MOODY'S
INVESTORS SERVICE

SPECIAL COMMENT

Default and Recovery Rates for Project Finance Bank Loans, 1983–2011

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This Special Comment (the "Study") is an update to Moody's previous study published in January 2012 examining the default and recovery performance of unrated project finance bank loans. The Study is based on an updated and expanded aggregate data (the "Study Data Set") from a consortium of leading sector lenders (the "Bank Group"). The Study Data Set includes 4,067 projects which account for some 53.6% of all project finance transactions originated globally during a 28 year period from January 1, 1983 to December 31, 2011. We find that:

- The 10-year cumulative default rate for project finance bank loans is consistent with 10-year cumulative default rates for corporate issuers of low investment-grade/high speculative-grade credit quality. However, marginal default rates, the likelihood that a performing obligor at the start of year t will default in year t, are initially consistent with marginal default rates exhibited by high speculative-grade credits, but trend towards marginal default rates consistent with Single A category ratings by year 10 from financial close.
- Ultimate recovery rates for project finance bank loans average approximately 80%. However the most likely ultimate recovery rate was 100% i.e. no economic loss, which occurs almost two thirds of the time.
- Ultimate recovery rates for construction phase defaults are lower than ultimate recovery rates for operations phase defaults. More generally, average ultimate recovery rates are higher for projects that default later in the project life cycle.
- On average, ultimate recovery rates realised through work outs exceed recovery rates achieved through distressed sale exits.
- Ultimate recovery rates for project finance loans appear to be substantially uncorrelated with certain factors which are key determinants of ultimate recovery rates for general corporate debt facilities – in particular, the legal jurisdiction of the defaulted company and default rates.
- PFI/PPP[1] projects represent a discrete sub-sector within Project Finance with a lower default rate and a higher average ultimate recovery rate than the Study average.

[1] Public Private Partnerships (PPPs), including projects procured under the UK Government's Private Finance Initiative (PFIs).

1. Introduction

The Study updates and expands the scope of research that Moody's has previously published on the historical default and recovery performance of unrated project finance bank loans, most recently in January 2012. Moody's wishes to acknowledge and thank each of the banks in the Bank Group for supporting and contributing to the Study. This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. The Study Data Set now comprises 4,067 projects which account for some 53.6% of all project finance transactions originated globally during a 28 year period from January 1, 1983 to December 31, 2011. The Study Data Set is substantially representative of industry-wide project finance activity by year of origination, by industry sector and by regional concentration.

The Study uses the Basel II[2] definition of default ("BII"). [3] Based on this definition the Study Data Set includes 302 projects for which at least one senior secured project finance bank loan has defaulted. Of these 302 defaulted projects, 161 have subsequently emerged from default.[4] The Study also compares the results based on Moody's definition of default ("MDY") - based on which the Study Data Set contains 275 defaults of which 148 have subsequently emerged from default.

The Study shows that project finance is a resilient class of specialized corporate lending. In particular, the Study shows that 10 year cumulative default rates for project finance bank loans are consistent with 10 year cumulative default rates for corporate issuers of low investment grade / high speculative grade credit quality. However, the Study also shows that marginal annual default rates improve significantly over time, trending towards marginal default rates consistent with single-A category ratings by year 10 from financial close. This seasoning characteristic differentiates the behaviour of project finance bank loans from corporate bank loans.

The Study shows that ultimate recovery rates for project finance bank loans are similar to ultimate recovery rates for senior secured corporate bank loans, despite features such as high gearing and long tenor that are typical for project finance loans, but generally associated with higher risk corporate loans.

While most project finance borrowers are highly leveraged, thinly-capitalized special purpose vehicles with limited financial flexibility, project finance loans are structured to be both highly robust to a wide range of potentially severe risks, and also to minimize any post-default economic loss. The findings of the Study suggest that the risk allocation, structural features, underwriting disciplines and incentive structures which characterize the project finance asset class have proved effective. The results described in the Study are consistent with the results of our previous study of published in January 2012, although the results of studies based on different data sets will necessarily be different.

We were delighted with the extensive feedback we have received in response to our previous research. Moody's would be pleased to hear from other banks and financial institutions that may be interested in participating in this ongoing research initiative. We look forward to expanding the data consortium and publishing further research based on an expanded and updated data set. In doing so, we will focus our research on topics that are of most relevance to data providers, and we will likely continue to differentiate between detailed results made available to the Bank Group, and summary information made available more generally.

While the Study reports on the historical performance of non-rated project finance bank loans, we highlight the recent publication of Special Comment "Infrastructure Default and Recovery Rates, 1983-2012H1", our first report on the historical performance of Moody's-rated long-term infrstructure debts (see Appendix E).

[2] "International Convergence of Capital Measurement and Capital Standards: A Revised Framework (Comprehensive Version: June 2006)" published by the Basel Committee on Banking Supervision at http://www.bis.org/publ/bcbs128.htm (the "**Basel II Framework**", or "**Basel II**")

[3] We reproduce the Basel II definition of default at Appendix B (Glossary)

[4] Emergence criteria are described more fully in Section 4.3 (Recovery Analysis).

2. Summary

We highlight and discuss below our key findings based on the Study Data Set:

» The Study Data Set is 15% larger than that considered in our previous study published in January 2012, containing 534 additional projects and 24 more (BII) defaults than our previous study. The results of the Study and the previous study are consistent.

» As part of the Study, we derived historical default rates for projects finance bank loans originated between 1990 and 2011, and compared these against historical default rates derived from corporate bond and loan issuers rated by Moody's.

- The 10 year cumulative default rate for project finance bank loans is consistent with 10 year cumulative default rates for corporate issuers of low investment grade / high speculative grade credit quality (see Exhibit 12).
- Marginal annual default rates for project finance bank loans are consistent with high speculative grade credit quality during an initial three year period following financial close, but fall significantly thereafter trending towards marginal default rates consistent with single-A category ratings by year 10 from financial close (see Exhibit 12.2). This characteristic of project finance bank loans is significantly different from the marginal annual default rates we have observed for corporate issuers, which are broadly stable for investment grade rating categories.
- In our view, the initial three year period of elevated marginal default rates is strongly linked to construction-phase risk, while the improvement in marginal default rates is associated with the maturity of project operations following the completion of initial construction works.

» Ultimate recovery rates for project finance bank loans averaged 80.3% (BII) and 78.6% (MDY), however, the most likely ultimate recovery rate was 100% (BII) and (MDY) (see Exhibit 24).

- Average ultimate recovery rates are broadly consistent across geographical regions. Similarly, average ultimate recovery rates are also broadly consistent for projects located in Organization for Economic Co-operation and Development ("OECD") and non-OECD countries (see Exhibit 29).
- Average ultimate recovery rates differ between industries. Average ultimate recovery rates by industry are disclosed within broad ranges in Exhibit 30 - more detailed information has been withheld at the request of the Bank Group.

» Ultimate recovery rates for construction phase defaults averaged 65.1% (BII) and 63.7% (MDY), somewhat lower than ultimate recovery rates for operations phase defaults which averaged 83.2% (BII) and 81.9% (MDY) (see Exhibit 31). More generally, the data suggests that average ultimate recovery rates are higher for projects that default later in the project life cycle (see Exhibit 32).

» Average ultimate recovery rates realized through a work-out process of 80.3% (BII) and 78.6% (MDY) substantially exceed average recovery rates achieved through distressed sale exits 48.3% (BII) and 45.5% (MDY) (see Exhibit 24).

» Average ultimate recovery rates for project finance bank loans emerging from default during the period 1999-2009 were in the range of 75.0% to 100.0% (BII) and in the range of 72.1% to 100.0% (MDY), but were substantially independent both of economic cycle at default and economic cycle at emergence throughout this period. Calendar years 2011, 2010 and calendar years prior to 1999 are excluded from this observation due to small sample sizes (see Exhibit 26).

» The Study Data Set contains 954 projects identified as PFI/PPP. For the PFI/PPP sector:

- The 10 year cumulative default rate (BII) is 3.9% (see Appendix H). This is lower than the 10 year cumulative default rate (BII) for the Infrastructure sector of 5.2%, and substantially lower than the 10 year cumulative default rate (BII) for the Study of 9.3%.
- Marginal annual default rates (BII) are broadly stable, and are consistent with marginal annual default rates for corporate issuers in the Baa ratings category (see Exhibit H7).
- The average ultimate recovery rate is 83.9% (BII) and 80.3% (MDY), somewhat better than the average ultimate recovery rates of 80.3% (BII) and 78.6% (MDY) for the Study Data Set as a whole.
- These results provide some evidence to support the view held by many market participants that PFI/PPP is a discrete sub-sector lying at the low-risk end of the project finance spectrum. We note, however, that these results should be interpreted with caution, since (i) there is some subjectivity in the classification of projects as PFI/PPP; and (ii) the number of defaults is relatively small.

» As part of the Study, we compared the recovery behavior of project finance bank loans to the recovery behavior of a data set comprising corporate bank loans (predominantly senior secured debt facilities) derived from Moody's Ultimate LGD Database.[5] The Study shows that ultimate recovery rates for project finance bank loans are broadly similar to ultimate recovery rates for senior secured corporate bank loans.[6] However, ultimate recovery rates for project finance loans appear to be substantially uncorrelated with certain factors which are key determinants of ultimate recovery rates for general corporate debt facilities – in particular, the legal jurisdiction of the defaulted company and default rates (see Appendix D).

3. Overview of the Project Finance industry

Project finance can be an efficient way to fund capital intensive and strategically important industries where underlying business risk is relatively stable and predictable. Project finance is often used to fund the development of energy, natural resource and social infrastructure assets, and the provision of associated public services.

Although the scope of what constitutes infrastructure is subjective, it is generally agreed that it refers to strategically important, capital intensive assets, utilities, services and primary industries, fulfilling major economic and social needs. The infrastructure sector[7] is characterized by inelastic demand for outputs or services, potentially underpinned by natural monopoly assets, which support predictable and resilient long-term revenues.

Infrastructure investment is vital to support economic activity and growth, but it is also expensive and is not without risk. According to a report published by the OECD, the average total annual infrastructure investment in road, rail, telecoms, electricity transmission & distribution, and water is likely to account for about 2.5% per annum of world GDP[8] through to 2030.[9] If electricity

[5] Moody's proprietary database which contains information on over 4,700 defaulted loans and bonds taken from 1,000+ non-financial U.S. corporations that initially defaulted between 1987 and 2012. The Corporate Bank Loan Data Set is described in Appendix D.

[6] As described in Appendix D, average ultimate recovery rates for defaulted senior secured corporate bank loans are substantially higher than average firm-wide ultimate recovery rates for defaulted companies.

[7] In this context we refer to the broad range of infrastructure assets, utilities, services and primary industries, which fulfill major economic and social needs. In our analysis of industry sectors within the Study, we apply the term "Infrastructure" to refer more specifically to social and transportation infrastructure assets and services procured using project finance.

[8] According to the World Bank, world GDP for 2011 stood at $69,982 billion (see World Development Indicators database, World Bank, December 2012)

[9] OECD (2006), "Infrastructure to 2030: Telecom, Land Transport, Water and Electricity", p29

generation and other energy-related infrastructure investments in oil, gas and coal are included, this proportion rises to around 3.5% per annum of world GDP. More recently, in its report "Strategic Transport Infrastructure Needs to 2030," published in March 2012, the OECD concluded that global infrastructure investment needs for airports, ports, rail, and oil and gas (transport and distribution) alone could amount to over USD 11 trillion (in constant USD 2008) over the period 2009-30.

Exhibit 1 shows the population of all project finance transactions originated from January 1, 1983 – December 31, 2011, based on industry data provided by Thomson Reuters Project Finance International (the "Industry Data Set").

EXHIBIT 1

Profile Of The Industry Data Set By Origination Year

Year of Financial Close	Debt Raised (US$ Billions)	Number of Projects
1983	3.7	28
1984	2.2	23
1985	1.3	10
1986	2.5	11
1987	11.0	16
1988	1.1	8
1989	.6	5
1990	8.6	23
1991	8.5	31
1992	15.4	70
1993	26.2	118
1994	29.0	118
1995	23.3	156
1996	42.8	192
1997	67.4	281
1998	56.7	239
1999	72.4	239
2000	110.9	450
2001	108.5	314
2002	62.2	298
2003	69.6	323
2004	117.8	471
2005	136.3	512
2006	183.8	552
2007	228.3	644
2008	251.2	714
2009	140.2	475
2010	213.9	620
2011	221.1	641
Industry Total	**$2,216.5**	**7,582**

Note: For consistency with the Study Data Set, the Industry Data Set from Thomson Reuters references projects reaching financial close in the period January 1, 1983 – December 31, 2011.

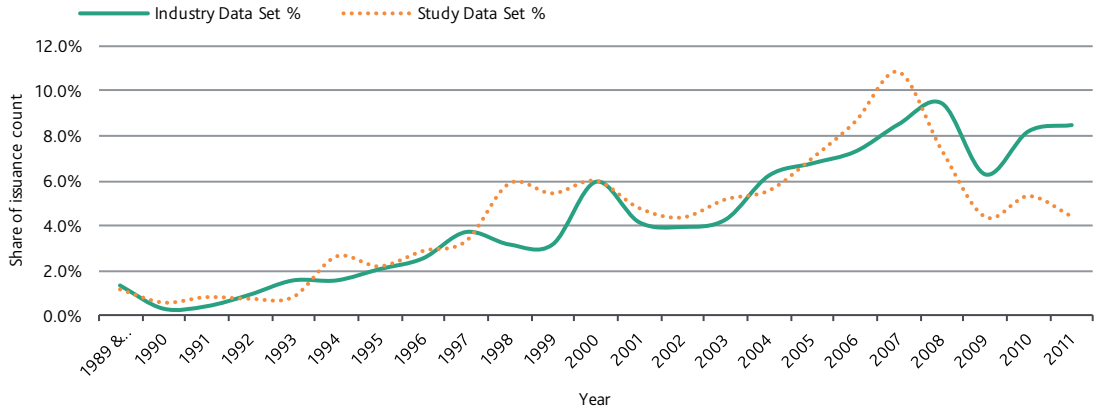
The Study Data Set accounts for approximately 53.6% of the larger Thomson Reuters Industry Data Set from 1983 through 2011. Correlations between the two data sets are very high – correlation by year of origination is in excess of 80%, and correlations by industry sector and by region are each in excess of 88%. We conclude therefore that the Study Data Set is a statistically robust data set which is substantially representative of industry-wide project finance activity by year of origination, by industry sector and by regional concentration.

Differences in concentrations by year, region and industry are the result of the different client relationships, loan origination strategy, geographic focus and industry focus of each bank in the Bank Group, as well potential differences in the classification of individual projects by year of origination, by industry and by region. For example, banks providing information for the same project may not always be consistent in their classification of industry and region. Moreover, banks that bought loan participations after financial close may have reported different origination dates from the date on which financial close occurred. Where possible, Moody's has verified and corrected inconsistencies between data submitted by multiple banks for the same project. However, we may not have been able to confirm all data submitted by a single bank.

Exhibit 2 compares the Study Data Set and the Thomson Reuters Industry Data Set by year of project origination.

EXHIBIT 2

Comparison Of Study Data Set And Industry Data Set By Year Of Project Origination



The correlation between the two data sets by year of origination is over 80%. As discussed further in Sections 5.1 and 5.2 below, similar high degrees of correlation also exist between the regional concentrations and the industry concentrations of the two data sets.

3.1 Characteristics of Project Finance

Project finance refers to the financing of long-term infrastructure, industrial or public services using limited recourse long-term debt raised by an enterprise operating in a focused line of business in accordance with contractual agreements. Principal and interest payments are made solely from cash flows generated by the enterprise. Projects are usually undertaken by special purpose vehicles ("SPVs") that can only engage in the business of the project – the scope and duration of which is defined in the contractual arrangements entered into by the SPV. Projects are usually structured with recourse to the SPV's assets,[10] and with only limited recourse to the project sponsors' other assets which are therefore outside the scope of collateral available to secured debt providers in the event of the failure of the project.

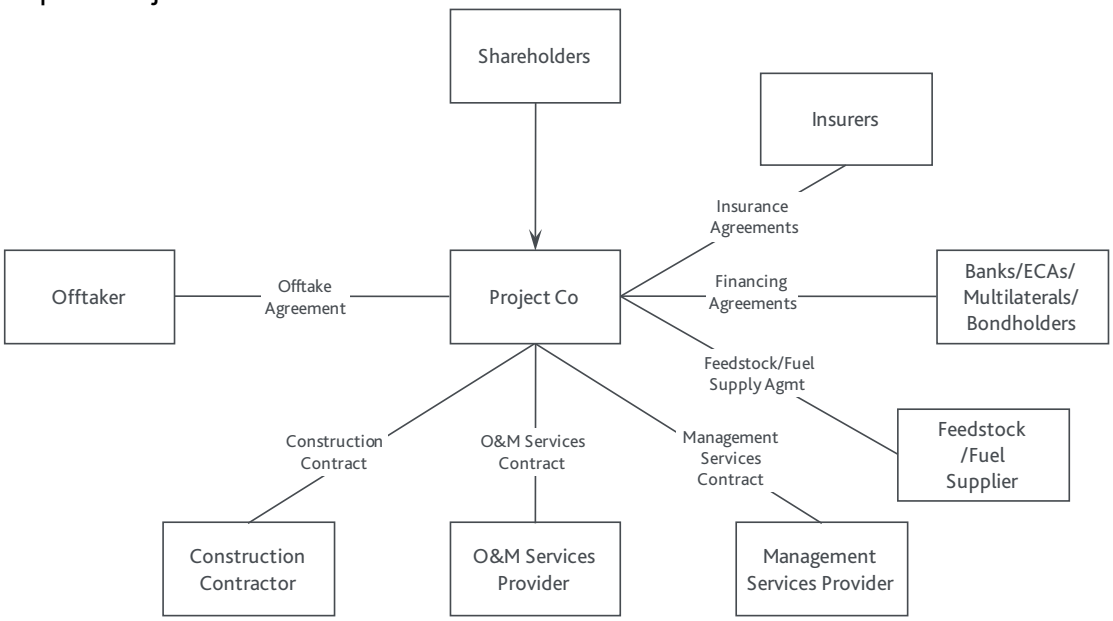
Although project financing arrangements differ from project to project, some common features are usually present. For example, projects are usually financed with long-term debt (often greater than 20 years) and high leverage (debt/equity ratios often greater than 80:20). At the same time, however, project finance senior debt facilities are typically structured to be robust to potentially severe risks, including significant macroeconomic and performance stresses.

[10] Including economic rights in relation to the contracts entered into by the SPV.

The Study Data Set comprises project finance bank loans which fall within the Basel II definition of Project Finance. For reference, we reproduce the Basel II definition of Project Finance at Appendix B (Glossary).

Exhibit 3 shows a simplified project structure. The contracts between the project company ("Project Co") and parties such as the off-taker,[11] construction contractor, feedstock supplier, fuel supplier and other parties are structured to mitigate the risks retained by the project company itself.

EXHIBIT 3
Simplified Project Structure



We comment further in Appendix C (Overview of Project Finance Characteristics) on the typical features found in project finance transactions which mitigate default risk and loss given default.

4. Data and Methodology

4.1 Study Data Set

The Study Data Set comprises 4,067 distinct projects originated during the period January 1, 1983 through December 31, 2011.

4.2 Default Analysis

The calculation of default rates is dependent on the definition of default adopted. At the request of the Bank Group, the Study analyzes the historical behavior of project finance bank loans using the Basel II definition of default. For reference, we have also included comparable results based on Moody's definition of default. We reproduce the Basel II definition of default as well as Moody's definition of default in Appendix B (Glossary).

In broad terms, the Basel II definition of default not only captures the events which are included in Moody's definition of default, but also captures a wider range of defaults, reflecting subjective assessments made by the reporting bank. For example, under the Basel II definition, defaulted credits would also include debt obligations where (i) the bank puts the credit obligation on non-accrued

[11] The recipient of the end product of the project.

status, or (ii) the bank makes a charge-off or account-specific provision resulting from a significant perceived decline in credit quality subsequent to the bank taking on the exposure.

Terminology: In certain instances we use suffix notation to clarify whether results are presented based on the Basel II definition of default (BII) or Moody's definition of default (MDY).

While the default of a single project finance debt facility necessarily occurs at the instrument level, we present default rate analysis in this Study on the basis of the number of projects for which at least one senior secured project finance bank loan has defaulted.[12] References in the Study to a "project default" should be construed accordingly.

The Basel II default date was used under the Basel II definition of default, whereas the actual payment default date was used under the Moody's definition of default. In some cases the Basel II default date was the same as the payment default date or bankruptcy date.

Based on the Basel II definition of default, the Study Data Set contains 302 distinct projects that defaulted (each a "Default" or "Default (BII)"), comprising:

» 107 Defaults still in the work-out process (each a "Default In Work-Out" or "Default In Work-Out (BII)").

» 34 Defaults for which recoveries have been realized following a distressed sale of the relevant defaulted loan participation (each a "Distressed Sale" or "Distressed Sale (BII)").

» 161 Defaults for which recoveries have been realized following emergence from default[13] (each an "Ultimate Recovery" or "Ultimate Recovery (BII)").

The default rates in the Study are calculated based on the entire population of 302 Defaults, whereas the calculation of ultimate recovery rates are based on the population of 161 Ultimate Recoveries.

The 107 Defaults In Work-Out are not included in the recovery analysis in the Study. However, as defaulted credits are resolved either through distressed sale exits or through emergence from default, we anticipate that additional information will be made available to Moody's for inclusion in an expanded and updated data set.

Based on the Moody's definition of default, the Study Data Set contains 275 distinct projects that defaulted (each a "Default (MDY)"), comprising:

» 95 Defaults (MDY) still in the work-out process (each a "Default In Work-Out (MDY)").

» 32 Defaults (MDY) for which recoveries have been realized following a distressed sale of the relevant defaulted loan participation (each a "Distressed Sale (MDY)").

» 148 Defaults (MDY) for which recoveries have been realized following emergence from default (each an "Ultimate Recovery (MDY)").

The 95 Defaults In Work-Out (MDY) are not included in the recovery analysis in the Study.

[12] This avoids the potential distortion arising from the calculation of facility-weighted defaults rates, where the number of facilities per project is arbitrary. Furthermore, while a default would necessarily occur at the instrument level, under typical project finance intercreditor arrangements it is likely that the instrument level default (if unremedied or not waived) would lead to the cross-default of the other pari passu senior secured project finance debt facilities raised by that project borrower.

[13] Emergence criteria are described more fully in Section 4.3 (Recovery Analysis).

4.3 Recovery Analysis

The calculation of recovery rates is dependent on the definition of emergence from default adopted. The Study uses the definition of emergence from default set out below.

For the reasons set out at Section 4.3.1 below, recovery analysis is based on the assumption that all pari passu senior secured debt facilities for a single project would share the same average recovery rate. However, in validating this assumption we have evaluated recoveries on a facility level.

Emergence From Default:

For a loan which has defaulted, emergence from default is deemed to occur following any of the events set out below:

» Repayment of overdue interest

» Restructuring with no subsequent default

» Restructuring with the lending bank being taken out of the deal – for example, by repayment of the defaulted loan with no participation in a restructured debt facility

» Material restructuring

» Liquidation

Ultimate recovery values are determined for each loan which has emerged from default based on the emergence criteria listed above, calculated as at the last date on which cash was paid prior to default. Cash flows arising post default such as interest payments, principal repayments, other cash payments or receipts[14] or asset-value recoveries, but excluding recoveries under any guaranty arrangements, are discounted to the last date on which cash was paid prior to default at the pre-petition interest rate implicit in the loan at the time of its default. In some instances, for example for a loan which has emerged from default following the repayment of overdue interest, it is possible for a separate default to occur subsequent to emergence from the initial default. In such instances of serial default, only a single default is deemed to have occurred for which the ultimate recovery value is determined with reference to the initial default. The ultimate recovery rates for a loan which has emerged from default is determined by dividing the ultimate recovery value by the principal outstanding at the date of default.

The definition of emergence from default set out above specifically excludes exits which individual banks may have executed via the distressed sale of relevant loan participations. Although distressed sales are a common exit route for lenders seeking early resolution of defaulted credits, the timing and value of such exits may differ significantly between lenders exiting from the same defaulted loan, and do not necessarily predict the loan's ultimate recovery value. The recovery value for a Distressed Sale (i.e. a distressed sale exit) is determined in a similar manner to that described above, including the disposal proceeds within post default cash flows. The recovery rate for a Distressed Sale is determined by dividing the recovery value by the principal outstanding at the date of default.

4.3.1 Facility Level Recovery Analysis

Recovery analysis for the Study is based on the assumption that all senior secured project finance debt facilities for a single defaulted project would share the same ultimate recovery rate – and the Study Data Set has been conformed accordingly (see Section 4.4 below). However, Basel II requires that

[14] For example, other cash payments would include legal fees; other cash receipts would include default interest.

recovery analysis is undertaken for each defaulted facility.[15] We have therefore undertaken a facility level recovery analysis as part of the Study.

Exhibit 4 shows that for the Study Data Set, there is minimal difference between (i) the average ultimate recovery rate calculated on a project level basis, and (ii) the average ultimate recovery rate calculated on a facility level basis.

Exhibit 4 also shows that for the Study Data Set, there is minimal difference between (i) the average recovery rate for distressed sales calculated on a project level basis, and (ii) the average recovery rate for distressed sales calculated on a facility level basis.

In the Study, therefore, we do not distinguish between project level and facility level ultimate recoveries nor project level and facility level distressed sales, other than in this Section 4.3.1.

The number of defaults of ECA-backed or ECA-insured facilities is de minimis, and is not statistically significant.

EXHIBIT 4

Comparison of Average Recovery Rates – Project Level vs. Facility Level Ultimate Recoveries and Distressed Sales

	Basel II Definition of Default				Moody's Definition of Default			
	Ultimate Recoveries		Distressed Sales		Ultimate Recoveries		Distressed Sales	
	Project Level Recovery Analysis	Facility Level Recovery Analysis	Project Level Recovery Analysis	Facility Level Recovery Analysis	Project Level Recovery Analysis	Facility Level Recovery Analysis	Project Level Recovery Analysis	Facility Level Recovery Analysis
Number of Recoveries	161	288	34	46	148	273	32	42
Average Recovery Rate	80.3%	80.3%	48.3%	50.9%	78.6%	79.2%	45.5%	46.9%

4.4 Data Cleansing

Each bank provided standardized information for each defaulted project loan, including key dates such as origination date, maturity date, default date, date of emergence (if appropriate) or date of exit via distressed sale (if appropriate). Further standardized information included the project's host country, industry sector, tranche name, seniority, collateral, origination amount and post-default cash flows.

Banks also provided a detailed narrative to accompany their data submission for each project – including a description of the project, details of the default and its cause, and an explanation of the recovery process and outcome. This narrative was used to validate the data and as a basis to reconfirm the recovery values.

Project-specific data from each bank were cross-checked based on the project's name, industry, region and key dates. Where inconsistencies were identified, banks were asked to reconfirm their data to

[15] See para 431 of the Basel II Framework (http://www.bis.org/publ/bcbs128.htm):

"431. Banks using the advanced IRB approach must also collect and store a complete history of data on the LGD and EAD estimates associated with each facility and the key data used to derive the estimate and the person/model responsible. Banks must also collect data on the estimated and realized LGDs and EADs associated with each defaulted facility. Banks that reflect the credit risk mitigating effects of guarantees/credit derivatives through LGD must retain data on the LGD of the facility before and after evaluation of the effects of the guarantee/credit derivative. Information about the components of loss or recovery for each defaulted exposure must be retained, such as amounts recovered, source of recovery (e.g. collateral, liquidation proceeds and guarantees), time period required for recovery, and administrative costs."

ensure its accuracy and consistency. Where available, external sources of information were also used to validate project data.

Where a single defaulted project was reported both as a Distressed Sale and as an Ultimate Recovery by different banks, we categorized the Default as an Ultimate Recovery.

Where multiple banks participated in the same defaulted loan, the relevant banks reported very similar ultimate recoveries. The differences were mostly due to the timing of the emergence process or the recovery methodology[16] reported by each bank. In the small percentage of instances where different banks reported different recovery values for the same project, we reviewed the project's narrative description to ensure that the timing and recovery methodology were correct, and reconfirmed the relevant data submitted by each bank. When working with historical data, specific details may not always be available and differences in data provided may be the result of different interpretations between banks, such as when one bank reports an ultimate recovery and another bank reports the charge-off amount. We will continue to consult with the Bank Group and establish further refinements in data capture which will support more granular analysis.

4.4.1 Excluded data

Loan details were reviewed to ensure that each debt facility met the Basel II definition of Project Finance. Loans which did not meet this definition were excluded from the Study Data Set. We reproduce the Basel II definition of Project Finance at Appendix B (Glossary).

Project loan defaults were reviewed to ensure that each loan default met the Basel II definition of default. Reported loan defaults which did not meet the Basel II definition of default were excluded.

Banks were not requested to provide recovery information for Defaults In Work-Out – although such projects are excluded from the recovery analysis they are counted as Defaults in the default analysis.

In a small number of instances where a recovery rate for an Ultimate Recovery or Distressed Sale (as applicable) could not be determined due to insufficient information, that project was excluded from the recovery analysis. However, if such omissions can be addressed, we would anticipate including this data in a future study based on an expanded and updated data set.

Defaults of subordinated debt facilities were excluded from the recovery analysis.

We applied an analogous approach in relation to our review of each Default (MDY), Default in Work-Out (MDY), Distressed Sale (MDY) and Ultimate Recovery (MDY).

4.5 Caveat – Limitations of small sample sizes

In the Study, Moody's has investigated a number of different aspects of historical project finance default and recovery rates – for example, by segmenting our analysis of default and recovery rates by industry and by region. Necessarily, such segmented analysis is likely to lead to small sample sizes which lack the statistical robustness of larger sample sizes.

As noted previously, further expansion of the Study Data Set would provide greater statistical confidence to the results and observations presented, and would support more detailed granular analysis. We will continue with our efforts to expand the Bank Group, and we look forward to publishing further research based on an expanded and updated data set . In the meantime, we would highlight that:

[16] For example, distressed restructuring, or restructuring without a loss (either extended maturity and or change in amortization). In certain instances, not all banks agreed that the maturity was extended or the amortization schedule changed.

» Results based on small sample sizes should be treated with caution, and

» The inclusion of additional data will lead to different results in a future study, and it is possible that such differences may be material.

5. Distribution of Projects

5.1 Distribution of Projects By Region

Exhibit 5 shows the regional distribution of all the projects in the Study Data Set, and compares this with the corresponding distribution of projects in the Industry Data Set.

The Study Data Set accounts for approximately 53.6% of the larger Industry Data Set from 1983 through 2011. The regional concentrations of the Study Data Set are very similar to those of the Industry Data Set – the correlation between the regional concentrations of the two data sets is 88.7%. There are modest differences between the two data sets in their respective concentrations in South East Asia, North America and Western Europe. It is likely that these differences are the result of the different client relationships, loan origination strategy and geographic focus of each bank in the Bank Group, as well as the potential classification differences discussed in Section 3.

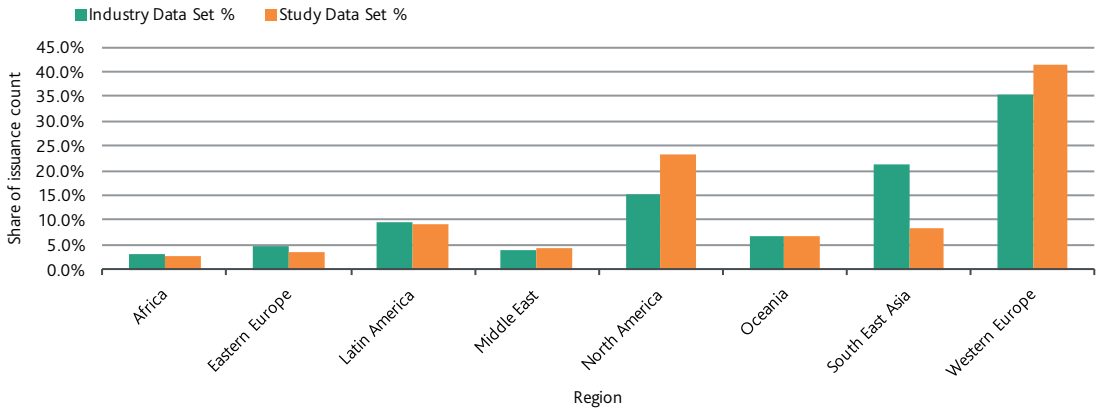
EXHIBIT 5

Comparison of Study Data Set and Industry Data Set by Region

Region	Industry Data Set	Industry Data Set %	Study Data Set	Study Data Set %
Africa	251	3.3%	119	2.9%
Eastern Europe	352	4.6%	143	3.5%
Latin America	740	9.8%	374	9.2%
Middle East	303	4.0%	180	4.4%
North America	1148	15.1%	946	23.3%
Oceania	500	6.6%	281	6.9%
South East Asia	1614	21.3%	344	8.5%
Western Europe	2674	35.3%	1680	41.3%
Total	**7582**	**100.0%**	**4067**	**100.0%**

EXHIBIT 6

Chart of Data Presented in Exhibit 5



5.2 Distribution of Projects By Industry

Exhibit 7 shows the industry sector distribution of all the projects in the Study Data Set, and compares this with the corresponding distribution of projects in the Industry Data Set. In our analysis of industry sectors within the Study, we apply the term "Infrastructure" to refer specifically to the sub-sector comprising social and transportation infrastructure assets and services.

As noted previously, the Study Data Set accounts for approximately 53.6% of the larger Industry Data Set from 1983 through 2011. The industry concentrations of the Study Data Set are very similar to those of the Industry Data Set – the correlation between the industry concentrations of the two data sets is 99.0%. There are modest differences between the two data sets in their respective concentrations in Infrastructure and Power. It is likely that these differences are the result of the different client relationships, loan origination strategy and industrial focus of each bank in the Bank Group, as well as the potential classification differences discussed in Section 3.

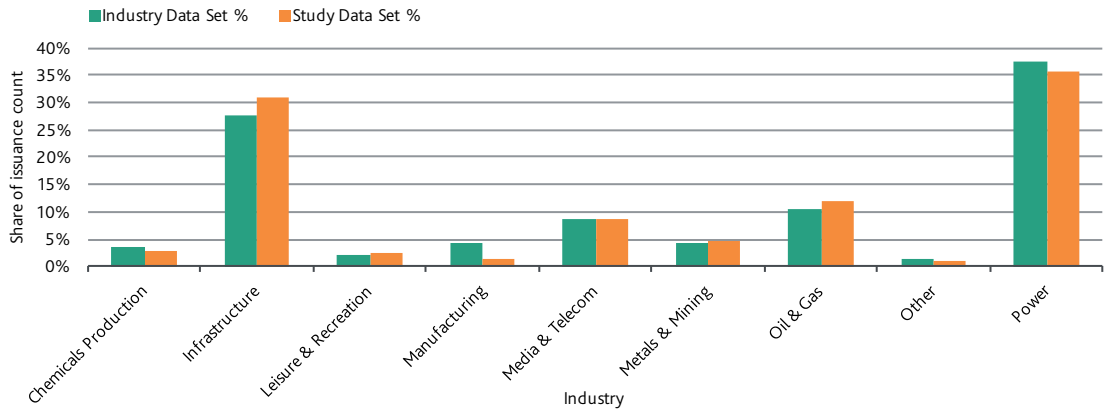
EXHIBIT 7

Comparison of Study Data Set and Industry Data Set by Industry

Industry	Industry Data Set	Industry Data Set %	Study Data Set	Study Data Set %
Chemicals Production	280	3.7%	119	2.9%
Infrastructure	2100	27.7%	1260	31.0%
Leisure & Recreation	160	2.1%	102	2.5%
Manufacturing	338	4.5%	53	1.3%
Media & Telecom	655	8.6%	354	8.7%
Metals & Mining	321	4.2%	195	4.8%
Oil & Gas	785	10.4%	486	11.9%
Other	93	1.2%	43	1.1%
Power	2850	37.6%	1455	35.8%
Total	**7582**	**100.0%**	**4067**	**100.0%**

EXHIBIT 8

Chart of Data Presented In Exhibit 7



6. Distribution of Defaults

6.1 Distribution of Defaults By Region

Exhibit 9 shows the regional distribution of the 302 Defaults (BII) in the Study Data Set. The three most significant regions are North America, Western Europe and Latin America, accounting for 75.8% of total Defaults (BII).

EXHIBIT 9

Distribution of Defaults by Region

	Basel II Definition of Default		Moody's Definition of Default	
Region	Defaults (BII)	Regional Concentration %	Defaults (MDY)	Regional Concentration %
Africa	1	0.3%	1	0.4%
Eastern Europe	7	2.3%	7	2.5%
Latin America	51	16.9%	51	18.5%
Middle East	2	0.7%	2	0.7%
North America	103	34.1%	92	33.5%
Oceania	18	6.0%	18	6.5%
South East Asia	45	14.9%	43	15.6%
Western Europe	75	24.8%	61	22.2%
Total	**302**	**100.0%**	**275**	**100.0%**

6.2 Distribution of Defaults By Industry

Exhibit 10 shows the industry sector distribution of the 302 Defaults (BII) in the Study Data Set. The three most significant industry sectors are Infrastructure, Media & Telecom and Power, accounting for 68.2% of total Defaults (BII).

EXHIBIT 10

Distribution of Defaults by Industry

	Basel II Definition of Default		Moody's Definition of Default	
Industry	Defaults (BII)	Industry Sector Concentration %	Defaults (MDY)	Industry Sector Concentration %
Chemicals Production	12	4.0%	12	4.4%
Infrastructure	49	16.2%	40	14.5%
Leisure & Recreation	9	3.0%	9	3.3%
Manufacturing	9	3.0%	9	3.3%
Media & Telecom	43	14.2%	40	14.5%
Metals & Mining	24	7.9%	23	8.4%
Oil & Gas	38	12.6%	36	13.1%
Other	4	1.3%	4	1.5%
Power	114	37.7%	102	37.1%
Total	**302**	**100.0%**	**275**	**100.0%**

7. Default Rate Analysis

7.1 Cohort Analysis: 1990 – 2011

Cumulative default rates are derived from marginal default rates based on static pools cohorts which follow the default behavior of the projects in each cohort, in annual intervals since financial close.

Cohort Analysis – Methodology

The cumulative default rate calculation methodology used by Moody's is a discrete-time approximation of the non-parametric continuous-time hazard rate approach. A static pool cohort is formed based on the number of active projects on January 1 of each year, and the default/survival status of the members of the cohort was tracked from 1990-2011.

The time horizon T for which we wish to measure a cumulative default rate is divided into years. Hence, the data is discrete in that the time to default is not measured continuously. In Exhibit 11, each cohort has N(0) active projects on January 1 of the initial cohort year with time intervals of t years thereafter labeled as years 1, 2, 3 etc.

Based on an annual time interval, the marginal default rate (hazard rate) is the probability that a project that has survived in the cohort up to the beginning of year t will default by the end of that year t. The marginal default rate is calculated as the ratio of defaults (in year t) to the number of surviving projects at the beginning of year t. Projects that have been repaid during year t are excluded from the count of survivors in subsequent time intervals.

The calculation of the average cumulative default rates was derived from the weighted average marginal default rates from all the available cohort marginal default rates (1990-2011) – i.e. marginal default rates are weighted by the relevant number of active projects at the start of year t for that cohort.

7.1.1 Cumulative Default Rates

Exhibit 11 tabulates cumulative default rates (BII) by origination year cohorts for the period 1990-2011. For comparison purposes, we have included certain cumulative default rate data taken from Moody's published research on default and recovery rates for corporate bond and loan issuers rated in the Baa and Ba rating categories.[17]

It is apparent that the 10 year cumulative default rate (BII) for the Study Data Set is consistent with 10 year cumulative default rates for corporate issuers of low investment grade / high speculative grade credit quality.

Exhibit 11A tabulates cumulative default rates (MDY) by origination year cohorts for the period 1990-2011.

EXHIBIT 11

Cumulative Default Rates by Origination Year Cohorts for the Period 1990 – 2011 (Basel II Definition of Default)

	N(0) (Note 1)	1	2	3	4	5	6	7	8	9	10
1990	46	2.17%	2.17%	15.22%	15.22%	17.54%	27.24%	30.04%	30.04%	30.04%	30.04%
1991	67	0.00%	8.96%	8.96%	12.09%	18.67%	22.32%	24.39%	24.39%	27.00%	27.00%
1992	99	7.07%	8.10%	11.27%	15.68%	18.08%	19.41%	19.41%	21.16%	21.16%	21.16%
1993	121	0.84%	3.40%	6.95%	9.82%	10.87%	10.87%	13.55%	13.55%	13.55%	13.55%
1994	149	2.71%	5.51%	8.51%	10.14%	10.14%	13.17%	13.17%	15.75%	15.75%	15.75%
1995	249	2.09%	4.87%	6.98%	9.98%	13.38%	13.38%	16.02%	18.96%	18.96%	18.96%
1996	312	2.37%	5.41%	9.26%	12.11%	13.17%	15.60%	17.65%	17.65%	17.65%	17.65%
1997	388	2.42%	7.13%	10.64%	12.06%	15.31%	20.37%	20.89%	20.89%	20.89%	20.89%
1998	479	3.70%	7.22%	8.75%	11.62%	17.79%	18.89%	19.32%	19.32%	19.32%	19.32%
1999	661	2.38%	3.79%	6.58%	12.22%	14.25%	14.85%	15.22%	15.22%	15.22%	15.22%
2000	808	1.44%	4.42%	11.16%	13.63%	14.52%	15.59%	15.59%	15.59%	15.59%	15.59%
2001	942	2.60%	10.54%	13.71%	14.54%	15.74%	15.74%	15.74%	15.74%	16.09%	16.09%
2002	992	7.59%	11.57%	12.79%	13.91%	14.11%	14.11%	14.11%	14.67%	14.67%	15.01%
2003	1003	3.68%	4.87%	5.86%	6.19%	6.19%	6.41%	6.89%	6.89%	7.18%	
2004	1071	1.29%	2.21%	2.61%	2.91%	3.08%	3.65%	3.86%	4.09%		
2005	1155	0.84%	1.27%	1.51%	1.77%	2.36%	2.52%	2.70%			
2006	1265	0.42%	0.61%	0.92%	1.37%	1.62%	1.75%				
2007	1461	0.22%	0.69%	1.63%	2.37%	2.87%					
2008	1761	0.47%	2.00%	2.97%	3.63%						
2009	1906	1.46%	2.51%	3.20%							
2010	1933	0.96%	1.65%								
2011	1993	0.62%									
Cumulative Default Rate (BII) 1990-2011		**1.67%**	**3.51%**	**5.09%**	**6.36%**	**7.46%**	**8.26%**	**8.72%**	**9.05%**	**9.21%**	**9.28%**
Moody's Baa (Note 2)		0.20%	0.55%	0.96%	1.43%	1.95%	2.48%	2.97%	3.45%	3.94%	4.53%
Moody's Ba (Note 2)		1.15%	3.29%	5.92%	8.66%	10.96%	13.08%	14.97%	16.78%	18.53%	20.25%

Notes:

(1) N(0) represents the number of active projects as at January 1.

(2) Comparative cumulative default rate data reproduced from Moody's Special Comment, "Corporate Default and Recovery Rates,1920-2011," (February 2012) – see Exhibit 34 (Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1983-2011)

[17] See Moody's Special Comment: "Corporate Default and Recovery Rates, 1920-2011," February 2012

EXHIBIT 11A

Cumulative Default Rates by Origination Year Cohorts for the Period 1990 – 2011 (Moody's Definition of Default)

	N(0) (Note 1)	1	2	3	4	5	6	7	8	9	10
1990	46	2.17%	2.17%	15.22%	15.22%	17.54%	27.24%	30.04%	30.04%	30.04%	30.04%
1991	67	0.00%	8.96%	8.96%	12.09%	18.67%	22.32%	24.39%	24.39%	24.39%	24.39%
1992	99	7.07%	8.10%	11.27%	15.68%	18.08%	19.41%	19.41%	19.41%	19.41%	19.41%
1993	121	0.84%	3.40%	6.95%	9.82%	10.87%	10.87%	12.21%	12.21%	12.21%	12.21%
1994	149	2.71%	5.51%	8.51%	10.14%	10.14%	11.15%	11.15%	13.71%	13.71%	13.71%
1995	248	1.68%	4.47%	6.59%	9.00%	11.05%	11.05%	13.67%	16.60%	16.60%	16.60%
1996	313	2.70%	5.35%	8.76%	10.65%	11.70%	14.12%	16.15%	16.15%	16.15%	16.15%
1997	388	2.15%	5.98%	8.85%	10.26%	13.49%	18.54%	19.06%	19.06%	19.06%	19.06%
1998	480	3.04%	6.08%	7.61%	10.47%	16.61%	17.34%	17.34%	17.34%	17.34%	17.34%
1999	665	2.05%	3.45%	6.02%	11.61%	13.39%	13.68%	14.05%	14.05%	14.05%	14.05%
2000	812	1.17%	3.99%	10.69%	12.58%	13.25%	13.79%	13.79%	13.79%	13.79%	13.79%
2001	949	2.59%	10.34%	13.06%	13.72%	14.32%	14.32%	14.32%	14.32%	14.67%	14.67%
2002	997	7.34%	10.96%	12.04%	12.52%	12.71%	12.71%	12.71%	13.28%	13.28%	13.63%
2003	1011	3.55%	4.61%	5.04%	5.37%	5.37%	5.58%	6.07%	6.07%	6.36%	
2004	1079	1.08%	1.54%	1.94%	2.25%	2.42%	2.99%	3.20%	3.43%		
2005	1162	0.37%	0.80%	1.04%	1.17%	1.62%	1.78%	1.95%			
2006	1271	0.42%	0.60%	0.81%	1.15%	1.27%	1.41%				
2007	1467	0.14%	0.54%	1.30%	1.86%	2.35%					
2008	1765	0.35%	1.56%	2.39%	3.05%						
2009	1913	1.24%	2.17%	2.85%							
2010	1944	0.85%	1.54%								
2011	2005	0.62%									
Cumulative Default Rate (MDY) 1990-2011		**1.52%**	**2.99%**	**4.42%**	**5.53%**	**6.48%**	**7.17%**	**7.57%**	**7.87%**	**7.97%**	**8.04%**
Moody's Baa (Note 2)		0.20%	0.55%	0.96%	1.43%	1.95%	2.48%	2.97%	3.45%	3.94%	4.53%
Moody's Ba (Note 2)		1.15%	3.29%	5.92%	8.66%	10.96%	13.08%	14.97%	16.78%	18.53%	20.25%

Notes:

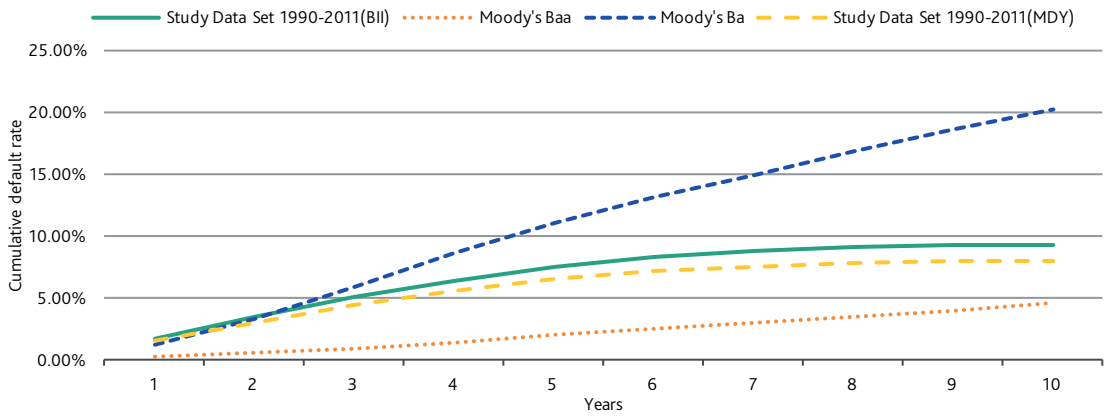
(1) N(0) represents the number of active projects as at January 1.

(2) Comparative cumulative default rate data reproduced from Moody's Special Comment, "Corporate Default and Recovery Rates 1920-2011," (February 2012) – see Exhibit 34 (Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1983-2011)

Exhibit 12 charts the data presented in Exhibits 11 and 11A:

EXHIBIT 12

Chart of Data Presented in Exhibits 11 and 11A



7.1.2 Marginal Annual Default Rates

Exhibit 12.1 tabulates marginal annual default rates for the Study Data Set based on origination year cohorts for the period 1990-2011. For comparison purposes, we have included marginal annual default rate data derived from Moody's published research on default and recovery rates for corporate bond and loan issuers rated in the single-A, Baa and Ba rating categories.[18]

» It is apparent that marginal annual default rates for project finance bank loans average 1.7% per annum during an initial three year period following financial close, but fall significantly thereafter trending towards marginal default rates consistent with single-A category ratings by year 10 from financial close.

» This characteristic of project finance bank loans is significantly different from the marginal annual default rates we have observed for corporate issuers, which are broadly stable.

» In our view, the initial three year period of elevated marginal default rates is strongly linked to construction-phase risk, while the improvement in marginal default rates is associated with the maturity of project operations.

[18] See Moody's Special Comment: "Corporate Default and Recovery Rates, 1920-2011," February 2012

EXHIBIT 12.1

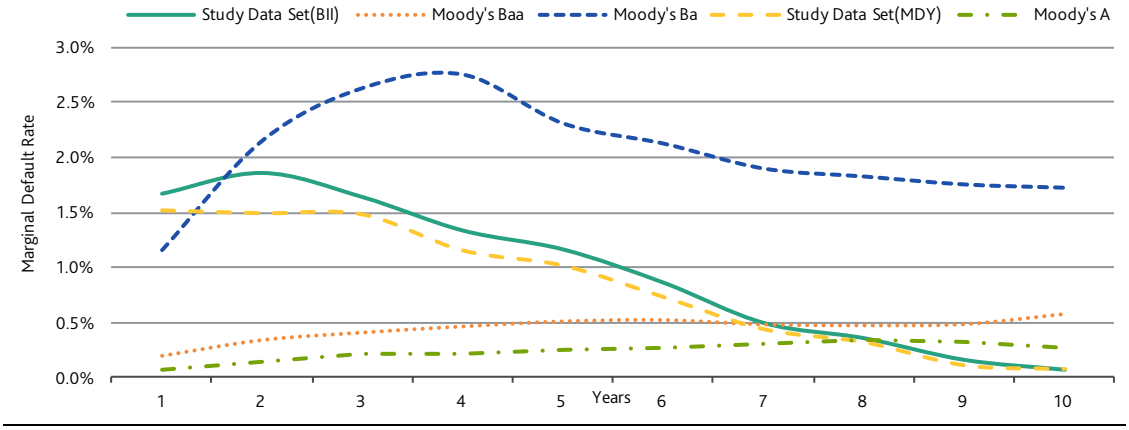
Marginal Annual Default Rates

	Marginal Annual Default Rate %				
Year	Study Data Set1990-2011(BII)	Study Data Set 1990-2011 (MDY)	Moody's A	Moody's Baa	Moody's Ba
1	1.67%	1.52%	0.07%	0.20%	1.15%
2	1.86%	1.49%	0.15%	0.35%	2.14%
3	1.64%	1.48%	0.22%	0.42%	2.62%
4	1.34%	1.15%	0.22%	0.47%	2.74%
5	1.17%	1.02%	0.25%	0.52%	2.30%
6	0.87%	0.73%	0.27%	0.53%	2.12%
7	0.50%	0.44%	0.30%	0.49%	1.89%
8	0.36%	0.32%	0.34%	0.48%	1.82%
9	0.17%	0.11%	0.32%	0.49%	1.75%
10	0.08%	0.08%	0.27%	0.59%	1.72%

Exhibit 12.2 charts the data presented in Exhibits 12.1:

EXHIBIT 12.2

Chart of Data Presented in Exhibit 12.1



7.2 Average Default Rates by Region

Exhibit 13 shows simple average default rates by region.

Caveat: The simple average default rates included in Exhibit 13 should be interpreted with caution, since (i) they do not reflect the risk profile of individual projects, which is likely to change based on time from origination; and (ii) they do not reflect the time-weighted population of active projects exposed to default.

EXHIBIT 13

Average Default Rates by Region

		Basel II Definition of Default		Moody's Definition of Default	
Region	Projects (Note 1)	Defaults (Note 2)	Average Default Rate %	Defaults (Note 3)	Average Default Rate %
Africa	119	1	0.8%	1	0.8%
Eastern Europe	143	7	4.9%	7	4.9%
Latin America	374	51	13.6%	51	13.6%
Middle East	180	2	1.1%	2	1.1%
North America	946	103	10.9%	92	9.7%
Oceania	281	18	6.4%	18	6.4%
South East Asia	344	45	13.1%	43	12.5%
Western Europe	1680	75	4.5%	61	3.6%
Total	**4067**	**302**	**N/A**	**275**	**N/A**
Average	**N/A**	**N/A**	**7.4%**	**N/A**	**6.8%**

Notes:

(1) Based on 4,067 projects
(2) Based on 302 Defaults (BII)
(3) Based on 275 Defaults (MDY)

It is apparent that simple average default rates calculated for the Study Data Set vary significantly by region – for example default rates for the Middle East, Africa and European regions are substantially lower than default rates for Latin America, North America and South East Asia.

Exhibits 14 and 14 A tabulate cumulative default rates for the period 1990-2011, broken down by region. Due to the small size of the regional subsets, differences between regional and average cumulative default rates for the Study Data Set may be due to statistical variations.

Caveat: The cumulative default rates included in Exhibit 14 should be interpreted with caution, since in certain instances sample sizes are small and do not support statistically robust conclusions.

EXHIBIT 14

Cumulative Default Rates by Region for the Period 1990 – 2011 (Basel II Definition of Default)

	1	2	3	4	5	6	7	8	9	10
Africa	0.20%	0.46%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%
Eastern Europe	1.01%	2.25%	3.15%	4.30%	5.06%	5.06%	5.06%	5.06%	5.06%	5.06%
Latin America	3.37%	6.96%	10.13%	12.74%	14.62%	15.53%	15.84%	16.31%	16.31%	16.31%
Middle East	0.23%	0.51%	0.69%	0.69%	0.69%	0.69%	0.69%	0.69%	0.69%	0.69%
North America	2.67%	5.68%	8.23%	10.08%	11.92%	13.40%	14.38%	14.78%	15.11%	15.32%
Oceania	1.81%	3.78%	5.74%	7.48%	9.30%	10.89%	10.89%	10.89%	10.89%	10.89%
South East Asia	2.61%	5.38%	7.73%	9.52%	11.27%	12.31%	13.22%	14.15%	14.15%	14.15%
Western Europe	0.95%	1.97%	2.85%	3.62%	4.14%	4.61%	4.81%	4.99%	5.12%	5.12%
Cumulative Default	**1.67%**	**3.51%**	**5.09%**	**6.36%**	**7.46%**	**8.26%**	**8.72%**	**9.05%**	**9.21%**	**9.28%**
Moody's Baa (Note 1)	0.20%	0.55%	0.96%	1.43%	1.95%	2.48%	2.97%	3.45%	3.94%	4.53%
Moody's Ba (Note 1)	1.15%	3.29%	5.92%	8.66%	10.96%	13.08%	14.97%	16.78%	18.53%	20.25%

Notes:

(1) Comparative cumulative default rate data reproduced from Moody's Special Comment, "Corporate Default and Recovery Rates 1920-2011," (February 2012) – see Exhibit 34 (Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1983-2011)

EXHIBIT 14A

Cumulative Default Rates by Region for the Period 1990 – 2011 (Moody's Definition of Default)

	1	2	3	4	5	6	7	8	9	10
Africa	0.20%	0.46%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%
Eastern Europe	1.01%	2.25%	3.15%	4.30%	5.06%	5.06%	5.06%	5.06%	5.06%	5.06%
Latin America	3.37%	6.96%	10.13%	12.76%	14.63%	15.54%	15.86%	16.33%	16.33%	16.33%
Middle East	0.23%	0.52%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%
North America	2.38%	5.02%	7.14%	8.57%	10.08%	11.21%	12.09%	12.36%	12.53%	12.73%
Oceania	1.81%	3.78%	5.74%	7.48%	9.30%	10.89%	10.89%	10.89%	10.89%	10.89%
South East Asia	2.48%	5.09%	7.43%	9.21%	10.95%	11.99%	12.90%	13.83%	13.83%	13.83%
Western Europe	0.77%	1.61%	2.35%	2.94%	3.31%	3.69%	3.82%	4.00%	4.13%	4.13%
Cumulative Default Rate (MDY) 1990-2011	**1.52%**	**2.99%**	**4.42%**	**5.53%**	**6.48%**	**7.17%**	**7.57%**	**7.87%**	**7.97%**	**8.04%**
Moody's Baa (Note 1)	0.20%	0.55%	0.96%	1.43%	1.95%	2.48%	2.97%	3.45%	3.94%	4.53%
Moody's Ba (Note 1)	1.15%	3.29%	5.92%	8.66%	10.96%	13.08%	14.97%	16.78%	18.53%	20.25%

Notes:

(1) Comparative cumulative default rate data reproduced from Moody's Special Comment, "Corporate Default and Recovery Rates 1920-2011," (February 2012) – see Exhibit 34 (Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1983-2011)

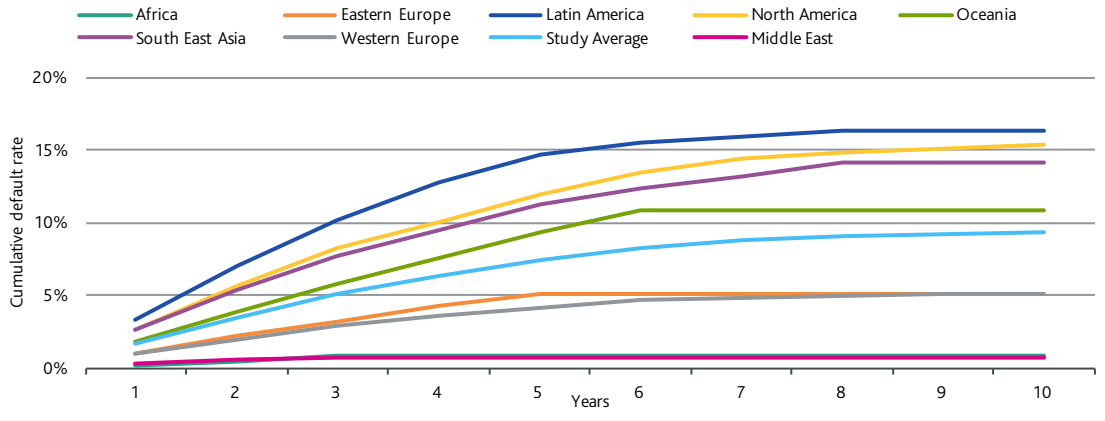
Exhibit 15 charts the data presented in Exhibit 14 i.e. cumulative default rates (BII) for each region.

Latin America has very little history in years 1991-97 with a substantial number of defaults relative to the number of originated and active projects, and the cumulative default rates for the region reflect this distortion. We observe that the average time to default for projects in Latin America was 4.8 years (BII) prior to 1999 and 3.7 years (BII) from 1999 to 2010. This has significance because projects that default later in the life of the project have a greater impact on cumulative default rates than projects that default earlier in the project life.

Default history in Africa and the Middle East has been exceptionally low, with only three defaults in the Study Data Set. For the Middle East region, against a background of regional geopolitical tensions exemplified by the Iran-Iraq war 1980-88, the Gulf War 1990-91, the invasion of Iraq in 2003, the wave of Arab Spring uprisings commencing 2011 and the ongoing Israeli/Palestinian conflict, this outcome is highly notable.

EXHIBIT 15

Chart of Data Presented in Exhibit 14 (Basel II Definition of Default)



7.2.1 Average Default Rate by OECD/Non-OECD Countries

Exhibit 16 shows simple average default rates by OECD/non-OECD countries. Exhibit 16 has been prepared on the basis of the 34 OECD member countries as at December 31, 2011 – the list of OECD members is included in Appendix B (Glossary)

Caveat: The simple average default rates included in Exhibit 16 should be interpreted with caution, since (i) they do not reflect the risk profile of individual projects, which is likely to change based on time from origination; and (ii) they do not reflect the time-weighted population of active projects exposed to default.

EXHIBIT 16

Average Default Rates by OECD/Non-OECD Countries

		Basel II Definition of Default		Moody's Definition of Default	
Region	Projects (Note 1)	Defaults (Note 2)	Average Default Rate %	Defaults (Note 3)	Average Default Rate %
OECD	3073	206	6.7%	181	5.9%
Non-OECD	994	96	9.7%	94	9.5%
Total	**4067**	**302**	**N/A**	**275**	**N/A**
Average	**N/A**	**N/A**	**7.4%**	**N/A**	**6.8%**

Notes:

(1) Based on 4,067 projects
(2) Based on 302 defaults (BII)
(3) Based on 275 defaults (MDY)

Exhibits 16.1 tabulates cumulative default rates (BII) for the period 1990-2011, broken down by OECD/non-OECD countries.

EXHIBIT 16.1

Cumulative Default Rates by Region for the Period 1990 – 2011 (Basel II Definition of Default)

	1	2	3	4	5	6	7	8	9	10
OECD	1.49%	3.13%	4.56%	5.70%	6.66%	7.45%	7.88%	8.11%	8.31%	8.39%
Non-OECD	2.26%	4.72%	6.82%	8.50%	10.00%	10.85%	11.43%	12.10%	12.10%	12.10%
Cumulative Default Rate (BII) 1990-2011	**1.67%**	**3.51%**	**5.09%**	**6.36%**	**7.46%**	**8.26%**	**8.72%**	**9.05%**	**9.21%**	**9.28%**
Moody's Baa (Note 1)	0.20%	0.55%	0.96%	1.43%	1.95%	2.48%	2.97%	3.45%	3.94%	4.53%
Moody's Ba (Note 1)	1.15%	3.29%	5.92%	8.66%	10.96%	13.08%	14.97%	16.78%	18.53%	20.25%

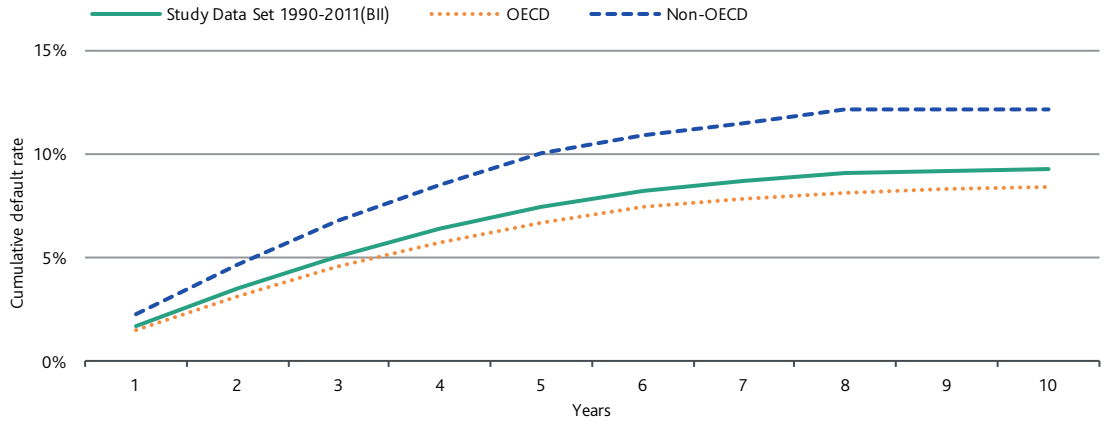
Notes:

(1) Comparative cumulative default rate data reproduced from Moody's Special Comment, "Corporate Default and Recovery Rates 1920-2011," (February 2012) – see Exhibit 34 (Average Cumulative Issuer-Weighted Global Default Rates by Letter Rating, 1983-2011)

Exhibit 16.2 charts the data presented in Exhibits 16.1:

EXHIBIT 16.2

Chart of Data Presented in Exhibit 16.1



7.3 Average Default Rate by Industry

Exhibit 17 shows simple average default rates by industry.

Caveat: The simple average default rates included in Exhibit 17 should be interpreted with caution, since (i) they do not reflect the risk profile of individual projects, which is likely to change based on time from origination; and (ii) they do not reflect the time-weighted population of active projects exposed to default.

EXHIBIT 17

Average Default Rates by Industry

		Basel II Definition of Default		Moody's Definition of Default	
Industry	Projects (Note 1)	Defaults (Note 2)	Average Default Rate %	Defaults (Note 3)	Average Default Rate %
Chemicals Production	119	12	10.1%	12	10.1%
Infrastructure	1260	49	3.9%	40	3.2%
Leisure & Recreation	102	9	8.8%	9	8.8%
Manufacturing	53	9	17.0%	9	17.0%
Media & Telecom	354	43	12.1%	40	11.3%
Metals & Mining	195	24	12.3%	23	11.8%
Oil & Gas	486	38	7.8%	36	7.4%
Other	43	4	9.3%	4	9.3%
Power	1455	114	7.8%	102	7.0%
Total	**4067**	**302**	**N/A**	**275**	**N/A**
Average	**N/A**	**N/A**	**7.4%**	**N/A**	**6.8%**

Notes:

(1) Based on 4,067 projects
(2) Based on 302 Defaults (BII)
(3) Based on 275 Defaults (MDY)

It is apparent that simple average default rates calculated for the Study Data Set vary significantly by industry – for example simple average default rates for Infrastructure are substantially lower than simple average default rates for Media & Telecom and Metals & Mining.

7.3.1 PFI/PPPs

Moody's anticipates that there is likely to be widespread market interest in the default and recovery performance of PFI/PPP projects. Indeed, many lenders view PFI/PPP as a discrete sub-sector lying at the low-risk end of the project finance spectrum.

The Study Data Set contains 954 projects identified as PFI/PPP by the Bank Group, many of which fall within the Infrastructure industry sector. We note, however, that there is some subjectivity in the classification of projects as PFI/PPP. The Study Data Set contains 25 Defaults (BII) and 20 Defaults (MDY) of PFI/PPP projects, corresponding to simple average default rates of 2.6%(BII) and 2.1% (MDY).

We note that the simple average default rates of 2.6% (BII) and 2.1% (MDY) for PFI/PPP are below the corresponding simple average default rates of 3.9% (BII) and 3.2% (MDY) for Infrastructure, and are substantially below the simple average default rates of 7.4% (BII) and 6.8% (MDY) for the whole Study Data Set.

These results are also consistent with the view held by many PFI/PPP proponents that default risk for such projects is low, especially where project revenues are based on availability-based payment mechanisms as opposed to being exposed to market risk. We comment further on our analysis of the PFI/PPP sector in Appendix H (Default and Recovery Analysis for PFI/PPP projects).

7.3.2 Power

The Power sector comprises 1,455 projects with 114 Defaults (BII) and 102 Defaults (MDY) in aggregate, corresponding to simple average default rates of 7.8% (BII) and 7.0% (MDY) respectively. However, we highlight a marked difference in default rates for US Power and Non-US Power.

Exhibit 17.1 shows simple average default rates by split by US Power and Non-US Power:

EXHIBIT 17.1

Average Default Rates within the Power Industry – US/Non US

		Basel II Definition of Default		Moody's Definition of Default	
Power	Projects (Note 1)	Defaults (Note 2)	Average Default Rate %	Defaults (Note 3)	Average Default Rate %
US Power	486	55	11.3%	48	9.9%
Non-US Power	969	59	6.1%	54	5.6%
Total Power	**1455**	**114**	**7.8%**	**102**	**7.0%**
Total Projects	**4067**	**302**	**7.4%**	**275**	**6.8%**
Concentration of Power	**35.8%**	**37.7%**	**N/A**	**37.1%**	**N/A**

(1) Based on 4,067 projects

(2) Based on 302 Defaults (BII), of which 114 are Power Defaults

(3) Based on 275 Defaults (MDY) of which 102 are Power Defaults

» The US Power sector comprises 486 projects with 55 Defaults (BII) and 48 Defaults (MDY), corresponding to simple average default rates of 11.3% (BII) and 9.9% (MDY), substantially higher than the simple average default rates of 7.4% (BII) and 6.8% (MDY) for the whole Study Data Set.

» The Non-US Power sector comprises 969 projects with 59 Defaults (BII) and 54 Defaults (MDY), corresponding to simple average default rates of 6.1% (BII) and 5.6% (MDY), substantially lower than US Power.

We comment further on this finding in Section 7.4 (Incidence of Defaults).

Exhibit 18 tabulates cumulative default rates (BII) for the period 1990-2011, broken down by industry sector. Exhibit 18A tabulates cumulative default rates (MDY) for the period 1990-2011, broken down by industry sector.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of Exhibits 18 and 18A has been withheld at the request of the Bank Group.

Caveat: The chart of cumulative default rates shown in Exhibit 19 should be interpreted with caution, since in certain instances sample sizes are small and do not support statistically robust conclusions.

Exhibit 19 shows cumulative default rates (BII) for each industry sector.

EXHIBIT 19

Chart of Cumulative Default Rates by Industry for the Period 1990-2011

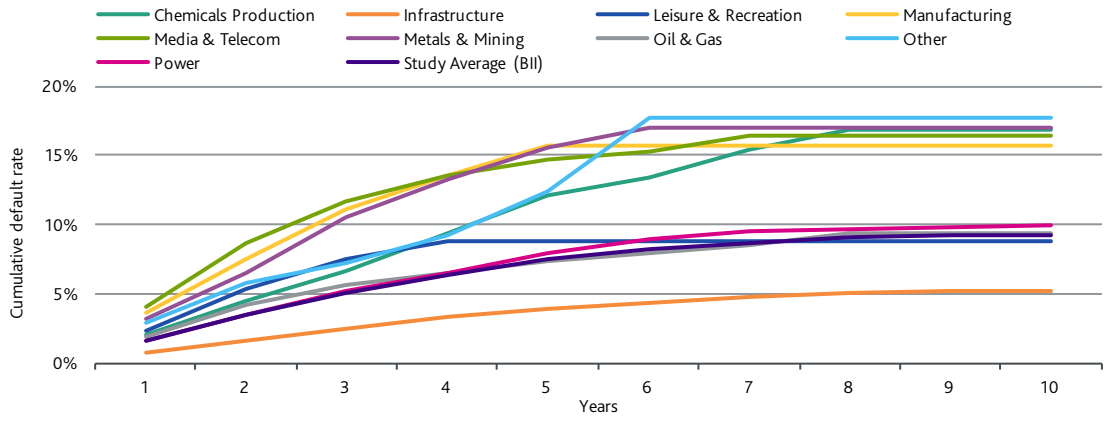


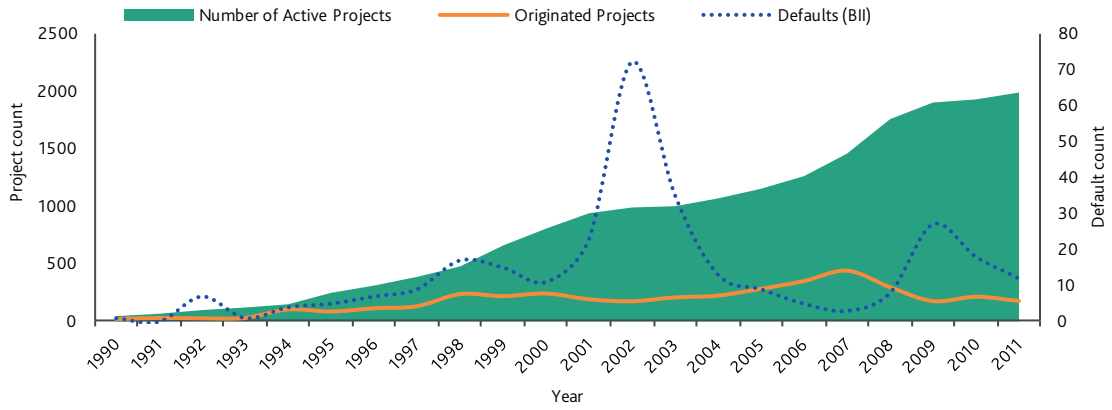
Exhibit 19 shows cumulative default rates (BII) for each industry sector. Most of the industry subsets flatten out after 5-6 years except for Chemicals Production and Media & Telecom. Chemicals Production flattens out after year 8. The default rate for Chemicals Production is distorted due to the low number of project defaults (there was 1 default before 1996 and an average of 1.5 defaults per year after 1996). Media & Telecom flattens out after year 7. Most of the Media & Telecom defaults occurred within the first four years; however, one project defaulted after 7 years. We anticipate that additional data will improve the statistical robustness of a future analysis based on an updated and expanded data set.

7.4 Incidence of Defaults (Basel II Definition of Default)

Exhibit 20 shows the incidence of project loans originated, active loans as at January 1 in the relevant year, and the incidence of Defaults.

EXHIBIT 20

Incidence of projects originated, active and defaulted by year



Supporting data for Exhibit 20 is set out in Exhibit 21.

The incidence of Defaults spiked sharply in 2002 and 2003. This may be partially explained by the stress affecting the Power and Media & Telecom sectors during the period 2001 through 2004 – we comment further in sections 7.4.1 and 7.4.2.

More recently, the incidence of Defaults rose noticeably during 2009 and 2010. This may be partially explained by stress affecting the Oil & Gas, Infrastructure and Power sectors during the period 2008 through 2011 – we comment further in section 7.4.3.

EXHIBIT 21

Supporting Data for Exhibit 20

		Basel II Definition of Default		Moody's Definition of Default	
Year of Origination	Originated Projects	Number of Active Projects	Defaults	Number of Active Projects	Defaults
1989 and prior	46				
1990	22	46	1	46	1
1991	32	67	0	67	0
1992	29	99	7	99	7
1993	32	121	1	121	1
1994	106	149	4	149	4
1995	88	249	5	248	4
1996	116	312	7	313	8
1997	134	388	9	388	8
1998	239	479	17	480	14
1999	221	661	15	665	13
2000	244	808	11	812	9
2001	194	942	23	949	23
2002	177	992	72	997	70
2003	210	1003	35	1011	34
2004	226	1071	13	1079	11
2005	285	1155	9	1162	4
2006	352	1265	5	1271	5
2007	442	1461	3	1467	2
2008	299	1761	8	1765	6

EXHIBIT 21

Supporting Data for Exhibit 20

		Basel II Definition of Default		Moody's Definition of Default	
Year of Origination	Originated Projects	Number of Active Projects	Defaults	Number of Active Projects	Defaults
2009	178	1906	27	1913	23
2010	216	1933	18	1944	16
2011	179	1993	12	2005	12
Total	**4067**	**N/A**	**302**	**N/A**	**275**

Notes:

(1) The number of active projects is stated as at January 1 of the relevant year

7.4.1 Incidence of Defaults within certain industry sectors (Basel II Definition of Default).

Exhibit 22 shows the incidence of Defaults for the following industry sectors: (i) Power, (ii) Media & Telecom, and (iii) Other; and illustrates their respective contributions to aggregate Defaults.

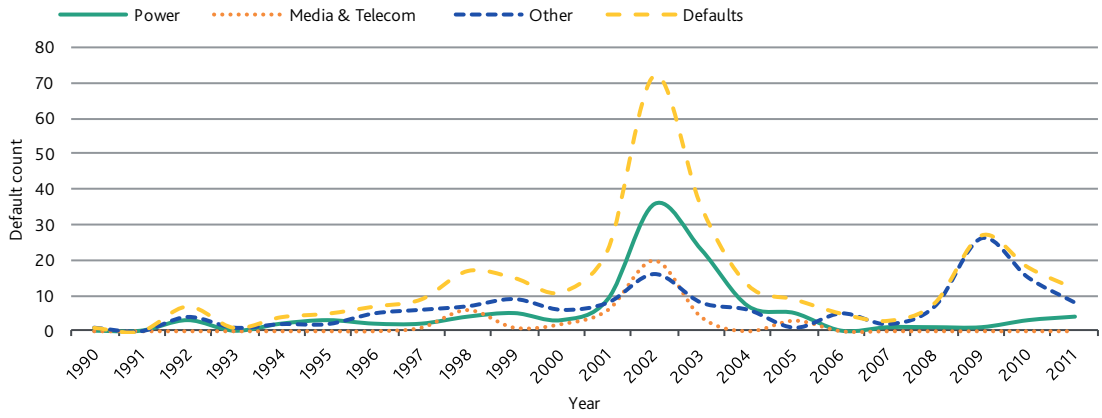
It is apparent from Exhibit 22 that the spike in Defaults in 2002/3 was substantially due to stress affect the Power and Media & Telecom sectors.

Supporting data for Exhibit 22 is tabulated in Exhibit 23

However, Exhibit 22 also shows an increased incidence of Defaults in the period 2008-2011. As discussed in section 7.4.3 below it is apparent that Defaults occurring in the 2008-2011 period are concentrated in the Oil & Gas, Infrastructure and Power sectors.

EXHIBIT 22

Incidence of Defaults within certain industry sectors



7.4.2 Incidence of Defaults 2001-2004 (Basel II Definition of Default)

Exhibit 23 shows that of the 114 Defaults in the Power sector, 75 occurred between 2001 and 2004 representing 24.8% of all 302 Defaults in the Study Data Set. Exhibit 23 also shows that of the 43 Defaults in the Media and Telecom sector, 30 occurred between 2001 and 2003 representing 9.9% of all 302 Defaults in the Study Data Set.

In relation to the stress affecting the Power sector during the period 2001 through 2004, we observe:

» As noted in Exhibit 17.1, the Power sector comprises 1,455 projects and 114 Defaults, corresponding to a simple average default rate of 7.8%.

» The analysis at Exhibit 17.1 shows that simple average default rates for US Power have been markedly higher than for non-US Power over the period of the Study:

- The US Power sector comprises 486 projects, and 55 Defaults, corresponding to a simple average default rate of 11.3%, substantially higher than the simple average default rate of 7.4% for the whole Study Data Set.

- The Non-US Power sector comprises 969 projects and 59 Defaults, corresponding to a simple average default rate of 6.1%, lower than the simple average default rate of 7.4% for the whole Study Data Set.

» However, further analysis of the incidence of Defaults in the US Power and non-US Power sectors show that the concentration of Defaults during the period 2001 through 2004 is very high, particularly for non-US Power:

- The 55 Defaults in the US Power Sector represent 18.2% of all 302 Defaults in the Study Data Set. Out of these 55 Defaults, 33 occurred between 2001 and 2004, representing 10.9% of all 302 Defaults in the Study Data Set, and 60.0% of all Defaults in the US Power sector.

- The 59 Defaults in the Non-US Power Sector represent 19.5% of all 302 Defaults in the Study Data Set. Out of these 59 Defaults, 42 occurred between 2001 and 2004, representing 13.9% of all 302 Defaults in the Study Data Set, and 71.2% of all Defaults in the non-US Power sector.

Exhibit 23 tabulates supporting data for Exhibit 22.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of Exhibit 23 has been withheld at the request of the Bank Group.

7.4.3 Incidence of Defaults 2008-2011 (Basel II Definition of Default)

Exhibit 23.1 shows the breakdown of Defaults during the period 2008-2011, split by (i) Oil & Gas, (ii) Infrastructure, (iii) Power and (iv) Other.

In relation to the stress affecting the Oil & Gas sector during the period 2008-2011 we observe:

» The Study Data Set contains 38 Defaults in the Oil & Gas sector, representing 12.6% of all 302 Defaults in the Study Data Set.

» Out of these 38 Defaults, 21 occurred during the period 2008-2011, representing 55.3% of all Defaults in the Oil & Gas sector.

In relation to the stress affecting the Infrastructure sector during the period 2009-2011 we observe:

» The Study Data Set contains 49 Defaults in the Infrastructure sector, representing 16.2% of all 302 Defaults in the Study Data Set.

» Out of these 49 Defaults 25 occurred during the period 2009-2011, representing 51.0% of all Defaults in the Infrastructure sector.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of Exhibit 23.1 has been withheld at the request of the Bank Group.

8. Recovery Analysis

8.1 Distribution of Ultimate Recovery Rates

Exhibit 24 tabulates the distribution of recovery rates for Ultimate Recoveries and Distressed Sales in the Study Data Set:

» The average ultimate recovery rate for Ultimate Recoveries of 80.3% (BII) and 78.6% (MDY), exceeds the average recovery rate for Distressed Sales of 48.3% (BII) and 45.5% (MDY). There are many reasons why an individual lender may choose to exit from a defaulted loan exposure via a distressed sale rather than participate in a work out – see Section 8.8 (Cash-out or Work-out) for further comment.

» 65.2% (BII) and 62.8% (MDY) of Ultimate Recoveries were fully restructured or repaid with no economic loss calculated on a Net Present Value basis

» 34.8% (BII) and 37.2% (MDY) of Ultimate Recoveries experienced an economic loss calculated on a Net Present Value basis, with average ultimate recovery rates for these projects of 43.4% (BII) and 42.4% (MDY).

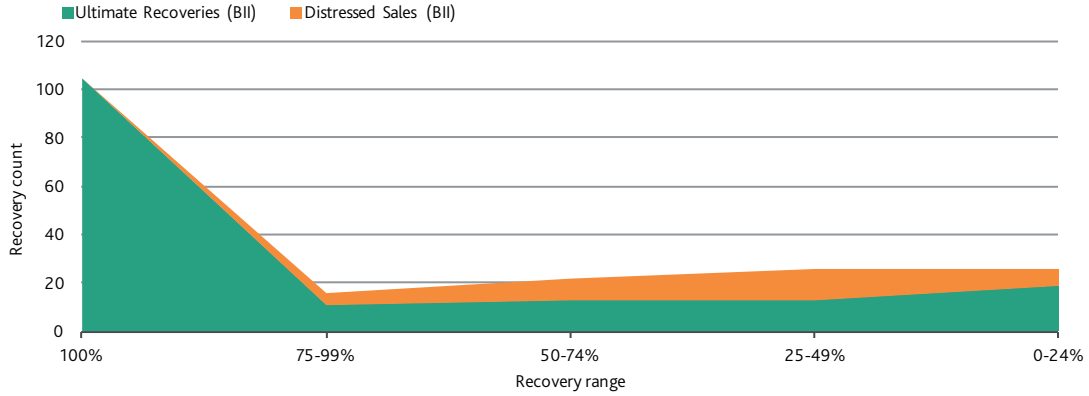
EXHIBIT 24
Distribution of Recovery Rates

	Basel II Definition of Default		Moody's Definition of Default	
Recovery Rates	Ultimate Recoveries	Distressed Sales	Ultimate Recoveries	Distressed Sales
100%	105		93	
75-99%	11	5	10	3
50-74%	13	9	13	9
25-49%	13	13	13	13
0-24%	19	7	19	7
Total	**161**	**34**	**148**	**32**
Average recovery rate	**80.3%**	**48.3%**	**78.6%**	**45.5%**
% of projects fully restructured without loss	65.2%	0.0%	62.8%	0.0%
Average recovery rate for projects experiencing a loss	43.4%	48.3%	42.4%	45.5%

Exhibit 25 charts the distribution of recovery rate data presented in Exhibit 24 based on the Basel II definition of default.

EXHIBIT 25

Chart of Data Presented in Exhibit 24



The distribution of recovery rates for Ultimate Recoveries shows a higher proportion of transactions at either end of the recovery spectrum, which is consistent with Moody's observations of ultimate recovery rates for corporate loans.[19]

The Study Data Set also includes a significant number of Ultimate Recoveries with ultimate recovery rates in the 0-24% range which points to a bimodal distribution of recovery rates which Moody's has also observed as a feature of corporate loan ultimate recoveries. For project finance loans, very low ultimate recovery rates might be indicative of project abandonment, or perhaps the occurrence of extreme loss risk scenarios originally assessed as low probability.

8.2 Ultimate Recoveries by year of emergence (Basel II Definition of Default)

Exhibit 26 displays average ultimate recovery rates for Ultimate Recoveries (BII) by year of emergence from default.

» Average ultimate recovery rates for project finance bank loans emerging from default during the period 1999-2009 were in the range of 75.0% to 100.0% (BII) and 72.1% to 100.0% (MDY), but were substantially independent both of economic cycle at default and economic cycle at emergence throughout this period. Calendar years 2011, 2010 and calendar years prior to 1999 are excluded from this observation on the basis that the number of projects emerging from default in each of these years is too small to support any statistically robust average ultimate recovery rates.

» This observation contrasts with Moody's research on corporate loans and bonds which has previously found that ultimate recovery rates for defaulted corporate debt facilities are negatively correlated with default rates (i.e. ultimate recovery rates fall as default rates rise).[20]

[19] 65.2% of Ultimate Recoveries (BII) had an ultimate recovery rate of 100%; for US corporate loans the corresponding proportion is 67.1%.
[20] See Moody's Special Comment: "Syndicated Bank Loans: 2008 Default Review and 2009 Outlook," March 2009

EXHIBIT 26

Chart of Average Recovery Rates for Ultimate Recoveries (BII) by Year of Emergence

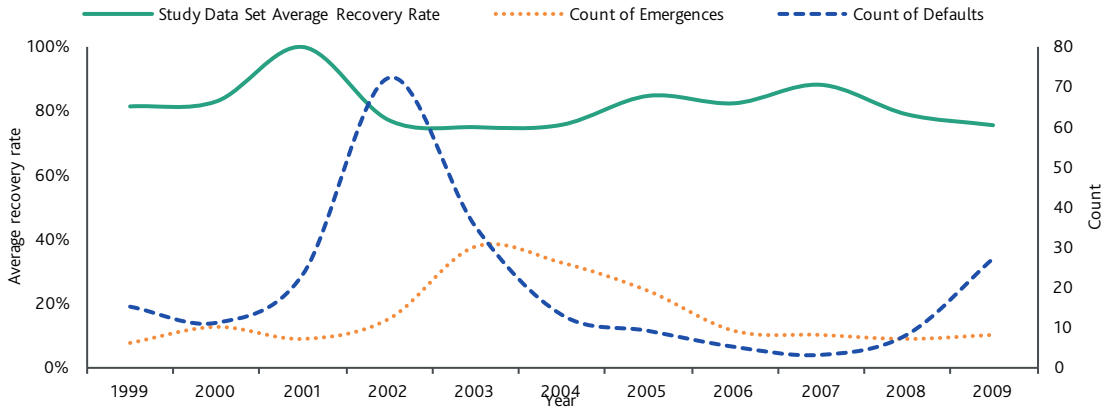


Exhibit 27 tabulates average recovery rates for Ultimate Recoveries by year of emergence.

EXHIBIT 27

Supporting Data for Exhibit 26

	Basel II Definition of Default			Moody's Definition of Default		
Year of Emergence	Average Recovery Rate (Note 1)	Emergences	Defaults	Average Recovery Rate (Note 2)	Emergences	Defaults
1990			1			1
1991			0			0
1992	73.5%	2	7	73.5%	2	7
1993	100.0%	1	1	100.0%	1	1
1994	100.0%	2	4	100.0%	2	4
1995	92.0%	1	5	92.0%	1	5
1996	61.6%	4	7	61.6%	4	7
1997	72.2%	3	9	72.2%	3	8
1998			17			14
1999	81.5%	6	15	72.2%	4	13
2000	83.0%	10	11	83.0%	10	11
2001	100.0%	7	23	100.0%	7	22
2002	77.2%	12	72	75.1%	11	71
2003	75.0%	30	35	74.1%	29	32
2004	75.7%	26	13	73.7%	24	11
2005	84.7%	19	9	82.9%	17	4
2006	82.4%	9	5	77.4%	7	5
2007	88.2%	8	3	86.5%	7	2
2008	79.0%	7	8	75.5%	6	7
2009	75.6%	8	27	72.1%	7	22
2010	100.0%	3	18	100.0%	3	16
2011	84.2%	3	12	78.6%	3	12
	80.3%	**161**	**302**	**78.6%**	**148**	**275**

Notes:

(1) Based on 161 Ultimate Recoveries (BII)
(2) Based on 148 Ultimate Recoveries (MDY)

8.3 Distribution of certain Defaults and Ultimate Recoveries by region

Exhibit 28 tabulates certain Defaults and Ultimate Recoveries by region. It should be noted that some regions have small sample sizes and the results presented in the Study may change significantly as the Study Data Set is expanded and updated.

EXHIBIT 28

Distribution of certain Defaults and Ultimate Recoveries by region

	Basel II Definition of Default					Moody's Definition of Default				
Region	Defaults (Note 1)	Average Years to Default	Defaults (Note 2)	Average Ultimate Recovery Rate	Average Years to Emergence	Defaults (Note 3)	Average Years to Default	Defaults (Note 4)	Average Ultimate Recovery Rate	Average Years to Emergence
Africa	1	3.0	1	32.0%	7.1	1	3.0	1	32.0%	7.1
Eastern Europe	2	2.7	2	100.0%	2.8	2	2.7	2	100.0%	2.8
Latin America	30	3.4	22	85.0%	2.5	29	3.4	21	84.3%	2.5
Middle East	2	2.9	2	100.0%	0.8	2	2.9	2	100.0%	0.8
North America	65	3.5	54	77.0%	2.0	60	3.5	50	75.2%	2.1
Oceania	11	3.7	9	78.6%	1.8	11	3.7	9	78.6%	1.8
South East Asia	36	3.3	31	78.7%	3.2	34	3.6	29	77.2%	3.0
Western Europe	48	2.8	40	83.1%	1.8	41	2.8	34	80.2%	1.9
Grand Total	**195**	**3.3**	**161**	**80.3%**	**2.3**	**180**	**3.3**	**148**	**78.6%**	**2.3**

Notes:

(1) Based on 195 Defaults (BII), corresponding to 161 Ultimate Recoveries (BII) and 34 Distressed Sales (BII)
(2) Based on 161 Ultimate Recoveries (BII)
(3) Based on 180 Defaults (MDY) corresponding to 148 Ultimate Recoveries (MDY) and 32 Distressed Sales (MDY)
(4) Based on 148 Ultimate Recoveries (MDY)

Based on the Basel II definition of default:

» The data shows a broad consistency of average ultimate recovery rates between Latin America, North America, South East Asia and Western Europe, representing a total of 147 out of 161 Ultimate Recoveries lying in the range of 77.0% to 85.0%. Other regions have sample sizes which are too small to support statistically robust conclusions about average ultimate recovery rates in each of those regions.

» The data also shows some variation of average years to default for Latin America, North America, South East Asia and Western Europe, lying in the range of 2.8 to 3.5 years. Other regions have sample sizes which are too small to support statistically robust conclusions about average years to default in each of those regions.

» The data shows a marked variation of average years to emergence from default by region. For Latin America, North America, South East Asia and Western Europe, average years to emergence from default lie in the range of 1.8 to 3.2 years. There appears to be a difference between average years to emergence from default (i) for North America (2.0 years) and Western Europe (1.8 years); and (ii) for regions which include a number of developing countries, for example Latin America (2.5 years) and South East Asia (3.2 years). This difference may be due to differences in institutional structures and legal process between these regions. Other regions have sample sizes which are too small to support statistically robust conclusions about average years to emergence from default in each of those regions.

8.3.1 Distribution of certain Defaults and Ultimate Recoveries by OECD/non-OECD countries

Exhibit 29 tabulates certain Defaults and Ultimate Recoveries by OECD/non-OECD countries. Exhibit 29 has been prepared on the basis of the 34 OECD member countries as at December 31, 2011 – the list of OECD members is included in Appendix B (Glossary).

EXHIBIT 29

Distribution of certain Defaults and Ultimate Recoveries by OECD/non-OECD countries

	Basel II Definition of Default					Moody's Definition of Default				
Region	Defaults (Note 1)	Average Years to Default (Note 1)	Defaults (Note 2)	Average Ultimate Recovery Rate (Note 2)	Average Years to Emergence (Note 2)	Defaults (Note 3)	Average Years to Default (Note 3)	Defaults (Note 4)	Average Ultimate Recovery Rate (Note 4)	Average Years to Emergence (Note 4)
OECD	130	3.3	108	81.1%	1.9	117	3.3	97	79.0%	2.0
NON-OECD	65	3.2	53	78.8%	3.0	63	3.4	51	77.9%	2.9
Grand Total	**195**	**3.3**	**161**	**80.3%**	**2.3**	**180**	**3.3**	**148**	**78.6%**	**2.3**

Notes:

(1) Based on 195 Defaults (BII), corresponding to 161 Ultimate Recoveries (BII) and 34 Distressed Sales (BII)
(2) Based on 161 Ultimate Recoveries (BII)
(3) Based on 180 Defaults (MDY) corresponding to 148 Ultimate Recoveries (MDY) and 32 Distressed Sales (MDY)
(4) Based on 148 Ultimate Recoveries (MDY)

Based on the Basel II definition of default:

» The data indicates a broad consistency of average ultimate recovery rates between OECD and non-OECD countries. This result points to the effectiveness of the structural features which characterize project finance and mitigate LGD, particularly in emerging market transactions.

» The data shows very similar average years to default for OECD and non-OECD countries.

» However, the data shows a marked difference between average years to emergence from default for OECD countries and non-OECD countries. As noted above, this result points to differences in institutional structures and legal process between developed and developing countries.

8.4 Distribution of certain Defaults and Ultimate Recoveries by industry

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of certain analysis within this section has been withheld at the request of the Bank Group.

Exhibit 30 shows average recovery rates for Ultimate Recoveries by industry. It should be noted that some industry sectors have small sample sizes and the results presented in the Study may change significantly when the Study Data Set is expanded and updated.

EXHIBIT 30

Average Recovery Rates for Ultimate Recoveries - by Industry

	Average Recovery				
Industry	0%-20%	20%-40%	40%-60%	60%-80%	80%-100%
Chemicals Production					✓
Infrastructure					✓
Leisure & Recreation				✓	
Manufacturing				✓	
Media & Telecom				✓	
Metals & Mining				✓	
Oil & Gas				✓	
Other				✓	
Power					✓

Based on the Basel II definition of default:

» Average ultimate recovery rates differ between industries. Average ultimate recovery rates by industry are disclosed within broad ranges - more detailed information has been withheld at the request of the Bank Group.

» The data shows a divergence of average years to default between industry sectors for Chemicals Production, Infrastructure, Media & Telecom, Metals & Mining, Oil & Gas, and Power, within a range of 2.5 to 4.3 years. It is perhaps unsurprising that the average time to default differs by industry, since (i) we would expect to observe some consistency of bankable risk appetite and transaction features within each industry sector; but (ii) we would also expect to see heterogeneous risk exposures and divergence of transaction features across different industries, which reflect the specific characteristics of each industry. Other industry sectors have sample sizes which are too small to support statistically robust conclusions about average years to default in each of those industries.

» The data also shows a divergence of average years to emergence from default between industry sectors for Chemicals Production, Infrastructure, Media & Telecom, Metals & Mining, Oil & Gas, and Power, within a range of 1.5 to 3.2 years. For the reasons noted above, we would expect to observe some differences across industry sectors. Other industry sectors have sample sizes which are too small to support statistically robust conclusions about average years to emergence in each of those industries.

8.4.1 PFI/PPPs

The Study Data Set contains 954 projects identified as PFI/PPP by the Bank Group, many of which fall within the Infrastructure industry sector. We note, however, that there is some subjectivity in the classification of projects as PFI/PPP.

» The Study Data Set contains 25 Defaults (BII) and 20 Defaults (MDY) in the PFI/PPP sector

» The Study Data Set contains 11 Ultimate Recoveries (BII) and 9 Ultimate Recoveries (MDY) in the PFI/PPP sector

We comment further on our analysis of the PFI/PPP sector in Appendix H (Default and Recovery Analysis for PFI/PPP projects).

8.5 Distribution of certain Defaults and Ultimate Recoveries by construction/operations phase

Exhibit 31 tabulates certain Defaults and Ultimate Recoveries based on whether a loan default occurred during the relevant project's construction or operations phase i.e. whether the default occurred before or after project completion. The Basel II default date was used in the analysis to calculate years to default for projects under the Basel II definition of default; whereas the actual payment default date was used to calculate years to default under the Moody's definition of default.

Exhibit 31

Distribution of Defaults and Ultimate Recoveries by project phase

	Basel II Definition of Default					Moody's Definition of Default				
Project Phase	Defaults (Note 1)	Average Years to Default (Note 1)	Defaults (Note 2)	Average Ultimate Recovery Rate (Note 2)	Average Years to Emergence (Note 2)	Defaults (Note 3)	Average Years to Default (Note 3)	Defaults (Note 4)	Average Ultimate Recovery Rate (Note 4)	Average Years to Emergence (Note 4)
Construction	30	2.7	25	65.1%	2.1	29	2.7	24	63.7%	2.2
Operations	160	3.4	132	83.2%	2.3	148	3.5	122	81.9%	2.3
Grand Total	**190**	**3.3**	**157**	**80.4%**	**2.3**	**177**	**3.3**	**146**	**78.9%**	**2.3**

Notes:

(1) Based on 190 Defaults, corresponding to 157 Ultimate Recoveries (BII) and 33 Distressed Sales (BII)

(2) Based on 157 Ultimate Recoveries (BII)

(3) Based on 177 Defaults (MDY), corresponding to 146 Ultimate Recoveries (MDY) and 31 Distressed Sales (MDY)

(4) Based on 146 Ultimate Recoveries (MDY)

- The data shows a material difference between (i) the average ultimate recovery rate for construction phase defaults of 65.1% (BII) and 63.7% (MDY) and (ii) the average ultimate recovery rate for operations phase defaults of 83.2% (BII) and 81.9% (MDY). It is interesting to note that project finance lenders typically seek loan margins which are higher during the construction phase compared to during early stage operations i.e. sector banks often price-in incremental risk during a project's construction phase.
- The data shows a difference between (i) the average years to default for construction phase defaults of 2.7 years (BII) and 2.7 years (MDY) and (ii) the average years to default for operations phase defaults of 3.4 years (BII) and 3.5 years (MDY). In theory, we would expect construction phase defaults to cluster around key construction milestones and/or completion dates which is when success or failure becomes apparent. Moreover, this may explain why the average years to default for construction phase defaults (2.7 years (BII) and 2.7 years (MDY)) is consistent with construction programmes which are often scheduled to complete within 2-4 years from financial close. However, the average years to default for projects in operations (3.4 years (BII) and 3.5 years (MDY)) is surprisingly short. It is possible that some projects are scraping through construction completion and then defaulting, potentially for reasons related to poor execution of the construction phase, technical or environmental problems. It is also possible that other projects subject to demand or volume risk may have defaulted where actual demand or volume levels are materially below projected levels. We include preliminary analysis of causes of default in Appendix J.
- The data also shows a material difference between the average years to emergence for construction phase Defaults of 2.1 years (BII) and operations phase Defaults of 2.3 years (BII). These results contrast with our expectation that a work out process following a construction phase default would likely be more complex and take longer than a work out process following an operations phase default. The Study Data Set contains several construction phase projects that defaulted just prior to commercial operations and were subsequently restructured within a very short time frame. These incidents have lowered the average time to emergence for construction phase Defaults.

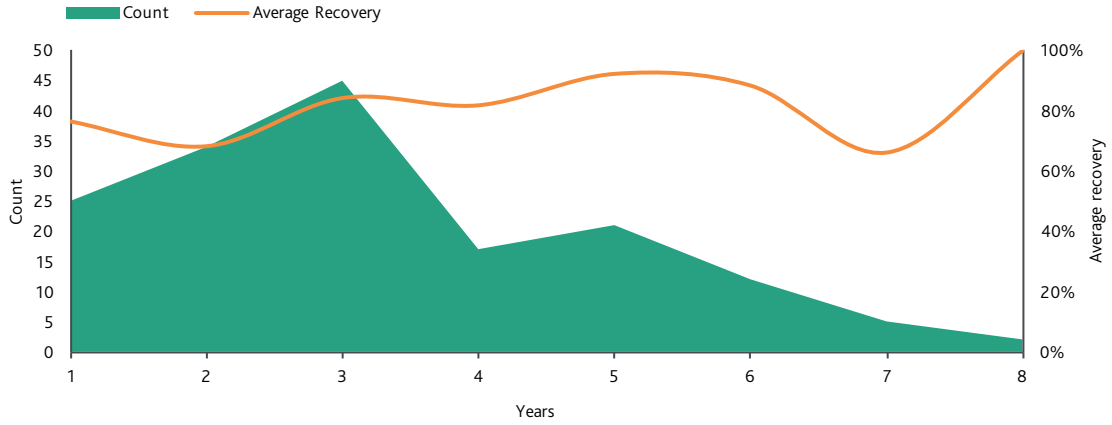
8.6 Average ultimate recovery rates by number of years to default (Basel II Definition of Default)

Exhibit 32 charts average ultimate recovery rates for the 161 Ultimate Recoveries (BII) by time to default.

The data suggests that average ultimate recovery rates are higher for projects that default later in the project life cycle. In making this observation, we have ignored certain Defaults (BII) occurring seven or more years after project origination, since sample sizes are too small to support statistically robust conclusions about average ultimate recovery rates in those years.

EXHIBIT 32

Average ultimate recovery rates by number of years to default (Basel II Definition of Default)



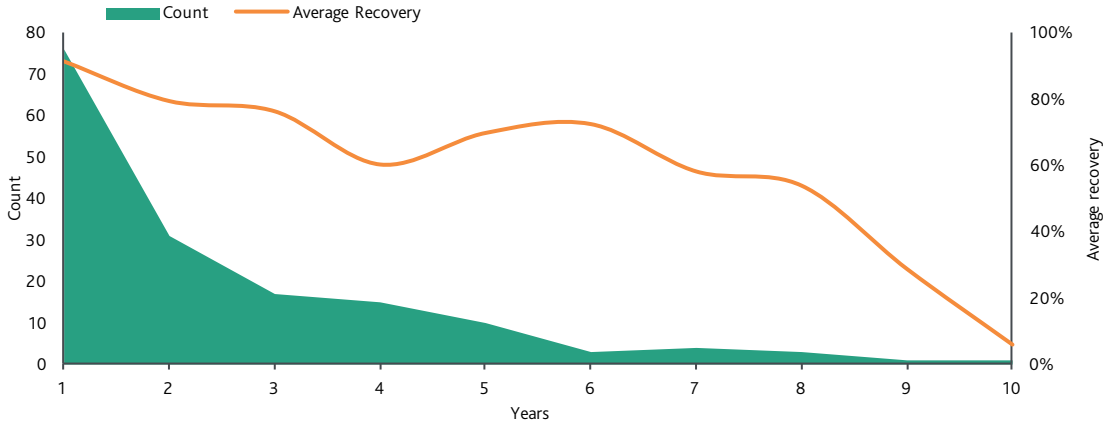
8.7 Average ultimate recovery rates by number of years to emergence (Basel II Definition of Default)

Exhibit 33 charts average ultimate recovery rates for the 161 Ultimate Recoveries (BII) by time to emergence from default.

The data indicates an inverse relationship between average ultimate recovery rates and the length of time to emergence from default i.e. average ultimate recovery rates are lower for project finance bank loans that take longer to emerge from default. However the results shown in Exhibit 33 should be interpreted with caution where the number of loans emerging from default after t years spent in default are low (i.e. for t ≥ 6 years)

EXHIBIT 33

Average ultimate recovery rate number of years to emergence (Basel II Definition of Default)



8.8 Cash-out or Work-out?

A key conclusion for the Study Data Set is that the average recovery rate for Ultimate Recoveries of 80.3% (BII) and 78.6% (MDY) exceeds the average recovery rate for Distressed Sales of 48.3% (BII) and 45.5% (MDY) (see Exhibit 24).

Hence the data shows that when a bank chooses to realize recoveries from a defaulted loan via a distressed sale, the average economic loss is likely to be substantially greater than if the bank "worked-out" the defaulted loan.

This result is not unexpected since Moody's has observed similar results for corporate bank loans. Indeed, Moody's Ultimate LGD Database shows that ultimate recoveries for loans exceeded the corresponding trading price 30 days after default in most cases. However, there are many reasons why an individual lender may choose to exit from a defaulted loan exposure via a distressed sale rather than participate in a work out. For example:

» Risk aversion: The work out process carries a number of risks and uncertainties for lenders, including:
  - Uncertainty over the timing of emergence from default following a work-out
  - Uncertainty over the timing and amount of ultimate recovery cash flows
  - Potential exposure to incremental costs or cash calls
  - Potential exposure to liability following assumption of control of a defaulted project
  - Portfolio exposure limits may constrain a bank's ability to work-out multiple defaults simultaneously

» Resource intensive nature of work-outs:
  - The cost of deploying suitably experienced staff to monitor and participate in a work-out process can be considerable
  - The consumption of senior management and credit oversight time may also be a significant burden

» Preferences: Time-value of money; Cash flow and accounting impact
  - Based on an analysis of the likely ultimate recovery prospects and risks, the bank may view a prospective bidder's price as attractive
  - An exit from a defaulted loan position via a distressed sale will accelerate cash flow recoveries, compared to a work-out process. As indicated in Sections 8.3 and 8.4, for the Study Data Set, the average time to emergence from default for Ultimate Recoveries (BII) is 2.3 years, although the timeframe for emergence from default may vary significantly between projects
  - The decision to exit from a defaulted loan position via a distressed sale will almost certainly result in a different P&L impact compared to a work-out process. The significance of this differential P&L impact will depend on the individual bank's circumstances. However, it may give rise to a preference for either exiting via immediate distressed sale or deferring such a decision and continuing with the work-out process

9. Further analysis of time to default and time to emergence by industry

In this section we further examine the relationship between time to default and time to emergence by industry sector.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of this section has been withheld at the request of the Bank Group.

10. Exposure at Default

Exposure at Default ("EAD") is calculated as the ratio of the amount outstanding at the time of default, to the committed exposure at the time of default.

The average EAD for the Study Data Set is 75.4% (BII). Approximately 23.0% of the observations had an EAD of 100%.

Exhibit 42 tabulates Exposure at Default by region

EXHIBIT 42

Regional Analysis of Exposure at Default

	Basel II Definition of Default		Moody's Definition of Default	
Region	Defaults (Note 1)	EAD	Defaults (Note 2)	EAD
Africa	1	100.0%	1	100.0%
Eastern Europe	2	82.1%	2	82.1%
Latin America	22	63.0%	21	64.2%
Middle East	2	92.8%	2	92.8%
North America	54	78.3%	50	77.6%
Oceania	9	70.7%	9	70.7%
South East Asia	31	77.0%	29	78.9%
Western Europe	40	76.4%	34	75.8%
Grand Total	**161**	**75.4%**	**148**	**75.5%**

Notes:

(1) The data presented above is based on 161 Ultimate Recoveries (BII)
(2) The data presented above is based on 148 Ultimate Recoveries (MDY)

Exhibit 43 tabulates Exposure at Default by industry

EXHIBIT 43

Industry Analysis of Exposure at Default

	Basel II Definition of Default		Moody's Definition of Default	
Industry	Defaults (Note 1)	EAD	Defaults (Note 2)	EAD
Chemicals Production	9	72.4%	9	72.4%
Infrastructure	19	78.3%	15	76.4%
Leisure & Recreation	3	100.0%	3	100.0%
Manufacturing	8	64.7%	8	64.7%
Media & Telecom	26	61.1%	24	63.6%
Metals & Mining	16	80.1%	15	80.6%
Oil & Gas	17	73.8%	16	72.4%
Other	1	72.6%	1	72.6%
Power	62	80.5%	57	80.6%
Grand Total	**161**	**75.4%**	**148**	**75.5%**

Notes:

(1) The data presented above is based on 161 Ultimate Recoveries (BII)
(2) The data presented above is based on 148 Ultimate Recoveries (MDY)

Appendices

» Appendix A: Summary and List of Ultimate Recoveries

» Appendix B: Glossary

» Appendix C: Overview of Project Finance Characteristics

» Appendix D: Comparison of LGD behavior of Project Finance and Corporate Loans

» Appendix E: Comments on certain aspects of Moody's research

» Appendix F: Potential scope of work for follow-on research

» Appendix G: Default and Recovery Analysis for Power projects

» Appendix H: Default and Recovery Analysis for PFI/PPP projects

» Appendix I: The Impact of Causes of Default on Default and Recovery Experience

» Appendix J: The Impact of Market Risk on Default and Recovery Experience

» Appendix K: The Impact of Project Size on Default and Recovery Experience

» Appendix L: Expected Loss

Appendix A: Summary and List of Ultimate Recoveries

In this section we summarize average ultimate recovery rates and number of Ultimate Recoveries (BII) by region and by industry.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of this section has been withheld at the request of the Bank Group.

Appendix B: Glossary

Bank Group	A consortium of leading project finance lenders. The Study Data Set represents aggregated data provided by the Bank Group.
Basel II or Basel II Framework	"International Convergence of Capital Measurement and Capital Standards: A Revised Framework (Comprehensive Version: June 2006)" published by the Basel Committee on Banking Supervision at http://www.bis.org/publ/bcbs128.htm.
Corporate Bank Loan Data Set	A data set of corporate bank loans (predominantly senior secured) derived from Moody's Ultimate LGD Database, as further described in Appendix D (Comparison of LGD behavior of Project Finance and Corporate Loans).
Cumulative Default Rates	Cumulative default rates are calculated from the weighted average marginal default rates (hazard rates) for all cohorts, based on the methodology described in Section 7.1 (Cohort Analysis: 1990-2011).
Default or Default (BII)	A default based on the Basel II definition of default. We include below, relevant extracts from the Basel II Framework: *452 A default is considered to have occurred with regard to a particular obligor when either or both of the two following events have taken place.* » *The bank considers that the obligor is unlikely to pay its credit obligations to the banking group in full, without recourse by the bank to actions such as realizing security (if held).* » *The obligor is past due more than 90 days on any material credit obligation to the banking group. Overdrafts will be considered as being past due once the customer has breached an advised limit or been advised of a limit smaller than current outstandings.* *453. The elements to be taken as indications of unlikeliness to pay include:* » *The bank puts the credit obligation on non-accrued status.* » *The bank makes a charge-off or account-specific provision resulting from a significant perceived decline in credit quality subsequent to the bank taking on the exposure.* » *The bank sells the credit obligation at a material credit-related economic loss.* » *The bank consents to a distressed restructuring of the credit obligation where this is likely to result in a diminished financial obligation caused by the material forgiveness, or postponement, of principal, interest or (where relevant) fees.* » *The bank has filed for the obligor's bankruptcy or a similar order in respect of the obligor's credit obligation to the banking group.* » *The obligor has sought or has been placed in bankruptcy or similar protection where this would avoid or delay repayment of the credit obligation to the banking group.*
Default (MDY)	A default based on Moody's definition of default. As discussed further in Appendix E (Comments on certain aspects of Moody's research), Moody's definition of default includes four types of credit events: » A missed or delayed disbursement of a contractually-obligated interest or principal payment (excluding missed payments cured within a contractually allowed grace period), as defined in credit agreements and indentures; » A bankruptcy filing or legal receivership by the debt issuer or obligor that will likely cause a miss or delay in future contractually-obligated debt service payments; » A distressed exchange whereby 1) an obligor offers creditors a new or restructured debt, or a new package of securities, cash or assets that amount to a diminished financial obligation relative to the original obligation and 2) the exchange has the effect of allowing the obligor to avoid a bankruptcy or payment default in the future; or » A change in the payment terms of a credit agreement or indenture imposed by the sovereign that results in a diminished financial obligation, such as a forced currency re-denomination (imposed by the debtor, himself, or his sovereign) or a forced change in some other aspect of the original promise, such as indexation or maturity. Moody's definition of default does not include so-called "technical defaults," such as maximum leverage or minimum debt coverage violations, unless the obligor fails to cure the violation and fails to honor the resulting debt acceleration which may be required. Also excluded are payments owed on long-term debt obligations which are missed due to purely technical or administrative errors which are 1) not related to the ability or willingness to make the payments and 2) are cured in very short order (typically, 1-2 business days). Finally, in select instances based on the facts and circumstances, missed payments on financial contracts or claims may be excluded if they are the result of legal disputes regarding the validity of those claims.
Default In Work-Out or Default In Work-Out (BII)	A Default (BII) still in the work-out process.
Default In Work-Out (MDY)	A Default (MDY) still in the work-out process.
Distressed Sale or Distressed Sale (BII)	A Default (BII) for which a recovery has been realized following a distressed sale of a defaulted loan participation.
Distressed Sale (MDY)	A Default (MDY) for which a recovery has been realized following a distressed sale of a defaulted loan participation.
Emergence From Default	For a loan which has defaulted, emergence from default is deemed to occur following any of the events set out below: » Repayment of overdue interest. » Restructuring with no subsequent default. » Restructuring with bank being taken out of the deal – for example, by repayment of the defaulted loan with no participation

	in a restructured debt facility. » Material restructuring. » Liquidation.
EAD	Exposure at Default is calculated as the ratio of the amount outstanding at the time of default, to the committed exposure at the time of default.
Industry Data Set	The population of all project finance bank loans originated from January 1, 1983 – December 31, 2011, based on industry data provided by Thomson Reuters Project Finance International.
Marginal Default Rate	The marginal default rate (hazard rate) is the ratio of the number of project defaults in a specific time period divided by the number of projects exposed to the risk of default at the beginning of that time period. For the purposes of this Study, marginal default rates have been calculated on an annual basis.
Moody's Ultimate LGD Database	Moody's proprietary database which contains information on over 4,700 defaulted loans and bonds taken from 1,000 non-financial U.S. corporations that initially defaulted between 1987 and 2012.
OECD	Organization for Economic Co-operation and Development. There are currently 34 OECD member countries: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. Four countries joined the OECD in 2010: Chile joined on May 7, 2010; Slovenia joined on July 21, 2010; Israel joined on September 7, 2010; and Estonia joined on 9 December, 2010. Prior to the new joiners in 2010, the most recent joiner had been the Slovak Republic which joined the OECD on 14 December 2000. The analyses at Exhibit 16 (Average Default Rates by OECD/Non-OECD countries) and Exhibit 29 (Distribution of certain Defaults and Ultimate Recoveries by OECD/Non-OECD countries) have been prepared based on the 34 OECD member countries as at December 31, 2011.
PFI	A public sector procurement structured under the UK Government's Private Finance Initiative.
Project Finance	We reproduce below the Basel II definition of Project Finance: *218 In general, a corporate exposure is defined as a debt obligation of a corporation, partnership, or proprietorship. Banks are permitted to distinguish separately exposures to small- and medium-sized entities (SME), as defined in paragraph 273.* *219 Within the corporate asset class, five sub-classes of specialized lending (SL) are identified. Such lending possesses all the following characteristics, either in legal form or economic substance:* *» The exposure is typically to an entity (often a special purpose entity (SPE)) which was created specifically to finance and/or operate physical assets;* *» The borrowing entity has little or no other material assets or activities, and therefore little or no independent capacity to repay the obligation, apart from the income that it receives from the asset(s) being financed;* *» The terms of the obligation give the lender a substantial degree of control over the asset(s) and the income that it generates; and* *» As a result of the preceding factors, the primary source of repayment of the obligation is the income generated by the asset(s), rather than the independent capacity of a broader commercial enterprise.* *220. The five sub-classes of specialized lending are project finance, object finance, commodities finance, income-producing real estate, and high-volatility commercial real estate. Each of these sub-classes is defined below.* *Project finance* *221. Project finance (PF) is a method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is usually for large, complex and expensive installations that might include, for example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure. Project finance may take the form of financing of the construction of a new capital installation, or refinancing of an existing installation, with or without improvements.* *222. In such transactions, the lender is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output, such as the electricity sold by a power plant. The borrower is usually an SPE that is not permitted to perform any function other than developing, owning, and operating the installation. The consequence is that repayment depends primarily on the project's cash flow and on the collateral value of the project's assets. In contrast, if repayment of the exposure depends primarily on a well established, diversified, credit-worthy, contractually obligated end user for repayment, it is considered a secured exposure to that end-user...."*
PPP	A public sector procurement structured as a Public Private Partnership.
Study Data Set	The aggregated data set for the Study, based on data provided by the Bank Group. The Study Data Set includes 4,067 projects which account for some 53.6% of all project finance bank loans originated globally during a period from January 1, 1983 to December 31, 2011.
Ultimate Recovery or Ultimate Recovery (BII)	A Default (BII) for which recoveries have been realized following Emergence From Default, as defined above.
Ultimate Recovery (MDY)	A Default (MDY) for which recoveries have been realized following Emergence From Default, as defined above.

Appendix C: Overview of Project Finance Characteristics

The Study shows that project finance is a resilient class of specialized corporate lending. In particular, the Study shows that the 10 year cumulative default rate for projects finance bank loans is consistent with 10 year cumulative default rates for corporate issuers of low investment grade / high speculative grade credit quality. The Study also shows that marginal annual default rates improve significantly over time – in particular, marginal annual default rates are consistent with high speculative grade credit quality during an initial three year period following financial close, but fall significantly thereafter trending towards marginal default rates consistent with single-A category ratings by year 10 from financial close.

The Study shows that ultimate recovery rates for the project finance asset class have been consistently high over time, across regions, and across industry sectors (although the variation of ultimate recovery rates by industry sector is marked), and that ultimate recovery rates for project finance bank loans are similar to ultimate recovery rates for senior secured corporate bank loans. This observation is despite features such as high gearing and long tenors that are typical for project finance loans, but generally associated with higher risk corporate loans.

While most project finance borrowers are highly leveraged, thinly capitalized special purpose vehicles with limited financial flexibility, project finance loans are structured to be both highly robust to a wide range of potentially severe risks, and also to minimize any post-default economic loss. The findings of the Study suggest that the risk allocation, structural features, underwriting disciplines and incentive structures which characterize the project finance asset class have proved effective. We highlight a number of these features below, and discuss their significance in minimizing default risk and loss given default.

Typical characteristics which mitigate default risk

» Construction risk substantially transferred to a construction contractor through a bespoke turnkey construction contract to deliver a functional asset within an agreed timetable, to a fixed budget, and to meet required performance parameters. Contractor performance risk is typically mitigated through an appropriate incentive structure within the construction contract, including provisions for liquidated damages. Contractor counterparty credit risk would be mitigated as necessary by financial support instruments such as Bank L/Cs, or other performance support instruments.

» Predictable, resilient revenue stream over the long term, especially where revenue risk is transferred through an offtake contract which mitigates Project Co's exposure to price risk and demand risk.

» Detailed appraisal of whole life operating & maintenance costs, and periodic capital maintenance expenditures.

» Covenant structure which controls the scope of the project, underpinning a predictable trajectory for the business of Project Co such that the business cannot evolve outside its pre-agreed core scope.

» Protective forward-looking covenants, reserving mechanisms, cash traps and other structural features which mitigate liquidity risk – i.e. Project Co's ability to withstand transient cash flow strain. Project finance transactions are ideally structured to avoid refinancing risk by raising all necessary funding at an initial financial close – however, market tolerance of refinancing risk has evolved differently across different geographical markets.

» Detailed due diligence by lenders' advisors – e.g. technical advisors, market consultants, legal advisors, insurance advisors, accounting & tax advisors, and/or other advisors as relevant. All concerns raised by lenders' advisors to be addressed to lenders' satisfaction.

» Preparation of a detailed financial model based on lenders' base case assumptions and evaluation of the project's resilience to severe downside stress scenarios. The financial model and designated sensitivities would typically be subject to audit prior to financial close.

» Detailed appraisal by lenders of all aspects of the project, and negotiation of key terms where relevant to ensure that key risks are identified, allocated and mitigated such that residual risk is within acceptable parameters – i.e. bankable.

» Pro-active monitoring by agents, representatives and/or advisors acting on behalf of senior lenders. The scope of information provision by Project Co and monitoring oversight is typically greater than for traditional corporate borrowers. Enhanced reporting and monitoring controls may be triggered by poor technical performance, or weak cash flows.

Typical characteristics which mitigate loss given default

» Senior secured lenders benefit from first ranking security interests over all material assets, including contractual rights and intellectual property held by Project Co. Such security interests would generally be perfected on or before financial close – i.e. legal, valid, binding and enforceable

» Step-in regime (i.e. step-in, cure, and step-out rights) pre-agreed with Project Co's key contractual counterparties to provide senior secured lenders with appropriate rights and sufficient time to remedy a default by Project Co. Threshold covenants may be triggered before senior lenders actually incur any economic loss.

» Pre-agreed intercreditor arrangements, including decision-making and voting procedures which establish senior lender control rights up-front.

» Structural mitigation of the risk that other creditor claimants might emerge during a bankruptcy or administration process to challenge pre-agreed intercreditor rights and security interests.

» Strategic or essential nature of the project which underpins the project's ongoing profitable operation (although it might well be the case that while a defaulted project is profitable at the operating level it may be unable to meet its debt service obligations in full).

» The project's structure creates incentives for the various stakeholders to mitigate economic loss following a default.

Appendix D: Comparison of LGD behavior of Project Finance and Corporate Loans

Moody's compared corporate bank loan LGD data from Moody's Ultimate LGD Database to the results of the LGD analysis for the Study Data Set.

The corporate recovery data set (the "Corporate Bank Loan Data Set") was created using the Moody's Ultimate LGD Database, which contains information on over 4,700 defaulted loans and bonds taken from over 1,000 non-financial U.S. corporations that initially defaulted between 1987 and 2012. Of these defaulted instruments, over 1,900 were defaulted bank loans – and 1,693 of these loans were senior secured. It should be noted that the average ultimate recovery rate for the instruments below represents the average ultimate recovery rate for defaulted debt – it does not represent the average firm-wide ultimate recovery rate for defaulted companies which would be substantially lower.[21]

The results compare as follows:[22]

EXHIBIT D1

Ultimate Recovery Rates by debt class - Moody's Ultimate LGD Database

	Emergence Year			Default Year		
Lien Position	2011	2010	1987-2011	2011	2010	1987-2010
Loans	68.4%	79.7%	80.3%	81.1%	75.8%	80.3%
Bonds						
Senior Secured Bonds	43.3%	65.1%	63.7%	43.3%	62.6%	63.7%
Senior Unsecured Bonds[1]	4.8%	44.2%	48.5%	3.1%	67.0%	48.5%
Subordinated Bonds[2]	24.1%	22.5%	28.7%	24.1%	21.4%	28.7%

Notes:

(1) The recovery rate for 2011's senior unsecured bonds was based on three defaults.
(2) Includes senior subordinated, subordinated, and junior subordinated bonds.

EXHIBIT D2

Ultimate Recovery Rates – Corporate Bank Loan Data Set compared to the Study Data Set

Data Set	Average Recovery	Standard Deviation
Corporate Bank Loan Data Set (All Loans)	68.4%	31.8%
Corporate Bank Loan Data Set (Senior Secured Loans)	80.3%	30.6%
Study Data Set (Basel II Definition Of Default)	80.3%	32.7%
Study Data Set (Moody's II Definition Of Default)	78.6%	33.6%

The senior secured loans within the Corporate Bank Loan Data Set averaged a recovery of 80.3% (versus 68.4% for all loans) between 1987 and 2011 so it would appear that the average ultimate recovery rates for project finance bank loans and for senior secured corporate bank loans are similar.

However, the Study shows that ultimate recovery rates for project finance loans are substantially uncorrelated with a number of factors which are key determinants of ultimate recovery rates for corporate debt facilities:

» Moody's has stated in previous research on corporate debt that two of the most important variables in determining recovery rates of defaulted debt are the legal jurisdiction of a defaulted

[21] As stated in Moody's Special Comment "Lessons from 1,000 Corporate Defaults" November 2011, for the period 1988-2011, the average firm-wide ultimate recovery rate for defaulted companies is 54.5%

[22] See Moody's Special Comment Exhibit 9, "Annual Default Study: Corporate Default and Recovery Rates, 1920-2011" February 2012

company and its debt structure. We comment below on the influence of these factors on ultimate recovery rates for both data sets

» We also discuss below an additional factor which appears to be emerging as a further significant factor affecting recovery rates for defaulted corporate debt: type of default

» Moody's has stated in previous research on corporate debt that default rates are negatively correlated with recovery rates. We comment further below on the correlation of default rates and recovery rates

Impact of legal jurisdiction

Although the legal jurisdiction of a defaulted company is an important determinant of recovery rates for corporate debt, the results of the Study suggest that the legal jurisdiction of a project's host country is not a key determinant of recovery rates for project finance bank loans. For project finance transactions, project documentation and onshore security arrangements will typically be governed by local law, while finance documentation and offshore security arrangements will typically be governed by New York law or English law. Exhibit 28 (Distribution of certain Defaults and Ultimate Recoveries by region) shows a broad consistency of average ultimate recovery rates (BII) for Latin America, North America, South East Asia and Western Europe (representing a total of 147 out of 161 Ultimate Recoveries lying in the range of 77.0% to 85.0%). Furthermore, Exhibit 29 (Distribution of certain Defaults and Ultimate Recoveries by OECD/non-OECD countries) shows that average ultimate recovery rates (BII) for OECD and non-OECD countries are similar, at 81.1% and 78.8%, respectively.

Impact of debt structure

While debt structure is an important determinant of recovery rates for corporate debt, for the reasons set out below it is less significant for project finance transactions.

The 1,988 loans in the Corporate Bank Loan Data Set have an average "debt cushion" (debt contractually subordinated to the bank debt as a percentage of total debt) of 45.9%. This debt cushion enhances average ultimate recovery rates for senior lenders to corporates to levels similar to average ultimate recovery rates for the Study Data Set.

The importance of debt structure in determining recovery rates for corporate debt was emphasized in Moody's Special Comment "Lessons from 1000 Corporate Defaults" published in November 2011:

> *"The average firm-wide recovery for the entire database of 1,000 defaults was 54.5%. Around that figure is a wide range of average instrument-level recoveries, from 80.4% for bank debt to 28.8% for subordinated bonds. This clearly illustrates the significance of an instrument's location in a company's capital structure and the amount of subordinated debt beneath it that can take first losses. "*

At its simplest, the funding structure for a project finance transaction will comprise one or more pari passu senior secured debt facilities and sponsor equity. For complex international project financings, pari passu senior secured debt facilities might be raised from a number of different sources (e.g. commercial banks, one or more export credit agencies, and/or a project bond). Potentially, subordinated secured debt facilities might also be raised from third-party funders. Although sponsor funding might also be provided in the form of deeply subordinated unsecured debt rather than in the form of share capital, such debt facilities would generally be regarded as quasi-equity. Hence, typical project finance transactions would have no more than two layers of debt at most – i.e. senior secured debt facilities and third-party subordinated secured debt facilities.

Where third-party subordinated secured debt is raised, intercreditor arrangements are typically such that the security interests and intercreditor rights of subordinated secured funders are deeply subordinated and these creditors should not be able to materially or adversely impact the ability of senior secured creditors to enforce their first ranking security interests and exercise their own intercreditor rights. Accordingly, the presence of third-party deeply subordinated debt should not materially impact on the project's senior secured debt capacity, nor should it materially affect the default and recovery experience of senior secured lenders. In other words, third-party subordinated debt in project finance transactions typically provides no beneficial debt cushion to senior secured funders. We note, however, that the presence of subordinated debt on terms which are less than deeply subordinated may actually increase default risk and erode recovery performance for senior secured lenders.

Impact of Default Type

Moody's definition of default includes the following types of default events:

- A missed or delayed disbursement of a contractually-obligated interest or principal payment (excluding missed payments cured within a contractually allowed grace period), as defined in credit agreements and indentures;
- A bankruptcy filing or legal receivership by the debt issuer or obligor that will likely cause a miss or delay in future contractually-obligated debt service payments;
- A distressed exchange whereby 1) an obligor offers creditors a new or restructured debt, or a new package of securities, cash or assets that amount to a diminished financial obligation relative to the original obligation and 2) the exchange has the effect of allowing the obligor to avoid a bankruptcy or payment default in the future; or
- A change in the payment terms of a credit agreement or indenture imposed by the sovereign that results in a diminished financial obligation, such as a forced currency re-denomination (imposed by the debtor, himself, or his sovereign) or a forced change in some other aspect of the original promise, such as indexation or maturity.

Moody's definition of default does not include so-called "technical defaults," such as maximum leverage or minimum debt coverage violations, unless the obligor fails to cure the violation and fails to honor the resulting debt acceleration which may be required. Also excluded are payments owed on long-term debt obligations which are missed due to purely technical or administrative errors which are 1) not related to the ability or willingness to make the payments and 2) are cured in very short order (typically, 1-2 business days). Finally, in select instances based on the facts and circumstances, missed payments on financial contracts or claims may be excluded if they are the result of legal disputes regarding the validity of those claims.

We initially commented in our Special Comment "Corporate Default and Recovery Rates, 1920-2010" published in February 2011, we observed that 23 of the initial default events were distressed exchanges, 11 were regular bankruptcies, and 4 were pre-packaged bankruptcies (which we consider to be closer in behavior to distressed exchanges than to regular bankruptcies). The corresponding figures in Moody's Ultimate LGD Database are 109, 541 and 180 – i.e. a much smaller proportion of distressed exchanges.

As we commented in our Special Comment "After Black Swans, Now What?" published in May 2010:

> *"Distressed exchanges and prepackaged bankruptcies tend to produce higher corporate-level recoveries than other types of defaults. Syndicated project finance where less than half of the defaults in the bank group data are bankruptcies is an example of an asset class with a long history of employing distressed exchanges and other restructurings, as opposed to regular bankruptcy, and it has enjoyed recovery rates as good as, if not stronger than, those seen in syndicated corporate finance. In the corporate arena, we're seeing more non- traditional Chapter 11 defaults executed by private equity. In fact, a little more than half of U.S. non-financial corporate defaults in 2009 had the involvement of private equity owners, and these defaulted sponsored transactions had a higher incidence of distressed exchanges and prepackaged bankruptcies than the defaults of companies without private equity backing. We can assume this behavior will continue as long as it can be demonstrated that both the sponsors and the holders of senior debt benefit more than they would from a traditional bankruptcy".*

This development in corporate lending is already hard-wired into project finance transactions, as discussed in Appendix C (Overview of Project Finance Characteristics). For example, the following features are examples of key creditor protections/characteristics typically structured into project finance transactions, which facilitate the proactive management of defaulted credits by senior creditors seeking to maximize their recoveries:

- Senior secured lenders benefit from first ranking security interests over all material assets, including contractual rights and intellectual property held by Project Co. Such security interests would generally be perfected on or before financial close – i.e. legal, valid, binding and enforceable
- Step-in regime (i.e. step-in, cure, and step-out rights) pre-agreed with Project Co's key contractual counterparties to provide senior secured lenders with appropriate rights and sufficient time to remedy a default by Project Co
- Pre-agreed intercreditor arrangements, including decision-making and voting procedures which establish senior lender control rights up-front
- Structural mitigation of the risk that other creditor claimants might emerge during a bankruptcy or administration process to challenge pre-agreed intercreditor rights and security interests
- Strategic or essential nature of the project underpins the project's ongoing profitable operation (although a project which is profitable at the operating level may not be able to meet its debt service obligations in full)

We then followed up on our initial 2010 observations with the following taken from the Special Comment "Lessons from 25 Years of Chapter 22" published in November of 2012:

> *"While Chapter 22s (a Chapter 11 bankruptcy filing followed by another Chapter 11 filing) were most prevalent between 1988 and 2011, during the Great Recession the most prevalent re-default scenario was a distressed exchange followed by a Chapter 11 filing. If these distressed exchanges were preemptive efforts by private equity owners or company managements to control the default process and maximize owners' equity, they did not work. This gives us early evidence that at least some distressed exchanges during the Great Recession did not provide sufficient capital restructuring, and raises the specter of re-defaults among companies that defaulted for the first time during the crisis."*

Correlation of Default Rates and Recovery Rates

In Moody's Special Comment: "Syndicated Bank Loans: 2008 Default Review and 2009 Outlook," March 2009, we note that default rates for corporate bank loans are negatively correlated with recovery rates.[23]

For the Study Data Set, ultimate recovery rates appear to be substantially independent of both economic cycle at default and economic cycle at emergence. In particular, Exhibit 26 (Chart of average recovery rates for Ultimate Recoveries (BII) by year of emergence) shows that average ultimate recovery rates for project finance bank loans emerging from default during the period 1999-2009 were in the range of 75.0% to 100.0% (BII), but were substantially independent both of economic cycle at default and economic cycle at emergence throughout this period. Calendar years 2011, 2010 and calendar years prior to 1999 are excluded from this observation on the basis that the number of projects emerging from default in each of these years is too small to support any statistically robust conclusion about average ultimate recovery rates.

Summary

In summary it would appear that average ultimate recovery rates for project finance bank loans and for senior secured corporate bank loans are similar.

However, further review suggests that the two asset classes rely on different means to achieve robust recovery rates. While corporate lenders rely predominantly on debt cushion, project finance lenders focus on the proactive management of defaulted credits, facilitated by comprehensive creditor-friendly structural features which are a key characteristic of project finance.

We summarize key points of comparison below, but would observe that our analysis shows that project finance is a resilient class of specialized corporate lending, displaying high ultimate recovery rates which are substantially uncorrelated with a number of factors which are key determinants of ultimate recovery rates for general corporate debt facilities:

- Moody's research on corporate debt has previously found that the legal jurisdiction of a defaulted company is an important determinant of ultimate recovery rates for defaulted debt. The results of the Study suggest that the legal jurisdiction of a project's host country is not a key determinant of ultimate recovery rates for project finance bank loans.
- Moody's research on corporate debt has previously found that the debt structure of corporate loans (i.e. the presence of debt contractually subordinated to senior lenders) is an important determinant of ultimate recovery rates for defaulted senior loans to corporate borrowers. For project finance loans, we consider that the credit quality of senior secured project finance loans is typically structured to be substantially independent of the presence (or absence) of deeply subordinated debt.
- Moody's research on corporate debt has found that negotiated restructurings following a corporate default tend to produce higher ultimate higher recovery rates than a regular bankruptcy. This behavior, facilitated by creditor-friendly structural features, is already prevalent in project finance.

[23] The relationship between default rates and recovery rates on corporate debt facilities has been in Moody's research, as well as external research. A negative correlation between default rates and recovery rates is consistent with the hypothesis that a larger supply of defaulted debt depresses the ultimate recovery and the prices of such defaulted debt. For further background discussion, see Moody's Special Comment Syndicated Bank Loans: 2008 Default Review and 2009 Outlook," March 2009.

» Moody's research on corporate debt has previously found that ultimate recovery rates are negatively correlated with default rates. For the Study Data Set, ultimate recovery rates appear to be substantially independent of both economic cycle at default and economic cycle at emergence.

Appendix E: Comments on certain aspects of Moody's research

Default Rate Calculations

The default analysis undertaken in the Study is based on the Basel II definition of default. In addition, the Study also provides comparable results based on Moody's definition of default. Moody's standard definition of default differs from the Basel II definition of default. We set out below Moody's definition of default, and comment on the impact of applying Moody's default definition on the results and observations described within this Study.

Moody's Definition of Default

Moody's definition of default is applicable only to debt or debt-like obligations (e.g., swap agreements). Four events constitute a debt default under Moody's definition:

» A missed or delayed disbursement of a contractually-obligated interest or principal payment (excluding missed payments cured within a contractually allowed grace period), as defined in credit agreements and indentures;

» A bankruptcy filing or legal receivership by the debt issuer or obligor that will likely cause a miss or delay in future contractually-obligated debt service payments;

» A distressed exchange whereby: 1) an obligor offers creditors a new or restructured debt, or a new package of securities, cash or assets that amount to a diminished financial obligation relative to the original obligation and 2) the exchange has the effect of allowing the obligor to avoid a bankruptcy or payment default in the future; or

» A change in the payment terms of a credit agreement or indenture imposed by the sovereign that results in a diminished financial obligation, such as a forced currency re-denomination (imposed by the debtor, himself, or his sovereign) or a forced change in some other aspect of the original promise, such as indexation or maturity.

Moody's definition of default does not include so-called "technical defaults," such as maximum leverage or minimum debt coverage violations, unless the obligor fails to cure the violation and fails to honor the resulting debt acceleration which may be required. Also excluded are payments owed on long-term debt obligations which are missed due to purely technical or administrative errors which are 1) not related to the ability or willingness to make the payments and 2) are cured in very short order (typically, 1-2 business days). Finally, in select instances based on the facts and circumstances, missed payments on financial contracts or claims may be excluded if they are the result of legal disputes regarding the validity of those claims.

In broad terms, the Basel II definition of default not only captures the events which are included in Moody's definition of default, but also captures a wider range of defaults, reflecting subjective assessments made by the reporting bank. For example, under the Basel II definition, defaulted credits would also include debt obligations where:

» The bank puts the credit obligation on non-accrued status

» The bank makes a charge-off or account-specific provision resulting from a significant perceived decline in credit quality subsequent to the bank taking on the exposure

In theory therefore, the number of defaults reported under the Basel II definition might differ materially from the number of defaults considered to have occurred under Moody's definition of default.

Impact: Moody's default definition vs. Basel II default definition

As described at Section 4.4 above, we reviewed the individual circumstances of each reported loan default against the Basel II definition of default and Moody's definition of default.

Results based on the Basel II definition of default and comparative results based on Moody's definition of default have been included throughout the Study.

In summary:

» The Study Data Set contains 302 Defaults (BII) and 275 Defaults (MDY)
  – Cumulative default rates under the Basel II definition of default are slightly higher than comparative cumulative default rates calculated under Moody's definition of default (see Exhibit 12)
  – Marginal default rates for under the Basel II definition of default are slightly higher than comparative marginal default rates calculated under Moody's definition of default (see Exhibit 12.2)

» The Study Data Set contains 161 Ultimate Recoveries (BII) and 148 Ultimate Recoveries (MDY)
  – The average ultimate recovery rate under the Basel II definition of default (80.3%) is slightly higher than the average ultimate recovery rate under Moody's definition of default (78.6%) (see Exhibit 24)

» The results summarized above are directionally consistent with the fact that the Basel II definition of default is broader than Moody's definition of default. We would expect the Basel II definition of default to result in a greater number of defaults with a higher average ultimate recovery rate, than under Moody's definition of default

Recovery Rate Calculations

The calculation of recovery rates in the Study is dependent on the definition of emergence from default. The definition of emergence from default used in the Study has been adopted at the request of the Bank Group.

We highlight that the determination of recovery rates in Moody's Special Comment "Default and Recovery Rates for Project Finance Debts, 1992-2008," published in November 2009 is based on 30-day post-default trading prices rather than ultimate recovery values. The use of post-default trading prices to measure recovery parallels common practice in the credit default swaps market. In Moody's view, recovery rates measured in this way are most relevant for cash bond investors who liquidate their holdings shortly after default as often required by their portfolio governance rules or their own investment objectives.

We contrast this with the focus on ultimate recovery rates in the Study, and highlight the material difference between average recovery rates for recoveries for Ultimate Recoveries and Distressed Sales – Section 8.1 (Distribution of Ultimate Recovery Rates) refers.

Implications for the calibration of Moody's sector ratings

Moody's ratings represent a rank-ordering of creditworthiness, or expected loss – which is a function of the probability of default and the expected severity of loss given a default. The Study provides evidence of the default and recovery performance of a large sample of project finance debt obligations over an extended period. We consider the results of the Study to be insightful in the context of

enhancing the accuracy and calibration of our own ratings. However, as we assess the potential impact of the Study's results on our ratings, we are also mindful of the following considerations:

» The standard deviation of the Study Data Set's ultimate recovery rates is 32.7% (BII) and 33.6% (MDY) i.e. relatively large

» For consistency with our recovery research and findings for other sectors, Moody's will consider distressed sales as well as ultimate recoveries

» Behavioral drivers for bank lenders tend to differ from those of bond investors

» The past doesn't necessarily predict the future because default rates and recovery rates may change over time. For example, there may be changes to exogenous risk factors such as legal framework and market environment, and to endogenous variables such as project characteristics and structural features

We also note that tenors of 20-30 years (or longer) are common within project finance, especially PFI/PPP. While the time period covered by the Study is long relative to most corporate loans, it is short relative to the typical tenor for project finance loans, with many loans within the Study Data Set yet to reach final maturity. This limits our ability to assess any changes in default or recovery which may emerge as these loans reach maturity, since exposure to lifecycle risk and costs, or risks in meeting minimum handback requirements, may be significant.

Special Comment "Infrastructure Default and Recovery Rates, 1983-2012H1"

We highlight the recent publication of our Special Comment: "Infrastructure Default and Recovery Rates, 1983-2012H1", December 2012 which reported on the historical performance of long-term infrastructure debts (including project finance debts) rated by Moody's.

"This is Moody's first report on the historical credit performance of Moody's-rated long-term infrastructure debts. The study covers the 1983-2012H1 period and compares historical cumulative default rates, rating transition rates, recovery rates and rating accuracy measures for infrastructure debts. Moody's currently rates $2.4 trillion debt issued by corporate infrastructure and project finance entities and $0.8 trillion infrastructure debt issued by US municipal entities1. We find that:

» *For much of the study period, total infrastructure debt ratings have been more stable than non-financial corporate issuers, especially US municipal infrastructure debts. Non-financial corporate issuers are almost six times more volatile than US municipal infrastructure debts and 20% more volatile than corporate infrastructure debts.*

» *Compared with like-rated non-financial corporate issuers, corporate infrastructure debts have broadly similar credit risk profiles by like-rating category. The one exception is Ba-rated debts, for which both loss and default rates are lower for corporate infrastructure debts than for non-financial corporates.*

» *Single-A senior credit loss rates for corporate infrastructure debts (representing about a third of corporate infrastructure debts) and non-financial corporate issuers are very similar: A-rated corporate infrastructure debts have higher default rates but lower losses given default than non-financial corporate issuers.*

» *Default rates for Baa-rated corporate infrastructure debts (representing the higher proportion of corporate infrastructure debts) are very similar to Baa-rated non-financial corporates. However, as recoveries have historically been better among the infrastructure debts, total credit loss rates have*

been about 30% lower than those of non-financial corporates, although in absolute terms they are of the same order of magnitude, indicating overall comparability in performance.

» *Credit loss rates for Ba-rated corporate infrastructure (representing a small proportion of corporate infrastructure debts) are lower than for non-financial corporate. This is driven by regulated utilities' (the major sub-sector of all Ba-rated infrastructure corporate debts) very low propensity to default and their high recovery rates. All other Ba-rated corporate infrastructure debts have credit loss rates similar to their non-financial corporate counterparts"*

Appendix F: Potential scope of work for follow-on research

We look forward to expanding the Bank Group and publishing further research based on an expanded and updated data set. However, we note that the results of a future study based on a different data set will necessarily be different.

The following list indicates the potential scope of work for follow-on research:

- Further analysis of the impact of economic cycle on default and recovery experience
- Further analysis of the impact of jurisdiction on default and recovery experience
- Further analysis of facility level recoveries
- Default and recovery analysis for ECA or ECA-insured facilities
- Default and recovery analysis for projects in certain regions, such as the countries within the Gulf Cooperation Council region
- Analysis of 15-year, 20-year cumulative default rates
- Analysis of default and recovery performance over different time intervals

Appendix G: Default and Recovery Analysis for Power projects

In this appendix we examine historic default and recovery behavior for key sub-sectors within the Power Sector, including Renewable Power Generation.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of this section has been withheld at the request of the Bank Group.

Appendix H: Default and Recovery Analysis for PFI/PPP projects

In this appendix we examine historic default and recovery behavior for PFI/PPP projects within the Study Data Set.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of certain analysis within this section this section has been withheld at the request of the Bank Group.

Caveat: The observations noted below for projects identified as PFI/PPP projects should be interpreted with caution, since (i) there is some subjectivity in the classification of projects as PFI/PPP; and (ii) the number of defaults is relatively small.

The Study Data Set contains 954 projects identified as PFI/PPP with 25 Defaults (BII) and 11 Ultimate Recoveries (BII).

- The 10 year cumulative default rate (BII) is 3.9%, which is consistent with 10 year cumulative default rates for corporate issuers in the Baa ratings category.
- The 10 year cumulative default rate (BII) of 3.9% is lower than the 10 year cumulative default rate (BII) for the Infrastructure sector of 5.2%, and substantially lower than the 10 year cumulative default rate (BII) for the Study of 9.3% (see Exhibit 19).
- Marginal annual default rates (BII) are broadly stable, and are consistent with marginal annual default rates for corporate issuers in the Baa ratings category (see Exhibit H7).
- The average ultimate recovery rate is 83.9% (BII) and falls within a range from 28.5% to 100% with a standard deviation of 24.3%. The average ultimate recovery rate for PFI/PPP is somewhat better than the average ultimate recovery rate of 80.3% (BII) for the full Study Data Set.
- All 11 recoveries were in the infrastructure sector, specifically healthcare, roads, rail and civil defence – 7 of the recoveries were in Western Europe, 2 in Oceania, 1 in Eastern Europe, and 1 in South East Asia.
- These results provide some evidence to support the view held by many market participants that PFI/PPP is a discrete sub-sector lying at the low-risk end of the project finance spectrum.

Exhibit H5 charts cumulative default rate data for PFI/PPP projects identified in the Study Data Set:

EXHIBIT H5

Chart of cumulative default rates for PFI/PPP projects

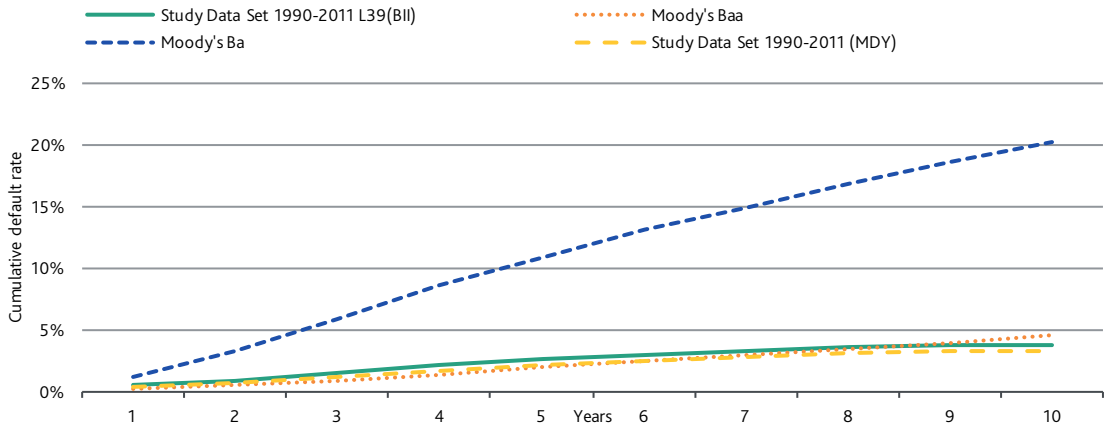
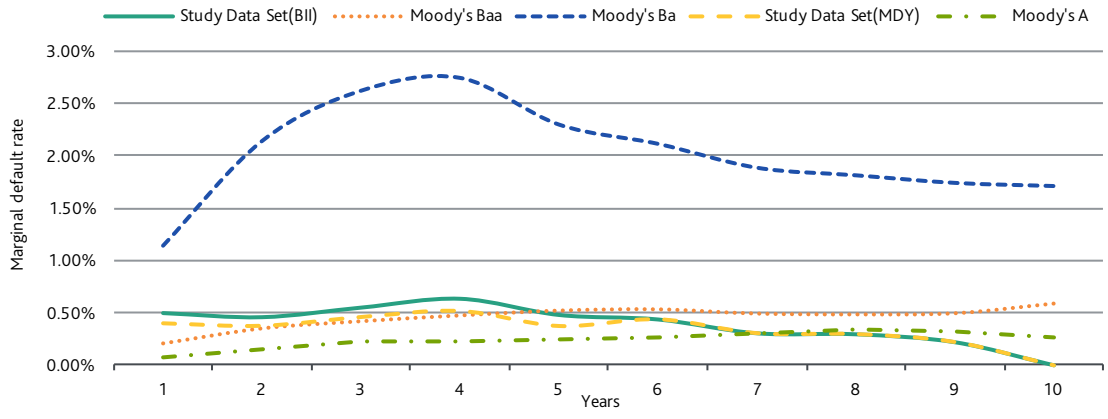


Exhibit H7 charts marginal annual default rates for the PFI/PPP projects identified in the Study Data Set. For comparison purposes, we have included marginal annual default rate data derived from Moody's published research on default and recovery rates for corporate bond and loan issuers rated in the single-A, Baa and Ba rating categories:[24]

EXHIBIT H7

Chart of marginal default rates for PFI/PPP projects



[24] See Moody's Special Comment: "Corporate Default and Recovery Rates, 1920-2011," February 2012

Appendix I: The Impact of Causes of Default on Default and Recovery Experience

In this appendix we examine the impact of causes of default on default and recovery experience.

Data was analyzed to determine the primary cause of default and categorized into the following categories:

1. Defaults primarily due to construction risk:
   Includes defaults caused by construction schedule delays, construction cost overruns, delays in the commencement of operations, failure to complete construction works to achieve minimum acceptance criteria, construction contractor default or non-performance, or the failure or inadequacy of financial or performance supports intended to mitigate construction risk.
2. Defaults primarily due to counterparty credit or performance risk:
   Includes defaults caused by default or non-performance of key counterparty obligors under principal project contracts erg offtake agreement, fuel supply agreement, feedstock supply agreement, maintenance agreement, sponsor support agreement. Excludes construction-related defaults categorized at #1 above.
3. Defaults primarily due to market risk:
   Includes defaults caused by adverse variances in price and volume assumptions e.g. lower than expected output commodity prices; higher than expected input commodity prices; or lower than projected traffic volumes/demand/usage/patronage.
4. Defaults primarily due to operational performance risk:
   Includes defaults caused by weak operational performance, cost overruns or technical problems during the operations phase. For the purpose of this analysis, we also include in this category, defaults arising from reserves risk (e.g. in relation to an oil & gas production project) or resource risk (e.g. in relation to a wind power project).
5. Defaults primarily due to country risk:
   Includes defaults caused by currency transfer or convertibility constraints, local currency devaluation, expropriation, imposition of discriminatory taxation or regulation, contract repudiation by a sovereign entity, political force majeure, or war & civil disturbance.
6. Other causes of default:

Defaults for reasons other than categories 1-5 above.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of analysis within this section has been withheld at the request of the Bank Group.

Appendix J: The Impact of Market Risk on Default and Recovery Experience

In this appendix we examine the impact of the components of market risk on default and recovery experience.

Defaults primarily due to market risk include defaults caused by adverse variances in price and volume assumptions e.g. lower than expected output commodity prices; higher than expected input commodity prices; or lower than projected traffic volumes/demand/usage/patronage.

Defaults due to market risk were further analyzed by Price Risk and Volume/Demand Risk.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of analysis within this section has been withheld at the request of the Bank Group.

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Appendix K: The Impact of Project Size on Default and Recovery Experience

In this appendix we examine the impact of project size on default and recovery experience.

In our analysis, project size has been determined with reference to total senior secured debt plus equity and converted to US Dollars as of the date of the loan origination.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of analysis within this section has been withheld at the request of the Bank Group.

Appendix L: Expected Loss

In this appendix we report on expected losses and expected loss rates.

This Special Comment is an abridged version of a more comprehensive study undertaken on behalf of the Bank Group. Publication of analysis within this section has been withheld at the request of the Bank Group.

Moody's Related Research

Rating Implementation Guidance:

» Moody's Approach to Evaluating Distressed Exchanges, March 2009 (115337)

Special Comments:

» Infrastructure Default and Recovery Rates, 1983-2012H1, December 2012 (146791)

» Lessons from 25 Years of Chapter 22, November 2012 (147863)

» Corporate Default and Recovery Rates, 1920-2011, February 2012 (140015)

» Lessons from 1000 Corporate Defaults, November 2011 (137405)

» Hard Data for Hard Times, July 2010 (126338)

» After Black Swans, Now What?, May 2010 (124964)

» Default and Recovery Rates for Project Finance Debts, 1992-2008, November 2009 (120845)

» Syndicated Bank Loans: 2008 Default Review and 2009 Outlook, March 2009 (115212)

» Determinants of Recovery Rates on Defaulted Bonds and Loans for North American Corporate Issuers, 1983-2003, December 2004 (90593)

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.

Acknowledgement

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