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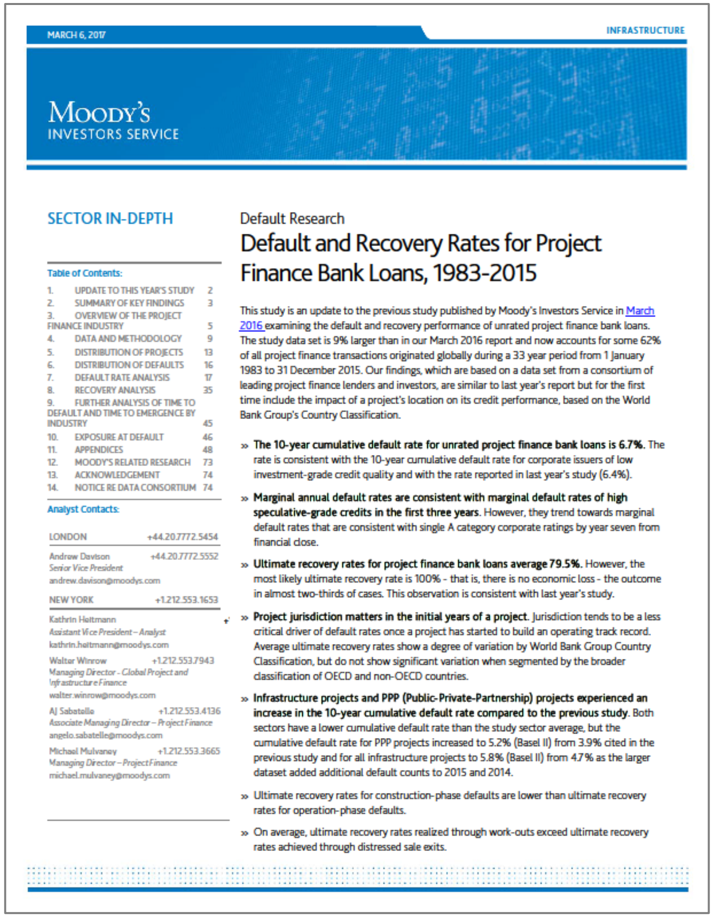
Moody's Infrastructure-relevant Data Sets

ANDREW DAVISON, SENIOR VICE PRESIDENT

10 MAY, 2017

Moody's PF Bank Loan Default and Recovery Study



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SECTOR IN-DEPTH

Default Research

Default and Recovery Rates for Project Finance Bank Loans, 1983-2015

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This study is an update to the previous study published by Moody's Investors Service in March 2016 examining the default and recovery performance of unrated project finance bank loans. The study data set is 9% larger than in our March 2016 report and now accounts for some 62% of all project finance transactions originated globally during a 33 year period from 1 January 1983 to 31 December 2015. Our findings, which are based on a data set from a consortium of leading project finance lenders and investors, are similar to last year's report but for the first time include the impact of a project's location on its credit performance, based on the World Bank Group's Country Classification.

» **The 10-year cumulative default rate for unrated project finance bank loans is 6.7%.** The rate is consistent with the 10-year cumulative default rate for corporate issuers of low investment-grade credit quality and with the rate reported in last year's study (6.4%).

» **Marginal annual default rates are consistent with marginal default rates of high speculative-grade credits in the first three years.** However, they trend towards marginal default rates that are consistent with single A category corporate ratings by year seven from financial close.

» **Ultimate recovery rates for project finance bank loans average 79.5%.** However, the most likely ultimate recovery rate is 100% - that is, there is no economic loss - the outcome in almost two-thirds of cases. This observation is consistent with last year's study.

» **Project jurisdiction matters in the initial years of a project.** Jurisdiction tends to be a less critical driver of default rates once a project has started to build an operating track record. Average ultimate recovery rates show a degree of variation by World Bank Group Country Classification, but do not show significant variation when segmented by the broader classification of OECD and non-OECD countries.

» **Infrastructure projects and PPP (Public-Private-Partnership) projects experienced an increase in the 10-year cumulative default rate compared to the previous study.** Both sectors have a lower cumulative default rate than the study sector average, but the cumulative default rate for PPP projects increased to 5.2% (Basel II) from 3.9% cited in the previous study and for all infrastructure projects to 5.8% (Basel II) from 4.7% as the larger dataset added additional default counts to 2015 and 2014.

» Ultimate recovery rates for construction-phase defaults are lower than ultimate recovery rates for operation-phase defaults.

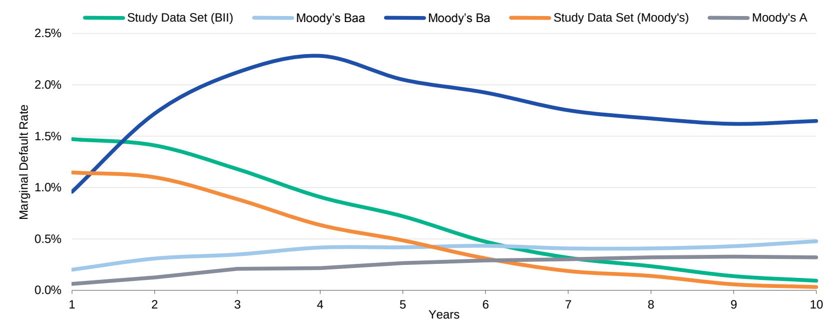
» On average, ultimate recovery rates realized through work-outs exceed ultimate recovery rates achieved through distressed sale exits.

» Moody's latest study of the historical performance of unrated project finance bank loans was published in March 2017

- Now includes 6,389 projects representing 62% of all project finance transactions originated worldwide over the 33-year period 1983-2015
- Provides strategic insight into the behaviour of project finance debt

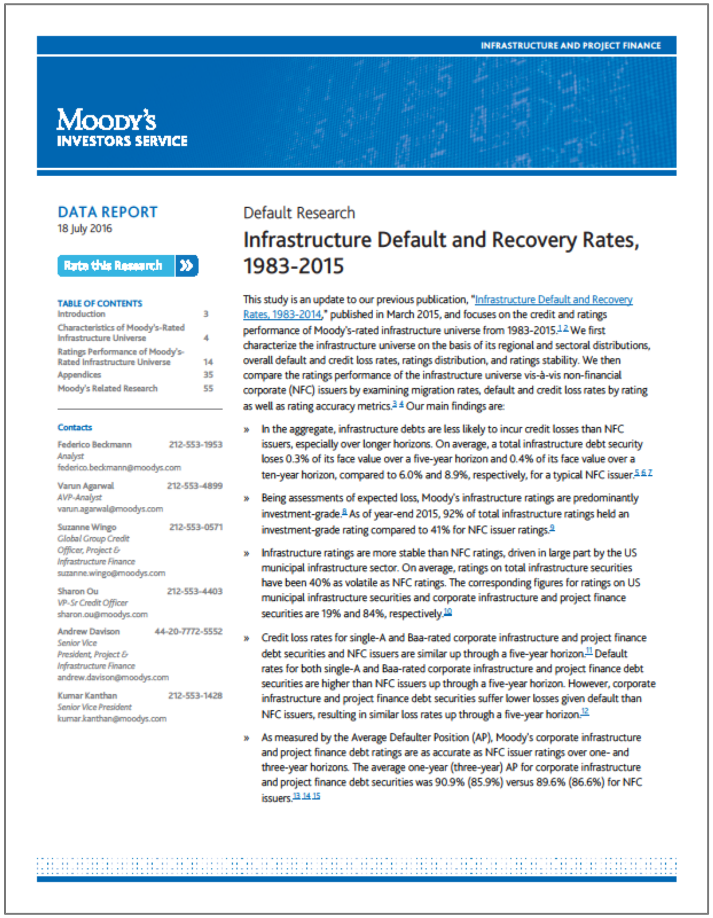
» Key findings include

- Marginal default rates trend towards levels consistent with single-A ratings by year 10 from financial close:



- Ultimate recovery rates are high, averaging 80%.
- Defaults in the Infrastructure industry sector 2009-15 are largely due to demand risk
- Projects face significant incremental risk during the construction phase and/or the commencement and ramp-up of operations.
- Project jurisdiction matters
- PPP projects are a discrete sector with a default rate lower than the Study average, and a slightly higher recovery rate than the Study average

Moody's Infrastructure Default and Recovery Study


INFRASTRUCTURE AND PROJECT FINANCE

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DATA REPORT
18 July 2016

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Default Research

Infrastructure Default and Recovery Rates, 1983-2015

This study is an update to our previous publication, "Infrastructure Default and Recovery Rates, 1983-2014," published in March 2015, and focuses on the credit and ratings performance of Moody's-rated infrastructure universe from 1983-2015.[1,2] We first characterize the infrastructure universe on the basis of its regional and sectoral distributions, overall default and credit loss rates, ratings distribution, and ratings stability. We then compare the ratings performance of the infrastructure universe vis-à-vis non-financial corporate (NFC) issuers by examining migration rates, default and credit loss rates by rating as well as rating accuracy metrics.[3,4] Our main findings are:

» In the aggregate, infrastructure debts are less likely to incur credit losses than NFC issuers, especially over longer horizons. On average, a total infrastructure debt security loses 0.3% of its face value over a five-year horizon and 0.4% of its face value over a ten-year horizon, compared to 6.0% and 8.9%, respectively, for a typical NFC issuer.[5,6,7]

» Being assessments of expected loss, Moody's infrastructure ratings are predominantly investment-grade.[8] As of year-end 2015, 92% of total infrastructure ratings held an investment-grade rating compared to 41% for NFC issuer ratings.[9]

» Infrastructure ratings are more stable than NFC ratings, driven in large part by the US municipal infrastructure sector. On average, ratings on total infrastructure securities have been 40% as volatile as NFC ratings. The corresponding figures for ratings on US municipal infrastructure securities and corporate infrastructure and project finance securities are 19% and 84%, respectively.[10]

» Credit loss rates for single-A and Baa-rated corporate infrastructure and project finance debt securities and NFC issuers are similar up through a five-year horizon.[11] Default rates for both single-A and Baa-rated corporate infrastructure and project finance debt securities are higher than NFC issuers up through a five-year horizon. However, corporate infrastructure and project finance debt securities suffer lower losses given default than NFC issuers, resulting in similar loss rates up through a five-year horizon.[12]

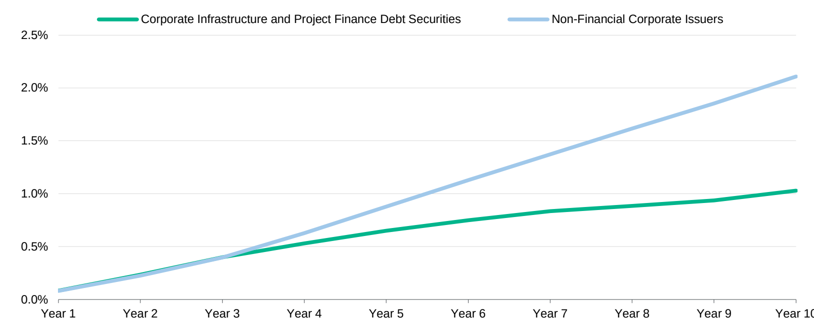
» As measured by the Average Defaulter Position (AP), Moody's corporate infrastructure and project finance debt ratings are as accurate as NFC issuer ratings over one- and three-year horizons. The average one-year (three-year) AP for corporate infrastructure and project finance debt securities was 90.9% (85.9%) versus 89.6% (86.6%) for NFC issuers.[13,14,15]

» In July 2016, Moody's published an updated study of the historical performance of rated infrastructure debts, now covering the 33-year period 1983-2015

» The study focuses on the comparison of corporate infrastructure (i.e. excluding municipal infrastructure) vs non-financial corporates

- Infrastructure ratings are more stable than those of non-financial corporates
- Credit loss rates for infrastructure debts are lower over the medium/long term compared with like-rated non-financial corporates

Baa Credit Loss Rates:



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