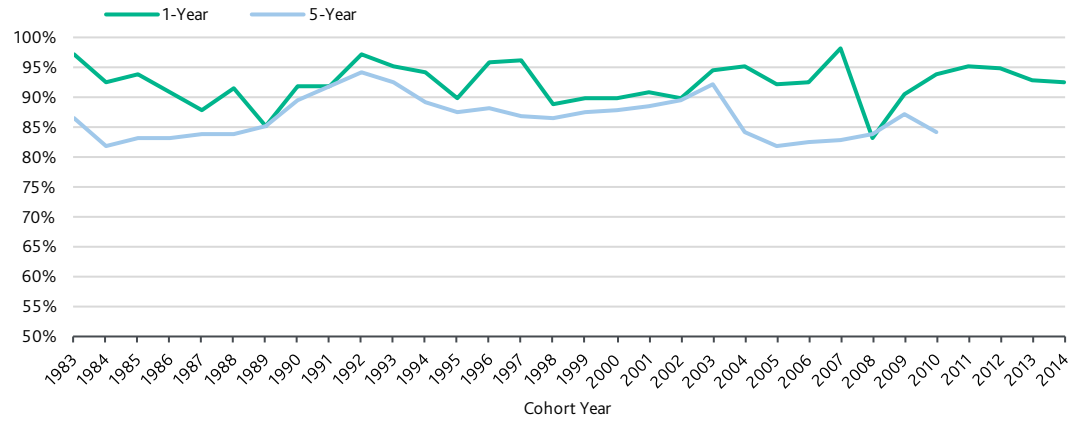
[22] For a detailed discussion of average default position and the mathematical derivation of the accuracy ratio from the average default position, please refer to Moody's Special Comment, Measuring Ratings Accuracy Using Average Default Position, Feb 2011.

92.0% for the one-year horizon and 86.6% for the five-year horizon. Such high APs indicate that Moody's ratings have been effective in predicting defaults over both the short- and long-term periods. The lowest one-year AP was observed in 2008 when Lehman Brothers and several other high grade financial institutions failed. Since then, the AP has quickly recovered and reached 92.5% in 2014.

Across broad sectors, the average APs are higher among non-financial corporate issuers than for financial institutions, particularly in Europe over the five year horizon. The lower AP in the European financial sector mainly results from a few defaults among high rated financial institutions, most of which were in the form of distressed exchanges on junior obligations only. This reflects the structural changes in the European banking sector. Specifically, the systemic support which was widely expected in the financial sector before the global financial crisis had its limits with the junior debt holders uncovered in some cases.[23] As a growing number of countries have moved toward adopting bank resolution regimes that include provisions for burden-sharing with creditors (or "bail-in") to resolve failing banks, Moody's has updated its banking methodologies to appropriately assess government support assumption in bank ratings.[24]

EXHIBIT 14

One- and five-year accuracy default position by cohort year, 1983-2014



Source: Moody's Investors Service

[23] See more details in Moody's Special Comment, European Corporate Default and Recovery Rates, 1985 – 1H 2014, December 2014.

[24] See Moody's Special Comments - Supported Bank Debt Ratings at Risk of Downgrade Due to New Approaches to Bank Resolution (February 2011), European Banks: How Moody's Analytic Approach Reflects Evolving Challenges (January 2012), FAQs: Moody's Finalizes Approach for Rating Certain Bank Contingent Capital Securities and Changes Baseline Assumptions for Rating Bank Subordinated Debt (May 2013), Reassessing Systemic Support for EU Banks (May 2014) and Bank Systemic Support Global Update: Resolution Regimes Drive Shifts in Support (July 2014). For Moody's latest banking rating methodology and request for comment for proposed changes in its bank rating methodology, please see Global Banks (July 2014) and Proposed Bank Rating Methodology (September 2014).

Moody's Related Research

Special Comments:

- 2015 Outlook – North American Non-Financial Corporates, December 2014 (177645)
- 2015 Outlook - EMEA Non-Financial Corporates, December 2014 (177584)
- 2015 Outlook - Global Banks, December 2014 (178070)
- Annual Default Study: Corporate Default and Recovery Rates, 1920-2013, March 2014 (165331)
- European Corporate Default and Recovery Rates, 1985–2014H1, December 2014 (177782)
- Glossary of Moody's Ratings Performance Metrics, September 2011 (135451)
- Industry Credit Risk: Recent Trends for Global Non-Financial Corporations, October 2013 (159346)
- Lower Oil Prices in 2015 Reduce E&P Spending and Raise Risk for OFS Sector, January 2015 (1001977)
- Measuring Ratings Accuracy Using Average Default Position, February 2011 (129451)
- Moody's Global Macro Outlook 2015-16 - Lower oil price fails to spur global growth, February 2015 (1002683)
- Moody's SGL Monitor - Liquidity Pressure Confined to Energy, February 2015 (179258).
- Refunding Risk and Needs 2015-19: US Speculative-Grade Corporations Record Maturities Due in 2019; New Issuance Wave Likely in 2017, February 2015 (179022)
- Refunding Risk and Needs: EMEA Speculative-grade Non-Financial Companies: Record Liquidity Levels Push Maturity Wall Out to 2018, July 2014 (173568)
- US Corporate Default Monitor - Fourth Quarter 2014 - Defaults Projected to Tick Up in 2015, Following Slow End to 2014, January 2015 (1002527)

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

Methodology and Data Sources

Moody's Definition of Default

Moody's definition of default is applicable only to debt or debt-like obligations (e.g., swap agreements). For details, please refer to Moody's Rating Symbols and Definitions.

Methodology

The methodology used in this study can be found in the Glossary of Moody's Ratings Performance Metrics. The Glossary report is a technical paper that explains how Moody's calculates default rates, transition rates, and rating performance metrics in detail.

Changes in this Year's Report

Moody's occasionally discovers historical defaults, leading to minor revisions of the historical data. In 2014, Moody's reclassified the industry codes for certain sovereign- and sub-sovereign-related issuers leading to small changes to the universe of the study. As always, the data contained in the most recently published Moody's default study supersedes the data published in previous reports.

Data Sources

Moody's bases the results of this study on its proprietary database of ratings and defaults for corporate bond and loan issuers. Municipal and sub-sovereign debt issuers, structured finance securities, private placements, and issuers with only short-term debt ratings are excluded unless otherwise noted. In total, Moody's data covers the credit experiences of over 20,000 corporate issuers that sold long-term public debt at some time between 1920 and 2014. As of January 1, 2015, over 5,000 corporate issuers held a Moody's long-term bond, loan, or corporate family rating.

Moody's database of corporate defaults covers more than 3,000 long-term bond and loan defaults by issuers both rated and non-rated by Moody's. Additional data sources, such as Barclay's Fixed Income Index data, supplemented Moody's proprietary data in the construction of the aggregate dollar volume-weighted default rates. Defaulted bond pricing data was derived from Bloomberg, Reuters, IDC, and TRACE. The majority of these market quotes represent an actual bid on the debt instrument, although no trade may have occurred at that price. Over the 1982-2014 period, the dataset includes post-default prices for approximately 5,000 defaulted instruments issued by over 1,700 defaulting corporations. Moody's makes the 1970-2014 credit rating, default, and recovery rate data used in this study available through its Default and Recovery Database (DRD).

Guide to Data Tables and Charts

In this section, we briefly describe the interpretation of some of the Exhibits contained in this report. Exhibit 13 was derived by mapping Moody's ratings to a linear scale, then taking the median values of the numerically mapped ratings.

Exhibit 21 shows average senior unsecured recovery rates by letter rating and year prior to default. Each cell in the table indicates the average recovery rate on senior unsecured bonds with a specific rating within T years of default. For example, the 37.2% two-year B recovery rate reported in Exhibit 21 indicates the average recovery rate on B rated issues that default at some time within a two-year period, not recovery rate for issuers rated B exactly two years before default. Together with issuer-weighted average cumulative

default rates, these multi-period recovery estimates are used to calculate cumulative expected credit loss rates, as presented in Exhibit 22.

Exhibits 32 through 37 show issuer-weighted historical average default rates by rating category over various investment horizons. These data were generated by averaging the multi-year default rates of cohorts formed at monthly intervals. In addition to their being statements of historical fact, these data are also useful proxies for expected default rates. For example, over a five-year period a portfolio of B-rated issuers defaulted at a 23.3% average rate between 1983 and 2014 (see Exhibit 34). For an investor with a five-year exposure to a B-rated debt obligation or counterparty, this estimate also happens to be the best estimate of the expected risk of default for a B-rated exposure based on the available historical data, particularly over long investment horizons.

Exhibit 40 shows average cumulative volume-weighted default rates by rating category. Whereas issuer-based default rates weight each issuer equally, these data weight each issuer by the total volume of defaulted debt; larger defaults receive relatively more weight. Average default rates based on debt volume affected are less suitable estimates of expected default risk. One reason is that issuer default volumes vary considerably over time. On average, a leveraged corporate issuer defaults on approximately $300 million of bonds. However, that total has been as high as $30 billion (WorldCom). Issuer-based default rates receive particular emphasis in the rating process because the expected likelihood of default of a debt issuer holding a given rating is expected be the same regardless of differences in the nominal sizes of the exposures.

Exhibit 41 shows the cumulative issuer-weighted historical default rates of cohorts formed between the years 1970 and 2014 (January 1 of each year). These data are a subset of the data used to calculate the issuer-weighted averages shown in Exhibits 32 through 34 (which, again, are based on cohorts formed at monthly time intervals). The default rates in Exhibit 41 may be useful for scenario analysis. For example, if one believed that future default rates for a given pool of issuers will behave as they did in, say, 1997, then one can use the January 1, 1997 cohort cumulative default rates as proxies for expected default rates.

EXHIBIT 15

Moody's-Rated 2014 Corporate Bond and Loan Defaults*

Company	Country	Initial Default Type	Bonds (US$ mil)	Loans (US$ mil)	In Jan 2014 cohort?**
Affinion Group Holdings, Inc.	United States	Distressed exchange	89		yes
African Bank Limited	South Africa	Missed interest payment	350		yes
Alion Science and Technology Corp	United States	Distressed exchange	213		yes
Allen Systems Group, Inc.	United States	Missed interest payment	300	195	yes
Alliance Bank	Kazakhstan	Missed interest payment	615		no
Altegrity, Inc.	United States	Distressed exchange	599		yes
American Media, Inc.	United States	Distressed exchange	121		yes
Banco Espirito Santo, S.A.***	Portugal	Missed interest payment	800		yes
Bumi Resources Tbk (P.T.)	Indonesia	Distressed exchange	1,075	950	yes
Cash Store Financial Services Inc. (The)	Canada	Bankruptcy	121	11	yes
China Forestry Holdings Co Ltd	China	Missed interest payment	180		yes
Codere S.A.	Spain	Missed interest payment	1,033	181	no
Corporacion GEO, S.A.B. DE C.V.	Mexico	Missed interest payment		75	no
Desarrolladora Homex, S.A.B. de C.V.	Mexico	Missed interest payment		24	no
Endeavour International Corporation	United States	Missed interest payment	705		yes
Energy Future Competitive Holdings Co.	United States	Chapter 11	0		yes
Energy Future Holdings Corp.	United States	Chapter 11	650		yes
Energy Future Intermediate Holding Company	United States	Chapter 11	7,709		yes
Espirito Santo Financial Group S.A.	Luxembourg	Bankruptcy	1,162		yes
Espirito Santo Financiere S.A.	Luxembourg	Bankruptcy	269		yes
Essar Steel Algoma Inc.	Canada	Missed interest payment	785	350	yes
Global Geophysical Services	United States	Chapter 11	250	81	yes
GSE Environmental, Inc.	United States	Prepackaged Chapter 11		172	yes
Guitar Center Inc.	United States	Distressed exchange	535		yes
Harlan Laboratories, Inc.	United States	Distressed exchange		280	yes
Heta Asset Resolution AG***	Austria	Distressed exchange	589		yes
Hidili Industry International Development Ltd	China	Distressed exchange	197		yes
Ideal Standard International S.A.	Luxembourg	Distressed exchange	360		yes
iPayment Holdings, Inc	United States	Distressed exchange	134		yes
iPayment Inc.	United States	Distressed exchange	375		yes
James River Coal Company	United States	Chapter 11	473	65	yes
Metinvest B.V.	Netherlands	Distressed exchange	386		yes
Midwest Vanadium Pty Ltd	Australia	Missed interest payment	335		yes
MModal Inc.	United States	Chapter 11	250	500	yes
Momentive Performance Materials Inc. (Old)	United States	Chapter 11	3,077	291	yes
Nelson Education Ltd.	Canada	Missed interest payment		433	yes
New Sbarro Intermediate Holdings, Inc.	United States	Prepackaged Chapter 11		137	yes
New World Resources N.V.	Netherlands	Missed interest payment	368		yes
NexTag, Inc.	United States	Distressed exchange		93	yes

EXHIBIT 15

Moody's-Rated 2014 Corporate Bond and Loan Defaults*

Company	Country	Initial Default Type	Bonds (US$ mil)	Loans (US$ mil)	In Jan 2014 cohort?**
NII Capital Corp	Brazil	Missed interest payment	2,750		yes
NII Holdings Inc.	Brazil	Missed interest payment	0		yes
NII International Telecom S.C.A.	Brazil	Missed interest payment	1,600		yes
Northland Resources AB	Sweden	Bankruptcy	745		yes
Phones4u Finance plc	United Kingdom	Placed under administration	698	203	yes
Phosphorus Holdco plc	United Kingdom	Placed under administration	333		yes
Renhe Commercial Holdings Company Limited	China	Distressed exchange	660		yes
Sare Holding, S.A.B. de C.V.	Mexico	Distressed exchange	18		yes
SMU S.A.	Chile	Missed principal and interest payments		72	yes
Sorenson Communications, Inc.	United States	Prepackaged Chapter 11	735	571	yes
Texas Competitive Electric Holdings Co LLC	United States	Chapter 11	8,234	22,636	yes
Travelport LLC	United States	Distressed exchange	389		yes
UniTek Global Services, Inc.	United States	Missed interest payment		191	yes
USEC Inc.	United States	Chapter 11	530		yes
VAB Bank	Ukraine	Missed principal and interest payments	112		yes
Verso Paper Holdings LLC	United States	Distressed exchange	401		yes
Waterford Gaming LLC	United States	Missed principal payment	42		yes
YRC Worldwide Inc.	United States	Distressed exchange	51		yes

* This list only includes companies that have rated bonds and/or loans within one year prior to default.

** Only issuers included in the Jan 1st cohort are included in Moody's default rates in this report.

*** These banks only defaulted on subordinated debts.

EXHIBIT 16

Annual Moody's-Rated Global Corporate Issuer Default Counts, 1920-2014

Year	Inv-Grade	Spec-Grade	All-Rated
1920	8	25	33
1921	7	25	32
1922	10	23	33
1923	5	22	27
1924	3	37	40
1925	7	34	41
1926	4	18	22
1927	1	15	16
1928	0	8	8
1929	3	12	15
1930	2	21	23
1931	6	78	84
1932	10	108	118
1933	9	189	198
1934	5	60	65
1935	9	51	60
1936	3	19	22
1937	4	18	22
1938	9	17	26
1939	2	13	15
1940	2	22	24
1941	0	10	10
1942	0	4	4
1943	0	3	3
1944	0	3	3
1945	0	2	2
1946	0	0	0
1947	0	2	2
1948	0	0	0
1949	0	5	5
1950	0	0	0
1951	0	1	1
1952	0	0	0
1953	0	0	0
1954	0	1	1
1955	0	1	1
1956	0	0	0
1957	0	1	1
1958	0	0	0
1959	0	0	0
1960	0	2	2
1961	0	3	3
1962	0	4	4
1963	0	3	3
1964	0	0	0
1965	0	0	0
1966	0	1	1
1967	0	0	0
1968	0	1	1
1969	0	0	0
1970	2	25	27
1971	0	3	3
1972	0	5	5
1973	2	3	5
1974	0	3	3
1975	0	4	4
1976	0	2	2
1977	1	3	4
1978	0	4	4
1979	0	1	1
1980	0	4	4
1981	0	2	2
1982	2	11	13
1983	0	13	13
1984	1	12	13
1985	0	15	15
1986	3	30	33
1987	0	31	31
1988	0	29	29
1989	4	47	51
1990	0	83	83
1991	1	65	66
1992	0	31	31
1993	0	19	19
1994	0	16	16
1995	0	27	27
1996	0	17	17
1997	0	25	25
1998	1	48	49
1999	1	100	101
2000	4	120	124
2001	4	183	187
2002	13	126	139
2003	0	83	83
2004	0	38	38
2005	2	29	31
2006	0	31	31
2007	0	18	18
2008	14	89	103
2009	11	255	266
2010	2	56	58
2011	1	38	39
2012	1	64	65
2013	1	68	69
2014	2	51	53

EXHIBIT 17

Annual Rated Global Corporate Bond and Loan Default Volumes, 1970-2014*

	Investment Grade			Speculative Grade			All Ratings		
Year	Bond	Loan	Total	Bond	Loan	Total	Bond	Loan	Total
1970	$154	$0	$154	$756	$0	$756	$910	$0	$910
1971	$0	$0	$0	$132	$0	$132	$132	$0	$132
1972	$0	$0	$0	$215	$0	$215	$215	$0	$215
1973	$17	$0	$17	$94	$0	$94	$112	$0	$112
1974	$0	$0	$0	$69	$0	$69	$69	$0	$69
1975	$0	$0	$0	$176	$0	$176	$176	$0	$176
1976	$0	$0	$0	$34	$0	$34	$34	$0	$34
1977	$68	$0	$68	$179	$0	$179	$247	$0	$247
1978	$0	$0	$0	$112	$0	$112	$112	$0	$112
1979	$0	$0	$0	$18	$0	$18	$18	$0	$18
1980	$0	$0	$0	$302	$0	$302	$302	$0	$302
1981	$0	$0	$0	$47	$0	$47	$47	$0	$47
1982	$243	$0	$243	$515	$0	$515	$758	$0	$758
1983	$0	$0	$0	$1,110	$0	$1,110	$1,110	$0	$1,110
1984	$183	$0	$183	$399	$0	$399	$582	$0	$582
1985	$0	$0	$0	$1,344	$0	$1,344	$1,344	$0	$1,344
1986	$138	$0	$138	$3,993	$0	$3,993	$4,131	$0	$4,131
1987	$0	$0	$0	$8,940	$242	$9,182	$8,940	$242	$9,182
1988	$0	$0	$0	$5,435	$361	$5,796	$5,435	$361	$5,796
1989	$1,506	$0	$1,506	$9,517	$0	$9,517	$11,023	$0	$11,023
1990	$0	$0	$0	$20,071	$1,603	$21,674	$20,071	$1,603	$21,674
1991	$1,348	$0	$1,348	$15,485	$570	$16,055	$16,833	$570	$17,403
1992	$0	$0	$0	$6,601	$698	$7,299	$6,601	$698	$7,299
1993	$0	$0	$0	$1,871	$424	$2,295	$1,871	$424	$2,295
1994	$0	$0	$0	$2,100	$299	$2,399	$2,100	$299	$2,399
1995	$0	$0	$0	$4,788	$172	$4,961	$4,788	$172	$4,961
1996	$0	$0	$0	$4,053	$1,435	$5,488	$4,053	$1,435	$5,488
1997	$0	$0	$0	$5,104	$948	$6,052	$5,104	$948	$6,052
1998	$399	$0	$399	$9,469	$3,017	$12,486	$9,868	$3,017	$12,885
1999	$461	$1,225	$1,686	$25,311	$14,107	$39,418	$25,772	$15,332	$41,104
2000	$4,115	$3,950	$8,065	$24,723	$26,206	$50,928	$28,838	$30,156	$58,994
2001	$21,195	$5,363	$26,558	$78,379	$34,103	$112,483	$99,574	$39,466	$139,041
2002	$46,350	$13,122	$59,472	$104,091	$37,223	$141,314	$150,441	$50,345	$200,786
2003	$0	$870	$870	$35,281	$10,208	$45,490	$35,281	$11,078	$46,359
2004	$0	$0	$0	$11,810	$4,197	$16,008	$11,810	$4,197	$16,008
2005	$2,155	$2,825	$4,980	$26,798	$8,745	$35,543	$28,953	$11,570	$40,523
2006	$0	$0	$0	$7,758	$2,630	$10,388	$7,758	$2,630	$10,388
2007	$0	$0	$0	$4,755	$1,983	$6,738	$4,755	$1,983	$6,738

EXHIBIT 17

Annual Rated Global Corporate Bond and Loan Default Volumes, 1970-2014*

	Investment Grade			Speculative Grade			All Ratings		
Year	Bond	Loan	Total	Bond	Loan	Total	Bond	Loan	Total
2008	$183,155	$10,380	$193,535	$55,060	$32,322	$87,382	$238,215	$42,701	$280,916
2009	$38,945	$21,931	$60,876	$145,361	$123,876	$269,237	$184,306	$145,807	$330,113
2010	$4,856	$0	$4,856	$20,553	$14,042	$34,595	$25,409	$14,042	$39,451
2011	$1,156	$1,411	$2,567	$29,336	$4,671	$34,007	$30,492	$6,082	$36,574
2012	$323	$0	$323	$31,360	$18,289	$49,650	$31,683	$18,289	$49,973
2013	$1,893	$0	$1,893	$35,671	$17,889	$53,560	$37,564	$17,889	$55,453
2014	$939	$0	$939	$40,466	$27,510	$67,976	$41,405	$27,510	$68,915

* Default volume in millions of USD

EXHIBIT 18

Annual Issuer Default Counts and Volume Totals by Geographical Region, 1986-2014

	Issuer Counts					Dollar Volumes (US$ mil)				
Year	Africa & Middle East	Asia Pacific	Europe	Latin America	North America	Africa & Middle East	Asia Pacific	Europe	Latin America	North America
1986	0	0	0	0	33	$0	$0	$0	$0	$4,131
1987	0	0	0	0	31	$0	$0	$0	$0	$9,182
1988	0	0	0	0	29	$0	$0	$0	$0	$5,796
1989	0	4	0	0	47	$0	$969	$0	$0	$10,054
1990	0	1	0	0	82	$0	$200	$0	$0	$21,474
1991	0	0	1	0	65	$0	$0	$999	$0	$16,404
1992	0	0	0	0	31	$0	$0	$0	$0	$7,299
1993	0	0	0	0	19	$0	$0	$0	$0	$2,295
1994	0	0	1	0	15	$0	$0	$774	$0	$1,625
1995	0	0	0	0	27	$0	$0	$0	$0	$4,961
1996	0	0	0	1	16	$0	$0	$0	$207	$5,280
1997	0	2	0	2	21	$0	$614	$0	$310	$5,129
1998	0	5	1	0	43	$0	$1,444	$200	$0	$11,241
1999	0	8	9	7	77	$0	$4,339	$4,012	$1,908	$30,845
2000	0	2	3	2	117	$0	$3,968	$713	$238	$54,074
2001	3	15	16	6	147	$2,444	$7,832	$10,635	$1,909	$116,221
2002	0	2	26	15	96	$0	$1,842	$47,385	$10,087	$141,472
2003	0	2	7	11	63	$0	$550	$3,296	$4,152	$38,361
2004	1	0	6	0	31	$183	$0	$2,521	$366	$12,938
2005	0	0	1	1	29	$0	$0	$207	$100	$40,215
2006	0	0	7	2	22	$0	$0	$1,601	$167	$8,620
2007	0	0	3	0	15	$0	$0	$771	$0	$5,967
2008	0	3	12	2	86	$0	$625	$53,374	$555	$226,361
2009	1	17	34	10	204	$650	$7,073	$28,010	$3,031	$291,350
2010	0	2	9	2	45	$0	$6,290	$9,119	$487	$23,554

EXHIBIT 18

Annual Issuer Default Counts and Volume Totals by Geographical Region, 1986-2014

	Issuer Counts					Dollar Volumes (US$ mil)				
Year	Africa & Middle East	Asia Pacific	Europe	Latin America	North America	Africa & Middle East	Asia Pacific	Europe	Latin America	North America
2011	0	0	12	1	26	$0	$4	$10,047	$358	$26,166
2012	1	0	12	4	48	$48	$0	$16,750	$3,016	$30,159
2013	0	2	24	9	34	$0	$546	$24,096	$9,249	$21,562
2014	1	5	11	5	31	$350	$3,397	$7,855	$4,539	$52,773

EXHIBIT 19

2014 Defaulted Corporates Bond and Loan Recoveries*

		Bank Loans		Bonds			
Company	Initial Default Type	1st Lien	2nd Lien	Sr. Sec.	Sr. Unsec.	Sr. Sub.	Sub.
African Bank Limited**	payment default				78.5%		
Alion Science and Technology Corporation	distressed exchange				82.1%		
Allen Systems Group, Inc.	payment default			50.0%			
Alliance Bank	payment default				47.5%		
Altegrity, Inc.	distressed exchange				89.8%	82.0%	
Bumi Resources Tbk (P.T.)	distressed exchange			23.0%			
Cash Store Financial Services Inc. (The)	bankruptcy			22.3%			
China Forestry Holdings Co Ltd	payment default				32.0%		
Codere S.A.	payment default				40.5%		
Endeavour International Corporation	payment default			45.5%	3.1%		
Energy Future Holdings Corp.***	bankruptcy			106.3%	51.5%		
Energy Future Intermediate Holding Company***	bankruptcy			105.1%			
Espirito Santo Financial Group S.A.	bankruptcy				5.0%	4.3%	
Espirito Santo Financiere S.A.	bankruptcy				13.8%		
Essar Steel Algoma Inc.	payment default	100.4%		100.0%	84.3%		
Global Geophysical Services	bankruptcy	100.3%			55.0%		
Harlan Laboratories, Inc.	distressed exchange	83.5%					
Hidili Industry International Development Ltd	distressed exchange				67.0%		
Hypo Alpe-Adria-Bank International AG	distressed exchange						38.8%
Ideal Standard International S.A.	distressed exchange			39.0%			
iPayment Holdings, Inc.	distressed exchange				32.0%		
iPayment Inc.	distressed exchange				78.5%		
James River Coal Company	bankruptcy				7.3%		
Metinvest B.V.	distressed exchange				82.5%		
Midwest Vanadium Pty Ltd	payment default			54.0%			
MModal Inc.	Bankruptcy	83.3%			5.0%		
Momentive Performance Materials Inc.	Bankruptcy			90.4%		29.5%	

EXHIBIT 19

2014 Defaulted Corporates Bond and Loan Recoveries*

		Bank Loans		Bonds			
Company	Initial Default Type	1st Lien	2nd Lien	Sr. Sec.	Sr. Unsec.	Sr. Sub.	Sub.
Nelson Education Ltd.	payment default	83.7%	10.5%				
New Sbarro Intermediate Holdings, Inc.	Bankruptcy	45.0%					
New World Resources N.V.	payment default				8.5%		
NexTag, Inc.	distressed exchange	29.9%					
NII Capital Corp.	payment default				23.8%		
NII International Telecom S.C.A.	payment default				63.8%		
Northland Resources AB	Bankruptcy			0.2%			
Phones4u Finance plc	Bankruptcy			33.0%			
Phosphorus Holdco plc	Bankruptcy				3.0%		
Renhe Commercial Holdings Company Limited	distressed exchange				85.4%		
Sorenson Communications, Inc.	Bankruptcy	100.1%		91.0%			
Texas Competitive Electric Holdings Company LLC	Bankruptcy	79.2%		71.5%	9.6%		
USEC Inc.	bankruptcy				34.3%		
Verso Paper Holdings LLC****	distressed exchange			60.6%		72.0%	

* Based on trading prices.

** African Bank was placed under curatorship. Retail deposits, which comprise less than 1% of the bank's creditors, will be met in full while wholesale deposits and senior debt will be transferred to a good bank at 90% of face value, implying a 10% ultimate loss.

*** The secured bonds of EFH and EFIH are high as they have collateral from Oncor which is ring fenced from its distressed parent and affiliates.

**** Verso Paper's senior secured bond is a second lien debt.

EXHIBIT 20

Annual Defaulted Corporate Bond and Loan Recoveries*

	Loan	Bond					
Year	1st Lien	Sr. Sec.	Sr. Unsec.	Sr. Sub.	Sub.	Jr. Sub.	All Bonds
1982	n.a.	72.5%	35.8%	48.1%	30.0%	n.a.	35.3%
1983	n.a.	40.0%	52.7%	43.5%	41.1%	n.a.	44.5%
1984	n.a.	n.a.	49.4%	67.9%	44.3%	n.a.	45.5%
1985	n.a.	83.6%	60.2%	29.6%	39.7%	48.5%	43.6%
1986	n.a.	59.2%	51.1%	46.8%	41.4%	n.a.	47.4%
1987	n.a.	71.0%	63.8%	46.5%	46.9%	n.a.	51.3%
1988	n.a.	55.4%	45.2%	33.4%	33.8%	36.5%	38.8%
1989	n.a.	46.5%	43.6%	35.3%	26.8%	16.9%	32.3%
1990	72.0%	33.8%	38.2%	25.5%	18.9%	10.7%	25.6%
1991	67.9%	48.4%	36.7%	41.8%	24.4%	7.8%	35.5%
1992	60.6%	62.1%	49.2%	49.4%	38.0%	13.5%	45.9%
1993	53.4%	n.a.	37.1%	51.9%	44.1%	n.a.	43.1%
1994	67.6%	69.3%	53.7%	29.6%	38.0%	40.0%	45.6%
1995	75.4%	62.0%	47.6%	34.3%	41.5%	n.a.	43.3%

EXHIBIT 20

Annual Defaulted Corporate Bond and Loan Recoveries*

	Loan	Bond					
Year	1st Lien	Sr. Sec.	Sr. Unsec.	Sr. Sub.	Sub.	Jr. Sub.	All Bonds
1996	85.5%	47.6%	62.8%	43.8%	22.6%	n.a.	41.5%
1997	78.8%	75.5%	56.1%	44.7%	33.1%	30.6%	48.8%
1998	56.7%	46.8%	39.5%	45.0%	18.2%	62.0%	38.3%
1999	73.5%	36.0%	38.0%	26.9%	35.6%	n.a.	33.8%
2000	68.8%	38.6%	24.2%	20.8%	31.9%	7.0%	25.1%
2001	64.9%	31.7%	21.2%	19.8%	15.9%	47.0%	21.6%
2002	58.4%	50.6%	29.5%	21.4%	23.4%	n.a.	29.7%
2003	73.4%	69.2%	41.9%	37.8%	12.3%	n.a.	41.4%
2004	87.7%	73.3%	52.1%	42.3%	94.0%	n.a.	58.5%
2005	83.8%	71.9%	54.9%	32.8%	51.3%	n.a.	56.5%
2006	83.6%	74.6%	55.0%	41.4%	56.1%	n.a.	55.0%
2007	68.6%	80.6%	53.7%	56.2%	n.a.	n.a.	55.1%
2008	61.7%	54.9%	33.2%	23.3%	23.6%	n.a.	33.9%
2009	53.6%	37.5%	36.9%	22.7%	45.3%	n.a.	33.9%
2010	70.9%	62.5%	51.5%	37.5%	33.7%	n.a.	51.8%
2011	70.9%	63.3%	41.3%	36.7%	35.4%	n.a.	46.3%
2012	66.4%	51.2%	43.0%	33.7%	37.3%	n.a.	44.7%
2013	75.1%	59.8%	43.8%	20.7%	26.4%	n.a.	46.8%
2014	78.4%	59.5%	43.3%	46.9%	38.8%	n.a.	47.8%

* Based on trading prices.

EXHIBIT 21

Average Sr. Unsecured Bond Recovery Rates by Year Prior to Default, 1982-2014*

	Year 1	Year 2	Year 3	Year 4	Year 5
Aaa**	n.a.	3.33%	3.33%	61.88%	75.58%
Aa	37.24%	39.02%	38.08%	43.95%	42.27%
A	31.77%	42.68%	44.49%	43.92%	43.69%
Baa	41.66%	43.04%	43.52%	43.33%	43.35%
Ba	45.68%	44.24%	43.26%	42.66%	42.32%
B	38.03%	37.20%	37.39%	37.79%	38.43%
Caa-C	37.47%	37.51%	37.37%	37.58%	37.65%
Investment Grade	39.33%	42.59%	43.51%	43.64%	43.71%
Speculative Grade	38.22%	38.00%	38.05%	38.36%	38.72%
All Rated	38.27%	38.32%	38.52%	38.90%	39.30%

* Issuer-weighted, based on post default trading prices

** The Aaa recovery rates are based on five observations, three of which are Icelandic banks that have an average recovery rate of 3.33%.

EXHIBIT 22

Average Cumulative Credit Loss Rates by Letter Rating, 1982 - 2014*

	Year 1	Year 2	Year 3	Year 4	Year 5
Aaa	0.00%	0.02%	0.02%	0.02%	0.03%
Aa	0.02%	0.05%	0.09%	0.16%	0.25%
A	0.05%	0.13%	0.27%	0.43%	0.62%
Baa	0.11%	0.30%	0.52%	0.79%	1.06%
Ba	0.60%	1.77%	3.20%	4.77%	6.12%
B	2.29%	5.59%	8.91%	11.80%	14.35%
Caa-C	9.32%	16.00%	21.47%	25.76%	29.41%
Investment Grade	0.06%	0.17%	0.31%	0.47%	0.66%
Speculative Grade	2.79%	5.80%	8.68%	11.19%	13.33%
All Rated	1.12%	2.29%	3.37%	4.29%	5.05%

* Based on average default rates and senior unsecured bond recoveries measured on issuer-weighted basis.

EXHIBIT 23

Annual Credit Loss Rates by Letter Rating, 1982-2014*

Year	Aaa	Aa	A	Baa	Ba	B	Caa-C	Inv-Grade	Spec-Grade	All Rated
1982	0.00%	0.00%	0.16%	0.21%	1.78%	1.43%	14.82%	0.14%	2.28%	0.67%
1983	0.00%	0.00%	0.00%	0.00%	0.43%	3.02%	19.70%	0.00%	1.81%	0.46%
1984	0.00%	0.00%	0.00%	0.18%	0.42%	3.45%	50.59%	0.05%	1.70%	0.47%
1985	0.00%	0.00%	0.00%	0.00%	0.56%	3.02%	0.00%	0.00%	1.38%	0.38%
1986	0.00%	0.00%	0.00%	0.51%	1.02%	5.66%	10.87%	0.12%	2.77%	0.92%
1987	0.00%	0.00%	0.00%	0.00%	1.01%	2.37%	7.25%	0.00%	1.60%	0.58%
1988	0.00%	0.00%	0.00%	0.00%	0.68%	3.39%	14.93%	0.00%	1.95%	0.75%
1989	0.00%	0.36%	0.00%	0.35%	1.77%	4.85%	14.11%	0.17%	3.26%	1.35%
1990	0.00%	0.00%	0.00%	0.00%	2.13%	9.89%	37.79%	0.00%	6.35%	2.33%
1991	0.00%	0.00%	0.00%	0.18%	3.14%	7.76%	28.50%	0.04%	5.99%	1.96%
1992	0.00%	0.00%	0.00%	0.00%	0.17%	4.69%	15.01%	0.00%	2.65%	0.76%
1993	0.00%	0.00%	0.00%	0.00%	0.38%	2.93%	17.32%	0.00%	1.98%	0.56%
1994	0.00%	0.00%	0.00%	0.00%	0.12%	1.91%	2.50%	0.00%	0.99%	0.31%
1995	0.00%	0.00%	0.00%	0.00%	0.40%	2.30%	4.82%	0.00%	1.61%	0.54%
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.54%	5.34%	0.00%	0.64%	0.22%
1997	0.00%	0.00%	0.00%	0.00%	0.09%	0.90%	6.60%	0.00%	0.94%	0.34%
1998	0.00%	0.00%	0.00%	0.08%	0.54%	2.43%	6.24%	0.03%	1.99%	0.80%
1999	0.00%	0.00%	0.00%	0.07%	0.88%	3.19%	11.49%	0.03%	3.53%	1.50%
2000	0.00%	0.00%	0.00%	0.32%	0.60%	4.74%	14.94%	0.12%	5.07%	2.17%
2001	0.00%	0.00%	0.15%	0.17%	1.19%	7.84%	25.18%	0.12%	8.53%	3.43%
2002	0.00%	0.00%	0.14%	0.79%	1.07%	3.29%	20.79%	0.35%	5.90%	2.35%
2003	0.00%	0.00%	0.00%	0.00%	0.62%	1.27%	13.58%	0.00%	3.26%	1.19%
2004	0.00%	0.00%	0.00%	0.00%	0.22%	0.42%	6.12%	0.00%	1.23%	0.45%
2005	0.00%	0.00%	0.00%	0.09%	0.00%	0.47%	3.05%	0.04%	0.82%	0.33%
2006	0.00%	0.00%	0.00%	0.00%	0.10%	0.55%	2.83%	0.00%	0.84%	0.33%

EXHIBIT 23

Annual Credit Loss Rates by Letter Rating, 1982-2014*

Year	Aaa	Aa	A	Baa	Ba	B	Caa-C	Inv-Grade	Spec-Grade	All Rated
2007	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.82%	0.00%	0.45%	0.19%
2008	0.00%	0.48%	0.37%	0.35%	0.82%	1.43%	10.09%	0.37%	3.01%	1.51%
2009	0.00%	0.00%	0.14%	0.59%	1.47%	4.75%	21.95%	0.28%	8.41%	3.80%
2010	0.00%	0.00%	0.11%	0.00%	0.00%	0.25%	5.77%	0.04%	1.60%	0.69%
2011	0.00%	0.00%	0.00%	0.05%	0.12%	0.07%	5.11%	0.02%	1.21%	0.54%
2012	0.00%	0.00%	0.00%	0.05%	0.10%	0.28%	6.76%	0.02%	1.71%	0.81%
2013	0.00%	0.00%	0.00%	0.04%	0.29%	0.60%	5.38%	0.02%	1.69%	0.81%
2014	0.00%	0.00%	0.07%	0.04%	0.10%	0.14%	3.98%	0.04%	1.16%	0.59%
Average	0.00%	0.03%	0.03%	0.12%	0.67%	2.72%	12.61%	0.06%	2.68%	1.03%
Max	0.00%	0.48%	0.37%	0.79%	3.14%	9.89%	50.59%	0.37%	8.53%	3.80%
Min	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.45%	0.19%

* Based on issuer-weighted average default rates and issuer-weighted senior unsecured bond recovery rates.

EXHIBIT 24

2014 One-Year Letter Rating Migration Rates

From/To:	Aaa	Aa	A	Baa	Ba	B	Caa	Ca-C	WR	Default
Aaa	97.778%	2.222%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Aa	0.000%	88.696%	6.957%	0.000%	0.000%	0.000%	0.000%	0.000%	4.348%	0.000%
A	0.000%	2.712%	90.212%	2.712%	0.000%	0.000%	0.000%	0.000%	4.245%	0.118%
Baa	0.000%	0.000%	4.342%	88.750%	2.303%	0.132%	0.000%	0.000%	4.408%	0.066%
Ba	0.000%	0.000%	0.320%	6.080%	77.600%	7.840%	0.320%	0.000%	7.680%	0.160%
B	0.000%	0.000%	0.075%	0.075%	3.219%	75.524%	7.186%	0.000%	13.698%	0.225%
Caa	0.000%	0.000%	0.000%	0.000%	0.000%	6.516%	71.388%	1.558%	15.297%	5.241%
Ca-C	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	4.348%	39.130%	13.043%	43.478%

EXHIBIT 25

Average One-Year Letter Rating Migration Rates, 1920-2014

From/To:	Aaa	Aa	A	Baa	Ba	B	Caa	Ca-C	WR	Default
Aaa	86.500%	7.892%	0.842%	0.157%	0.033%	0.001%	0.001%	0.000%	4.573%	0.000%
Aa	1.143%	83.509%	7.499%	0.833%	0.182%	0.040%	0.006%	0.005%	6.716%	0.068%
A	0.068%	2.719%	84.207%	5.725%	0.715%	0.119%	0.029%	0.008%	6.319%	0.091%
Baa	0.037%	0.261%	4.116%	82.112%	4.743%	0.745%	0.119%	0.013%	7.596%	0.256%
Ba	0.007%	0.078%	0.446%	5.887%	73.528%	6.894%	0.599%	0.059%	11.325%	1.177%
B	0.006%	0.042%	0.137%	0.532%	5.420%	71.603%	5.779%	0.472%	12.775%	3.233%
Caa	0.000%	0.016%	0.022%	0.145%	0.656%	8.186%	64.528%	3.439%	12.284%	10.724%
Ca-C	0.000%	0.023%	0.131%	0.054%	0.463%	2.910%	7.772%	50.594%	12.720%	25.332%

EXHIBIT 26

Average One-Year Letter Rating Migration Rates, 1970-2014

From/To:	Aaa	Aa	A	Baa	Ba	B	Caa	Ca-C	WR	Default
Aaa	87.325%	8.150%	0.621%	0.000%	0.028%	0.002%	0.002%	0.000%	3.873%	0.000%
Aa	0.887%	84.545%	8.446%	0.495%	0.066%	0.021%	0.008%	0.001%	5.510%	0.021%
A	0.047%	2.413%	86.146%	5.538%	0.538%	0.107%	0.033%	0.004%	5.118%	0.057%
Baa	0.035%	0.159%	3.961%	85.420%	3.834%	0.707%	0.148%	0.015%	5.559%	0.162%
Ba	0.007%	0.050%	0.328%	5.592%	75.783%	7.327%	0.584%	0.062%	9.264%	1.004%
B	0.008%	0.025%	0.106%	0.293%	4.421%	73.565%	6.069%	0.546%	11.515%	3.450%
Caa	0.000%	0.014%	0.014%	0.095%	0.365%	8.370%	63.553%	3.447%	12.340%	11.802%
Ca-C	0.000%	0.000%	0.056%	0.000%	0.349%	1.939%	8.915%	36.537%	15.039%	37.165%

EXHIBIT 27

Average Five-Year Letter Rating Migration Rates, 1970-2014*

From/To:	Aaa	Aa	A	Baa	Ba	B	Caa	Ca-C	WR	Default
Aaa	51.499%	23.500%	5.207%	0.388%	0.325%	0.036%	0.036%	0.000%	18.922%	0.088%
Aa	2.662%	44.233%	21.701%	4.304%	0.775%	0.289%	0.100%	0.011%	25.601%	0.323%
A	0.182%	7.264%	49.713%	14.618%	2.613%	0.859%	0.190%	0.006%	23.775%	0.779%
Baa	0.172%	0.979%	11.626%	47.929%	8.314%	2.650%	0.529%	0.065%	26.211%	1.525%
Ba	0.039%	0.155%	1.940%	12.010%	26.702%	10.871%	1.479%	0.113%	39.084%	7.606%
B	0.029%	0.041%	0.241%	1.613%	6.395%	21.921%	5.387%	0.616%	45.843%	17.914%
Caa	0.000%	0.000%	0.017%	0.528%	1.480%	8.190%	10.028%	0.977%	43.270%	35.510%
Ca-C	0.000%	0.000%	0.000%	0.000%	0.000%	3.099%	1.852%	3.982%	38.366%	52.701%

* Last cohort formed on 1/1/2010

EXHIBIT 28

2014 One-Year Alphanumeric Rating Migration Rates*

From/To:	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca-C	WR	Default
Aaa	97.778	2.222	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa1	0.000	97.727	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.273	0.000
Aa2	0.000	2.174	91.304	4.348	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.174	0.000
Aa3	0.000	0.000	3.571	79.286	10.714	0.714	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.714	0.000
A1	0.000	0.000	0.000	10.952	77.619	4.762	0.476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.714	0.476
A2	0.000	0.000	0.000	0.000	8.602	83.871	2.509	1.792	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.226	0.000
A3	0.000	0.000	0.000	0.000	0.000	13.092	77.716	4.178	0.836	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.178	0.000
Baa1	0.000	0.000	0.000	0.000	0.000	0.227	13.605	70.748	9.297	2.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.082	0.000
Baa2	0.000	0.000	0.000	0.000	0.000	0.000	0.842	12.458	73.737	7.071	1.010	0.168	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.714	0.000
Baa3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.649	11.753	75.876	4.742	1.031	0.000	0.206	0.206	0.000	0.000	0.000	0.000	0.000	4.330	0.206
Ba1	0.000	0.000	0.000	0.000	0.000	0.000	0.549	0.000	0.549	13.187	68.681	7.692	1.099	1.099	0.549	0.000	0.000	0.000	0.000	0.000	6.593	0.000
Ba2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.882	6.417	69.519	8.556	0.535	0.000	0.000	0.000	0.000	0.535	0.000	8.556	0.000
Ba3	0.000	0.000	0.000	0.000	0.000	0.000	0.391	0.000	0.000	0.781	1.563	7.813	63.281	12.891	2.734	1.953	0.391	0.000	0.000	0.000	7.813	0.391
B1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.324	1.294	1.618	8.414	65.049	7.767	1.942	0.647	0.000	0.000	0.000	12.945	0.000
B2	0.000	0.000	0.000	0.000	0.000	0.000	0.251	0.000	0.000	0.000	0.000	0.251	1.508	8.543	63.819	8.794	2.764	1.005	0.000	0.000	12.312	0.754
B3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.159	0.000	0.318	6.995	65.024	10.970	1.590	0.000	0.000	14.944	0.000
Caa1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.214	0.427	8.547	63.889	8.120	1.709	0.427	14.530	2.137
Caa2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.538	1.075	13.441	51.613	8.602	2.151	16.667	5.914
Caa3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.923	5.769	34.615	9.615	17.308	30.769
Ca-C	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.348	0.000	39.130	13.043	43.478

* Data in percent.

EXHIBIT 29

Average One-Year Alphanumeric Rating Migration Rates, 1983-2014*

From/To:	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca-C	WR	Default
Aaa	86.126	5.688	2.501	0.521	0.317	0.130	0.022	0.000	0.000	0.000	0.017	0.017	0.000	0.002	0.000	0.000	0.000	0.002	0.000	0.000	4.656	0.000
Aa1	2.004	74.136	8.617	6.186	1.763	0.713	0.103	0.222	0.031	0.006	0.034	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.182	0.000
Aa2	1.012	4.122	72.433	10.019	3.612	1.593	0.519	0.111	0.229	0.070	0.034	0.021	0.000	0.017	0.009	0.006	0.000	0.026	0.000	0.004	6.162	0.000
Aa3	0.133	1.264	3.982	74.444	8.779	3.635	0.951	0.269	0.327	0.146	0.024	0.027	0.030	0.028	0.000	0.000	0.003	0.000	0.000	0.000	5.910	0.048
A1	0.063	0.113	1.124	5.077	74.809	8.198	3.020	0.739	0.417	0.185	0.222	0.147	0.050	0.073	0.029	0.010	0.000	0.007	0.004	0.000	5.639	0.075
A2	0.064	0.015	0.157	1.002	4.920	75.255	7.972	2.980	1.022	0.443	0.215	0.125	0.130	0.051	0.027	0.012	0.033	0.032	0.006	0.000	5.473	0.065
A3	0.016	0.050	0.086	0.208	1.451	6.285	73.520	7.025	3.054	1.043	0.504	0.161	0.191	0.098	0.051	0.021	0.006	0.004	0.007	0.013	6.152	0.053
Baa1	0.022	0.036	0.083	0.109	0.193	1.501	6.450	73.480	7.740	2.596	0.710	0.386	0.290	0.302	0.081	0.041	0.048	0.030	0.006	0.018	5.731	0.144
Baa2	0.037	0.057	0.035	0.068	0.143	0.545	2.022	6.334	74.978	6.385	1.423	0.533	0.484	0.375	0.261	0.094	0.105	0.014	0.013	0.005	5.936	0.152
Baa3	0.040	0.010	0.030	0.052	0.091	0.195	0.433	2.156	8.818	71.796	4.749	2.284	1.057	0.727	0.314	0.255	0.146	0.075	0.094	0.036	6.401	0.242
Ba1	0.024	0.002	0.025	0.045	0.137	0.119	0.311	0.562	2.613	10.080	63.739	4.961	3.915	1.418	1.022	0.644	0.119	0.192	0.065	0.051	9.358	0.597
Ba2	0.000	0.000	0.023	0.023	0.029	0.085	0.062	0.275	0.657	3.551	8.102	63.097	7.012	2.820	2.004	0.909	0.215	0.207	0.109	0.087	10.071	0.661
Ba3	0.000	0.016	0.010	0.008	0.019	0.137	0.105	0.133	0.303	0.712	2.240	6.651	63.519	6.402	4.478	2.027	0.515	0.351	0.081	0.079	10.663	1.549
B1	0.025	0.011	0.014	0.007	0.034	0.073	0.081	0.057	0.138	0.245	0.447	2.340	6.830	63.658	6.737	3.904	1.176	0.537	0.208	0.291	11.134	2.053
B2	0.000	0.000	0.006	0.007	0.015	0.000	0.045	0.085	0.077	0.108	0.194	0.557	1.802	7.063	61.388	8.591	3.214	1.460	0.452	0.488	11.301	3.145
B3	0.000	0.004	0.029	0.000	0.006	0.014	0.049	0.031	0.048	0.083	0.055	0.190	0.469	1.978	6.721	59.852	7.380	3.410	0.989	0.887	12.624	5.179
Caa1	0.000	0.025	0.000	0.000	0.000	0.020	0.000	0.040	0.000	0.003	0.040	0.055	0.176	0.579	1.887	9.296	55.119	9.113	3.384	1.879	11.923	6.461
Caa2	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.009	0.048	0.165	0.078	0.078	0.321	0.460	1.054	3.244	8.705	47.361	5.621	4.615	12.569	15.666
Caa3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.257	0.090	0.013	0.128	0.257	1.721	2.800	8.208	37.136	8.272	14.618	26.500
Ca-C	0.000	0.000	0.000	0.000	0.000	0.000	0.058	0.000	0.000	0.000	0.058	0.130	0.173	0.188	0.477	1.171	1.590	3.469	4.177	34.947	15.580	37.982

* Data in percent.

EXHIBIT 30

Annual Issuer-Weighted Corporate Default Rates by Letter Rating, 1920-2014*

Year	Aaa	Aa	A	Baa	Ba	B	Caa-C	Inv Grade	Spec Grade	All rated
1920	0.000	0.000	0.323	0.942	2.153	4.382	0.000	0.427	3.009	1.234
1921	0.000	0.189	0.353	0.648	0.444	2.683	13.332	0.387	2.150	1.068
1922	0.000	0.185	0.165	1.100	1.078	1.705	7.629	0.506	1.762	1.007
1923	0.000	0.000	0.000	0.622	0.929	2.270	5.932	0.244	1.705	0.804
1924	0.000	0.367	0.000	0.126	2.065	2.705	12.835	0.140	2.852	1.152
1925	0.000	0.000	0.141	0.707	1.745	2.585	14.397	0.321	2.562	1.171
1926	0.000	0.395	0.147	0.113	1.387	2.900	3.704	0.188	1.909	0.768
1927	0.000	0.000	0.212	0.000	1.300	1.980	12.842	0.069	1.831	0.736
1928	0.000	0.000	0.000	0.000	0.164	1.320	10.477	0.000	0.877	0.363
1929	0.000	0.293	0.000	0.445	0.825	0.918	9.733	0.241	1.401	0.715
1930	0.000	0.000	0.000	0.401	0.917	3.163	7.720	0.151	2.204	1.040
1931	0.000	0.000	0.269	1.082	3.005	9.523	31.670	0.502	7.897	3.804
1932	0.000	0.670	1.099	0.927	6.097	13.978	24.062	0.861	10.989	5.500
1933	0.000	0.000	0.258	1.771	11.734	16.147	25.921	0.790	15.783	8.531
1934	0.000	0.617	0.306	0.857	2.529	4.224	16.504	0.586	5.897	3.405
1935	0.000	0.000	1.429	1.923	5.134	4.275	13.024	1.285	6.253	3.935
1936	0.000	0.847	0.543	0.327	1.230	2.385	7.795	0.482	2.716	1.633
1937	0.000	0.000	0.505	1.043	0.994	2.669	9.074	0.619	2.745	1.722
1938	0.000	0.855	1.639	1.990	0.988	1.467	12.808	1.550	2.595	2.108
1939	0.000	0.000	0.000	0.995	0.621	1.744	6.073	0.412	1.771	1.223
1940	0.000	0.000	0.000	1.370	0.431	3.307	11.829	0.592	3.557	2.470
1941	0.000	0.000	0.000	0.000	0.973	0.810	5.071	0.000	1.710	1.084
1942	0.000	0.000	0.000	0.000	0.000	0.787	2.004	0.000	0.735	0.455
1943	0.000	0.000	0.000	0.000	0.000	1.353	0.000	0.000	0.614	0.370
1944	0.000	0.000	0.000	0.000	0.000	0.493	2.551	0.000	0.665	0.388
1945	0.000	0.000	0.000	0.000	0.000	0.000	3.571	0.000	0.563	0.306
1946	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1947	0.000	0.000	0.000	0.000	0.000	0.719	2.778	0.000	0.636	0.315
1948	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1949	0.000	0.000	0.000	0.000	1.360	1.031	8.571	0.000	1.926	0.837
1950	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1951	0.000	0.000	0.000	0.000	0.000	0.000	4.762	0.000	0.433	0.176
1952	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1953	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1954	0.000	0.000	0.000	0.000	0.000	0.000	7.143	0.000	0.467	0.166
1955	0.000	0.000	0.000	0.000	0.000	1.613	0.000	0.000	0.518	0.166
1956	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1957	0.000	0.000	0.000	0.000	0.000	1.266	0.000	0.000	0.448	0.143
1958	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1959	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

EXHIBIT 30

Annual Issuer-Weighted Corporate Default Rates by Letter Rating, 1920-2014*

Year	Aaa	Aa	A	Baa	Ba	B	Caa-C	Inv Grade	Spec Grade	All rated
1960	0.000	0.000	0.000	0.000	1.251	0.000	0.000	0.000	0.750	0.245
1961	0.000	0.000	0.000	0.000	0.599	0.000	8.696	0.000	1.072	0.353
1962	0.000	0.000	0.000	0.000	1.749	1.471	0.000	0.000	1.516	0.471
1963	0.000	0.000	0.000	0.000	1.162	1.471	0.000	0.000	1.152	0.351
1964	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1965	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1966	0.000	0.000	0.000	0.000	0.000	2.439	0.000	0.000	0.439	0.122
1967	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1968	0.000	0.000	0.000	0.000	0.000	0.000	5.000	0.000	0.375	0.105
1969	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1970	0.000	0.000	0.000	0.543	4.237	19.444	50.000	0.271	8.678	2.628
1971	0.000	0.000	0.000	0.000	0.885	0.000	12.500	0.000	1.155	0.286
1972	0.000	0.000	0.000	0.000	0.000	6.897	37.500	0.000	1.922	0.453
1973	0.000	0.000	0.000	0.461	0.000	3.846	37.500	0.231	1.280	0.455
1974	0.000	0.000	0.000	0.000	0.513	7.162	0.000	0.000	1.332	0.274
1975	0.000	0.000	0.000	0.000	1.029	6.158	0.000	0.000	1.742	0.360
1976	0.000	0.000	0.000	0.000	0.995	0.000	0.000	0.000	0.868	0.175
1977	0.000	0.000	0.000	0.294	0.543	3.226	33.333	0.110	1.360	0.353
1978	0.000	0.000	0.000	0.000	1.124	5.405	0.000	0.000	1.823	0.353
1979	0.000	0.000	0.000	0.000	0.513	0.000	0.000	0.000	0.435	0.088
1980	0.000	0.000	0.000	0.000	0.000	5.000	33.333	0.000	1.630	0.343
1981	0.000	0.000	0.000	0.000	0.000	4.397	0.000	0.000	0.698	0.162
1982	0.000	0.000	0.256	0.328	2.777	2.222	23.077	0.213	3.544	1.036
1983	0.000	0.000	0.000	0.000	0.901	6.386	41.667	0.000	3.832	0.967
1984	0.000	0.000	0.000	0.365	0.839	6.817	100.000	0.097	3.361	0.938
1985	0.000	0.000	0.000	0.000	1.414	7.573	0.000	0.000	3.470	0.962
1986	0.000	0.000	0.000	1.038	2.087	11.568	22.222	0.246	5.666	1.879
1987	0.000	0.000	0.000	0.000	2.780	6.525	20.000	0.000	4.417	1.592
1988	0.000	0.000	0.000	0.000	1.250	6.184	27.273	0.000	3.555	1.375
1989	0.000	0.645	0.000	0.627	3.131	8.590	25.000	0.305	5.782	2.393
1990	0.000	0.000	0.000	0.000	3.443	15.986	61.111	0.000	10.268	3.762
1991	0.000	0.000	0.000	0.290	4.965	12.245	45.000	0.070	9.464	3.101
1992	0.000	0.000	0.000	0.000	0.332	9.236	29.534	0.000	5.224	1.504
1993	0.000	0.000	0.000	0.000	0.604	4.661	27.557	0.000	3.156	0.891
1994	0.000	0.000	0.000	0.000	0.265	4.124	5.405	0.000	2.148	0.664
1995	0.000	0.000	0.000	0.000	0.772	4.380	9.206	0.000	3.064	1.033
1996	0.000	0.000	0.000	0.000	0.000	1.446	14.335	0.000	1.719	0.588
1997	0.000	0.000	0.000	0.000	0.195	2.054	15.030	0.000	2.145	0.766
1998	0.000	0.000	0.000	0.133	0.895	4.019	10.327	0.045	3.298	1.318
1999	0.000	0.000	0.000	0.113	1.420	5.139	18.541	0.041	5.694	2.413

EXHIBIT 30

Annual Issuer-Weighted Corporate Default Rates by Letter Rating, 1920-2014*

Year	Aaa	Aa	A	Baa	Ba	B	Caa-C	Inv Grade	Spec Grade	All rated
2000	0.000	0.000	0.000	0.421	0.792	6.253	19.706	0.158	6.685	2.859
2001	0.000	0.000	0.190	0.217	1.510	9.954	31.968	0.153	10.831	4.355
2002	0.000	0.000	0.197	1.120	1.516	4.668	29.503	0.495	8.373	3.329
2003	0.000	0.000	0.000	0.000	1.060	2.190	23.365	0.000	5.611	2.050
2004	0.000	0.000	0.000	0.000	0.454	0.880	12.772	0.000	2.567	0.943
2005	0.000	0.000	0.000	0.199	0.000	1.050	6.752	0.078	1.817	0.739
2006	0.000	0.000	0.000	0.000	0.219	1.215	6.293	0.000	1.862	0.723
2007	0.000	0.000	0.000	0.000	0.000	0.000	6.090	0.000	0.981	0.402
2008	0.000	0.724	0.547	0.520	1.220	2.144	15.089	0.547	4.496	2.258
2009	0.000	0.000	0.221	0.937	2.325	7.529	34.770	0.445	13.320	6.024
2010	0.000	0.000	0.230	0.000	0.000	0.508	11.888	0.085	3.302	1.413
2011	0.000	0.000	0.000	0.090	0.198	0.112	8.714	0.042	2.058	0.914
2012	0.000	0.000	0.000	0.085	0.170	0.485	11.871	0.042	2.995	1.425
2013	0.000	0.000	0.000	0.073	0.520	1.076	9.573	0.041	3.010	1.446
2014	0.000	0.000	0.121	0.068	0.169	0.250	7.026	0.078	2.044	1.044
Mean	0.000	0.061	0.096	0.266	1.062	3.356	13.077	0.149	2.833	1.195
Median	0.000	0.000	0.000	0.000	0.604	2.054	8.696	0.000	1.862	0.768
St Dev	0.000	0.188	0.268	0.459	1.643	4.015	15.972	0.275	3.093	1.444
Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Max	0.000	0.855	1.639	1.990	11.734	19.444	100.000	1.550	15.783	8.531

* Data in percent.

EXHIBIT 31

Annual Issuer-Weighted Corporate Default Rates by Alphanumeric Rating, 1983-2014*

Year	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca-C	Inv Grade	Spec Grade	All rated
1983	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.600	0.000	11.859	21.053	0.000	53.125	0.000	0.000	0.000	3.832	0.967
1984	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.075	1.205	1.613	0.000	5.949	11.407	4.167	0.000	0.000	0.000	100.000	0.097	3.361	0.938
1985	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.667	2.894	4.478	8.824	11.364	0.000	0.000	0.000	0.000	0.000	3.470	0.962
1986	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.652	0.909	1.176	3.533	7.808	16.268	14.554	0.000	28.571	0.000	0.000	0.246	5.666	1.879
1987	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.788	0.962	3.034	4.331	5.737	11.726	0.000	22.222	0.000	0.000	0.000	4.417	1.592
1988	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.554	4.237	6.679	10.960	0.000	22.222	0.000	50.000	0.000	3.555	1.375
1989	0.000	0.000	0.000	1.418	0.000	0.000	0.000	0.000	0.885	1.075	0.813	1.942	4.956	5.802	7.861	18.603	0.000	27.273	0.000	0.000	0.305	5.782	2.393
1990	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.727	2.957	3.539	8.196	23.157	28.763	0.000	61.905	0.000	75.000	0.000	10.268	3.762
1991	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.800	0.000	0.000	1.099	0.000	9.260	3.613	11.141	26.163	0.000	50.000	0.000	40.000	0.070	9.464	3.101
1992	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.781	1.053	1.449	26.882	0.000	31.601	0.000	25.000	0.000	5.224	1.504
1993	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.010	0.000	0.794	2.627	3.226	10.159	0.000	23.982	0.000	50.000	0.000	3.156	0.891
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.671	1.991	3.568	8.867	0.000	7.143	0.000	0.000	0.000	2.148	0.664
1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.953	4.566	5.942	1.981	0.000	2.632	0.000	24.706	0.000	3.064	1.033
1996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.237	0.000	3.422	0.000	15.316	0.000	13.462	0.000	1.719	0.588
1997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.474	0.000	1.227	7.105	0.000	13.944	0.000	18.981	0.000	2.145	0.766
1998	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.348	0.000	0.000	1.399	1.288	2.314	5.649	4.980	5.734	9.285	26.667	16.667	0.045	3.298	1.318
1999	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.376	0.595	0.613	2.583	2.668	5.292	8.660	11.981	22.427	20.870	47.368	0.041	5.694	2.413
2000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.322	0.000	1.093	0.602	0.680	1.053	3.248	5.133	12.223	11.386	30.042	20.139	41.765	0.158	6.685	2.859
2001	0.000	0.000	0.000	0.000	0.000	0.497	0.000	0.333	0.290	0.000	0.000	1.375	2.952	3.523	10.654	17.850	25.641	35.481	43.704	44.000	0.153	10.831	4.355
2002	0.000	0.000	0.000	0.000	0.000	0.000	0.515	1.204	0.805	1.436	2.766	0.685	1.144	2.330	4.902	7.559	17.338	25.470	34.368	53.932	0.495	8.373	3.329
2003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.735	0.758	1.528	0.362	2.484	4.507	10.825	21.619	33.840	43.077	0.000	5.611	2.050
2004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.806	0.518	0.000	0.625	2.451	8.473	9.756	14.360	35.386	0.000	2.567	0.943
2005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.266	0.347	0.000	0.000	0.000	0.000	0.606	2.517	3.158	7.498	22.083	17.670	0.078	1.817	0.739
2006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.521	0.777	0.574	2.314	2.485	6.967	18.713	19.025	0.000	1.862	0.723
2007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.258	8.600	15.862	32.500	0.000	0.981	0.402
2008	0.000	0.000	0.000	2.139	1.545	0.300	0.000	0.294	0.855	0.366	0.000	0.000	2.833	1.869	0.883	3.246	7.608	19.845	36.601	55.364	0.547	4.496	2.258
2009	0.000	0.000	0.000	0.000	0.000	0.000	0.618	1.260	0.776	0.776	2.444	0.610	3.637	4.148	8.978	8.522	17.284	39.907	58.022	75.511	0.445	13.320	6.024
2010	0.000	0.000	0.000	0.000	0.435	0.000	0.296	0.000	0.000	0.000	0.000	0.000	0.000	0.899	0.000	0.629	2.751	11.504	26.331	36.431	0.085	3.302	1.413

EXHIBIT 31

Annual Issuer-Weighted Corporate Default Rates by Alphanumeric Rating, 1983-2014*

Year	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2	Caa3	Ca-C	Inv Grade	Spec Grade	All rated
2011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.244	0.000	0.000	0.000	0.543	0.000	0.365	0.000	2.128	13.752	19.373	38.095	0.042	2.058	0.914
2012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.261	0.000	0.000	0.000	0.000	0.490	0.000	0.923	0.432	4.183	13.926	24.227	61.401	0.042	2.995	1.425
2013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.239	0.000	0.000	0.000	0.000	1.344	0.000	1.255	1.551	1.187	9.810	36.098	66.632	0.041	3.010	1.446
2014	0.000	0.000	0.000	0.000	0.495	0.000	0.000	0.000	0.000	0.215	0.000	0.000	0.418	0.000	0.830	0.000	2.375	6.552	33.345	47.388	0.078	2.044	1.044
Mean	0.000	0.000	0.000	0.111	0.077	0.025	0.045	0.147	0.140	0.325	0.615	0.539	1.809	2.438	5.234	8.850	4.275	20.387	15.144	35.293	0.093	4.569	1.752
Median	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.216	2.152	4.235	7.332	1.658	17.580	15.111	37.263	0.041	3.416	1.394
StDev	0.000	0.000	0.000	0.447	0.291	0.101	0.147	0.332	0.283	0.731	1.080	0.755	1.911	2.371	5.430	8.290	6.433	15.287	16.580	25.459	0.151	2.992	1.257
Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.981	0.402
Max	0.000	0.000	0.000	2.139	1.545	0.497	0.618	1.260	0.885	3.652	3.788	2.957	9.260	8.196	23.157	28.763	25.641	61.905	58.022	100.000	0.547	13.320	6.024

* Data in percent.

EXHIBIT 32

Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1920-2014*

Rating	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	0.000	0.009	0.030	0.083	0.161	0.244	0.351	0.499	0.654	0.834	0.989	1.117	1.251	1.291	1.327	1.399	1.472	1.531	1.600	1.647
Aa	0.072	0.212	0.342	0.536	0.827	1.161	1.491	1.805	2.101	2.441	2.830	3.251	3.668	4.067	4.363	4.592	4.797	5.041	5.338	5.587
A	0.098	0.304	0.627	0.986	1.374	1.784	2.225	2.669	3.145	3.616	4.093	4.560	4.975	5.385	5.863	6.286	6.644	7.005	7.340	7.680
Baa	0.276	0.818	1.454	2.146	2.873	3.595	4.286	4.989	5.721	6.454	7.175	7.895	8.625	9.289	9.884	10.506	11.092	11.612	12.108	12.634
Ba	1.328	3.158	5.186	7.314	9.339	11.265	13.020	14.727	16.358	18.072	19.599	21.121	22.594	23.913	25.135	26.261	27.391	28.450	29.393	30.290
B	3.590	8.195	12.796	16.895	20.545	23.809	26.812	29.335	31.547	33.497	35.242	36.889	38.473	40.005	41.414	42.765	43.942	44.914	45.616	46.082
Caa-C	13.343	22.736	29.824	35.335	39.769	43.138	45.841	48.152	50.418	52.361	54.312	56.287	58.133	59.986	61.866	63.653	65.238	66.666	67.994	69.308
Inv Grade	0.156	0.465	0.848	1.276	1.747	2.231	2.715	3.202	3.706	4.218	4.734	5.250	5.746	6.206	6.647	7.062	7.435	7.793	8.146	8.498
Spec Grade	3.812	7.711	11.365	14.632	17.512	20.052	22.317	24.329	26.173	27.941	29.532	31.086	32.579	33.964	35.258	36.471	37.624	38.671	39.571	40.388
All rated	1.570	3.206	4.740	6.115	7.345	8.441	9.425	10.319	11.163	11.980	12.746	13.492	14.202	14.854	15.467	16.039	16.562	17.050	17.503	17.937

* Data in percent.

EXHIBIT 33

Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1970-2014*

Rating	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	0.000	0.013	0.013	0.036	0.102	0.166	0.235	0.309	0.390	0.475	0.567	0.665	0.766	0.822	0.882	0.946	1.014	1.038	1.038	1.038
Aa	0.022	0.068	0.137	0.258	0.405	0.552	0.691	0.808	0.905	1.019	1.159	1.338	1.546	1.712	1.836	1.971	2.140	2.363	2.712	3.058
A	0.061	0.198	0.430	0.672	0.961	1.277	1.620	1.993	2.378	2.744	3.093	3.430	3.765	4.114	4.528	4.949	5.416	5.920	6.377	6.859
Baa	0.168	0.486	0.877	1.336	1.802	2.290	2.763	3.252	3.801	4.425	5.074	5.748	6.459	7.185	7.898	8.679	9.431	10.136	10.769	11.389
Ba	1.079	2.983	5.208	7.591	9.745	11.738	13.479	15.216	16.945	18.728	20.536	22.376	24.129	25.859	27.591	29.183	30.633	31.870	33.169	34.250
B	3.706	8.861	14.132	18.804	23.095	27.104	30.818	33.940	36.725	39.164	41.173	43.084	44.879	46.692	48.330	49.682	50.731	51.841	52.653	53.558
Caa_C	14.951	25.658	34.276	41.169	46.973	51.231	54.772	58.084	61.373	63.918	65.712	66.955	68.606	69.272	70.087	71.627	72.044	72.044	72.044	72.044
Inv Grade	0.090	0.268	0.511	0.792	1.100	1.424	1.752	2.093	2.452	2.828	3.208	3.596	3.996	4.392	4.800	5.229	5.674	6.126	6.560	7.000
Spec Grade	4.338	8.920	13.292	17.151	20.533	23.497	26.094	28.379	30.482	32.422	34.178	35.887	37.504	39.080	40.603	41.974	43.163	44.209	45.242	46.142
All rated	1.657	3.368	4.959	6.329	7.505	8.522	9.405	10.187	10.916	11.602	12.237	12.852	13.449	14.025	14.594	15.149	15.682	16.196	16.691	17.171

* Data in percent.

EXHIBIT 34

Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1983-2014*

Rating	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	0.000	0.016	0.016	0.047	0.083	0.126	0.173	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178
Aa	0.025	0.076	0.155	0.288	0.444	0.572	0.681	0.772	0.862	0.985	1.141	1.349	1.562	1.708	1.842	1.980	2.154	2.433	2.842	3.198
A	0.068	0.225	0.493	0.769	1.101	1.457	1.841	2.249	2.644	2.998	3.318	3.626	3.955	4.345	4.814	5.308	5.873	6.523	7.026	7.537
Baa	0.183	0.522	0.916	1.373	1.849	2.337	2.798	3.258	3.722	4.244	4.808	5.379	6.052	6.739	7.400	8.175	8.965	9.688	10.344	10.848
Ba	1.098	3.150	5.624	8.243	10.463	12.505	14.318	16.048	17.663	19.268	20.833	22.430	23.973	25.642	27.315	28.677	29.926	31.044	32.445	33.429
B	3.691	8.899	14.232	18.942	23.283	27.362	31.123	34.270	36.995	39.346	41.245	43.092	44.886	46.710	48.294	49.454	50.576	52.012	53.076	54.295
Caa	12.348	22.844	31.429	38.425	44.373	48.851	52.492	55.797	59.631	63.124	65.723	67.645	70.488	71.747	73.882	78.289	79.592	79.592	79.592	79.592
Ca-C	42.529	55.272	64.645	71.461	76.352	77.870	80.488	83.856	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	n.a.
Inv Grade	0.098	0.291	0.548	0.842	1.167	1.497	1.826	2.156	2.481	2.810	3.141	3.476	3.845	4.223	4.622	5.055	5.525	6.037	6.499	6.915
Spec Grade	4.527	9.371	14.043	18.165	21.740	24.882	27.657	30.050	32.169	34.063	35.692	37.276	38.809	40.378	41.860	43.049	44.118	45.174	46.303	47.215
All rated	1.825	3.734	5.523	7.053	8.351	9.462	10.421	11.243	11.965	12.617	13.196	13.752	14.310	14.870	15.421	15.944	16.472	17.027	17.548	18.000

* Data in percent.

EXHIBIT 35

Average Cumulative Issuer-Weighted Global Default Rates by Alphanumeric Rating, 1983-2014*

Rating	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	0.000	0.016	0.016	0.047	0.083	0.126	0.173	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178	0.178
Aa1	0.000	0.000	0.000	0.085	0.156	0.234	0.239	0.239	0.239	0.239	0.239	0.239	0.375	0.541	0.728	0.796	0.796	0.796	0.796	0.796
Aa2	0.000	0.017	0.151	0.323	0.485	0.606	0.742	0.893	1.063	1.253	1.465	1.699	1.906	2.001	2.105	2.299	2.557	2.845	3.250	3.504
Aa3	0.050	0.146	0.223	0.351	0.541	0.693	0.827	0.914	0.988	1.114	1.294	1.563	1.808	1.981	2.113	2.239	2.418	2.793	3.355	3.924
A1	0.086	0.267	0.563	0.857	1.171	1.461	1.710	1.911	2.115	2.345	2.599	2.859	3.146	3.511	3.909	4.348	4.798	5.219	5.447	5.688
A2	0.066	0.206	0.421	0.682	0.989	1.423	1.908	2.440	2.945	3.417	3.806	4.107	4.433	4.838	5.292	5.800	6.550	7.343	7.920	8.492
A3	0.055	0.207	0.508	0.785	1.161	1.492	1.889	2.353	2.806	3.143	3.448	3.816	4.195	4.593	5.166	5.707	6.166	6.897	7.627	8.372
Baa1	0.147	0.403	0.681	1.005	1.323	1.639	1.939	2.160	2.340	2.564	2.864	3.296	3.790	4.269	4.863	5.645	6.307	6.715	6.850	7.040
Baa2	0.161	0.467	0.830	1.323	1.755	2.248	2.699	3.113	3.612	4.222	4.985	5.777	6.504	7.189	7.860	8.474	9.185	10.018	10.909	11.410
Baa3	0.252	0.731	1.299	1.869	2.596	3.293	3.976	4.812	5.609	6.418	7.073	7.531	8.378	9.346	10.082	11.051	12.089	13.045	14.007	14.855
Ba1	0.651	1.947	3.562	5.346	7.019	8.797	10.190	11.213	12.150	13.229	14.484	15.931	16.938	17.776	19.104	20.177	21.363	22.866	25.068	26.506
Ba2	0.723	2.023	3.646	5.392	6.961	8.175	9.446	10.840	12.103	13.234	14.687	16.357	18.158	19.816	21.835	23.255	24.509	24.931	25.106	25.106
Ba3	1.679	4.807	8.517	12.383	15.494	18.358	20.928	23.533	26.041	28.513	30.484	32.219	34.190	36.924	38.786	40.552	41.977	43.271	44.721	46.053
B1	2.229	6.221	10.593	14.553	18.605	22.525	26.630	30.030	33.001	35.819	38.111	40.540	43.039	45.543	47.200	48.622	50.256	51.790	53.539	55.713
B2	3.407	8.631	13.899	18.734	22.895	26.812	30.260	33.183	36.047	38.241	39.808	40.924	42.102	43.372	45.288	46.819	47.694	49.940	50.294	50.294
B3	5.500	12.073	18.674	24.260	29.314	33.960	37.732	40.943	43.050	44.784	46.575	48.733	50.109	51.349	52.231	52.231	52.480	52.879	52.879	52.879
Caa1	6.836	15.698	23.835	30.832	37.233	41.779	45.165	48.127	52.362	56.541	60.254	64.403	71.052	74.049	74.049	74.049	n.a.	n.a.	n.a.	n.a.
Caa2	16.723	28.485	37.748	45.022	50.338	55.133	59.107	62.411	65.698	68.124	70.072	70.072	70.072	70.072	72.861	77.841	79.171	79.171	79.171	79.171
Caa3	28.992	44.359	53.252	59.306	64.889	67.668	71.383	75.858	78.847	81.831	81.831	81.831	81.831	81.831	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ca-C	42.529	55.272	64.645	71.461	76.352	77.870	80.488	83.856	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	84.977	n.a.
Inv Grade	0.098	0.291	0.548	0.842	1.167	1.497	1.826	2.156	2.481	2.810	3.141	3.476	3.845	4.223	4.622	5.055	5.525	6.037	6.499	6.915
Spec Grade	4.527	9.371	14.043	18.165	21.740	24.882	27.657	30.050	32.169	34.063	35.692	37.276	38.809	40.378	41.860	43.049	44.118	45.174	46.303	47.215
All rated	1.825	3.734	5.523	7.053	8.351	9.462	10.421	11.243	11.965	12.617	13.196	13.752	14.310	14.870	15.421	15.944	16.472	17.027	17.548	18.000

* Data in percent.

EXHIBIT 36

Average Cumulative Issuer-Weighted Global Default Rates by Alphanumeric Rating, 1998-2014*

Rating/Year	1	2	3	4	5	6	7	8	9	10
Aaa	0.000	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
Aa1	0.000	0.000	0.000	0.000	0.054	0.176	0.187	0.187	0.187	0.187
Aa2	0.000	0.014	0.206	0.424	0.571	0.740	0.939	1.176	1.462	1.812
Aa3	0.052	0.154	0.227	0.371	0.635	0.873	1.138	1.290	1.446	1.652
A1	0.151	0.362	0.653	1.025	1.510	1.964	2.412	2.785	3.142	3.560
A2	0.105	0.306	0.585	0.852	1.250	1.868	2.492	3.231	4.054	4.972
A3	0.072	0.246	0.605	0.972	1.457	1.761	2.221	2.809	3.474	4.084
Baa1	0.178	0.458	0.730	1.028	1.263	1.553	1.810	2.075	2.290	2.626
Baa2	0.188	0.491	0.823	1.198	1.481	1.828	2.139	2.400	2.747	3.108
Baa3	0.273	0.737	1.281	1.804	2.424	2.827	3.344	4.160	5.002	6.083
Ba1	0.420	1.656	2.993	4.200	5.499	6.792	7.958	8.975	10.160	11.616
Ba2	0.647	1.521	2.637	3.894	4.920	5.789	6.602	7.951	8.987	10.415
Ba3	1.060	3.089	5.476	8.123	9.919	11.623	13.179	15.298	17.766	20.084
B1	1.435	4.752	8.589	11.965	14.821	17.431	20.246	22.851	25.424	28.185
B2	2.942	7.768	12.832	17.600	21.205	24.674	27.785	30.395	33.047	35.014
B3	4.000	10.037	16.609	21.929	26.610	30.864	34.495	37.694	40.124	41.600
Caa1	6.843	15.682	23.785	30.686	37.072	41.678	45.101	48.077	51.926	56.195
Caa2	16.349	28.988	38.882	46.074	51.585	56.261	60.307	63.368	65.719	65.719
Caa3	29.335	44.688	53.679	59.629	65.068	67.035	69.745	73.217	74.264	74.264
Ca-C	46.937	60.715	70.570	76.794	80.289	80.900	82.118	84.800	86.336	86.336
Inv Grade	0.131	0.354	0.638	0.942	1.289	1.633	2.002	2.414	2.859	3.363
Spec Grade	4.599	9.529	14.251	18.229	21.415	24.109	26.477	28.677	30.785	32.677
All rated	1.993	4.071	5.999	7.573	8.831	9.876	10.799	11.669	12.508	13.317

* Data in percent.

EXHIBIT 37

Average Cumulative Issuer-Weighted Global Default Rates by Broad Industry Group, 1970-2014*

Broad Industry Group	1	2	3	4	5	6	7	8	9	10
Banking	0.616	1.279	1.968	2.608	3.193	3.750	4.260	4.760	5.237	5.725
Capital Industries	2.169	4.523	6.779	8.823	10.616	12.197	13.640	14.965	16.176	17.274
Consumer Industries	2.503	5.136	7.571	9.675	11.456	13.010	14.360	15.528	16.639	17.610
Energy & Environment	1.600	3.163	4.538	5.652	6.631	7.481	8.170	8.716	9.245	9.733
Non-Bank Finance	0.781	1.627	2.447	3.179	3.832	4.468	5.099	5.722	6.381	7.089
Media & Publishing	3.926	7.980	11.880	15.215	18.267	20.869	22.963	24.687	26.186	27.650
Retail & Distribution	2.803	5.752	8.605	11.027	13.168	15.025	16.529	17.908	19.297	20.637
Government Related Issuers	0.259	0.552	0.725	0.851	0.996	1.009	1.009	1.009	1.009	1.009
Technology	1.903	3.862	5.602	6.992	8.046	8.821	9.471	9.974	10.374	10.732
Transportation	2.391	4.478	6.311	7.892	9.244	10.439	11.440	12.390	13.305	14.281
Utilities	0.146	0.286	0.419	0.543	0.666	0.790	0.902	1.002	1.109	1.223

* Data in percent.

EXHIBIT 38

Annual Default Rates by Broad Industry Group, 1970-2014*

Year	Banking	Capital Industries	Consumer Industries	Energy & Environment	Non-Bank Finance	Media & Publishing	Retail & Distribution	Gov't-Related Issuers	Technology	Transportation	Utilities
1970	n.a.	0.000	0.926	0.000	16.667	0.000	0.000	0.000	0.833	15.484	0.000
1971	n.a.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.314	0.000
1972	n.a.	0.353	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.053	0.000
1973	n.a.	0.360	0.000	0.000	0.000	0.000	3.030	0.000	0.000	1.613	0.000
1974	n.a.	0.355	0.000	0.000	0.000	0.000	3.078	0.000	0.000	0.000	0.000
1975	0.000	0.369	0.769	0.000	0.000	4.167	1.563	0.000	0.000	0.000	0.000
1976	0.000	0.352	0.735	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1977	0.000	0.000	0.746	0.000	0.000	4.000	0.000	0.000	0.000	1.786	0.000
1978	0.000	0.000	0.746	1.176	0.000	0.000	1.639	0.000	0.725	0.000	0.000
1979	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.709	0.000	0.000
1980	0.000	0.375	0.000	1.124	0.000	0.000	0.000	0.000	0.690	0.926	0.000
1981	0.000	0.366	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.909	0.000
1982	0.000	1.106	0.000	0.917	0.000	4.000	4.814	0.000	1.841	1.951	0.000
1983	0.000	1.415	0.565	2.382	0.000	0.000	0.000	0.000	0.617	3.912	0.000
1984	0.000	0.708	1.081	3.894	0.000	0.000	0.000	0.000	1.779	1.031	0.000
1985	0.000	1.214	1.391	3.338	1.220	0.000	0.000	0.000	0.559	0.971	0.000
1986	0.000	3.377	1.582	7.068	0.000	3.511	1.000	0.000	0.521	2.770	0.000
1987	0.410	2.433	2.463	5.393	0.000	1.351	1.845	0.000	0.455	0.893	0.424
1988	2.053	0.762	2.584	1.394	0.629	3.346	1.681	0.000	1.205	0.000	0.422
1989	2.195	3.190	4.320	0.000	3.528	5.811	0.800	11.111	1.210	1.802	0.000
1990	2.775	4.904	8.590	1.320	0.000	7.479	5.675	0.000	2.421	5.744	0.000
1991	2.148	3.551	3.711	1.320	0.543	4.209	10.195	0.000	1.711	9.102	1.324
1992	0.539	2.011	3.017	0.658	0.532	7.341	2.487	0.000	1.284	0.000	0.870
1993	0.491	1.650	1.157	1.270	0.000	2.857	2.518	0.000	0.457	0.000	0.000
1994	0.000	0.427	0.971	0.625	0.000	1.316	2.771	0.000	1.242	1.896	0.000
1995	0.000	1.353	2.930	0.568	1.288	0.000	1.876	0.000	0.738	0.917	0.000
1996	0.000	0.706	1.318	1.005	0.000	2.679	0.621	0.000	0.709	0.000	0.000
1997	0.000	0.480	2.307	0.000	0.314	1.418	3.452	0.000	0.596	0.855	0.000

EXHIBIT 38

Annual Default Rates by Broad Industry Group, 1970-2014*

Year	Banking	Capital Industries	Consumer Industries	Energy & Environment	Non-Bank Finance	Media & Publishing	Retail & Distribution	Gov't-Related Issuers	Technology	Transportation	Utilities
1998	0.149	1.099	2.478	1.502	1.051	2.837	5.917	0.000	0.780	0.758	0.000
1999	0.281	2.344	4.747	5.727	0.704	3.333	2.880	2.941	2.027	5.474	0.338
2000	0.000	4.340	6.825	1.369	0.925	1.865	5.898	0.000	2.792	4.169	0.000
2001	0.136	7.640	5.920	2.076	1.384	3.767	8.356	0.000	8.009	4.286	0.601
2002	0.587	2.960	2.192	4.278	0.460	10.451	3.828	0.000	9.237	6.408	0.569
2003	0.147	2.669	2.276	1.316	0.660	3.886	4.471	0.000	4.950	3.348	0.561
2004	0.000	1.586	2.308	0.310	0.231	1.635	1.180	0.000	0.861	1.778	0.264
2005	0.131	1.374	0.730	0.968	0.221	0.000	1.895	0.000	0.248	4.205	0.262
2006	0.000	1.380	1.065	0.000	0.439	1.557	1.140	0.000	0.794	2.543	0.000
2007	0.000	0.748	0.688	0.000	0.000	1.056	1.837	0.000	0.480	0.000	0.000
2008	1.097	3.232	4.049	1.717	2.205	4.541	2.287	0.000	1.266	3.216	0.000
2009	1.860	10.833	8.087	2.033	3.802	23.087	4.821	0.000	5.530	6.183	0.251
2010	0.699	1.449	1.910	2.313	0.947	3.831	3.897	0.000	1.320	0.926	0.240
2011	0.804	0.816	0.744	1.418	0.672	1.769	2.448	0.000	0.000	6.228	0.000
2012	1.073	1.452	2.227	1.829	0.657	4.388	1.634	0.000	1.414	0.909	0.446
2013	2.002	1.430	1.669	2.115	0.418	4.835	1.039	0.000	1.149	1.762	0.000
2014	0.838	1.673	0.473	1.298	0.396	1.106	1.765	0.000	1.987	0.741	0.000

* Data in percent.

EXHIBIT 39

Annual Volume-weighted Corporate Bond Default Rates by Letter Rating, 1994-2014*

Year	Aaa	Aa	A	Baa	Ba	B	Caa-C	Inv-Grade	Spec-Grade	All- Rated
1994	0.000	0.000	0.000	0.000	0.141	1.971	2.797	0.000	1.220	0.249
1995	0.000	0.000	0.000	0.000	0.567	4.651	6.876	0.000	3.088	0.716
1996	0.000	0.000	0.000	0.000	0.000	1.624	22.529	0.000	2.309	0.659
1997	0.000	0.000	0.000	0.000	0.051	3.064	7.111	0.000	1.950	0.504
1998	0.000	0.000	0.000	0.000	0.654	3.023	13.225	0.000	2.872	0.853
1999	0.000	0.000	0.000	0.140	1.143	5.483	20.515	0.031	5.783	1.114
2000	0.000	0.000	0.000	0.623	1.039	6.069	20.723	0.137	5.857	1.350
2001	0.000	0.000	0.692	0.957	1.178	13.898	55.371	0.532	15.646	3.006
2002	0.000	0.000	2.718	2.298	4.872	15.699	75.944	1.859	21.363	4.895
2003	0.000	0.000	0.000	0.000	3.622	2.560	17.170	0.000	5.689	0.994
2004	0.000	0.000	0.000	0.000	0.000	0.258	9.190	0.000	1.879	0.328
2005	0.000	0.000	0.000	0.201	0.000	1.639	16.473	0.073	3.787	0.754
2006	0.000	0.000	0.000	0.000	0.033	1.062	4.008	0.000	1.050	0.212
2007	0.000	0.000	0.000	0.000	0.000	0.000	3.655	0.000	0.602	0.117
2008	0.000	0.816	2.370	1.108	8.097	1.287	11.019	1.466	5.807	2.221
2009	0.000	0.000	0.014	0.642	2.599	6.416	40.318	0.187	16.759	2.808
2010	0.000	0.000	0.151	0.000	0.000	0.083	6.283	0.072	1.698	0.344
2011	0.000	0.000	0.000	0.005	0.224	0.047	8.473	0.002	1.766	0.335
2012	0.000	0.000	0.000	0.018	0.000	0.218	10.236	0.007	1.883	0.367
2013	0.000	0.000	0.000	0.069	0.000	0.131	6.631	0.029	1.170	0.267
2014	0.000	0.000	0.023	0.000	0.108	0.202	9.665	0.010	1.764	0.394
Mean	0.000	0.039	0.284	0.289	1.158	3.304	17.534	0.210	4.950	1.071
Median	0.000	0.000	0.000	0.000	0.141	1.639	10.236	0.007	2.309	0.659
StDev	0.000	0.178	0.768	0.572	2.069	4.344	18.434	0.501	5.758	1.206
Min	0.000	0.000	0.000	0.000	0.000	0.000	2.797	0.000	0.602	0.117
Max	0.000	0.816	2.718	2.298	8.097	15.699	75.944	1.859	21.363	4.895

* Data in percent

EXHIBIT 40

Average Volume-weighted Corporate Bond Default Rates by Letter Rating, 1994-2014*

Rating / Year	1	2	3	4	5
Aaa	0.000	0.048	0.048	0.048	0.048
Aa	0.026	0.078	0.115	0.165	0.245
A	0.312	0.614	0.873	1.071	1.327
Baa	0.231	0.504	0.709	1.059	1.562
Ba	0.828	2.172	3.545	4.907	5.683
B	3.009	7.295	11.080	14.332	16.458
Caa-C	15.611	25.009	31.704	34.191	35.697
Inv-Grade	0.220	0.452	0.636	0.838	1.116
Spec-Grade	4.363	8.382	11.730	14.106	15.595
All Rated	1.004	1.940	2.701	3.294	3.787

*Data in percent

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/70

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	39	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.703	2.703	2.703
Aa	78	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.429	1.429	1.429	2.922	2.922	2.922	2.922
A	254	0.000	0.000	0.000	0.413	0.413	0.835	0.835	0.835	0.835	0.835	1.292	1.292	1.292	1.292	1.292	1.292	1.796	1.796	2.869	2.869
Baa	372	0.543	0.543	0.543	1.123	1.415	1.415	1.728	2.368	3.038	3.038	3.396	3.396	4.584	4.992	5.418	5.864	7.256	8.313	9.398	9.994
Ba	238	4.237	5.120	5.565	6.050	7.042	8.072	8.606	9.208	10.456	10.456	10.456	12.020	14.560	15.489	15.489	17.575	21.076	23.608	23.608	25.077
B	36	19.444	19.444	22.321	22.321	22.321	22.321	22.321	22.321	22.321	22.321	22.321	22.321	30.498	30.498	30.498	30.498	36.290	36.290	36.290	36.290
Caa-C	16	50.000	56.250	75.000	81.250	81.250	81.250	81.250	90.625	90.625	90.625	90.625	90.625	90.625	90.625	90.625	90.625	90.625	90.625	90.625	90.625
IG	743	0.271	0.271	0.271	0.697	0.840	0.987	1.137	1.441	1.754	1.754	2.085	2.085	2.608	2.962	3.145	3.332	4.297	4.912	5.755	5.977
SG	290	8.678	9.764	11.601	12.382	13.192	14.035	14.471	15.443	16.450	16.450	16.450	17.693	21.008	21.733	21.733	23.347	26.969	28.932	28.932	30.097
All	1033	2.628	2.926	3.430	3.951	4.267	4.593	4.816	5.277	5.752	5.752	6.008	6.270	7.361	7.783	7.929	8.379	9.787	10.621	11.308	11.673

1/1/71

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.703	2.703	2.703	2.703
Aa	75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.786
A	282	0.000	0.000	0.366	0.366	0.739	0.739	0.739	0.739	0.739	1.140	1.140	1.550	1.964	1.964	1.964	2.401	2.401	3.326	3.326	3.326
Baa	398	0.000	0.000	0.534	0.802	1.075	1.366	1.966	2.595	2.595	2.930	2.930	4.059	4.445	4.849	5.272	6.588	7.577	8.592	9.143	10.308
Ba	228	0.885	1.332	1.815	2.810	3.844	4.381	4.986	6.241	6.241	6.241	7.798	10.322	11.247	11.247	13.311	17.937	20.487	20.487	21.959	21.959
B	27	0.000	3.846	3.846	3.846	3.846	3.846	3.846	3.846	3.846	3.846	3.846	15.865	15.865	15.865	15.865	23.514	23.514	23.514	23.514	23.514
Caa-C	8	12.500	50.000	62.500	62.500	62.500	62.500	81.250	81.250	81.250	81.250	81.250	81.250	81.250	81.250	81.250	81.250	81.250	81.250	81.250	81.250
IG	795	0.000	0.000	0.394	0.525	0.796	0.935	1.218	1.509	1.509	1.816	1.816	2.467	2.798	2.968	3.142	3.862	4.433	5.215	5.421	6.063
SG	263	1.155	3.112	3.942	4.806	5.706	6.173	7.216	8.295	8.295	8.295	9.620	13.174	13.950	13.950	15.671	20.478	22.588	22.588	23.837	23.837
All	1058	0.286	0.769	1.267	1.570	1.986	2.200	2.645	3.103	3.103	3.349	3.602	4.788	5.195	5.336	5.769	7.124	7.924	8.583	8.933	9.482

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/72

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	41	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.632	2.632	2.632	2.632	2.632
Aa	79	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.667	1.667
A	304	0.000	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.338	0.715	1.096	1.096	1.096	1.498	1.498	2.351	2.351	2.822	3.316
Baa	431	0.000	0.489	0.735	1.246	1.513	2.061	2.639	2.639	3.274	3.274	3.977	4.337	5.089	5.479	6.693	7.604	8.542	9.576	11.201	14.023
Ba	224	0.000	0.476	1.455	2.474	3.001	3.589	4.810	4.810	4.810	6.291	9.477	10.348	10.348	13.240	17.526	19.852	19.852	21.188	22.647	28.876
B	29	6.897	6.897	6.897	6.897	6.897	6.897	6.897	6.897	6.897	6.897	17.850	17.850	17.850	17.850	25.318	25.318	25.318	25.318	25.318	25.318
Caa-C	8	37.500	50.000	50.000	50.000	50.000	66.667	66.667	66.667	66.667	66.667	66.667	66.667	66.667	66.667	66.667	66.667	66.667	66.667	66.667	n.a.
IG	855	0.000	0.364	0.485	0.736	0.864	1.125	1.394	1.394	1.680	1.680	2.134	2.440	2.757	2.919	3.586	4.115	4.842	5.231	6.236	7.482
SG	261	1.922	2.734	3.578	4.459	4.914	5.920	6.963	6.963	6.963	8.216	12.233	12.965	12.965	15.405	19.910	21.865	21.865	23.014	24.297	29.814
All	1116	0.453	0.920	1.204	1.593	1.793	2.209	2.636	2.636	2.866	3.103	4.209	4.588	4.851	5.388	6.648	7.391	8.005	8.499	9.532	11.318

1/1/73

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	41	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.632	2.632	2.632	2.632	2.632	2.632
Aa	82	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.587	1.587	1.587
A	311	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.364	0.730	0.730	0.730	1.121	1.121	1.948	1.948	2.402	2.878	3.364
Baa	441	0.461	0.693	1.175	1.425	1.940	2.484	2.484	3.081	3.081	3.745	4.424	5.136	5.874	7.024	7.881	8.763	9.742	11.801	13.966	13.966
Ba	205	0.000	1.018	2.080	2.630	3.239	4.496	4.496	4.496	5.994	10.008	10.874	10.874	12.770	17.027	20.521	20.521	21.824	23.245	30.613	32.155
B	27	3.846	3.846	3.846	3.846	3.846	3.846	3.846	3.846	3.846	15.158	15.158	15.158	15.158	22.871	22.871	22.871	22.871	22.871	22.871	22.871
Caa-C	6	37.500	37.500	37.500	37.500	58.333	58.333	58.333	58.333	58.333	58.333	58.333	58.333	58.333	58.333	58.333	58.333	58.333	58.333	n.a.	n.a.
IG	875	0.231	0.347	0.586	0.708	0.956	1.213	1.213	1.486	1.486	1.920	2.360	2.664	2.974	3.615	4.123	4.819	5.193	6.348	7.349	7.553
SG	238	1.280	2.164	3.088	3.565	4.613	5.695	5.695	5.695	6.974	11.740	12.475	12.475	14.096	18.614	21.583	21.583	22.719	23.986	30.602	31.990
All	1113	0.455	0.731	1.110	1.305	1.708	2.123	2.123	2.346	2.574	3.764	4.252	4.507	5.026	6.247	7.112	7.705	8.182	9.345	11.072	11.426

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/74

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.500	2.500	2.500	2.500	2.500	2.500	2.500
Aa	90	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.250	1.250	1.250	1.250	1.250	1.250	1.250	1.250	2.746	2.746	2.746	2.746
A	309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.362	0.727	0.727	0.727	1.114	1.114	1.927	1.927	2.371	2.836	3.310	3.310
Baa	431	0.000	0.480	0.730	1.244	1.786	1.786	2.381	2.381	3.045	3.723	4.437	5.177	5.566	6.431	7.322	8.306	9.840	12.013	12.013	12.013
Ba	197	0.513	1.601	2.166	2.793	4.090	4.090	4.090	4.851	8.921	9.805	9.805	11.704	17.935	21.390	21.390	22.723	25.585	33.014	34.572	36.441
B	29	7.162	7.162	7.162	7.162	7.162	7.162	7.162	11.804	22.180	22.180	22.180	22.180	29.962	29.962	29.962	29.962	29.962	29.962	29.962	29.962
Caa-C	3	0.000	0.000	0.000	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	n.a.	n.a.	n.a.
IG	874	0.000	0.235	0.355	0.600	0.852	0.852	1.120	1.120	1.692	2.126	2.425	2.731	3.048	3.549	4.235	4.603	5.545	6.526	6.727	6.727
SG	229	1.332	2.270	2.756	3.825	4.928	4.928	4.928	6.226	11.030	11.778	11.778	13.412	19.682	22.647	22.647	23.801	26.384	33.146	34.568	36.246
All	1103	0.274	0.650	0.843	1.243	1.653	1.653	1.873	2.100	3.397	3.880	4.132	4.646	5.852	6.708	7.294	7.766	8.913	10.615	10.965	11.162

1/1/75

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	52	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.041	2.041	2.041	2.041	2.041	2.041	2.041	2.041
Aa	105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.031	1.031	1.031	1.031	1.031	1.031	2.195	2.195	3.418	3.418	3.418	3.418	3.418
A	322	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.351	0.351	0.351	0.723	0.723	1.511	1.511	1.941	2.838	3.303	3.846	3.846
Baa	412	0.000	0.000	0.268	0.825	0.825	1.436	1.436	2.444	3.131	3.850	4.596	4.987	5.851	6.295	7.282	9.335	11.481	11.481	11.481	11.481
Ba	200	1.029	2.117	3.266	3.886	3.886	3.886	4.593	8.443	9.275	9.275	11.089	17.015	20.310	21.465	22.732	24.087	29.744	31.208	32.928	32.928
B	33	6.158	6.158	6.158	9.510	9.510	9.510	13.444	22.100	22.100	22.100	22.100	28.591	28.591	28.591	28.591	38.793	48.994	48.994	48.994	48.994
Caa-C	3	0.000	0.000	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	n.a.	n.a.	n.a.	n.a.
IG	891	0.000	0.000	0.119	0.362	0.362	0.620	0.620	1.166	1.580	1.865	2.156	2.457	2.932	3.584	3.932	5.002	6.109	6.298	6.516	6.516
SG	236	1.742	2.659	4.117	5.135	5.135	5.135	6.329	10.801	11.497	11.497	13.037	18.908	21.686	22.653	23.712	26.060	32.175	33.455	34.933	34.933
All	1127	0.360	0.545	0.927	1.320	1.320	1.529	1.745	2.979	3.438	3.677	4.164	5.306	6.116	6.810	7.254	8.487	10.239	10.567	10.939	10.939

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/76

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	66	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695
Aa	114	0.000	0.000	0.000	0.000	0.000	0.000	0.943	0.943	0.943	0.943	0.943	0.943	2.020	2.020	3.146	3.146	3.146	3.146	3.146	3.146
A	368	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.612	0.612	0.612	1.276	1.276	2.346	2.346	3.121	4.344	4.344	4.842	4.842	5.386
Baa	371	0.000	0.288	0.584	0.584	0.906	0.906	2.344	3.078	3.849	4.650	5.068	5.984	5.984	7.038	9.239	10.963	11.548	11.548	11.548	11.548
Ba	206	0.995	2.044	3.163	3.163	3.788	4.425	7.202	7.957	7.957	9.586	14.850	17.801	18.828	19.956	21.169	27.415	28.711	30.196	30.196	30.196
B	27	0.000	0.000	4.000	4.000	4.000	8.800	19.529	19.529	19.529	19.529	28.471	28.471	28.471	28.471	42.776	57.082	57.082	57.082	57.082	57.082
Caa-C	3	0.000	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	n.a.	n.a.	n.a.	n.a.	n.a.
IG	919	0.000	0.113	0.227	0.227	0.347	0.347	0.989	1.510	1.779	2.055	2.485	2.937	3.558	3.888	5.074	6.128	6.307	6.516	6.516	6.752
SG	236	0.868	2.248	3.691	3.691	4.235	5.355	8.959	9.618	9.618	11.064	16.540	19.160	20.068	21.067	23.245	30.089	31.294	32.669	32.669	32.669
All	1155	0.175	0.538	0.909	0.909	1.107	1.310	2.472	3.013	3.238	3.701	4.908	5.678	6.338	6.759	8.073	9.889	10.200	10.556	10.556	10.759

1/1/77

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	67	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695
Aa	121	0.000	0.000	0.000	0.000	0.000	0.885	0.885	0.885	0.885	0.885	0.885	1.907	1.907	2.962	2.962	2.962	2.962	2.962	2.962	2.962
A	389	0.000	0.000	0.000	0.000	0.000	0.000	0.575	0.575	0.575	1.199	1.199	2.888	2.888	3.978	5.135	5.135	5.607	5.607	6.123	6.123
Baa	355	0.294	0.595	0.595	0.595	0.595	2.054	2.798	3.581	4.398	4.825	5.754	5.754	6.826	8.506	10.244	10.830	10.830	10.830	10.830	10.830
Ba	195	0.543	1.674	1.674	2.273	2.920	5.721	6.481	6.481	8.107	13.365	16.300	17.320	18.438	19.637	25.808	27.110	28.598	28.598	28.598	28.598
B	31	3.226	6.563	6.563	10.625	14.881	24.895	24.895	24.895	24.895	33.240	33.240	33.240	33.240	46.592	59.944	59.944	59.944	59.944	59.944	59.944
Caa-C	3	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
IG	932	0.110	0.221	0.221	0.221	0.221	0.843	1.348	1.610	1.879	2.296	2.735	3.644	3.964	5.113	6.134	6.308	6.511	6.511	6.741	6.741
SG	229	1.360	2.788	2.788	3.843	4.955	8.551	9.209	9.209	10.638	16.052	18.633	19.527	20.509	22.643	29.341	30.539	31.901	31.901	31.901	31.901
All	1161	0.353	0.715	0.715	0.908	1.106	2.238	2.765	2.985	3.437	4.613	5.363	6.267	6.676	7.951	9.713	10.015	10.363	10.363	10.560	10.560

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/78

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	71	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.563	1.563	1.563	3.150	3.150	3.150	3.150	3.150	3.150	3.150	3.150
Aa	133	0.000	0.000	0.000	0.000	0.806	0.806	0.806	0.806	0.806	0.806	1.716	1.716	1.716	1.716	1.716	1.716	1.716	1.716	1.716	1.716
A	381	0.000	0.000	0.000	0.000	0.000	0.580	0.580	0.580	1.212	1.212	2.595	2.595	4.092	4.877	4.877	5.360	5.360	5.886	5.886	5.886
Baa	341	0.000	0.000	0.000	0.000	1.415	1.777	2.540	2.938	3.353	4.684	5.144	6.171	7.779	10.009	10.571	10.571	10.571	10.571	10.571	10.571
Ba	187	1.124	1.124	1.124	1.770	4.583	6.092	6.092	9.330	15.441	17.431	18.437	19.555	21.939	28.124	29.430	32.371	32.371	32.371	32.371	32.371
B	37	5.405	5.405	11.712	14.982	22.375	22.375	26.941	26.941	32.561	38.692	38.692	38.692	47.450	60.587	60.587	60.587	60.587	60.587	60.587	60.587
Caa-C	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	50.000	50.000	50.000	50.000	50.000	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
IG	926	0.000	0.000	0.000	0.000	0.607	0.976	1.231	1.363	1.769	2.336	3.222	3.533	4.812	5.806	5.976	6.173	6.173	6.396	6.396	6.396
SG	227	1.823	1.823	2.841	3.909	7.370	8.614	9.281	12.009	18.681	21.156	22.004	22.943	26.013	32.611	33.793	36.441	36.441	36.441	36.441	36.441
All	1153	0.353	0.353	0.541	0.733	1.835	2.348	2.667	3.216	4.589	5.435	6.313	6.710	8.224	9.939	10.234	10.738	10.738	10.930	10.930	10.930

1/1/79

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	75	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.471	1.471	1.471	2.963	2.963	2.963	2.963	2.963	2.963	2.963	2.963	2.963
Aa	134	0.000	0.000	0.000	0.794	0.794	0.794	0.794	0.794	0.794	1.687	1.687	1.687	1.687	1.687	1.687	1.687	1.687	1.687	1.687	1.687
A	377	0.000	0.000	0.000	0.000	0.571	0.571	0.571	1.194	1.194	2.564	2.564	3.670	4.442	4.442	4.920	4.920	5.434	5.434	5.434	5.434
Baa	336	0.000	0.313	0.313	1.696	2.051	2.426	2.813	2.813	4.110	4.560	5.577	8.254	10.472	11.031	11.031	11.031	11.031	11.031	11.031	11.031
Ba	207	0.513	0.513	1.072	3.478	6.061	9.475	12.261	18.888	20.543	21.388	22.324	25.377	31.697	32.798	35.242	35.242	35.242	35.242	35.242	35.242
B	34	0.000	6.452	9.793	17.009	17.009	21.620	26.519	38.954	45.737	45.737	45.737	56.589	56.589	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Caa-C	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	50.000	50.000	50.000	50.000	50.000	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
IG	922	0.000	0.112	0.112	0.707	1.069	1.194	1.322	1.587	2.141	3.009	3.315	4.732	5.708	5.875	6.068	6.068	6.287	6.287	6.287	6.287
SG	244	0.435	1.345	2.293	5.337	7.533	11.045	14.051	21.806	23.952	24.691	25.509	29.144	34.989	36.037	38.363	38.363	38.363	38.363	38.363	38.363
All	1166	0.088	0.359	0.544	1.603	2.295	3.011	3.643	5.181	5.993	6.837	7.221	8.955	10.614	10.900	11.386	11.386	11.571	11.571	11.571	11.571

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/80

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	88	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.266	1.266	1.266	2.565	2.565	2.565	2.565	2.565	2.565	2.565	2.565	2.565	2.565
Aa	131	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.885	1.778	1.778	1.778	1.778	1.778	1.778	1.778	1.778	1.778	1.778	1.778	1.778
A	382	0.000	0.000	0.275	0.828	0.828	0.828	1.730	2.045	3.040	3.040	4.117	4.868	4.868	5.330	5.330	5.828	5.828	5.828	5.828	7.020
Baa	336	0.000	0.000	1.010	1.357	1.722	2.465	2.465	3.309	4.188	5.621	8.154	10.748	11.818	11.818	11.818	11.818	11.818	11.818	11.818	11.818
Ba	207	0.000	0.524	3.871	5.077	8.849	12.082	18.197	20.464	21.243	23.961	26.861	33.099	35.432	37.916	37.916	37.916	37.916	39.468	39.468	39.468
B	41	5.000	7.568	15.723	21.536	27.949	31.552	44.781	49.383	49.383	49.383	61.434	69.148	69.148	69.148	69.148	69.148	69.148	69.148	69.148	69.148
Caa-C	6	33.333	33.333	33.333	33.333	33.333	33.333	55.556	55.556	55.556	55.556	55.556	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
IG	937	0.000	0.000	0.460	0.809	0.930	1.175	1.557	2.227	3.062	3.500	4.860	5.949	6.277	6.462	6.462	6.673	6.673	6.673	6.673	7.176
SG	254	1.630	2.482	6.538	8.478	12.575	15.774	23.176	25.676	26.322	28.556	32.582	38.807	40.869	43.059	43.059	43.059	43.059	44.415	44.415	44.415
All	1191	0.343	0.519	1.706	2.363	3.235	4.035	5.701	6.690	7.490	8.218	9.986	11.819	12.380	12.842	12.842	13.019	13.019	13.210	13.210	13.637

1/1/81

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	93	0.000	0.000	0.000	0.000	0.000	0.000	1.220	1.220	1.220	2.486	2.486	2.486	2.486	2.486	2.486	2.486	2.486	2.486	2.486	2.486
Aa	135	0.000	0.000	0.000	0.000	0.000	0.000	0.826	2.507	2.507	2.507	2.507	2.507	2.507	2.507	2.507	2.507	2.507	2.507	2.507	3.985
A	387	0.000	0.269	0.269	0.269	0.269	1.162	1.478	2.145	2.145	3.220	3.975	3.975	4.439	4.439	4.942	4.942	4.942	4.942	6.130	6.740
Baa	339	0.000	0.640	1.952	2.652	3.379	3.379	3.793	4.634	6.008	8.426	10.404	11.419	11.419	11.419	11.419	11.419	11.419	11.419	11.419	12.342
Ba	241	0.000	3.637	5.115	8.155	11.857	18.546	21.054	21.707	24.756	28.947	35.417	37.593	39.905	39.905	39.905	39.905	41.335	42.802	42.802	42.802
B	46	4.397	11.393	16.315	24.335	27.245	41.234	41.234	41.234	41.234	51.518	57.578	57.578	57.578	57.578	57.578	57.578	57.578	57.578	57.578	57.578
Caa-C	7	0.000	0.000	0.000	0.000	0.000	16.667	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333	33.333
IG	954	0.000	0.330	0.776	1.009	1.249	1.619	2.143	2.956	3.384	4.706	5.614	5.933	6.113	6.113	6.317	6.317	6.317	6.317	6.808	7.575
SG	294	0.698	4.772	6.764	10.496	13.971	21.880	24.458	24.994	27.485	32.330	38.537	40.390	42.344	42.344	42.344	42.344	43.571	44.825	44.825	44.825
All	1248	0.162	1.346	2.130	3.124	4.060	6.011	6.946	7.702	8.506	10.428	12.177	12.715	13.157	13.157	13.325	13.325	13.508	13.698	14.107	14.746

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/82

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	96	0.000	0.000	0.000	0.000	0.000	1.190	1.190	1.190	2.441	2.441	2.441	2.441	2.441	2.441	2.441	2.441	2.441	2.441	2.441	2.441
Aa	147	0.000	0.000	0.000	0.000	0.000	0.752	2.291	2.291	2.291	2.291	2.291	2.291	2.291	3.414	3.414	3.414	3.414	3.414	4.794	4.794
A	396	0.256	0.256	0.256	0.256	1.122	1.122	1.772	1.772	3.172	3.907	3.907	4.349	4.349	4.349	4.349	4.349	4.349	4.922	5.509	9.141
Baa	326	0.328	0.328	1.396	2.137	2.527	3.362	4.225	5.625	8.091	10.112	11.160	11.160	11.160	11.160	11.160	11.160	11.160	12.040	12.986	12.986
Ba	254	2.777	5.350	8.043	11.785	18.626	20.834	21.408	24.098	28.647	32.821	34.802	36.905	36.905	36.905	36.905	38.277	39.782	39.782	39.782	43.177
B	45	2.222	9.101	14.084	16.769	29.169	29.169	29.169	29.169	35.072	55.478	55.478	55.478	55.478	55.478	55.478	55.478	55.478	55.478	55.478	55.478
Caa-C	13	23.077	46.154	46.154	46.154	55.128	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103	64.103
IG	965	0.213	0.213	0.552	0.787	1.270	1.783	2.578	2.997	4.442	5.337	5.652	5.830	5.830	6.030	6.030	6.030	6.030	6.512	7.265	8.803
SG	312	3.544	7.655	10.564	13.990	21.651	23.894	24.361	26.592	31.020	36.635	38.329	40.116	40.116	40.116	40.116	41.290	42.567	42.567	42.567	45.476
All	1277	1.036	2.024	2.967	3.945	6.079	6.971	7.694	8.469	10.446	12.142	12.665	13.094	13.094	13.258	13.258	13.437	13.623	14.024	14.649	16.349

1/1/83

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	97	0.000	0.000	0.000	0.000	2.381	2.381	2.381	3.683	3.683	3.683	3.683	3.683	3.683	3.683	3.683	3.683	3.683	3.683	3.683	3.683
Aa	223	0.000	0.000	0.000	0.000	0.490	2.001	2.001	2.001	2.001	2.001	2.001	2.001	2.716	2.716	2.716	2.716	2.716	2.716	3.609	4.554
A	423	0.000	0.000	0.000	0.262	0.262	0.855	0.855	2.119	3.449	4.150	4.542	4.542	4.542	4.542	4.542	4.542	4.542	5.093	6.782	7.376
Baa	270	0.000	1.181	1.603	3.347	3.851	4.368	5.477	6.644	7.853	7.853	7.853	7.853	7.853	7.853	7.853	7.853	8.912	11.189	13.590	16.094
Ba	229	0.901	2.383	4.497	12.177	14.265	17.307	21.106	26.308	31.987	31.987	33.499	33.499	33.499	33.499	35.455	37.472	39.705	41.938	46.497	51.150
B	114	6.386	11.153	18.080	25.279	28.544	29.644	32.275	40.478	48.053	53.392	56.134	56.134	56.134	56.134	56.134	56.134	56.134	56.134	56.134	56.134
Caa-C	10	41.667	65.000	65.000	65.000	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667	76.667
IG	1013	0.000	0.309	0.417	0.968	1.439	2.182	2.440	3.372	4.204	4.497	4.661	4.661	4.846	4.846	4.846	4.846	5.070	5.769	7.199	8.207
SG	353	3.832	7.019	10.716	18.012	20.913	23.118	26.370	32.574	38.825	40.495	42.354	42.354	42.354	42.354	43.581	44.957	46.444	47.974	51.083	54.344
All	1366	0.967	1.976	2.942	5.061	6.063	7.121	7.945	9.790	11.493	11.983	12.385	12.385	12.539	12.539	12.707	12.882	13.260	14.042	15.644	16.912

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/84

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	78	0.000	0.000	0.000	1.449	1.449	1.449	3.065	3.065	3.065	3.065	3.065	3.065	3.065	3.065	3.065	3.065	3.065	3.065	3.065	3.065
Aa	238	0.000	0.000	0.000	0.901	1.838	1.838	1.838	1.838	1.838	1.838	1.838	2.501	2.501	2.501	2.501	2.501	2.501	3.314	4.177	4.177
A	447	0.000	0.238	0.479	0.740	1.546	1.546	2.695	3.899	4.532	4.532	4.532	4.532	4.532	4.532	4.532	4.532	5.032	6.556	7.087	7.711
Baa	279	0.365	0.365	0.765	1.252	1.750	2.827	3.965	5.150	5.150	5.848	5.848	5.848	5.848	5.848	5.848	6.894	9.138	12.678	15.173	15.173
Ba	246	0.839	3.513	11.698	14.451	18.067	21.764	27.354	32.591	33.645	34.769	34.769	34.769	34.769	36.322	36.322	38.252	40.244	42.236	46.362	46.362
B	120	6.817	12.951	20.340	24.274	27.384	32.252	42.631	47.841	50.109	55.098	55.098	55.098	55.098	55.098	59.588	59.588	59.588	59.588	59.588	59.588
Caa-C	2	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
IG	1042	0.097	0.200	0.407	0.966	1.672	1.919	2.812	3.611	3.893	4.051	4.051	4.229	4.229	4.229	4.229	4.446	5.122	6.735	7.712	7.980
SG	368	3.361	7.179	15.068	18.207	21.617	25.767	33.053	38.285	39.662	41.953	41.953	41.953	41.953	43.008	44.247	45.607	47.039	48.470	51.501	51.501
All	1410	0.938	1.987	4.114	5.293	6.634	7.695	9.826	11.426	11.887	12.393	12.393	12.538	12.538	12.699	12.866	13.227	13.976	15.508	16.724	16.947

1/1/85

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	81	0.000	0.000	0.000	0.000	0.000	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587	1.587
Aa	293	0.000	0.000	0.000	0.802	0.802	0.802	0.802	0.802	0.802	0.802	1.422	1.422	1.422	1.422	1.422	1.422	2.186	2.995	2.995	2.995
A	510	0.000	0.211	1.351	2.332	2.332	3.666	4.790	5.088	5.088	5.088	5.088	5.088	5.088	5.088	5.088	5.561	6.525	7.553	8.123	8.123
Baa	274	0.000	0.855	1.288	1.796	2.903	3.468	4.675	5.294	6.017	6.017	6.017	6.017	6.017	6.017	8.311	10.858	14.835	16.254	16.254	16.254
Ba	291	1.414	6.747	9.497	12.895	18.593	24.315	29.891	31.445	32.281	32.281	33.339	33.339	34.508	34.508	35.997	37.638	40.966	44.339	44.339	44.339
B	149	7.573	16.899	23.027	26.307	30.447	42.274	47.025	49.144	54.497	54.497	54.497	54.497	54.497	58.634	58.634	58.634	58.634	58.634	58.634	58.634
Caa-C	5	0.000	0.000	0.000	33.333	33.333	33.333	33.333	33.333	33.333	33.333	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
IG	1158	0.000	0.284	0.885	1.649	1.880	2.712	3.464	3.730	3.879	3.879	4.051	4.051	4.051	4.051	4.468	5.125	6.468	7.418	7.678	7.678
SG	445	3.470	10.120	14.061	17.687	22.826	30.444	35.693	37.347	39.190	39.190	40.711	40.711	41.558	42.532	43.638	44.863	47.342	49.911	49.911	49.911
All	1603	0.962	3.007	4.498	6.015	7.409	9.722	11.384	11.911	12.378	12.378	12.790	12.790	12.941	13.099	13.610	14.324	15.788	16.947	17.159	17.159

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/86

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	289	0.000	0.000	0.807	0.807	1.250	1.250	1.250	1.250	1.250	1.867	1.867	1.867	1.867	1.867	1.867	2.658	3.463	3.463	3.463	3.463
A	569	0.000	0.197	0.812	1.026	1.688	2.380	2.380	2.380	2.380	2.380	2.380	2.380	2.380	2.380	3.181	4.006	4.899	5.392	5.392	5.904
Baa	306	1.038	1.395	3.096	3.996	5.854	7.335	8.400	9.015	9.015	9.015	9.015	9.015	9.015	10.872	11.921	14.057	16.247	16.247	16.247	16.247
Ba	357	2.087	6.117	8.657	13.821	20.527	26.929	28.864	30.944	32.462	33.327	33.327	35.305	35.305	35.305	38.065	44.043	45.555	45.555	45.555	47.370
B	187	11.568	17.455	21.266	25.212	34.913	40.359	46.098	49.467	49.467	49.467	49.467	49.467	52.440	60.366	60.366	60.366	60.366	60.366	60.366	60.366
Caa-C	10	22.222	22.222	37.778	37.778	37.778	37.778	37.778	37.778	37.778	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
IG	1272	0.246	0.420	1.260	1.556	2.368	3.007	3.234	3.362	3.362	3.509	3.509	3.509	3.509	3.866	4.440	5.413	6.441	6.665	6.665	6.906
SG	554	5.666	10.285	13.477	18.166	25.740	31.723	34.745	37.135	38.210	39.447	39.447	40.873	41.672	43.584	45.603	49.916	51.029	51.029	51.029	52.317
All	1826	1.879	3.365	4.885	6.325	8.777	10.635	11.441	12.032	12.244	12.592	12.592	12.855	12.990	13.577	14.346	15.775	16.774	16.956	16.956	17.346

1/1/87

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	131	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	303	0.000	0.000	0.000	0.402	0.402	0.402	0.402	0.402	0.981	0.981	0.981	0.981	0.981	0.981	1.703	2.443	2.443	2.443	2.443	2.443
A	536	0.000	0.000	0.209	1.074	1.744	1.744	1.744	1.744	1.744	1.744	1.744	1.744	1.744	2.137	2.941	3.804	4.736	4.736	5.225	5.225
Baa	337	0.000	1.066	1.446	3.384	5.029	6.307	7.276	7.276	7.276	7.276	7.983	7.983	9.530	10.400	12.166	13.071	13.071	13.071	13.071	13.071
Ba	461	2.780	4.304	9.212	16.036	23.043	25.716	28.773	30.475	31.782	32.485	34.094	35.157	35.157	37.520	41.245	45.166	45.166	45.166	46.828	46.828
B	270	6.525	13.901	20.719	32.428	40.298	46.080	48.115	48.115	48.115	48.115	48.115	49.968	54.516	59.304	61.847	67.525	67.525	67.525	67.525	67.525
Caa-C	10	20.000	30.000	30.000	30.000	30.000	30.000	30.000	30.000	65.000	65.000	65.000	65.000	65.000	65.000	65.000	65.000	65.000	65.000	65.000	65.000
IG	1307	0.000	0.256	0.436	1.358	2.033	2.334	2.561	2.561	2.692	2.692	2.841	2.841	3.164	3.511	4.391	5.129	5.523	5.523	5.738	5.738
SG	741	4.417	8.263	13.804	22.253	29.451	33.126	35.778	36.897	38.192	38.664	39.727	41.038	42.494	45.606	48.831	53.162	53.162	53.162	54.277	54.277
All	2048	1.592	3.116	5.071	8.314	10.878	12.066	12.893	13.165	13.557	13.662	14.000	14.241	14.751	15.554	16.793	18.093	18.402	18.402	18.741	18.741

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/88

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	136	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	326	0.000	0.676	1.023	1.023	1.023	1.023	1.023	1.525	1.525	1.525	1.525	1.525	2.145	2.764	3.404	3.404	3.404	3.404	3.404	3.404
A	535	0.000	0.200	0.820	1.457	1.457	1.457	1.457	1.457	1.457	1.457	1.457	1.457	1.457	2.234	2.640	3.540	3.540	4.017	4.017	4.017
Baa	323	0.000	0.345	1.408	2.895	4.048	4.928	4.928	4.928	4.928	5.562	5.562	6.257	7.031	9.396	11.028	11.028	11.028	11.028	11.028	11.028
Ba	504	1.250	6.703	12.672	20.221	22.674	25.927	26.870	27.946	29.113	30.426	31.245	32.094	33.996	39.134	43.546	43.546	43.546	45.031	45.031	48.696
B	336	6.184	12.863	25.926	34.115	39.644	43.113	44.799	46.772	46.772	48.010	54.001	57.539	61.583	63.717	68.741	68.741	68.741	68.741	68.741	68.741
Caa-C	11	27.273	27.273	27.273	27.273	27.273	27.273	27.273	63.636	63.636	63.636	63.636	63.636	63.636	63.636	63.636	63.636	63.636	63.636	63.636	63.636
IG	1320	0.000	0.328	0.920	1.536	1.812	2.020	2.020	2.141	2.141	2.277	2.277	2.426	2.746	3.726	4.407	4.770	4.770	4.967	4.967	4.967
SG	851	3.555	9.433	18.073	25.779	29.362	32.641	33.819	35.516	36.272	37.534	40.060	41.768	44.276	48.312	52.720	52.720	52.720	53.705	53.705	56.079
All	2171	1.375	3.747	7.160	10.131	11.415	12.495	12.815	13.337	13.525	13.927	14.466	14.922	15.644	17.138	18.444	18.723	18.723	19.029	19.029	19.366

1/1/89

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	323	0.645	0.645	0.645	0.645	0.645	0.645	1.118	1.118	1.118	1.118	1.118	1.707	2.295	2.910	2.910	2.910	2.910	2.910	2.910	4.659
A	553	0.000	0.189	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	1.898	2.284	2.715	2.715	3.169	3.169	3.169	4.748
Baa	335	0.627	1.269	1.950	2.997	2.997	2.997	2.997	2.997	3.539	3.539	4.131	4.779	7.429	9.492	10.222	10.222	10.222	10.222	10.222	11.148
Ba	480	3.131	9.858	17.588	20.059	23.284	23.694	24.692	26.359	27.592	29.928	30.724	33.452	38.266	44.631	44.631	44.631	44.631	44.631	48.265	52.328
B	373	8.590	23.375	31.350	37.450	41.240	43.876	46.932	46.932	49.959	53.507	56.412	59.835	61.581	65.744	65.744	65.744	68.379	68.379	68.379	71.015
Caa-C	12	25.000	45.313	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250	56.250
IG	1358	0.305	0.538	0.947	1.203	1.203	1.203	1.316	1.316	1.442	1.442	1.579	1.874	3.085	3.873	4.210	4.210	4.394	4.394	4.394	5.668
SG	865	5.782	16.037	23.917	27.827	31.210	32.478	34.246	35.263	37.149	39.910	41.439	44.288	47.899	53.284	53.284	53.284	54.165	54.165	56.273	59.697
All	2223	2.393	6.289	9.300	10.756	11.799	12.165	12.723	12.983	13.535	14.129	14.545	15.316	16.915	18.480	18.737	18.737	19.020	19.020	19.333	20.818

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/90

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	167	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	359	0.000	0.000	0.000	0.000	0.000	0.402	0.402	0.402	0.402	0.402	0.402	0.923	1.470	1.470	1.470	1.470	1.470	1.470	3.060	5.470
A	572	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.340	0.681	1.039	1.435	1.435	1.856	1.856	1.856	3.335	4.854
Baa	329	0.000	0.659	0.659	0.659	0.659	0.659	0.659	0.659	0.659	1.261	1.919	5.289	8.090	8.831	8.831	8.831	8.831	8.831	9.833	12.839
Ba	466	3.443	11.793	14.399	17.395	18.207	19.577	20.595	21.687	23.748	24.441	26.758	32.602	37.097	37.097	37.097	37.097	37.097	39.925	44.509	44.509
B	385	15.986	25.055	32.549	36.211	38.391	41.022	41.830	45.635	48.989	51.786	56.966	58.759	65.066	65.066	65.066	67.977	67.977	67.977	70.889	77.075
Caa-C	21	61.111	72.222	72.222	72.222	72.222	72.222	72.222	72.222	72.222	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
IG	1427	0.000	0.150	0.150	0.150	0.150	0.253	0.253	0.253	0.253	0.380	0.654	1.636	2.514	2.826	2.826	2.998	2.998	2.998	4.207	6.049
SG	872	10.268	19.011	23.628	26.804	28.161	29.989	30.897	32.911	35.372	37.156	40.167	44.481	49.170	49.170	49.170	49.977	49.977	51.780	55.620	57.643
All	2299	3.762	6.930	8.465	9.465	9.863	10.441	10.678	11.184	11.732	12.212	13.029	14.622	16.182	16.420	16.420	16.687	16.687	16.980	18.541	20.293

1/1/91

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	155	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	395	0.000	0.000	0.000	0.000	0.350	0.350	0.350	0.350	0.350	0.350	0.826	1.327	1.327	1.327	1.327	1.327	1.327	2.789	5.736	5.736
A	562	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.334	0.671	1.022	1.409	1.409	1.825	1.825	1.825	3.297	4.806	5.353
Baa	354	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.290	0.793	1.333	4.080	6.378	6.990	6.990	6.990	6.990	7.765	8.611	10.304	10.304
Ba	365	4.965	6.272	8.181	8.600	9.622	10.770	11.377	13.730	14.522	17.242	23.094	27.289	27.289	28.588	28.588	28.588	28.588	33.651	35.547	35.547
B	333	12.245	21.878	27.189	29.895	33.778	34.566	39.130	42.454	45.198	50.513	52.416	60.899	60.899	60.899	63.906	63.906	66.914	70.223	77.313	77.313
Caa-C	20	45.000	45.000	45.000	45.000	45.000	45.000	45.000	45.000	72.500	72.500	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
IG	1466	0.070	0.070	0.070	0.070	0.166	0.166	0.166	0.166	0.284	0.538	1.448	2.264	2.555	2.555	2.717	2.717	2.897	4.032	5.759	5.965
SG	718	9.464	14.524	17.868	19.283	21.480	22.448	24.588	27.238	29.202	32.567	37.386	42.576	42.576	43.385	44.283	44.283	45.261	49.453	52.863	52.863
All	2184	3.101	4.649	5.621	6.008	6.641	6.872	7.364	7.898	8.365	9.161	10.715	12.239	12.473	12.595	12.857	12.857	13.146	14.682	16.560	16.730

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/92

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	138	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	408	0.000	0.000	0.000	0.308	0.308	0.308	0.308	0.308	0.308	0.732	0.732	0.732	0.732	0.732	0.732	0.732	0.732	2.112	2.842	2.842
A	618	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.289	0.581	1.186	1.520	1.520	1.520	1.520	1.520	3.630	5.791	6.742	7.714
Baa	363	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.467	0.958	3.509	5.136	5.711	5.711	6.357	6.357	7.077	7.833	9.350	9.350	10.182
Ba	344	0.332	1.092	1.092	2.101	2.664	3.246	5.445	6.977	8.735	14.388	20.406	20.406	21.670	23.068	23.068	23.068	29.002	31.153	31.153	31.153
B	262	9.236	16.184	20.081	24.812	27.335	31.247	34.808	37.679	44.974	46.939	53.403	53.403	53.403	53.403	53.403	53.403	56.731	68.048	68.048	68.048
Caa-C	26	29.534	34.567	34.567	34.567	34.567	45.472	45.472	63.648	63.648	81.824	81.824	81.824	81.824	81.824	81.824	100.000	100.000	100.000	100.000	100.000
IG	1527	0.000	0.000	0.000	0.086	0.086	0.086	0.086	0.193	0.420	1.242	1.862	2.127	2.127	2.275	2.275	2.440	3.470	5.048	5.614	6.197
SG	632	5.224	8.726	10.363	12.816	14.100	16.214	18.792	21.211	24.544	29.293	35.021	35.021	35.813	36.693	36.693	37.697	42.428	47.596	47.596	47.596
All	2159	1.504	2.467	2.888	3.543	3.830	4.288	4.784	5.304	6.043	7.490	8.916	9.134	9.249	9.496	9.496	9.769	11.222	13.159	13.640	14.140

1/1/93

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	407	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.629	1.314	1.314	1.314
A	657	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.753	1.280	1.574	1.574	1.574	1.574	1.574	3.060	4.614	5.036	5.900	6.343
Baa	415	0.000	0.000	0.292	0.292	0.618	0.971	1.702	2.471	4.474	5.754	6.652	6.652	7.146	7.146	7.705	9.457	11.817	12.447	13.115	13.833
Ba	365	0.604	0.604	2.951	3.800	4.715	6.406	8.825	10.188	14.520	19.141	19.141	19.141	20.177	21.286	21.286	25.479	28.402	28.402	28.402	28.402
B	250	4.661	9.408	14.416	16.388	19.573	22.426	26.878	35.697	39.832	44.167	45.676	47.373	47.373	49.566	51.968	55.170	65.941	65.941	65.941	65.941
Caa-C	23	27.557	27.557	34.801	44.115	44.115	44.115	72.058	72.058	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
IG	1592	0.000	0.000	0.075	0.075	0.161	0.252	0.439	0.736	1.458	2.003	2.352	2.352	2.482	2.482	2.627	3.684	5.079	5.581	6.100	6.461
SG	638	3.156	5.052	8.584	10.081	11.788	13.847	17.280	21.144	25.719	30.101	30.615	31.219	31.880	33.292	34.050	37.730	42.635	42.635	42.635	42.635
All	2230	0.891	1.407	2.368	2.734	3.193	3.692	4.516	5.470	6.889	8.122	8.498	8.597	8.810	9.037	9.274	10.666	12.491	12.914	13.353	13.658

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/94

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	368	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.685	0.685	0.685	0.685
A	760	0.000	0.000	0.000	0.000	0.000	0.000	0.198	0.597	1.012	1.463	1.463	1.463	1.463	1.463	2.640	4.177	4.512	5.561	5.923	5.923
Baa	473	0.000	0.228	0.228	0.482	0.752	2.146	2.736	4.286	5.271	5.962	5.962	6.359	6.359	6.809	8.781	11.351	11.894	13.061	13.691	13.691
Ba	413	0.265	1.980	2.290	3.301	5.380	8.951	11.953	15.236	18.836	19.486	19.486	20.380	21.388	21.388	25.204	32.180	32.180	32.180	33.919	33.919
B	339	4.124	8.401	11.614	13.542	16.994	21.995	28.341	33.487	38.972	42.959	46.249	46.249	49.006	50.551	54.507	58.557	58.557	58.557	58.557	58.557
Caa-C	38	5.405	11.521	23.555	23.555	23.555	38.226	38.226	76.835	76.835	76.835	76.835	76.835	76.835	76.835	76.835	n.a.	n.a.	n.a.	n.a.	n.a.
IG	1711	0.000	0.063	0.063	0.135	0.211	0.602	0.850	1.452	1.904	2.288	2.288	2.398	2.398	2.521	3.549	4.895	5.331	6.092	6.409	6.409
SG	790	2.148	5.150	7.163	8.493	11.044	15.528	19.699	24.225	28.434	30.344	31.670	32.192	33.892	34.510	38.263	43.918	43.918	43.918	44.976	44.976
All	2501	0.664	1.603	2.182	2.598	3.281	4.601	5.686	7.099	8.309	8.992	9.235	9.412	9.694	9.892	11.278	13.173	13.538	14.175	14.576	14.576

1/1/95

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Aaa	108	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	388	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.595	1.228	1.228	1.228	1.228	1.228
A	810	0.000	0.000	0.000	0.000	0.000	0.173	0.522	1.075	1.470	1.470	1.470	1.470	1.470	2.559	3.695	4.007	4.987	5.326	5.326	5.326
Baa	478	0.000	0.000	0.000	0.255	1.572	2.136	3.916	4.543	4.868	4.868	5.251	5.251	5.685	7.592	10.070	10.596	11.713	12.318	12.318	12.318
Ba	421	0.772	1.050	2.263	4.103	8.081	10.711	14.038	17.191	18.893	18.893	19.712	20.614	20.614	22.892	33.320	33.320	33.320	34.947	34.947	34.947
B	454	4.380	6.885	9.808	13.158	17.109	23.467	32.775	40.205	44.771	47.260	48.025	49.637	50.552	53.849	56.103	56.103	56.103	56.103	56.103	56.103
Caa-C	58	9.206	19.117	19.117	27.807	41.200	49.600	68.500	79.000	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
IG	1784	0.000	0.000	0.000	0.069	0.423	0.648	1.274	1.685	1.947	1.947	2.048	2.048	2.164	3.134	4.408	4.821	5.543	5.844	5.844	5.844
SG	933	3.064	4.943	6.922	9.889	14.246	18.775	25.286	30.611	33.686	34.978	35.748	37.003	37.460	40.236	46.215	46.215	46.215	47.030	47.030	47.030
All	2717	1.033	1.650	2.271	3.185	4.623	5.944	8.030	9.628	10.548	10.832	11.069	11.319	11.497	12.750	14.767	15.100	15.681	16.047	16.047	16.047

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/96

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Aaa	112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	427	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.538	1.106	1.106	1.106	1.106	1.106
A	876	0.000	0.000	0.000	0.000	0.150	0.453	0.773	1.116	1.116	1.116	1.116	1.116	2.084	3.335	3.608	4.465	4.760	4.760	4.760
Baa	551	0.000	0.000	0.207	0.855	1.535	3.212	3.961	4.488	4.773	5.088	5.425	5.425	7.370	9.445	9.891	11.299	11.809	11.809	11.809
Ba	451	0.000	0.756	2.276	6.498	8.663	12.971	16.039	17.975	17.975	19.365	20.133	20.992	22.938	31.776	31.776	31.776	33.113	33.113	33.113
B	520	1.446	4.474	9.641	12.817	19.826	28.113	36.430	40.794	43.918	44.708	46.397	47.354	52.140	57.120	58.708	58.708	58.708	58.708	58.708
Caa-C	74	14.335	20.582	27.282	43.656	51.389	64.647	69.066	69.066	69.066	69.066	69.066	69.066	69.066	69.066	69.066	69.066	69.066	69.066	69.066
IG	1966	0.000	0.000	0.059	0.244	0.501	1.108	1.461	1.762	1.845	1.933	2.027	2.027	2.981	4.205	4.565	5.321	5.584	5.584	5.584
SG	1045	1.719	3.975	7.659	12.150	16.823	23.274	28.760	31.724	33.165	34.210	35.356	36.226	39.312	45.984	46.627	46.627	47.369	47.369	47.369
All	3011	0.588	1.331	2.504	3.931	5.374	7.493	9.119	10.028	10.398	10.674	10.967	11.123	12.395	14.443	14.831	15.443	15.764	15.764	15.764

1/1/97

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Aaa	115	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	465	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.455	0.938	0.938	0.938	0.938	0.938
A	930	0.000	0.000	0.000	0.133	0.400	0.686	1.288	1.288	1.288	1.288	1.288	2.590	3.718	3.964	4.998	5.263	5.538	5.538
Baa	653	0.000	0.167	0.860	1.407	2.768	3.592	4.029	4.266	4.792	5.075	5.075	6.443	8.620	9.014	10.249	10.693	10.693	10.693
Ba	537	0.195	1.824	6.231	9.709	12.825	16.413	18.376	18.376	19.502	20.116	20.817	22.366	29.135	29.135	29.135	30.133	30.133	30.133
B	619	2.054	6.758	11.001	17.368	28.328	35.506	39.753	42.908	43.427	46.046	47.524	53.158	60.080	61.290	61.290	61.290	63.050	63.050
Caa-C	85	15.030	24.703	38.356	49.618	66.262	69.636	69.636	69.636	69.636	69.636	69.636	69.636	69.636	69.636	69.636	69.636	69.636	69.636
IG	2163	0.000	0.051	0.262	0.484	1.008	1.379	1.770	1.842	1.995	2.076	2.076	3.021	4.208	4.530	5.317	5.552	5.672	5.672
SG	1241	2.145	5.893	10.743	16.019	23.571	28.904	31.903	33.449	34.237	35.741	36.763	39.979	46.416	46.899	46.899	47.464	48.035	48.035
All	3404	0.766	2.064	3.743	5.476	8.026	9.751	10.802	11.220	11.509	11.884	12.085	13.409	15.490	15.826	16.445	16.724	16.913	16.913

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/98

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Aaa	105	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	499	0.000	0.000	0.000	0.000	0.000	0.000	0.317	0.317	0.317	0.317	0.317	0.745	1.203	1.660	1.660	1.660	1.660
A	939	0.000	0.000	0.122	0.368	0.631	1.191	1.191	1.191	1.191	1.191	2.393	3.656	3.887	4.626	5.136	5.657	5.657
Baa	793	0.133	0.677	1.103	2.296	3.590	3.933	4.299	4.710	4.929	4.929	6.040	7.540	7.861	8.867	8.867	8.867	8.867
Ba	605	0.895	3.828	7.142	11.223	14.760	17.250	17.968	19.289	19.787	20.352	21.598	28.936	28.936	28.936	30.525	30.525	30.525
B	829	4.019	10.522	18.396	29.715	36.557	42.089	46.089	46.736	49.148	51.452	55.529	59.881	60.573	60.573	60.573	61.535	61.535
Caa-C	121	10.327	27.659	39.118	55.463	61.047	65.638	69.074	69.074	73.492	73.492	86.746	86.746	n.a.	n.a.	n.a.	n.a.	n.a.
IG	2336	0.045	0.228	0.422	0.928	1.476	1.822	2.010	2.145	2.217	2.217	3.067	4.149	4.442	5.157	5.370	5.589	5.589
SG	1555	3.298	9.233	15.613	24.501	29.962	34.165	36.759	37.646	39.272	40.676	43.468	48.819	49.139	49.139	49.910	50.307	50.307
All	3891	1.318	3.664	6.091	9.529	11.731	13.283	14.179	14.512	14.972	15.305	16.543	18.504	18.789	19.317	19.633	19.876	19.876

1/1/99

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Aaa	89	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	518	0.000	0.000	0.000	0.000	0.000	0.284	0.284	0.284	0.284	0.284	0.668	1.492	1.904	1.904	1.904	1.904
A	968	0.000	0.000	0.229	0.349	0.869	0.869	0.869	0.869	0.869	1.992	3.162	3.162	3.838	4.305	4.785	4.785
Baa	907	0.113	0.591	1.599	2.977	3.414	3.725	4.074	4.441	4.441	5.601	7.625	7.890	8.742	8.742	8.742	8.742
Ba	603	1.420	3.581	6.146	9.530	12.017	12.641	13.786	14.623	15.103	17.208	23.342	23.986	23.986	25.463	25.463	25.463
B	996	5.139	14.162	25.131	33.787	38.853	42.443	43.869	46.005	48.506	52.165	57.107	57.643	57.643	57.643	58.326	58.326
Caa-C	240	18.541	29.536	48.812	55.651	61.918	66.646	66.646	68.869	68.869	74.058	74.058	74.058	91.353	91.353	91.353	91.353
IG	2482	0.041	0.216	0.675	1.220	1.584	1.754	1.876	2.004	2.004	2.853	4.078	4.341	4.988	5.182	5.380	5.380
SG	1839	5.694	12.786	22.125	28.809	33.066	35.668	36.853	38.400	39.827	42.616	47.449	47.969	48.526	49.141	49.457	49.457
All	4321	2.413	5.404	9.395	12.293	14.041	15.022	15.465	15.991	16.371	17.659	19.708	20.018	20.608	20.884	21.097	21.097

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/00

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Aaa	99	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	513	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.813	1.220	1.220	1.220	1.220
A	1030	0.000	0.207	0.433	0.906	1.038	1.038	1.038	1.038	2.392	3.999	3.999	4.610	5.242	5.674	5.674
Baa	985	0.421	0.970	2.175	2.814	3.087	3.544	3.865	3.865	4.435	6.782	7.008	7.982	8.239	8.239	8.239
Ba	533	0.792	2.529	5.218	7.136	7.136	8.630	9.061	9.553	12.884	21.203	21.889	21.889	23.443	23.443	23.443
B	1080	6.253	17.277	26.632	32.287	35.872	37.692	41.038	43.148	46.158	52.197	52.647	52.647	52.647	53.232	53.873
Caa-C	277	19.706	42.442	52.606	59.764	66.330	67.933	69.715	69.715	73.500	78.800	78.800	92.933	92.933	92.933	92.933
IG	2627	0.158	0.446	0.983	1.408	1.561	1.727	1.843	1.843	2.600	4.077	4.316	4.985	5.335	5.515	5.515
SG	1890	6.685	16.802	24.343	28.991	31.726	33.353	35.446	36.727	39.671	46.005	46.490	47.012	47.583	47.875	48.189
All	4517	2.859	7.123	10.389	12.366	13.408	14.025	14.703	15.047	16.309	18.902	19.185	19.785	20.164	20.358	20.427

1/1/01

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Aaa	99	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	561	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.746	1.119	1.119	1.540	1.540
A	1059	0.190	0.502	0.829	0.829	0.829	0.829	0.829	2.527	3.828	4.000	4.556	4.934	5.327	5.532
Baa	959	0.217	1.613	2.232	2.633	3.080	3.393	3.393	3.764	6.235	6.235	7.168	7.665	7.665	7.665
Ba	483	1.510	3.444	5.063	5.063	6.593	7.049	7.574	10.540	18.919	19.676	19.676	21.386	21.386	21.386
B	1037	9.954	20.068	26.191	29.648	31.565	35.007	37.003	40.619	48.693	49.127	49.127	49.127	49.686	50.308
Caa-C	261	31.968	43.886	55.491	62.981	65.449	67.019	67.019	70.017	73.765	73.765	82.510	82.510	82.510	82.510
IG	2678	0.153	0.776	1.126	1.268	1.423	1.530	1.530	2.365	3.731	3.953	4.577	4.904	5.156	5.245
SG	1781	10.831	18.905	24.361	27.216	29.016	31.238	32.518	35.668	43.128	43.619	44.149	44.728	45.025	45.348
All	4459	4.355	7.818	10.011	11.061	11.713	12.397	12.726	14.070	16.786	17.058	17.632	17.995	18.244	18.376

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/02

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12	13
Aaa	109	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	557	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.704	1.056	1.056	1.459	1.459
A	1066	0.197	0.401	0.401	0.401	0.401	0.401	2.003	3.074	3.399	4.087	4.804	5.358	5.550
Baa	1045	1.120	1.551	1.662	1.920	2.059	2.059	2.547	4.702	4.702	4.910	5.569	5.569	5.569
Ba	489	1.516	3.671	4.808	6.088	7.198	7.660	9.716	16.518	17.141	17.141	18.621	18.621	18.621
B	804	4.668	10.223	12.906	15.304	18.830	20.376	25.769	36.648	38.010	39.035	39.035	39.615	40.265
Caa-C	305	29.503	43.754	52.982	55.255	59.484	62.299	64.184	70.402	70.402	76.979	76.979	76.979	76.979
IG	2777	0.495	0.734	0.776	0.870	0.921	0.921	1.744	2.935	3.206	3.633	4.159	4.469	4.551
SG	1598	8.373	14.303	17.482	19.441	22.088	23.312	26.889	35.408	36.323	37.348	37.896	38.177	38.483
All	4375	3.329	5.527	6.573	7.216	7.967	8.277	9.720	12.558	12.965	13.508	14.024	14.318	14.443

1/1/03

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11	12
Aaa	109	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	508	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.741	1.111	1.111	1.532	1.532
A	1029	0.000	0.000	0.000	0.000	0.000	1.576	2.487	2.810	3.664	4.207	4.766	4.959
Baa	1005	0.000	0.000	0.242	0.372	0.372	0.522	1.863	1.863	1.863	2.460	2.460	2.460
Ba	488	1.060	1.561	2.384	3.016	3.405	6.280	12.198	13.196	13.196	14.960	14.960	14.960
B	790	2.190	3.914	6.186	9.138	10.427	15.022	26.806	28.335	29.209	30.641	31.628	32.175
Caa-C	296	23.365	36.797	39.229	44.367	46.584	49.472	57.001	57.001	63.791	63.791	63.791	63.791
IG	2651	0.000	0.000	0.091	0.140	0.140	0.829	1.686	1.950	2.363	2.803	3.106	3.186
SG	1574	5.611	8.808	10.599	12.983	14.028	17.664	26.468	27.602	28.669	30.047	30.518	30.771
All	4225	2.050	3.149	3.785	4.527	4.821	6.272	9.185	9.667	10.233	10.891	11.229	11.349

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/04

Rating	n(0)	1	2	3	4	5	6	7	8	9	10	11
Aaa	118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	478	0.000	0.000	0.000	0.000	0.300	0.300	1.039	1.408	1.408	1.833	1.833
A	1005	0.000	0.000	0.000	0.000	1.513	1.941	2.250	3.069	3.587	4.309	4.497
Baa	1048	0.000	0.216	0.216	0.216	0.348	2.145	2.145	2.145	2.846	2.846	2.846
Ba	483	0.454	0.695	1.590	1.954	4.228	10.346	10.818	10.818	11.944	11.944	11.944
B	878	0.880	2.307	4.516	5.478	9.000	20.837	22.030	22.693	24.544	25.713	26.150
Caa-C	255	12.772	19.460	25.203	28.817	34.334	48.159	49.423	58.040	59.947	59.947	59.947
IG	2649	0.000	0.085	0.085	0.085	0.780	1.637	1.884	2.269	2.746	3.100	3.175
SG	1616	2.567	4.373	6.635	7.729	11.057	21.183	22.143	23.414	24.984	25.602	25.826
All	4265	0.943	1.625	2.355	2.688	4.124	7.592	8.033	8.646	9.398	9.816	9.927

1/1/05

Rating	n(0)	1	2	3	4	5	6	7	8	9	10
Aaa	117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	495	0.000	0.000	0.000	0.273	0.273	1.268	1.605	1.605	1.989	1.989
A	1033	0.000	0.000	0.000	1.008	1.539	1.831	2.607	3.100	3.971	4.153
Baa	1065	0.199	0.199	0.199	0.713	2.243	2.243	2.243	3.050	3.218	3.218
Ba	477	0.000	0.778	1.093	3.769	9.943	10.728	10.728	12.130	12.130	12.130
B	936	1.050	3.011	4.018	7.822	20.283	21.260	22.101	24.358	25.720	26.105
Caa-C	321	6.752	11.667	15.038	23.181	41.367	45.394	55.145	56.464	58.019	60.018
IG	2710	0.078	0.078	0.078	0.719	1.517	1.803	2.164	2.672	3.140	3.211
SG	1734	1.817	3.979	5.204	9.371	20.812	22.197	23.849	25.649	26.509	26.890
All	4444	0.739	1.510	1.921	3.678	7.845	8.472	9.198	10.061	10.632	10.784

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/06

Rating	n(0)	1	2	3	4	5	6	7	8	9
Aaa	111	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	507	0.000	0.000	0.246	0.246	1.132	1.433	1.433	1.770	1.770
A	1051	0.000	0.000	0.924	1.415	1.687	2.407	2.864	3.996	4.164
Baa	1069	0.000	0.000	0.353	1.242	1.242	1.242	1.846	2.002	2.002
Ba	511	0.219	0.219	3.028	10.768	10.768	10.768	11.902	12.303	12.724
B	1004	1.215	2.174	7.303	19.131	21.041	22.931	25.887	27.065	27.737
Caa-C	340	6.293	10.538	20.650	40.209	46.719	52.811	53.754	56.076	57.590
IG	2738	0.000	0.000	0.542	1.078	1.341	1.672	2.082	2.637	2.701
SG	1855	1.862	3.133	8.419	20.350	22.447	24.259	26.248	27.250	27.892
All	4593	0.723	1.188	3.396	7.929	8.820	9.612	10.498	11.179	11.405

1/1/07

Rating	n(0)	1	2	3	4	5	6	7	8
Aaa	117	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	528	0.000	0.220	0.220	1.020	1.292	1.292	1.601	1.601
A	1051	0.000	0.959	1.410	1.659	2.321	2.887	4.228	4.383
Baa	1046	0.000	0.331	1.400	1.400	1.400	1.965	2.111	2.111
Ba	526	0.000	1.953	8.946	9.238	9.238	10.608	10.969	11.352
B	1157	0.000	4.744	17.240	20.986	23.038	26.448	28.093	29.443
Caa-C	324	6.090	18.815	41.581	46.036	50.813	52.439	57.051	58.182
IG	2742	0.000	0.541	1.123	1.365	1.672	2.107	2.735	2.794
SG	2007	0.981	6.237	18.893	21.812	23.618	26.089	27.648	28.594
All	4749	0.402	2.800	8.129	9.397	10.223	11.331	12.244	12.569

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/08

Rating	n(0)	1	2	3	4	5	6	7
Aaa	140	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aa	582	0.724	0.724	1.383	1.840	2.084	2.604	2.876
A	966	0.547	1.244	1.498	1.899	2.633	4.038	4.202
Baa	1021	0.520	1.187	1.187	1.187	1.446	1.446	1.446
Ba	528	1.220	7.370	7.621	7.902	9.374	10.277	10.940
B	1151	2.144	13.958	17.374	19.117	22.143	23.571	25.489
Caa-C	417	15.089	39.104	45.958	50.947	53.700	56.860	58.765
IG	2709	0.547	1.049	1.275	1.511	1.917	2.507	2.620
SG	2096	4.496	17.309	20.611	22.573	25.068	26.628	28.074
All	4805	2.258	8.089	9.611	10.510	11.680	12.598	13.146

1/1/09

Rating	n(0)	1	2	3	4	5	6
Aaa	128	0.000	0.000	0.000	0.000	0.000	0.000
Aa	515	0.000	0.230	0.700	0.950	1.484	1.762
A	951	0.221	0.460	0.584	1.142	2.465	2.622
Baa	1006	0.937	0.937	1.288	1.411	1.411	1.411
Ba	504	2.325	2.803	3.072	4.754	5.636	5.965
B	961	7.529	9.361	10.338	13.244	14.152	16.244
Caa-C	523	34.770	43.791	48.919	52.739	55.999	57.742
IG	2600	0.445	0.576	0.851	1.146	1.715	1.824
SG	1988	13.320	16.679	18.555	21.338	22.836	24.234
All	4588	6.024	7.518	8.413	9.630	10.516	11.048

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/10

Rating	n(0)	1	2	3	4	5
Aaa	87	0.000	0.000	0.000	0.000	0.000
Aa	396	0.000	0.000	0.000	0.000	0.000
A	921	0.230	0.582	1.228	2.317	2.750
Baa	1077	0.000	0.201	0.307	0.639	0.639
Ba	476	0.000	0.000	1.072	2.187	2.187
B	867	0.508	1.495	3.955	5.026	7.528
Caa-C	459	11.888	18.640	25.907	31.576	35.117
IG	2481	0.085	0.303	0.584	1.126	1.282
SG	1802	3.302	5.499	8.763	10.954	12.831
All	4283	1.413	2.391	3.776	4.891	5.614

1/1/11

Rating	n(0)	1	2	3	4
Aaa	76	0.000	0.000	0.000	0.000
Aa	368	0.000	0.000	0.000	0.000
A	908	0.000	0.126	0.903	1.040
Baa	1170	0.090	0.183	0.667	0.870
Ba	540	0.198	1.681	2.357	2.617
B	1053	0.112	1.817	3.394	5.768
Caa-C	456	8.714	18.838	25.387	30.554
IG	2522	0.042	0.130	0.632	0.776
SG	2049	2.058	5.557	7.908	10.154
All	4571	0.914	2.432	3.668	4.594

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/12

Rating	n(0)	1	2	3
Aaa	71	0.000	0.000	0.000
Aa	288	0.000	0.000	0.398
A	899	0.000	0.000	0.000
Baa	1240	0.085	0.429	0.520
Ba	612	0.170	1.624	1.825
B	1138	0.485	1.741	3.904
Caa-C	516	11.871	19.651	25.459
IG	2498	0.042	0.214	0.305
SG	2266	2.995	5.787	8.140
All	4764	1.425	2.763	3.807

1/1/13

Rating	n(0)	1	2
Aaa	49	0.000	0.000
Aa	231	0.000	0.000
A	848	0.000	0.126
Baa	1432	0.073	0.147
Ba	603	0.520	0.716
B	1212	1.076	2.442
Caa-C	592	9.573	15.670
IG	2560	0.041	0.124
SG	2407	3.010	5.200
All	4967	1.446	2.476

EXHIBIT 41

Cumulative Issuer-Weighted Default Rates by Annual Cohort, 1970-2014 (Data in Percent)

1/1/14

Rating	n(0)	1
Aaa	45	0.000
Aa	230	0.000
A	848	0.121
Baa	1520	0.068
Ba	625	0.169
B	1336	0.250
Caa-C	729	7.026
IG	2643	0.078
SG	2690	2.044
All	5333	1.044

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