

Operational Risk Assessments

Berkadia Commercial Mortgage, LLC

May 2018

Operational Classifications:	Commercial Mortgage Primary, Master and Special Servicer
Rankings:	Primary Servicer: MOR CS1 (Affirmed) Master Servicer: MOR CS1 (Affirmed) Special Servicer: MOR CS3 (Affirmed)
Forecast:	Primary Servicer: Stable Master Servicer: Negative Special Servicer: Stable
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Rationale

Morningstar Credit Ratings, LLC affirmed its MOR CS1 commercial mortgage primary-servicer and master-servicer rankings and affirmed its MOR CS3 commercial mortgage special-servicer ranking for Berkadia Commercial Mortgage, LLC. Morningstar also revised the forecast to Negative from Stable for the master-servicer ranking.

Morningstar affirmed the rankings based on the following factors:

Primary and Master Servicing

- **Technology Platform:** During 2017, Berkadia focused on an aggressive and broad-reaching technology initiative to boost operating efficiency and response levels. In addition, its annual Service Organization Control 2 Type II audit verifies consistent adherence to prescribed information-technology controls.
- **Offshore Facility:** India-based Berkadia Services India Pvt. Ltd., which has been in operation for over 15 years, is the longest-serving offshore facility in India among commercial-mortgage servicers and is capable of handling complex servicing functions.
- **Workload Capacity:** Berkadia effectively monitors BSIPL staffing to offset any operational issues related to attrition. Morningstar continues to monitor Berkadia's workload and attrition rates as the company leverages BSIPL staff for servicing tasks.
- **Management and Professional Depth:** Although Berkadia incurred some senior management turnover because of retirements, resignations, and organizational retooling during the past year, it continues to have a highly experienced management team, including some new hires, and a professional staff. Senior managers average nearly 32 years of industry experience and roughly 20 years' tenure with the company. The position of site director overseeing operations at BSIPL has seen the departure of an individual with over 20 years of relevant experience. However, currently leading the Hyderabad platform is a four-person senior council.
- **Investor-Reporting Expertise:** Berkadia strives to be responsive to information requests and is capable of accurate and timely reporting. BSIPL employees perform quality checks on investor-reporting functions to ensure accuracy.

- Audit Program: Berkadia's independent internal-audit function includes ongoing examinations of loan-administration and portfolio-management processes, supplemented with performance-monitoring activities embedded in the company's daily workflow practices. The latest audit results were satisfactory.
- Insurance Administration and Monitoring of Collateral Performance: Berkadia uses CertInView, its comprehensive insurance-tracking tool to monitor insurance coverage and administer insurance compliance. Berkadia's portfolio-management, surveillance, and special-requests teams demonstrate best practices by monitoring the watchlist for asset-level collateral performance, loan covenant compliance, and borrower requests. The special-requests team also reunderwrites certain complex requests.
- Master-Servicing Expertise: The affirmed master-servicer ranking considers Berkadia's investor-reporting expertise and demonstrated capabilities to effectively meet the complex requirements of commercial mortgage-backed securities transactions.

Special Servicing

- Staffing: Berkadia has adequate staffing resources, controlled and proactive loan-recovery procedures, effective technology, and generally favorable asset-resolution results albeit for a modest level of activity predominantly consisting of smaller-balance loans.
- Operational Scale: The special-servicer ranking reflects Berkadia's modest operational scale combined with its reduced volume of active and resolved assets during the past few years. Notwithstanding, Berkadia has an experienced senior level asset manager and other available personnel, along with solid control practices, technology, and reporting capabilities. While Berkadia's operating position is sufficient for and commensurate with its lower workflow (and exposure as a special servicer), it does limit our ability to assess asset-recovery performance in absolute terms and on a comparative basis with other, higher-volume special servicers.

As of Dec. 31, 2017, Berkadia's total primary-servicing and master-servicing portfolio consisted of 16,769 loans with an aggregate unpaid principal balance of \$205.91 billion. Berkadia was the primary and/or master servicer for 3,361 CMBS loans (including 1,547 loans from Freddie Mac K-Deals), and two loans from commercial real estate collateralized debt obligations. CMBS and CRE-CDO loans accounted for approximately 19.9% of Berkadia's total servicing portfolio based on UPB and 20.6% based on loan count.

At year-end 2017, Berkadia was the named special servicer on 16 CMBS transactions comprising 632 loans with a combined UPB of \$1.2 billion. Its total active special-servicing portfolio consisted of 15 loans involving 10 properties and one real estate owned asset with a combined UPB of \$71.7 million.

Forecast

The forecast is Stable for the primary-servicer and special-servicer rankings. Morningstar expects Berkadia to continue serving as an effective primary servicer and acceptable special servicer for CMBS and other third-party investors.

The forecast is Negative for the master-servicer ranking. The revised forecast for the master-servicer ranking reflects the company's much reduced master-servicing portfolio involving loans with subservicers, a core aspect of a master-servicer assessment, and anticipated further runoff. Berkadia has adjusted its subservicer auditing to match the easing level of required oversight.

Table of Contents	Page
Company Profile and Business Overview	4
Organizational Structure	5
Management and Staff Experience	6
Training	9
Audit, Compliance, and Procedural Completeness	10
Legal Liability and Corporate Insurance	10
Technology and Disaster Recovery	11
Primary- and Master-Servicing Portfolio Administration	12
Payment Processing	14
Real Estate Tax and Insurance Administration	15
Capital-Expenditure Reserve Management	16
Investor Reporting and Accounting	16
CMBS Advancing and Nonrecoverability Analysis	16
Financial-Statement Analysis and Property Inspections	17
Master Servicing: Subservicer Auditing and Compliance	19
Borrower Consents and Requests	20
Special Servicing Administration	20
Asset-Review Process	21
REO Property Management	21
Vendor Oversight	22
Managing Conflicts of Interest	22
Asset Resolution and Recovery Performance	23
Investor and Master Servicer Reporting	24
Appendix: Overview of Berkadia Services India Private Limited (BSIPL)	25
Operations Profile	25
Operational Infrastructure	26
Portfolio Management	29
Ranking Definitions	30
Disclaimer	30

Company Profile and Business Overview

Berkadia Commercial Mortgage, LLC, a commercial real estate finance company formed in August 2009, is a joint venture between Berkshire Hathaway Inc. and Leucadia National Corp. It operates across multiple business lines including investment sales, mortgage banking, and loan servicing. The company serves as a master, primary, and/or special servicer for commercial mortgage loans originated internally and through certain third-party production sources. In 2017, CMO Asia named Berkadia BPO organization of the year for the third-consecutive year.

The company's core primary- and master-servicing focus is on third-party fee-for-service assignments including CMBS transactions. In addition to its commercial mortgage-backed securities business, Berkadia's investor clients include government-sponsored agencies (Fannie Mae, Freddie Mac, and FHA/Ginnie Mae), the U.S. Department of Housing and Urban Development, financial institutions, life-insurance companies, and third-party investors. It also services a commercial-mortgage loan portfolio held on its balance sheet and commercial-mortgage loan portfolios for other balance-sheet lenders. The company's business model focuses on providing customized and flexible servicing solutions through its "Servicer's Servicer Model" as well as general primary and master servicing.

Berkadia has seven servicing locations: Ambler, Pennsylvania; New York City; Midvale, Utah; Tempe, Arizona; St. Louis; Irvine, California; and Hyderabad, India. Its special-servicing operations are conducted in Ambler and Irvine. Berkadia originates loans for Freddie Mac, Fannie Mae, HUD, insurance companies, financial institutions, conduits, its proprietary lending program, and other correspondents at its 58 production and investment sales offices in the United States.

Table 1 – Total Primary-Servicing and Master-Servicing Portfolio by Investor/Assignment Type

	Dec. 31, 2017		Dec. 31, 2016		Dec. 31, 2015	
	UPB (\$Mil)	Loans	UPB (\$Mil)	Loans	UPB (\$Mil)	Loans
CMBS Primary Only	4,186.9	325	3,484.0	346	3,917.1	418
CMBS Primary/Master Combined	8,931.6	1,397	15,338.7	2,240	28,108.0	3,590
CMBS Master Only	725.4	92	2,891.7	244	4,531.2	400
Freddie Mac CME/K Deals	27,187.4	1,547	24,178.7	1,300	15,056.1	882
Total CMBS Primary and Master	41,031.3	3,361	45,893.0	4,130	51,612.4	5,290
Fannie Mae	22,696.5	1,405	16,249.6	1,136	13,161.3	947
FHA/Ginnie Mae	9,458.7	1,488	8,766.3	1,507	8,442.0	1,575
Freddie Mac (nonsecuritized)	6,086.1	410	6,201.5	556	6,406.9	720
Total Agency	38,241.3	3,303	31,217.4	3,199	28,010.1	3,242
Fee for Service	110,108.2	8,506	124,444.4	8,922	122,208.2	9,498
Correspondent Life Companies	12,987.7	1,386	11,632.7	1,379	10,245.4	1,430
Warehoused	1,981.0	154	1,308.9	128	6,330.8	188
Banks/Financial Institutions	1,522.6	57	2,514.2	91	1,250.8	82
CRE-CDO	39.8	2	60.5	3	126.0	6
Subtotal	126,639.3	10,105	139,960.8	10,523	140,161.2	11,204
Total Primary Volume	205,186.5	16,677	214,179.5	17,608	215,252.4	19,336
Total Primary and Master Volume	205,911.9	16,769	217,071.2	17,852	219,783.7	19,736

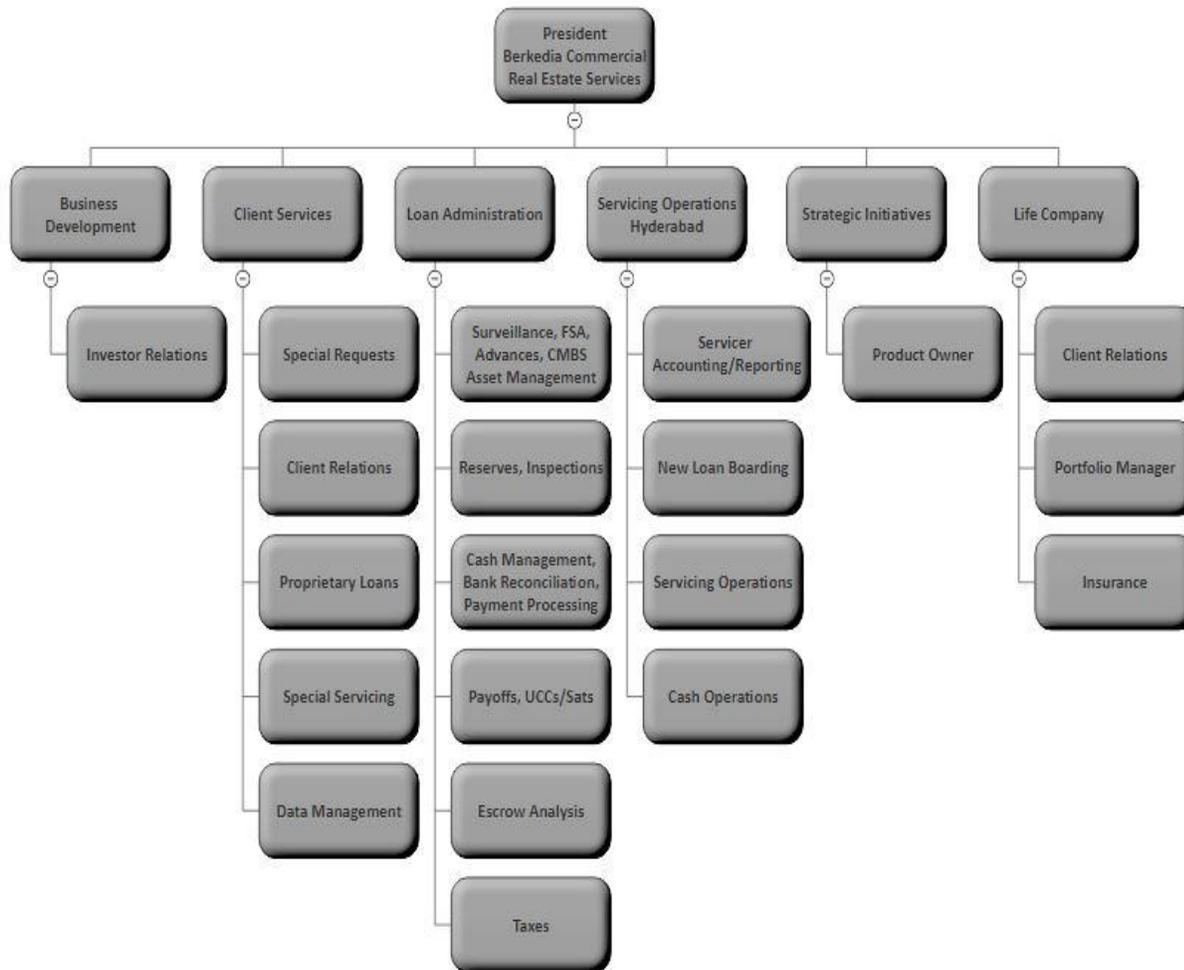
Operational Infrastructure

Organizational Structure

Berkadia is a commercial real estate services company with multiple lines of business, including commercial-loan servicing, mortgage banking, and investment sales. While the company essentially operates as an integrated line of business, the focus of this report is its loan-servicing platform. This sections' organizational structure combines product specific client relations managers, who are responsible for borrower and investor contact, with subject-matter experts. The company further aligns specific tasks by product type where appropriate. For more than 15 years, the company has maintained the India-based BSIPL, which focuses on core servicing functions. BSIPL also provides borrower request and consent support as volumes dictate. Berkadia uses vendors in the U.S. to assist with Uniform Commercial Code renewals, property inspections, and tax services.

Berkadia aligns its organizational structure by business line and function. The executive vice president, who is also the head of servicing, oversees human relations and facilities and manages the servicing platform detailed below:

Chart 1 – Organizational Structure



Management and Staff Experience

Experience levels among professional staff, portfolio-management staff, and middle and senior management remain strong. After transferring its CMBS special-servicing portfolio to KeyBank in July 2013, Berkadia moved its special-servicing function to reside within the consolidated servicing platform.

Table 2 – Average Years of Experience (U.S. Operation)

	Dec. 31, 2017		Dec. 31, 2016		Dec. 31, 2015	
	Industry	Tenure at Company	Industry	Tenure at Company	Industry	Tenure at Company
Primary/Master Servicing						
Senior Management	32	20	31	20	30	19
Middle Management	23	15	24	15	23	14
Staff	20	13	18	12	18	11
Portfolio-Management Staff Only*	16	11	19	12	16	9
Special Servicing						
Senior Management	N/A	N/A	N/A	N/A	N/A	N/A
Middle Management	28	20	24	17	28	17
Professional Staff	23	14	25	14	22	13
Asset Managers	21	14	26	18	23	17

Management and Staff Turnover (U.S. Operation)

For the year ended Dec. 31, 2017, the primary/master servicing turnover rate was 13.7% (including six management positions), which is down from the prior year and generally in line with other large-volume servicers. Special servicing experienced one departure in 2017.

Table 3 – Primary and Master Servicing - Employee Turnover Rates

	2017				2016			
	U.S. Personnel (#)	Rate (%)	Offshore Personnel (#)	Rate (%)	U.S. Personnel (#)	Rate (%)	Offshore Personnel (#)	Rate (%)
Employees - Beginning of Period	182		450		205		509	
Voluntary Management Departures	4	2.2	1	0.2	1	0.5	1	0.2
Involuntary Management Departures	2	1.1	0	0.0	1	0.5	0	0.0
Total Management Departures	6	3.3	1	0.2	2	1.0	1	0.2
Voluntary Staff Departures	16	8.8	30	6.6	11	5.3	83	16.3
Involuntary Staff Departures	3	1.6	34	7.6	18	8.8	4	0.8
Total Staff Departures	19	10.4	64	14.2	29	14.1	87	17.1
Total Turnover	25	13.7	65	14.4	31	15.1	88	17.3
Turnover Net of Intracompany Transfers	22	12.1	49	10.9	26	12.7	72	14.1
New Management Hires	1		0		0		0	
New Staff Hires	14		53		8		29	
Total New Hires	15		53		8		29	
Employees – End of Period	172		438		182		450	
Total U.S. and Offshore Employees - End of Period	610				632			

Staffing and Workload Ratios

The India-based personnel represent employees who work solely for Berkadia through its subsidiary BSIPL. As of Dec. 31, 2017, Berkadia did not use any vendor-provided personnel to supplement its staffing.

Primary/Master Servicing:

Morningstar calculated that Berkadia had a 97/1 ratio of loans per U.S. employee for its primary/master-servicing portfolio as of Dec. 31, 2017, nearly unchanged from the 98/1 ratio at year-end 2016. When including its India-based staff, the ratio dropped to 27/1 as of Dec. 31, 2017, also almost unchanged from the 28/1 as of Dec. 31, 2016. In Morningstar's view, the U.S.-based staffing ratio is considerably higher compared with that of some other servicers because of the India operation. However, the overall ratio may be closer to, or perhaps slightly below, the industry average.

Special Servicing:

Morningstar calculated that Berkadia's assets-to-asset manager ratio was 5/1 as of Dec. 31, 2017, unchanged from Dec. 31, 2016. This represents three employees (two asset managers and one administrator) actively working on the special-servicing portfolio. There are three

additional employees assigned to the special-requests group who focus primarily on assumptions and borrower-initiated requests. Berkadia has had modest special-servicing activity since it transferred its legacy CMBS portfolio to KeyBank in July 2013. As the special-servicing division had two asset managers (and four administrators to assist with asset management) as of Dec. 31, 2017, Morningstar believes the team could absorb additional caseload should market conditions change.

Assessment: Berkadia's organizational structure is unique compared with other servicers Morningstar reviews because it uses its offshore platform for its own business needs as well as for third parties. Because its offshore platform represents nearly 72% of its servicing operation headcount, the company uses economies of scale to efficiently provide specialized servicing functions for other servicers, as well as to address complex servicing-portfolio requirements within primary and master servicing as a whole.

Although Berkadia incurred some senior management turnover because of retirements, resignations, and organizational retooling during the past year, it has a highly experienced management team including some new hires.

Berkadia's workload is in line with other high-volume servicers and reflects the company's ability to maximize efficiencies through its BSIPL personnel. Refer to the Appendix for additional information about the extent to which Berkadia uses BSIPL for tasks related to loan administration, portfolio management, and reporting functions. Within special servicing, the company has excess capacity corresponding to its much-reduced special-servicing volume as a result of the transfer of its legacy CMBS portfolio to KeyBank.

Training

Berkadia provides formalized training activities for its servicing personnel. The company's corporate trainer works in conjunction with human resources and business groups in the U.S. and India to develop formal training programs. Berkadia University and the training group collaborate with external vendors, which include the Harvard Business School for Leadership as well as MBA and CRE industry programs providers. Personnel have access to the training program via the intranet-based Berkadia University to register for classes and track completed training hours. Berkadia requires servicing employees to complete at least 45 hours of training per year. As of Dec. 31, 2017, employees completed an average of 67 hours of training, well above the industry average, and the company had 115 employees enrolled in the Mortgage Bankers Association's Commercial Mortgage Servicing programs. In addition to industry-focused training, Berkadia invests significant training resources for offshore personnel, covering its servicing process groups and cross training across a range of functions. In addition, U.S.-based subject-matter experts, many of whom directly manage complex products and assets, provide live training with case studies, and provide quality assurance and guidance to offshore staff, for employee development and process improvement. Additionally, Berkadia has implemented a Relentless Employee Development program across the platform, which embodies the company's commitment to continual growth and development. The program fosters a learning culture that embraces forward-looking development through feedback, coaching, and related skills. Training programs and workshops help boost competence in these areas, with managers and work opportunities further supporting these initiatives.

Assessment: Berkadia has an effective training function based on its dedicated personnel and other resources, well-developed curriculum, and high degree of employee participation. (Please refer to the Appendix for our assessment of training within BSIPL.) Actual training hours that Berkadia employees complete are high compared with many other servicers.

Audit, Compliance, and Procedural Completeness

The independent risk, compliance, and control unit manages the company's documented policies and procedures and coordinates all auditing activities within Berkadia. It submits an annual plan to the audit committee (which reports to the board of managers) for approval. The company reported that it tracks any material control weaknesses or significant control deficiencies, and the progress of the corresponding remediation plans, and reports them to the audit committee.

The servicer undergoes several operational audits each year. Berkadia annually undergoes platformwide Uniform Single Attestation Program and Regulation AB attestations, which have cited no exceptions. Berkadia's most recent SOC 1 audit, which an external auditor conducted to test the effectiveness of operational controls for the period from October 2016 through September 2017, cited no exceptions. The company also underwent a SOC 2 audit, which covers security, confidentiality, processing integrity, and availability of technology, for the same period, with no exceptions. The company's internal-audit unit conducts operational audits throughout the year. The objective of the most recent internal-audit report, dated June 28, 2017, was to identify the servicing advance risk environment through a risk assessment, a review of financial and operational information, and ascertaining the effectiveness and efficiency of controls. The report assigned Berkadia an overall "2" out of "5" rating, which indicated that the company had a "satisfactory controls environment."

Berkadia supplements audits with an automated daily dashboard and metrics reporting process to ensure that each group and individual analyst delivers timely and accurate work against established performance standards. Performance metrics reports note any exceptions related to problems with procedures or applications, which management monitors for prompt resolution. The company's transformation team is heavily involved in helping management use the dashboards, diagnose issues, and oversee operational quality. The team employs one master Six Sigma Black Belt, two Black Belts, three Green Belts, and one project manager responsible for identifying and implementing ways to improve operational efficiency. (For quality-control measures in BSIPL please see the Appendix.)

Assessment: Berkadia undergoes frequent, detailed audits by external parties and by an independent internal-audit department that reports to an audit committee and ultimately to the board of managers. Berkadia has significant dedicated resources and initiatives to reduce operational risks by improving processes, reducing errors, and testing security access protocols through its SOC 2 audit. Berkadia's internal-audit function is effective when considering the platformwide Regulation AB examination and its self-administered compliance and performance metrics tracking process.

Legal Liability and Corporate Insurance

Berkadia noted that it or its affiliates are occasionally parties to lawsuits and other legal proceedings that, individually or in the aggregate, should not have a material adverse effect on its business or its ability to serve as a servicer. The servicer reported that it has directors and officers, errors and omissions, and mortgage impairment insurance coverage. As a servicer or special servicer, the company reported that it had not received notices of Pooling and Servicing Agreement default.

Assessment: The company's fidelity bond and E&O coverage amounts meet the insurance minimum set forth by the Fannie Mae DUS seller/servicer guidelines. Based on Berkadia's representations, Morningstar is not aware of any legal proceedings that would negatively affect the servicer's operations.

Technology and Disaster Recovery

Berkadia uses McCracken Financial Solutions' Strategy servicing system (version 17.6) via a remote-hosted application service provider. Strategy, widely used in the commercial mortgage servicing industry, provides loan-level transaction processing and accounting for the serviced portfolio. The Strategy software is integrated with the company's general ledger accounting system but not with its loan-origination system. In addition to Strategy, Berkadia operates with a variety of supplemental systems designed for specific purposes. These include the following:

Enterprise Productivity Management Suite: EPM is a proprietary document-imaging system that Berkadia uses. The system creates loan documents as images and makes them available to Berkadia staff for viewing, faxing, and printing.

SmartView: A combination of Servicing Data Warehouse and IBM Cognos Business Intelligence tools, SmartView has over 2,000 customized operational and management reports including many scheduled reports to both internal and external users.

SMARTTrack 2.0: Leveraging the integration of the Salesforce platform, McCracken and EDM, the Client Relations, Operations and Cash teams developed and implemented processes to track tasks, process requests and refer inquiries to other teams.

CertInView: Berkadia's industry-leading proprietary insurance compliance monitoring tool, CertInView, allows the company's insurance specialists to input and manage investor-specific insurance requirements at the loan, property, and building levels.

Investor Query: IQ provides investors, rating agencies, and other interested parties with reports, documents, data, and general information pertaining to Berkadia's CMBS transactions.

LoanView: This borrower website provides access to loan-level information, related documents, electronic billing, online bill pay, and alert functionality.

InvestorView: This website gives investors and fee-for-service clients access portfolio and loan-level information and documents.

LiveHelp: This customer-service tool is designed to enhance borrower communication, allowing users to "chat" with client service representatives in real time while viewing their loan information, documents, and/or transaction histories.

RIMS: CMBS deal/portfolio information is used to maintain all deal-related information.

Be Berkadia: An intranet-based platform, Be Berkadia provides employees with access to information about the company and its businesses, including policies and procedures, employee benefits, and other human resources related matters, and Berkadia University, the company's in-house training and development department.

Asset Surveillance: This web-based strategy tool is used for the collection, management, and review of operating statement, rent roll, and inspection information.

IRDDDB: Used to store CMBS investor information, IRDDDB is Berkadia's investor reporting deal database.

AIMS: Berkadia's proprietary asset-management system AIMS supports CMBS special-servicer reporting and accounting, provides asset and property-level analysis for large, complex assets, and addresses a variety of investor requirements.

Over the course of 2017, Berkadia technical staff have been pursuing an aggressive and broad-reaching technology initiative to boost operating efficiency and response levels. The project is led by its chief innovation officer who is also the senior vice president of strategic initiatives.

Berkadia conducts a business-recovery test every six months and a disaster-recovery test annually. The last full test was successfully completed in December 2017. Although Berkadia’s alternate site for data and business recovery is only 18 miles away from its primary site, both data centers employ backup power services. Berkadia replicates Strategy system data on a real-time mirrored basis to alternate servers at the company’s backup and recovery sites. Berkadia’s disaster-recovery capabilities enable it to restore core servicing processes within 24 hours. Certain employees also have laptops, so they may perform tasks remotely. The company provides employees with a mobile application for communication in the event of a major business disruption. An additional office in Pune, India, serves as the disaster-recovery site for BSIPL. The hot site has 105 dedicated seats and 26 laptop stations with a maximum of 131 seats per shift, eliminating dependence on a third-party vendor. BSIPL undergoes annual disaster-recovery testing, as referenced in the Appendix.

Assessment: Berkadia has dedicated significant resources for its technology platform. Its servicing system and various supplementary system components also benefit from ongoing development and maintenance efforts. Berkadia’s IT platform enables proactive loan- and portfolio-level management. In addition, AIMS acceptably supports special-servicer asset tracking, analysis, and reporting to address CMBS and other investor requirements. Having backup power services for the data centers mitigates some of the proximity risk, although a greater distance would be preferable.

Primary- and Master-Servicing Portfolio Administration

Chart 2 – Total Servicing by State (# of Properties)*

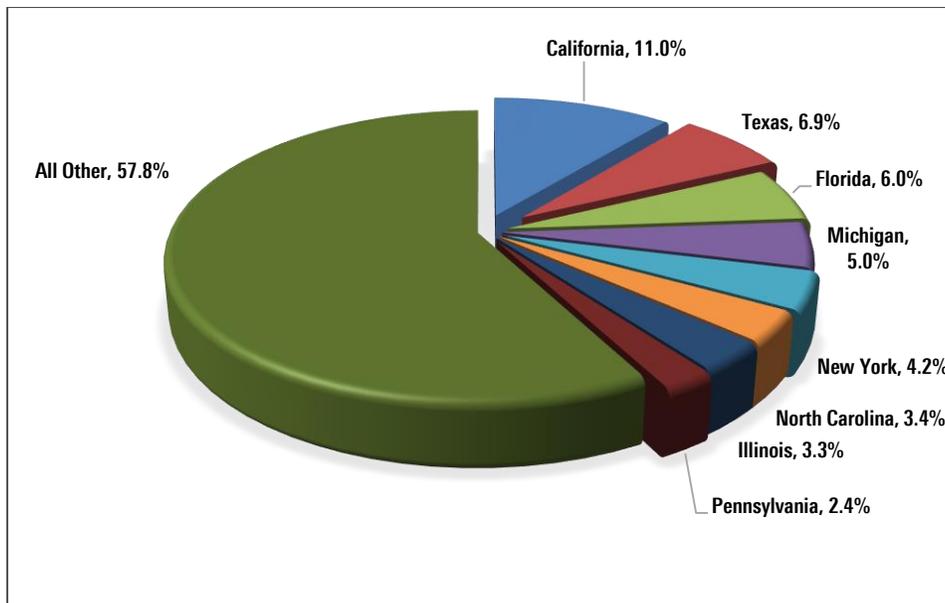


Chart 3 – Total Servicing by Investor Type (UPB)*

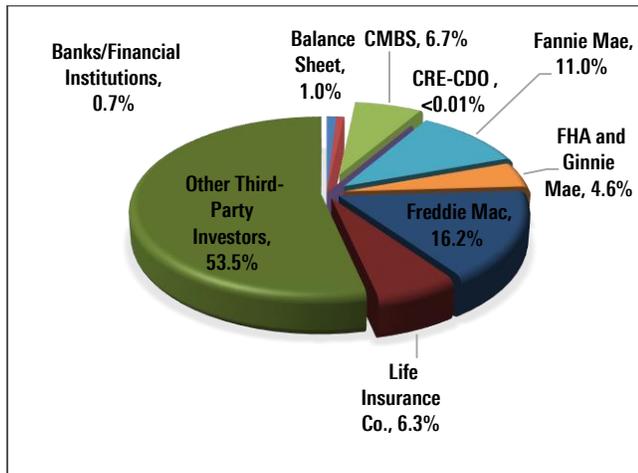
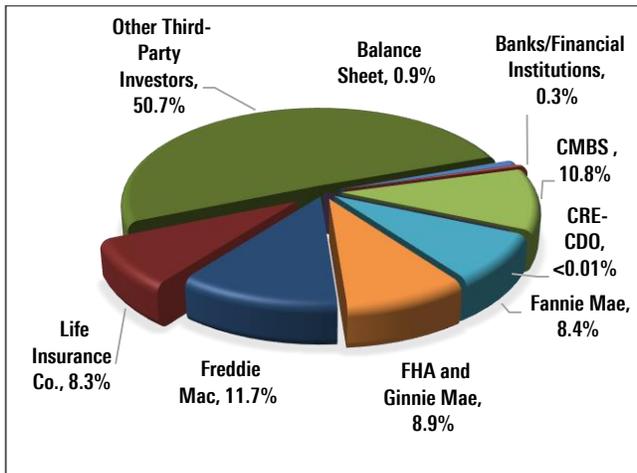


Chart 4 – Total Servicing by Investor Type (# of Loans)*



*As of Dec. 31, 2017. May not total 100% because the figures are rounded.

Table 4 – Total Primary- and Master-Servicing Volume Percentages by Property Type (as of Dec. 31, 2017)

Property Type	UPB (\$Mil)	% (UPB)	Loans	% Loans	Average Size (\$Mil)
Multifamily	93,352.5	45.3	7,200	42.9	13.0
Retail	32,050.6	15.6	1,743	10.4	18.4
Office	31,735.2	15.4	886	5.3	35.8
Mixed Use	8,791.4	4.3	318	1.9	27.6
Industrial	7,900.7	3.8	487	2.9	16.2
Healthcare	6,889.1	3.3	563	3.4	12.2
Lodging	6,411.2	3.1	216	1.3	29.7
Mobile Home Park	3,139.8	1.5	236	1.4	13.3
Self Storage	1,728.8	0.8	209	1.2	8.3
Land	482.5	0.2	10	0.1	48.3
Other	13,430.1	6.5	4,901	29.2	2.7
Total	205,911.9	100.0	16,769	100.0	12.3

Loan Boarding, Hedge Agreements, Letters of Credit, and UCC

During 2017, Berkadia boarded approximately \$39.27 billion of new loan balances, consisting of roughly 2,180 primary (or primary/master combined) serviced loans. No master-serviced-only loans were boarded during the year. Approximately 52% of all new loans boarded in 2017 came from Berkadia’s own loan-origination and production channels.

In 2017, Berkadia averaged six days to board new loans with data necessary to conduct payment processing and investor reporting. During the boarding phase, the company creates and then centrally maintains summaries of deal-specific critical servicing and related PSA requirements. The company's loan-origination application is not interfaced with its servicing system. Loan-boarding procedures require staff to compare system inputs with source data and include a secondary level of review. The servicing system provides exception reporting for timeliness and accuracy and issues borrower welcome letters with compliance requirements within five days of closing. It also tracks borrower compliance items, covenant triggers, and missing documents, although some supplemental applications also support these tasks. Berkadia reported that as of year-end 2017, none of the new loans boarded during the year had incomplete or missing file documentation.

Loan Modification Reboarding Activity

The company's practices address the timely and accurate reboarding of loan modifications received from external special servicers. The servicer reported that, at an average of 12 days, modification boarding turnaround times decreased over the course of 2017 from an average of 13 days in 2016.

Berkadia services some loans with interest-rate-cap agreements. It also services loans with letters of credit as supporting collateral, which are stored on-site in a fire-proof safe. It centrally tracks counterparty ratings and LOC expirations. It reported that all LOCs expiring during 2017 were successfully renewed. BSIPL staff use the servicing system to track UCC filing expiration dates, and Berkadia uses a third-party vendor to file and track UCC continuation statements. Berkadia reported no lapsed UCCs occurred during 2017, and, as a master servicer, it monitors UCC filing compliance through quarterly reports that its subservicers submit.

Assessment: Berkadia's loan-boarding practices are efficient and controlled. The company's stated practice of boarding new loans within 10 days of closing and averaging six days is consistent with the industry average. Overall, the servicer's procedures thoroughly address reboarding loan-modification functions. Moreover, Berkadia has sound practices for hedge agreements, LOCs, and UCC filings.

Payment Processing

Berkadia stated that, as of Dec. 31, 2017, it received, deposited, and system posted electronically (via a lockbox, wire, or an automated clearing house) nearly 100% of loan payments, including subservicer remittances. Payments are first deposited to a central clearing account and then automatically swept to investor custodial accounts, unless flagged as a suspense item. The lockbox interfaces with the servicing system. Payment posting, depositing, and system balancing tasks are segregated among the staff. The servicing system reconciles payment receipts daily for management's review. Berkadia routinely validates rate indexes, and it maintains current balances and paid-to dates of subserviced loans on its servicing systems.

As of Dec. 31, 2017, Berkadia did not report any unreconciled items older than two days in its clearing account, or any non-special-servicing-related suspense items older than 60 days. As of Dec. 31, 2017, the servicer held 664 items in suspense (\$175.9 million) in connection with specially serviced loans pending directions or resolution from the corresponding external special servicers. This compares with 1,080 suspense items (approximately \$434.0 million) associated with specially serviced loans as of year-end 2016. We recognize that special-servicer-related suspense balances are not in the direct control of a primary servicer to resolve.

Table 5 – Primary-Servicing Floating-Rate and Cash-Managed Loans

	<u>Dec. 31, 2017</u>		<u>Dec. 31, 2016</u>		<u>Dec. 31, 2015</u>	
	UPB (\$Mil)	Loans (#)	UPB (\$Mil)	Loans (#)	UPB (\$Mil)	Loans (#)
Floating-Rate Loans	34,721.5	2,452	33,033.4	2,603	28,628.4	2,704
Component of Primary Servicing (%)	16.92	14.6	15.4	14.8	13.3	14
Cash-Managed Loans	19,127.7	568	22,087.3	733	26,720.9	937
Component of Primary Servicing (%)	9.3	3.4	10.3	4.2	12.4	4.8

Assessment: Berkadia has strong controls over payment processing as demonstrated by its clear Regulation AB attestations and internal audits and the lack of any aged suspense items for non-special servicing-related matters. It has highly automated payment-processing functions. The company had fewer loans with lockbox accounts and fewer floating-rate loans over the past year.

Real Estate Tax and Insurance Administration

As of Dec. 31, 2017, approximately 52% of all primary serviced loans were escrowed for real estate taxes, compared with roughly 54% as of year-end 2016. During 2017, Berkadia incurred negligible nonreimbursable tax penalties. Tax payments generally are remitted within early-pay discount periods. The servicing system tracks tax payment due dates and the payment status for all loans, whether escrowed or not. A tax service tracks and remits payments to tax authorities for escrowed loans and reports unpaid taxes on nonescrowed loans. For nonescrowed loans, Berkadia sends a delinquent tax notice to the borrower and tracks the delinquent tax until paid. The servicing system does not automatically generate tax notices. As a master servicer, Berkadia reviews tax payment exception reports from subservicers quarterly.

Berkadia administers insurance in house and uses external insurance consultants to assist with policy reviews on the front end. Berkadia tracks insurance requirements at the loan, portfolio, property, building and policy levels via CertInView. The tool tracks compliance on a requirement level, issues letters for expiration and noncompliance, and feeds the company's data warehouse, providing customized reporting. Berkadia stated that it automatically issues its first policy renewal reminder notice to borrowers at 60 days before expiration, and again at 30 days before expiration. The company reviews insurance-carrier ratings prior to renewal for compliance, and it reported that as of Dec. 31, 2017, 45 loans were on its forced-placed policy, which automatically provides for 120 days of retroactive coverage. The forced-placed policy is through Great American Insurance Co., which has an A.M. Best financial strength rating of A+. The company also reviews insurance exception reports from its subservicers annually.

Assessment: Berkadia's tax and insurance administration practices are highly controlled, as shown by its low incidence of tax penalties and the degree to which it facilitates the insurance-renewal process, and its extensive insurance coverage via CertInView. Its forced-placed policy's automatic retroactive coverage provision is sound. As a master servicer, Berkadia follows standard industry practices by reviewing quarterly tax and annual insurance payment exception reports from its subservicers.

Capital-Expenditure Reserve Management

Portfolio managers work with account managers to review expenditure requests and release funds escrowed in capital-reserve accounts. The company uses the servicing system to manage workflows, track reserve funds, record disbursements, and reanalyze accounts. Prior to disbursement, management must approve all reserve-account disbursement requests. Berkadia's reserve-account management may also involve interest-reserve analysis and funding on construction and/or tenant build-out projects. Larger capital improvement/tenant build-out projects may require lien waivers and periodic inspections to verify the progress or completion of the work.

Assessment: Berkadia has sound oversight controls for capital expenditure funding requests and reserve-account management with experience involving a range of property types and complex loan structures.

Investor Reporting and Accounting

Berkadia produces the most current version of the Commercial Real Estate Finance Council investor-reporting package for all CMBS assets through its servicing system. The servicing system includes an investor-reporting module linked to a proprietary application to generate the CMBS investor-reporting package. Management must approve investor remittance and reporting tasks, and the company tracks custodial banks' credit ratings for servicing-agreement compliance. The company segregates investor-report preparation, investor remittance, and account reconciliation tasks. It also requires a secondary level of review and sign off for custodial-account reconciliations. Employees have online access to custodial-account activity, and investor reporting and custodial bank account reconciliation processes are largely automated. Berkadia reconciles bank-account activity daily, with more formal reconciliations performed each month-end. For 2017, the company reported no unidentified items in custodial accounts older than 60 days. As a master servicer, Berkadia reconciles subservicer remittances to trustee remittance reports monthly. Subservicers submit a monthly projected remittance report for Berkadia's review.

The company reported that it complies fully with SEC Rule 17g-5 related to sharing deal information with nationally recognized statistical rating organizations. Berkadia handles communications related to transactions affected by Rule 17g-5 through a dedicated email address, with the response channeled through the 17g-5 information provider identified in the applicable PSA. The Berkadia portfolio-surveillance team serves as liaison between Berkadia business groups and the 17g-5 information provider, with the information provider responsible for posting the communication to its Rule 17g-5 website.

Berkadia monitors the accuracy and timeliness of investor reporting data through servicing-system validations. The system also tracks PSA requirements. The investor-reporting group validates realized loss and appraisal-reduction calculations. During 2017, Berkadia reported no occurrences involving CMBS remittance recalculations and subsequent restatements of reports to trustees, nor did it report any late reporting occurrences across the whole portfolio during this period.

Assessment: Berkadia has proactive, well-controlled practices for investor accounting and reporting functions as demonstrated by its lack of reporting or remitting errors, its high degree of automation, and its segregation of duties. Berkadia has diligent practices for accurate and timely CMBS reporting.

CMBS Advancing and Nonrecoverability Analysis

As a master servicer, Berkadia provides advances on CMBS transactions. It centrally tracks each loan's cumulative advances versus its current value. The company stated that each loan advance is evaluated individually, taking into consideration variables including property type, local

market conditions, and resolution strategy. As advances increase relative to value, decisions to discontinue advancing require management approval as delineated in the servicer's approval authorization matrix.

Table 6 – Berkadia Advancing Activity

	Dec. 31, 2017	Dec. 31, 2016	Dec. 31, 2015
Total Advances (P&I and PPA) Outstanding (\$ Volume) *	162,962,876	159,917,447	232,383,488
Total Advances (P&I and PPA) Outstanding (# Loans)	355	403	519
Average Advance Per Loan (\$)	459,050	396,817	447,752
Outstanding Advances - P&I Only (\$ Volume)	141,511,745	140,493,941	196,510,816
Outstanding Advances - P&I Only (# Loans)	175	205	271
Average Aging of First P&I Advance (Days)	-	260	490
Total O/S Advances to CMBS Servicing Volume (%) **	1.95	0.88	0.71
CMBS Volume (Primary/Master and Master Only)	8,375,873,436	18,230,346,346	32,639,203,698

*P&I - principal and interest. PPA - property protection advances. **CMBS Servicing Volume - UPB of primary/master combined and master only.

Assessment: Berkadia maintains effective, controlled advancing and nonrecoverability determination practices. Its stated advancing threshold is more conservative than that of other master servicers. Berkadia stated that, as a rule, it avoids reimbursement of advances in a manner that may cause cash flow shortfalls to investment-grade bond holders, and that it has sometimes recovered advances in monthly increments to minimize losses to the trust. We support such practices as we believe that master servicers should determine how their methods of recapturing advances will affect the trust cash flows before submitting their reimbursement requests in their realized loss statements, and that they should make every effort to spread the repayment of advances if such spreading can avoid or minimize cash flow shortfalls to the trust.

Financial-Statement Analysis and Property Inspections

BSIPL largely performs the financial statement spreading and initial review function, and the company reported that experienced staff members make credit decisions based on financial-statement analysis. They communicate directly with borrowers to obtain clarifications on submitted data. Berkadia uses the servicing system for this financial statement analysis. The company, as a CMBS primary servicer, received a high percentage of previous year-end annual financial statements by May 31, 2017, and analyzed 98.2% of those by June 30, 2017, the industry-recognized CMBS deadline. It also collected a high percentage of all required year-end statements and analyzed 98.3% by June 30, 2017. On average, each staff member can spread seven operating statements per day. The company reported that, as a master servicer, it generally does not reanalyze financials submitted from a subservicer until the subservicer's audit review is completed.

Within primary servicing, outside vendors perform most property inspections. As a practice, loan originators are not permitted to inspect properties securing loans that they originated. All loans greater than \$2 million are inspected annually, which we view as a customary practice. During 2017, within primary and master servicing, the company reported 8,621 properties were due for inspection, and 97.6% were received by or within 30 days of their due dates. The servicing system tracks and maintains inspection reports. It also tracks deferred maintenance issues

and their resolution status. As a master servicer, the company's policy is to review and validate 100% of inspections received from subservicers for completeness, and it stated that it will follow up with subservicers on inspection items.

Table 7 – Full-Year Historical Financial Statement Collection Rates

	By May 31, 2017	By May 31, 2016	By May 31, 2015
CMBS Primary Servicing			
Statements Received	98.2	97.2	96.4
Statements Spread and OSARs Reported*	91.6	99.6	99.6
CMBS Master Servicing			
Statements Received	91.6	93.7	90.7
OSARs Reported*	79.8	99.8	100.0

*Based on total number of required statement submissions by June 30 and July 31.

OSAR - Operating Statement Analysis Report

Watchlist, Trigger Events, and Early-Stage Collections

The portfolio surveillance and reporting group handles watchlist management. Account managers also monitor loan performance and handle any related borrower discussions. Berkadia follows CREFC guidelines for watchlist triggers based on inspection data, financial statement spreads, and other information. The company maintains its own risk-rating system for balance sheet loans or GSE loans with loss sharing components, and has other watchlists for non CMBS loans with criteria inclusive of any investor-established requirements. A watchlist committee reviews the status of watchlisted loans and pending actions. Berkadia subjects all subserviced loans to its watchlist criteria. As of Dec. 31, 2017, Berkadia, as a primary servicer or a primary/master combined servicer, reported 5.8% of all serviced CMBS loans on its CREFC watchlist, compared with 8.5% as of Dec. 31, 2016. In addition to sending collections notices, Berkadia contacts borrowers directly based on daily delinquency reports. As a practice, it contacts borrowers one day after a missed due date and again after 10 days. The company maintains a centralized chronology of collection efforts and borrower comments on its servicing system. Client relationship managers are expected to review their portfolios daily based on system reports.

Assessment: Berkadia has effective practices for financial-statement analysis, property inspections, and trigger event and watchlist management. Berkadia validates the accuracy of subservicers' financial statement analyses as part of its compliance audit and rechecks calculations from subservicers on an exception basis. Its practices in this regard are contrary to those of some other master servicers who routinely validate the accuracy of subservicer financial-statement analysis, which we consider to be a best practice, particularly given that the master servicer is accountable for determining the recoverability of advances on subserviced loans. The company's practice of routinely reviewing all inspections submitted from subservicers demonstrates proactive oversight. We believe that the company effectively communicates with borrowers through its borrower website and dedicated account managers. Berkadia's stated average time frame to implement springing lockboxes also indicates a proactive process.

Table 8 – Historical Primary-Servicing Portfolio Delinquency Percentages

	Dec. 31, 2017		Dec. 31, 2016		Dec. 31, 2015	
	UPB	Loans	UPB	Loans	UPB	Loans
30 Days	0.4	0.4	0.4	0.5	0.3	0.4
60 Days	0.2	0.2	0.1	0.1	0.2	0.2
90 Days + and REO	2.9	2.9	3.2	2.6	3.3	3.1
Total	3.5	3.5	3.7	3.2	3.8	3.7

Table 9 – Berkadia CMBS Portfolio Delinquencies (Dec. 31, 2017)*

	30 Days		60 Days		90+ Days		Total	
	UPB	Loans	UPB	Loans	UPB	Loans	UPB	Loans
Delinquency Volume (\$mil./#)	137.4	14	211.2	9	1,259.8	116	1,608.4	139
Delinquency Volume (%)*	1.0	0.8	1.5	0.5	9.1	6.7	11.6	8.0

* Based on total CMBS portfolio, including master-serviced-only loans.

Master Servicing: Subservicer Auditing and Compliance

Berkadia has dedicated personnel for subservicer auditing and compliance oversight. As of Dec. 31, 2017, it monitored 12 subservicers, down from 16 subservicers as of Dec. 31, 2016. It tracks all subservicers for annual compliance, which includes collection and review of Reg AB and Uniform Single Attestation Program reports, collection of evidence of proper insurance, collection of financial statements, Sarbanes Oxley certificates, and attestations required by transaction documents.

On a quarterly basis and per the transaction documents, Berkadia tracks loan boarding, CREFC reporting compliance, surveillance and portfolio monitoring, and validating approvals for items such as payoffs and reserve disbursements. It also receives quarterly subservicer certifications for tax and insurance administration, reserve releases, UCC renewals, letters of credit, analyzed financial statements, rent rolls, and inspections.

Berkadia performs desktop and on-site audits. On-site visits are generally limited to large volume subservicers with cash-processing capabilities. Berkadia maintains a scorecard for each subservicer and focuses on springing lockboxes, consent request tracking and other trigger events. Berkadia gathers information on the performance of its subservicers from each of its functional units to assess subservicer performance. It completed three desktop audits in late 2016, and due to the modest subservicer exposure, it did not complete any audits in 2017. The company has an on-site review scheduled for 2018, which represents approximately 64% of the subserviced volume by UPB and 70% by loan count.

Assessment: Berkadia has an effective subservicer audit program, although its audit cycles are somewhat longer than some other master servicers. However, only a small number of Berkadia's subservicers represent significant exposure based on volume. As such, only a few subservicers have servicing volumes large enough to trigger on-site audits, and none of them perform cash processing.

Borrower Consents and Requests

Berkadia has dedicated asset-management teams to underwrite and close borrower consent requests, including assumptions, leasing and subordination and nondisturbance agreement reviews, and partial property releases. It also relies on BSIPL to assist with borrower requests and has a special-request team within BSIPL that reunderwrites complex requests. U.S.-based account managers serve as initial points of contact. The servicer noted that it manages consent approvals through the servicing system in conjunction with a proprietary application. It also relies on a third-party application to manage and track borrower requests, which routes the inquiry to the appropriate department. A dashboard module within the application provides daily exception reports, which are used for quality controls and process-improvement initiatives.

Table 10 – Borrower Consent Average Processing Times (Days)

	Full-Year 2017			Full-Year 2016			Full-Year 2015		
	Processed (#)	Internal Time	*Total Time	Processed (#)	Internal Time	*Total Time	Processed (#)	Internal Time	*Total Time
Assumptions	165	69	113	231	74	106	110	81	113
Leasing	533	20	39	914	18	24	1,275	20	23
Defeasance	143	26	32	238	23	25	500	19	23
Partial Releases	44	33	47	56	33	43	18	49	57
Total	885			1,439			1,903		

*Servicer's internal time plus third-party review time only for those transactions requiring external party consents.

Assessment: Berkadia has a suitable workflow practices and staffing for analyzing and approving a high volume of borrower consents. Its controls for analyzing and approving borrower consents are sound. Morningstar recognizes that processing times can often be extended by delays in receiving necessary documentation.

Special Servicing Administration

As of Dec. 31, 2017, Berkadia's active special-servicing portfolio had a total UPB of approximately \$71.7 million and contained 15 loans with a UPB of approximately \$71.6 million and one REO property with an aggregate balance of about \$130,000. The CMBS component of the active special-servicing portfolio had a total UPB of approximately \$1.7 million and contained nine assets including one REO property.

Chart 5 – Active Special Servicing by Property Type (UPB)*

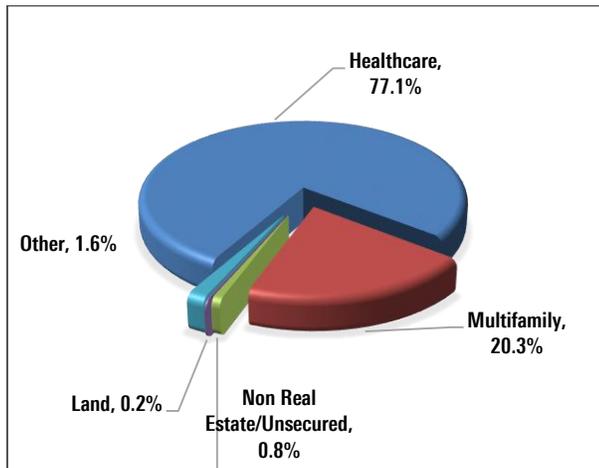
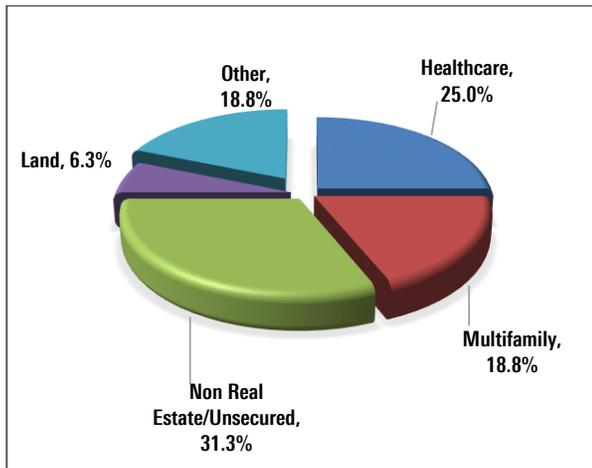


Chart 6 – Active Special Servicing by Property Type (# of Loans)*



*As of Dec. 31, 2017.

Asset-Review Process

Upon the transfer of a loan to special servicing, asset managers formally notify borrowers and require them to sign prenegotiation letters prior to workout discussions. Asset managers prepare loan resolution plans generally within 90 days of a loan transfer, and the company stated that such plans, or detailed asset-status reports, are required for all loans and REO assets. Asset managers submit an updated ASR or asset business plan, which includes a net present value analysis of alternative resolution strategies, to obtain approval for specific terms of negotiated resolutions. The company’s delegations of authority require a formal committee process for the approval of initial and updated business plans. Asset managers create and update asset plans directly through AIMS, the company’s asset-management system. For CMBS assets, Berkadia formally monitors master servicers’ outstanding advances against property values and expected recovery amounts. It also consults with master servicers on their advancing decisions. In the case of loan modifications, Berkadia stated that it can usually deliver the loan modification boarding package to master servicers within two days of closing. The company usually will not direct master servicers to place partial payments in suspense rather than having such payments applied to the loan. Before the KeyBank transaction, Berkadia had separate asset managers for loans and REO. An asset manager may now handle both loan and REO assets.

Assessment: Berkadia has sound and controlled asset recovery practices based on its stated policies and procedures. Though its activity is modest compared with many other special servicers’, we believe that Berkadia’s centralized asset-management system serves as an effective tool to track asset-resolution activities, including CMBS-related requirements.

REO Property Management

During 2017, Berkadia added five properties from new nonmonetary or imminent default loan transfers and one monetary default transfer, and had one property sale. By comparison, during 2016, it added 14 properties and had one property sale. For its REO properties, Berkadia uses single trust accounts rather than separate rent collection and expense accounts for property cash management. It receives monthly operating statements from external property managers and stores that information on the asset-management system. The company’s accounting department reconciles external property managers’ REO bank accounts. Berkadia requires its own standardized engagement agreement for

property managers, and it provides them with a set of reporting guidelines. Because of its minimal REO activity, and the latest REO asset also being land, Berkadia has not conducted any property manager audits in recent years.

Assessment: Berkadia's REO property management oversight is well controlled. That Berkadia's separate accounting department performs REO bank account reconciliations is a best practice.

Vendor Oversight

Berkadia, which maintains a centralized list of approved firms for appraisals, environmental and engineering assessments, legal counsel, property managers, and brokers, has a formal vendor performance review process. It also conducts a request for proposal bidding process for all engagements and uses its own form agreements for vendor engagements. Asset managers select prospective brokers or property managers based on their expertise and cost. Berkadia's in-house legal department engages outside counsel, and it uses its own standard engagement letter. Asset managers review and approve legal invoices prior to payment for delinquent assets because the legal charges on those assets are billed as property-protection advances. For nondelinquent assets, the legal department approves legal invoices. Asset managers order appraisals and environmental reports and track pending appraisals through the asset-management system.

Assessment: Berkadia's process for engaging vendors is well controlled and highly centralized. We believe that Berkadia's centralized process for qualifying, engaging, and tracking vendor assignments for special servicing work, including the use of standardized forms for all vendors, adds efficiency and consistency and is an industry best practice.

Managing Conflicts of Interest

Berkadia, as a special servicer, is unaffiliated with controlling class holders or B-piece buyers in the CMBS transactions it may manage. However, it does not use its affiliate as a broker on note sales or REO sales, or for property management. The company stated that while it has infrequently collected special servicing fees from the trust and from the borrower or other sources, it does not collect fees in excess of the trust contractual fee as outlined in the related PSA. Berkadia stated that it does not use affiliates with respect to its resolution and liquidation strategies, such as for buying assets out of the pool by exercising fair market value purchase options.

Assessment: Berkadia has effective controls for managing conflicts of interest for using third-party affiliates and for conducting its asset resolutions. Berkadia has sound controls for managing conflicts of interest, protecting confidential information, and passing through fees to CMBS trusts.

Asset Resolution and Recovery Performance

As indicated in the tables below, Berkadia's level of asset and recovery activity remained modest during 2017.

Table 11 – Special-Servicing Loan Portfolio Activity (2017)

	Total Vol (\$ Mil)	Total Loans	Total Properties	CMBS Vol (\$ Mil)	CMBS Loans	CMBS Properties
Loan Portfolio at Beginning of Period	53.0	33	104	2.8	15	3
Loans Transferred into Portfolio:						
Retransferred/Redefaulted Loans	0.1	1	1	0.1	1	1
New Nonmonetary/Imminent Default Transfers	63.8	4	4	0.0	0	0
New Monetary Default Transfers	0.0	0	0	0.0	0	0
Total Transfers into Special Servicing	63.9	5	5	0.1	1	1
Loans Fully Resolved:						
Modified or Corrected Loans	(16.0)	(10)	(11)	(0.2)	(4)	0
Discounted Payoffs	(0.5)	(2)	0	(0.5)	(2)	0
Full Payoffs	(23.6)	(6)	(88)	(0.3)	(2)	(2)
Total Loan Resolutions	(40.1)	(18)	(99)	(1.0)	(8)	(2)
Net Adjustments and Other Loans Transferred Out	(5.2)	(5)	0	(0.1)	0	0
Loan Portfolio at End of Period	71.6	15	10	1.8	8	2
Average Loan Size at End of Period	4.8			0.2		

Table 12 – REO Portfolio Activity (2017)

	Total Vol (\$ Mil)	Total Properties	CMBS Vol (\$ Mil)	CMBS Properties
REO Portfolio at Beginning of Period	0.7	2	0.7	2
Completed Foreclosures	0.0	0	0.0	0
REO Sold During Period	(0.2)	(1)	(0.2)	(1)
Other Adjustments	(0.4)	0	(0.4)	0
REO Portfolio at End of Period	0.1	1	0.1	1
Average REO Size	0.1		0.1	

Table 13 – Special-Servicing Loan Portfolio Activity (2016)

	Total Vol (\$ Mil)	Total Loans	Total Properties	CMBS Vol (\$ Mil)	CMBS Loans	CMBS Properties
Loan Portfolio at Beginning of Period	51.7	28	15	8.2	19	6
Loans Transferred into Portfolio:						
Retransferred/Redefaulted Loans	19.0	3	84	0.0	1	0
New Nonmonetary/Imminent Default Transfers	33.1	8	8	0.1	1	0
New Monetary Default Transfers	12.2	3	4	0.0	0	0
Total Transfers into Special Servicing	64.3	14	96	0.1	2	0
Loans Fully Resolved:						
Modified or Corrected Loans	(34.5)	(7)	(5)	(4.8)	(6)	(3)
Total Loan Resolutions	(34.5)	(7)	(5)	(4.8)	(6)	(3)
Net Adjustments and Other Loans Transferred Out	(28.5)	(2)	(2)	(0.7)	0	0
Loan Portfolio at End of Period	53.0	33	104	2.8	15	3
Average Loan Size at End of Period	1.6			0.2		

Table 14 – REO Portfolio Activity (2016)

	Total Vol (\$ Mil)	Total Properties	CMBS Vol (\$ Mil)	CMBS Properties
REO Portfolio at Beginning of Period	0.9	3	0.9	3
Completed Foreclosures	0.0	0	0.0	0
REO Sold During Period	(0.1)	(1)	(0.1)	(1)
Other Adjustments	(0.1)	0	(0.1)	0
REO Portfolio at End of Period	0.7	2	0.7	2
Average REO Size	0.4		0.4	

Assessment: Based on its resolution results, Berkadia demonstrates a successful performance record.

Investor and Master Servicer Reporting

Berkadia's procedures cover its formal reporting requirements as a CMBS special servicer with respect to reporting property protection advances and realized losses, pursuing updated appraisals, and communicating with other master servicers on asset management decisions. The special servicing components of the monthly investor reporting package are produced and provided to master servicers in a similar manner as Berkadia's master servicing reports, with the servicing system used to identify any PSA-specific requirements. Special servicing asset managers are expected to input fresh status comments at least monthly for IRP submissions. As a CMBS special servicer, Berkadia provides its

initial asset status report to the trustee, and stated that it subsequently releases the final asset resolution plans containing the specific terms and details of a completed workout or liquidation. The company's procedures address its special servicer reporting responsibilities for its GSE portfolios.

Assessment: Berkadia is highly experienced with and has effective special servicer-related reporting capabilities to address CMBS and other investor type requirements.

Appendix: Overview of Berkadia Services India Private Limited (BSIPL)

Operations Profile

As of Dec. 31, 2017, approximately 71.8% of Berkadia's servicing personnel were in Hyderabad. Berkadia had 438 employees in its India operations as of Dec. 31, 2017, compared with 450 employees as of year-end 2016. The India operation began with 16 employees in 2002. In addition to the Hyderabad facility, Berkadia has an office in Pune, India, which serves as BSIPL's concurrent disaster recovery site. The Pune site is located 320 miles from Hyderabad on a different power grid.

Berkadia provides transportation to work for its employees. In Morningstar's opinion, the Hyderabad facility with its diesel-driven electrical generator to provide a continual power source, reflects a prudent approach to mitigating the risk of power outages. This capability enables the servicer's systems to run without interruption and coverage during the execution of critical cash-payment and investor-reporting functions.

Morningstar has observed that turnover rates in India generally tend to be higher than in the U.S. The reasons for India's higher turnover rate may be culturally based and that servicing functions are performed during multiple shifts. In addition, the expansion of financial services companies in Hyderabad in recent years has created increasing competition for trained personnel. Given the challenges, however, Morningstar believes Berkadia is managing its India-staff turnover at reasonable levels.

Since its formation, BSIPL has expanded operations using three staffing shifts enabling Berkadia to become a 24/7 servicer. BSIPL's night shift coincides with Berkadia's U.S. hours of operation. In addition, BSIPL's second shift supports vendor and borrower contact and facilitates real-time interaction with U.S. personnel. Berkadia retains technical expertise in Ambler, Pennsylvania; Salt Lake City; and Hyderabad.

Berkadia continued its operational excellence program, first introduced in 2010, to maximize resources within BSIPL and to monitor performance to maintain optimal workloads and mitigate risks. Operational highlights in 2017 included:

- Being named BPO organization of the year by CMO Asia for the third consecutive year and being named one of Asia's top employer brands,
- The continued expansion of Berkadia's mortgage banking and underwriting support. BSIPL reported that it continues to enrich training, technology, and servicing practices, while focusing on process improvement and knowledge sharing to further improve productivity and organizational performance.

Additionally, BSIPL was the first company in India to launch a college-level CRE course, which was expanded to three Indian universities.

Operational Infrastructure

Organizational Structure

BSIPL staff have direct reporting lines to their local managers for nonfunctional issues but a direct reporting line to U.S. management for subject matter-specific responsibilities. U.S. managers are accountable for the processes and workflow of the Indian operation. Each servicing function is assigned a BSIPL team leader, who oversees local personnel dedicated to those tasks, and communicates directly with U.S.-based personnel.

Table 15 – Percentage of Servicing Staff Levels by Location (Dec. 31, 2017)

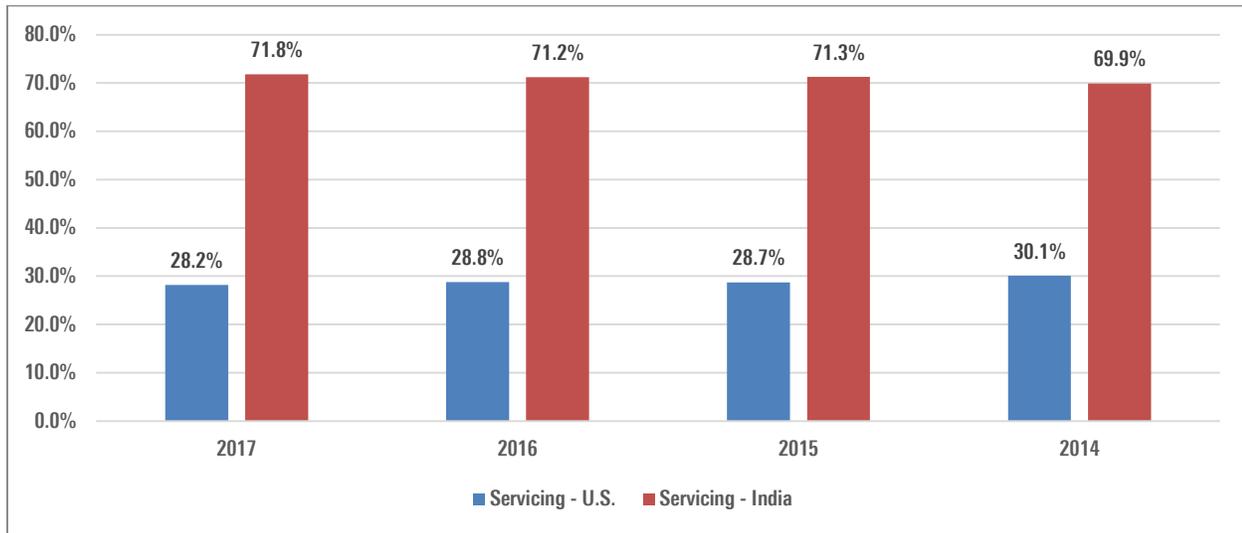
Servicing Activity	% U.S. Based	% India Based
UCC	25	75
Workflow / Document Imaging	3	97
Financial Statements/Inspections	6	94
New Loan Boarding/Servicing Data Center	26	74
Cash Administration/Bank Reconciliations	22	78
Loan Administration	22	78
Investor Reporting/Payoffs	26	74
Surveillance	27	73
Credit Administration	24	76
Client Relations (Support)	0	100
Client Relations (Voice)	89	11

Staffing and Experience

Table 16 – BSIPL Average Years of Experience - Primary/Master Servicing

	Dec. 31, 2017		Dec. 31, 2016	
	Industry	Tenure at BSIPL	Industry	Tenure at BSIPL
Senior Management	17.0	10.6	18.6	7.0
Middle Management	12.7	11.9	13.7	10.5
Staff	5.1	4.2	4.7	4.3

Chart 7 – Berkadia: BSIPL versus U.S. Staffing (2014-17)*



*610 was the total servicing headcount as of Dec. 31, 2017.

Berkadia reported that all employees are college graduates, with 78.7% holding postgraduate degrees. 81.1% of employees had no prior work experience, while approximately 19% had prior servicing or banking experience.

Turnover

BSIPL has dedicated resources to monitor and recognize employee performance to control attrition rates. The company conducts monthly performance reviews for each staff member and rewards performance with incremental salary increases. Attrition at the site is due in part to cultural reasons, including matrimonial and family obligations. In India, female employees may leave upon marriage. However, they typically provide sufficient notice, so the company has a succession plan, which includes hiring additional employees who are appropriately trained for the position.

Controllable attrition is defined as employees that leave Berkadia for the following reasons: (1) better perceived opportunity, (2) higher compensation level, (3) dissatisfaction with the position, supervisor or the overall system, (4) associates leaving for no apparent reason. The company’s goal is to maintain controllable attrition to below 12%. Uncontrollable attrition is defined as employees leaving for: (1) family reasons, and (2) further education. For the year ended Dec. 31, 2017, BSIPL experienced 31 controllable attrition-related departures, representing a turnover rate of 7%. By comparison, it experienced 38 controllable attrition-related departures, representing a controllable turnover rate of 8% for 2016.

Assessment: Berkadia continues to maintain appropriate staffing levels and has managed its attrition effectively over the past year.

Training

Berkadia effectively combats attrition within BSIPL by providing career development and mentoring.

Within BSIPL, the employee commitment involves not only specific job training but also cross-training opportunities, as well as industry-based educational opportunities. In the case of BSIPL, 204 employees successfully completed various campus MBA training modules during 2017, and of these the company expects that 115 employees will receive MBA CMS level 1 certifications and 30 employees will receive CMS Professional level 2 certifications in 2018. As of December 2017, employees within BSIPL received an average of 72 hours per year of training.

Employees earn training credits for classroom training, online courses and webinars, industry-related training, and conferences. They also earn credits for applicable functional, systems, and job-related instructional training. The formal training program covers system applications and sessions tailored for each functional department. The company's trainers have experience with Indian business operations and personnel who are primarily used for voice and general cross training. Senior analysts within each functional group receive corporate training at Berkadia's U.S. offices. The company completed 122 training trips between the U.S. and India during 2017, compared with 79 trips in 2016. In addition, U.S. functional managers travel to India for scheduled training regularly, and BSIPL provides training through video conference calls.

Assessment: BSIPL employees undergo a significant amount of training to maintain and build the requisite skills and knowledge required for effective commercial real estate mortgage servicing. BSIPL offers a variety of training programs that seek to develop and maintain employee performance. The company provides career-development opportunities and team-building programs, which help to maintain staff with appropriate levels necessary for the tasks that BSIPL performs.

Compliance

Berkadia reported that BSIPL is subject to the same audit regimen as its U.S. operation, and that recent audits did not cite any exceptions related to the BSIPL operation and practices. Specifically, BSIPL is part of Berkadia's annual Regulation AB and USAP attestations and is part of Berkadia's annual SOC 1 and now SOC 2 audit scopes. BSIPL also undergoes quarterly internal audits, and U.S. personnel monitor quarterly exception reports. Berkadia reviews policies and procedures with BSIPL including annual process mapping review.

Key Performance Measures

Berkadia and BSIPL adhere to key functional performance metrics. Within BSIPL, managers perform quality evaluations at 100% during the 90-day, new employee training period. BSIPL measures new hires in accordance with their development plan, which includes quality and production achievement targets. Quality control samples for seasoned analysts are selected randomly using the Six Sigma application based upon the average of their accuracy percentage over the prior three months. Quality control results are reviewed and used as part of the training protocols. Additionally, reports are in place to identify discrepancies. Process improvement methodologies are used to ensure that efficiencies continue to be created within existing as well as newly transitioned tasks. Monthly feedback and process improvements related to productivity, utilization, capacity, and quality are discussed during dashboard meetings involving both India and U.S. senior management. Process owners in the U.S. review and validate policy and procedures. Berkadia's internal-audit program as well as SSAE 16 procedures, SLA compliance, and external audits complemented quality control processes. During 2017, the financial statement analysis team completed 45,212 property financial statement reviews and achieved an overall average quality score of 98%.

Portfolio Management

Tasks Performed by BSIPL

The Hyderabad operation handles processes and subprocesses related to all aspects of primary and master servicing, including financial-statement analysis, rent-roll analysis, reserves, payoffs, property-inspection review, bank reconciliations, payment processing, trigger monitoring, client relations, special requests, lease review, real estate services, tax and insurance administration, escrow analysis, surveillance, asset management, cash management, investor reporting, loan boarding, document workflow, UCC processing, compliance, accounts payable, and IT services.

Assessment: Berkadia has highly effective quality controls to ensure accuracy, and productivity measures are addressing the numerous functions performed by BSIPL personnel.

Communication with Borrowers, Vendors, and U.S. Staff

Morningstar believes that consistent communication is a key component for successful offshoring. We further believe that vertically integrated organizations must focus on fluid and frequent interaction. During 2017, BSIPL personnel spent 1,416 hours at various Berkadia office locations in the U.S., and Berkadia U.S. managers spent 1,112 hours at BSIPL. Additionally, Berkadia personnel and BSIPL staff completed approximately 3,531 hours of training via conference participation, symposium attendance, workshops, internal/on-the-job training, and classroom participation, as well as through technological delivery. We believe that in the case of BSIPL, the subsidiary model lends itself to a significant commitment to employee training and morale, just as it should for any remote office stateside.

Most communication between Berkadia and BSIPL occurs during BSIPL's primary shift so that personnel within each location may communicate without delay. BSIPL personnel communicate with borrowers via scripted email and copy their U.S. counterparts. Nearly all communication with borrowers consists of email notification, with only U.S. subject-matter experts communicating with borrowers via phone.

Assessment: Berkadia takes appropriate measures governing BSIPL's communication practices with borrowers, vendors, and U.S.-based personnel. Permitting BSIPL staff to notify borrowers and other parties via scripted email notification and via limited direct phone contact is acceptable. However, communication problems could arise if a borrower has additional questions that may not be fully understood by the BSIPL analyst. As such, Berkadia demonstrates best practices by requiring U.S.-based personnel to be copied on any communication between BSIPL staff and outside parties. Berkadia has retained appropriate oversight controls with its U.S.-based personnel to govern approvals for cash transactions.

Ranking Definitions

The numerical scale of MOR CS1 to MOR CS4 is defined as follows:

- | | |
|---|--|
| 1 | Exceeds prudent loan servicing standards in key areas of risk |
| 2 | Demonstrates proficiency in key areas of risk |
| 3 | Demonstrates compliance in key areas of risk |
| 4 | Demonstrates lack of compliance in one or more key areas of risk |

A servicer assigned a ranking of at least MOR CS3 is deemed to comply with what we view as the minimum prudent loan servicing standards and requirements for the servicer's operational category and role. For access to Morningstar's Operational Risk Assessments of Commercial Servicers: Methodology and Process and other published reports, please visit www.morningstarcreditratings.com.

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