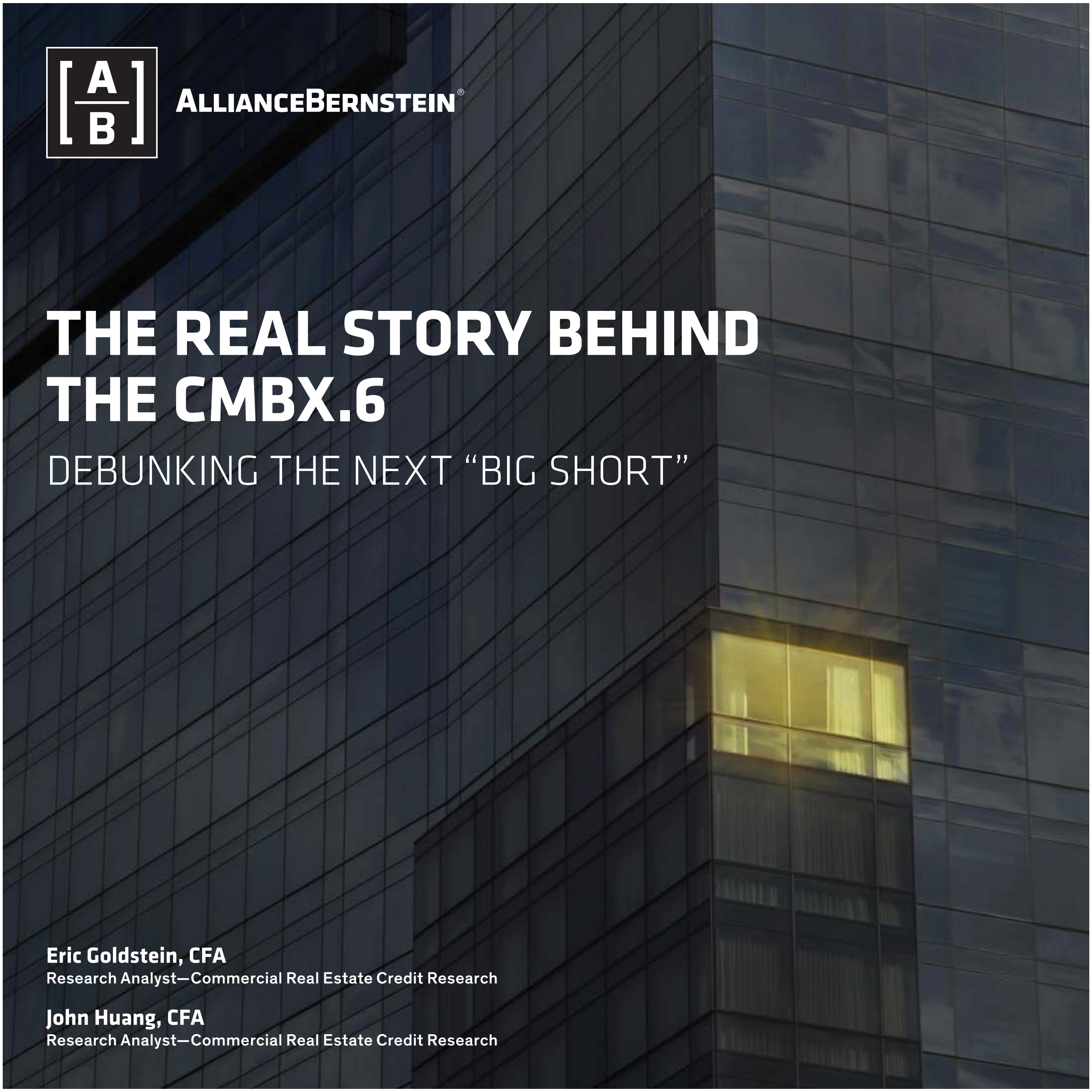

AllianceBernstein®

THE REAL STORY BEHIND THE CMBX.6

DEBUNKING THE NEXT "BIG SHORT"

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IN THIS PAPER: The CMBX.6 has become such a popular short by speculators placing bets on mall closings that it has been profiled in the media as the next "big short." It's true that as many as a third of American malls won't survive the upheaval in the retail sector. But that narrative conceals other realities. In fact, the American mall isn't dying—it's evolving to meet modern consumer demands. And thanks to the specific property composition of the CMBX.6, the loan losses in its collateral pool will likely be modest. As a result, returns on the CMBX.6 are likely to be far higher than short sellers expect. In this paper, we present the powerful research that illuminates our view.

SHINING A LIGHT ON A CONTROVERSIAL TRADE

The CMBX.6. The acronym has splashed across headlines and become a source of controversy on Wall Street. It's such a popular trade by speculators placing bets on store and mall closings that shorting the CMBX.6, a commercial real estate mortgage index, has been profiled in the media as the next "big short."

Controversy has brewed because of short sellers' assertions that the American mall is dying and that near-term defaults and losses on the CMBX.6 loan pool will therefore be high. We dispute these views.

In fact, our research shows that the American shopping mall is evolving, not dying.

It's true that apparel retailers are retrenching. Many mall assets are headed toward obsolescence. Some mall owners are reluctant to provide new investment. As many as one-third of the 1,100 regional malls in the US are at risk.

But that's only part of the story. Dig deeper, and the truth becomes far more complex and nuanced. Mall owners often support their assets, especially if a mall is regionally dominant. Such a mall has the potential to consolidate tenants when other, obsolete competitors exit its landscape.

Some of the 37 regional malls represented in the CMBX.6 can't survive. But most are dominant within their trade areas, produce ample or sufficient internal cash flow to support both capex and debt service, and have enough sponsor equity to reposition to meet evolving consumer demands.

Even if the American mall were dying, short selling the CMBX.6—which holds less than half of one percent of malls in the US—to express that view is inefficient. Our fundamental research suggests that not only will overall loan losses likely be modest but also returns on the CMBX.6 will ultimately be attractive, even under extremely stressful scenarios.

The performance of this complex trade depends on a host of diverse and interdependent factors requiring equally complex analysis. That's why the story of the American mall and of the CMBX.6 is best viewed in full color, not in black and white. In this paper, we present the powerful research that illuminates this view.

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THE CONTROVERSY AROUND THE CMBX.6

In our view, short sellers may be missing a number of critical points that support the protection seller of the CMBX.6 rather than the protection buyer[1]:

+ Most of the CMBX.6 is backed by non-retail assets that have enjoyed material growth in net operating income (NOI), considerable commercial real estate appreciation since 2012 (the year the CMBX.6 was created) and more defeased loans[2] than usual. These assets are not expected to suffer meaningful losses.
+ Short sellers expect near-term regional mall loan defaults with significant losses. But most of the 37 underlying malls produce significant internal cash flow, and we expect them to continue to do so. This makes term defaults less likely.
+ Mall closures and loan losses among these 37 malls are well below short sellers' assumptions—and are likely to remain so. The regional malls in the CMBX.6 are likely to fully or at least partially pay off their loans at maturity.
+ Mall loan losses may not occur as quickly as short sellers anticipate. Rather than forcing high-loss-severity liquidations of viable assets, special servicers are likely to work with borrowers to minimize losses by extending loan maturities and making loan modifications.
+ Loan losses on the entire CMBX.6 collateral pool will likely be modest, with more significant tranche-level losses concentrated in specific deals.
+ Thanks to the composition and characteristics of its underlying assets, returns on the CMBX.6 are likely to be much higher in the long run than short sellers expect.

Before we detail our loan- and mall-level analyses of the CMBX.6, we will address the numerous controversies around the series and describe the origins of the conservative assumptions that fuel our analyses. Let's begin with a closer look at the most contentious issues, beginning with the heavy tilt of the CMBX.6 toward retail assets.

IS THERE REALLY TOO MUCH RETAIL IN THE CMBX.6?

Speculators are betting against the CMBX.6 in part because of its heavy exposure to retail. And indeed, at the time of the index's origination in 2012, retail collateral—regional malls, power centers, strip centers, community shopping centers and factory outlets—comprised 36% of the loan pool. That represents a significant overweight to the retail sector. In comparison, just 29% of the average CMBS deal issued since 2010 has been retail loans.

Throughout this paper and for the purposes of our analysis, we employ an even more conservative metric: current loan balance *net of defeased loans* as a share of current loan balance. This metric gives us a current exposure to retail collateral of 44%.

While this figure sounds high, the equivalent defeasance-adjusted credit enhancement of the series has also improved since origination, from 6.8% to 10.7% for BBB– tranches and from 5.3% to 8.2% for BB (*see* "Under the Hood: The Mechanics of the CMBX.6," *page 4*). This substantially improved credit enhancement means that the default rate on the retail loans must now be materially higher in order to result in bond-level losses.

To demonstrate this, let's look at an extreme example in which losses stem only from retail loans. For our hypothetical case, we'll assign a loan loss severity of 50%. Assuming original levels of

1 Throughout this paper we refer to "short seller" and "protection buyer" interchangeably.
2 Defeasance eliminates the credit risk associated with prepaying a commercial real estate loan. To pay off the loan early, the borrower buys a bundle of US Treasury or agency bonds equivalent in value and duration to the loan it is replacing.

credit enhancement, the default rate must hit 37% to wipe out the BB tranche and cause a first-dollar loss on the BBB– tranche. However, when we raise the credit enhancement to 8.2%—the current defeasance-adjusted level—the default rate must rise to 49%. That's a high hurdle, especially since, from 1995 to 2017, the historical default rate for retail loans with material losses[3] was 10.1%, according to Wells Fargo.

What's more, given the CMBX.6's seven years of seasoning,[4] the pool has both a remarkably low default rate[5] and a low rate of loans that have been liquidated with a loss (*Display 1*). The high loan payoffs and low delinquency rate are consistent with commercial real estate's 10 years of recovery since the global financial crisis. According to Real Capital Analytics (RCA), the Commercial Property Price Index (CPPI), a national index of all nondistressed commercial properties, has appreciated 79% since the start of 2012. Even the lagging retail sector has appreciated nearly 50% (*Display 2*), mostly driven by non-mall properties such as community shopping centers.

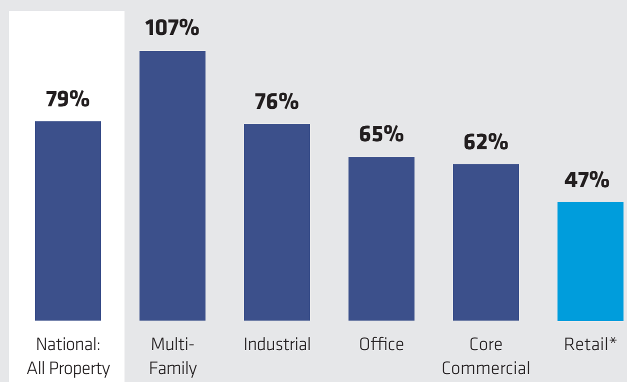
DISPLAY 1: THE CMBX.6 HAS RELATIVELY LOW DEFAULT AND SEVERITY RATES

CMBX Series	Origination Year	Cumulative Default	Cumulative Loss	Severity
CMBX.6	2012	1.78%	0.13%	21.60%
CMBX.7	2013	3.30%	0.28%	52.73%
CMBX.8	2014	1.80%	0.12%	42.36%
CMBX.9	2015	1.37%	0.00%	3.06%
CMBX.10	2016	0.23%	0.02%	61.40%
CMBX.11	2017	0.31%	0.00%	N/A
CMBX.12	2018	0.00%	0.00%	N/A

As of March 31, 2019
Source: Intex Solutions and Wells Fargo Securities

DISPLAY 2: EVEN RETAIL PROPERTY VALUES HAVE RECOVERED CONSIDERABLY SINCE 2012

Change in RCA CPPI Value: 2012–2018



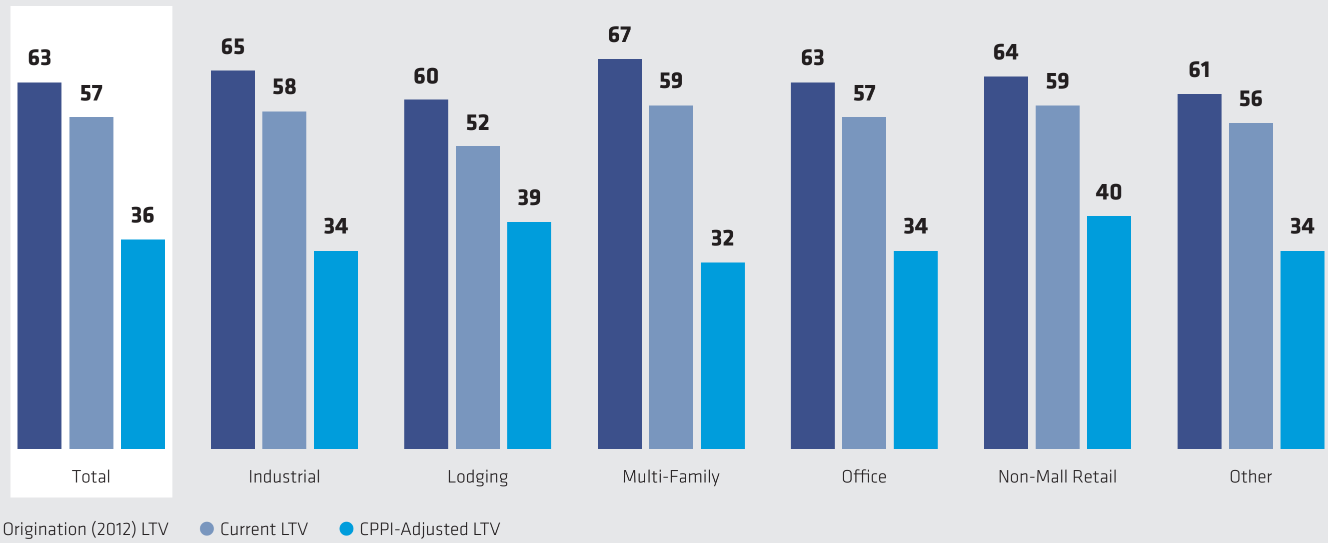
As of June 30, 2019
* Although regional malls are included in the retail category, not enough mall properties have sold during this period to represent a meaningful component.
Source: Real Capital Analytics (RCA)

3 We define a material loss as a loss greater than 3%.
4 Since 2012, 17% of the CMBX.6 pool has paid off, and 8% of outstanding loan balances have amortized. (Amortization should continue at a rate of between 2% and 3% per year.) Of the remaining pool, 14% has defeased. In total, that's about a third of the pool already paid down.
5 The CMBX.6's cumulative default rate is lower than would be expected historically for seven years of seasoning..

> CMBX.6 credit enhancement has improved since 2012”

DISPLAY 3: SIZE OF LOANS RELATIVE TO PROPERTY VALUE OF NON-MALL ASSETS IN THE CMBX.6 HAS PLUMMETED

Loan-to-Value (LTV) Ratio (%)



As of June 30, 2019
Source: RCA, Trepp and AllianceBernstein (AB)

But that’s not all. In *Display 3*, we have estimated the effective loan-to-value (LTV) on the remaining loans—nondefeased and not specially serviced—using the CPPI. We find that the 2012 pool has significantly deleveraged, from a 63% LTV ratio at origination to 36% today, due primarily to asset appreciation. And, combined with amortizing loans, today’s lower LTV indicates significantly more equity in the collateral real estate. This, in turn, provides an extra layer of cushion for investors and reduces balloon refinancing risk by shrinking the loan balance at maturity.

Asset appreciation also explains the high percentage of loan defeasance in the CMBX.6. This figure has spiked across all property types in the past few months, from 8% at the end of December 2018 to 14% in June 2019. Office-sector defeasance has led the way, with 36 loans worth 4.4% of the CMBX.6. Importantly, many retail loans in the CMBX.6 were also defeased during this six-month period—specifically, 52 retail loans, worth 2.9% of the CMBX.6.

The spike in defeasance indicates to us that many owners are willing to pay defeasance costs to redeploy trapped equity in the underlying properties. Bondholders and protection sellers of the CMBX.6 are the beneficiaries. They benefit from declining credit risk as loans are increasingly replaced through defeasance with AAA-rated US Treasuries or agency debt, which reduces the potential for idiosyncratic risk in the pool.

(*Continued on page 6*)

UNDER THE HOOD: THE MECHANICS OF THE CMBX.6

The IHS Markit CMBX is a synthetic index comprising 25 equally weighted, fixed-rate commercial mortgage-backed securities (CMBS) issued in the same year. The CMBX.6 was the first CMBX basket to be issued since 2009 and corresponds to CMBS issued in 2012. In turn, each CMBS in a CMBX typically contains 40 or more conduit loans[6] packaged in a trust. The trust has first lien on the properties and may foreclose for nonpayment.

A CMBS is structured into major rating tranches (*Display*), from senior AAA-rated bonds all the way down to single-B and non-rated tranches. These tranches correspond to varying levels of credit enhancement—that is, how much of the CMBS trust's loan collateral can be written down before a tranche experiences its first dollar loss.

Notably, with a 37% equity interest on average, the property owners (the borrowers)—not the CMBS trust (the lender)—are in the "first loss" position. This means that the real estate collateralizing the loans must decline more than 37% in value before the CMBS trust begins to absorb losses. In addition to the cushion of the borrowers' equity, the AAA-rated bonds have a 30% original credit enhancement. This makes default extremely unlikely for the AAA tranche. Conversely, the BB-rated tranche, with a 5% original credit enhancement, is more exposed to default risk. Since 2009, most CMBS deals have shared this type of structure.

A CMBX series has rated tranches corresponding to those of the 25 deals it references. A CMBX tranche does not have a contractual maturity date but rather is matched to the expected life of its underlying bonds. If any of the 25 underlying CMBS are fully or partially outstanding beyond this initial maturity date, the life of the CMBX will extend by the prorated amount of the bonds outstanding.

Contract holders of CMBX acquire their positions by selling and buying protection through the credit default swap market. A protection seller is "long" CMBS exposure, while a protection buyer is "short" CMBS exposure.

CMBX deliver significant incremental diversification—the CMBX.6, for example, provides exposure to more than 1,300 loans. In addition, in 2018, the traded volume of CMBX.6.BBB– was more than 20 times that of its combined underlying bonds' notional value. This sizable trading volume does not necessarily supply greater liquidity, which varies from day to day, but it does provide significant transparency with respect to the value of the index.

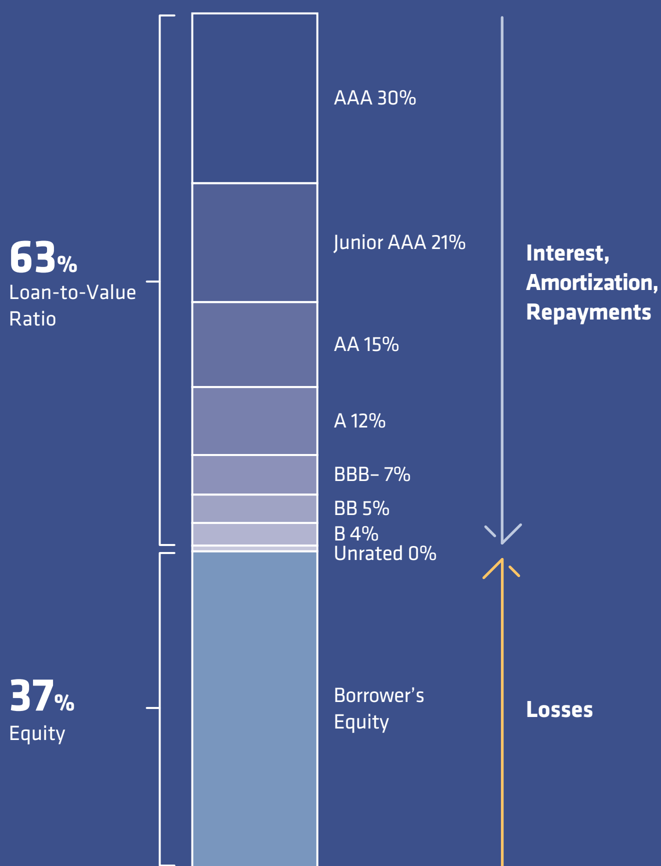
COUPONS, POINTS AND LEVERAGE

When investing in CMBX derivatives, in addition to the coupon, protection sellers receive "upfront points," or a percentage of the notional value of a tranche. If the points are positive, the protection seller receives them from the protection buyer; less frequently, the points are negative and are paid by the protection seller to the protection buyer. Points are calculated as the difference between par ($100) and the price of the index.

6 Conduit loans are fixed-rate commercial mortgage loans with both prepayment protections and initial stabilized cash flows that are intended for securitization with other commercial mortgage loans into a CMBS.

WHEN DOES A CMBS TRUST START TO EXPERIENCE LOSSES?

CMBX.6 Average Original Credit Enhancement



As of June 30, 2019
Source: Deal term sheets

For example, if the CMBX.6 BB tranche is trading at $79, the protection seller will collect $21 from the protection buyer, in addition to the annual 5% coupon.

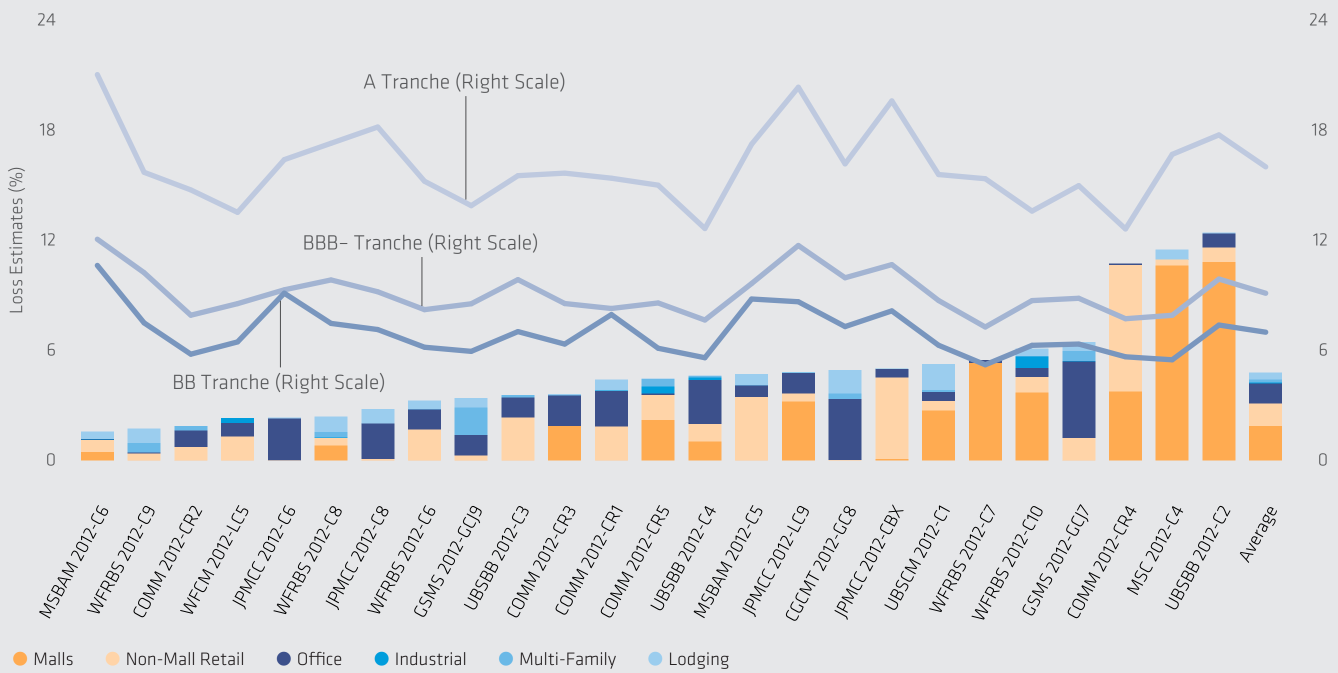
Because every CMBS comprises 4% of the CMBX series, $21 is equivalent to five BB bonds being completely wiped out at maturity, having earned the 5% coupon every year. After maturity, the upfront points and the coupon payment on the CMBS will be proportionately reduced when there is a realized loss or interest shortfall to the underlying bonds. Importantly, only a few of the deals in the CMBX.6 are concentrated enough in weak regional malls to put the BB-rated tranche at risk of loss.

Let's walk through our example. As of June 30, 2019, the protection seller of the CMBX.6 BB tranche will collect $21 points upfront, along with $20 points of coupon payment over the next roughly four years (based on the tranche's 5% coupon). Combined with our expected write-down of $12 points, this generates a cumulative potential return of 28% over the holding period, or almost 7% per year.

In addition, most CMBX series trade on margin. The initial margin of a CMBX trade ranges from 0% to 10%, potentially making the levered return very attractive for the protection seller. For example, if a protection seller of the CMBX.6 BB tranche initiated the trade with a 10% initial margin, the levered potential return would be 280% (assuming no funding cost). Conversely, this implies a hugely negative return for the protection buyer.

DISPLAY 4: RETAIL ASSETS PROJECTED TO CONTRIBUTE TO MATERIAL BONDHOLDER LOSSES IN ONLY 3 OF 25 DEALS

Projected Losses by Deal and Property Type vs. Current Credit Enhancement* by Tranche



***Not defeasance-adjusted**
As of June 30, 2019
Source: Trepp and AB

(*Continued from page 3*)

To put the CMBX.6's exposure to retail risk in perspective, we developed a base case estimate for full and partial losses. Employing conservative modeling assumptions, **we estimate that three of the 25 CMBS in the CMBX.6 will see their BB bonds wiped out fully, while three BBB– bonds will experience only partial write-downs** (*Display 4*). Three other CMBS may experience nonmaterial losses.

The lines in the display represent the current credit enhancement on the 25 CMBS. The bars represent projected losses for each deal. Wherever the bars penetrate the credit enhancement lines, we expect elevated losses from retail assets that we've determined to be functionally obsolete. Bear in mind that each of the deals in the CMBX.6 represents just 4% of the whole.

ARE RETAIL PROPERTIES—ESPECIALLY NON-MALL RETAILERS—REALLY TOO RISKY?

Now that we've established a more realistic understanding of the CMBX.6's total exposure to retail and its likely effect on losses, let's drill down further into the composition of those retail assets.

Short sellers of the 2012 series have argued that malls dominate the CMBX.6. But the truth is that most of its retail exposure is not to regional malls, but to power centers and strip centers (*Display 5 , page 7*).

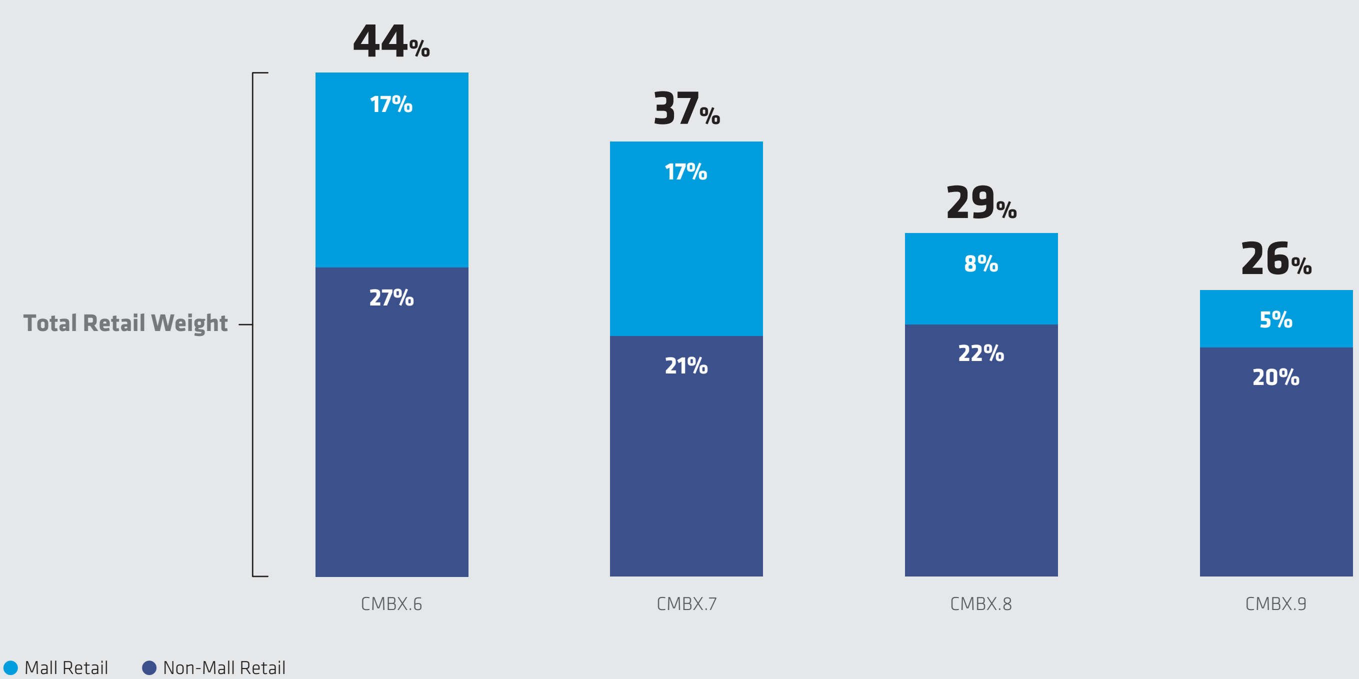
These property types, which are typically anchored by necessity retailers such as grocery stores and discount stores, face far fewer store closures than do regional malls. In many cases, they are even benefiting from expansions of retail fleets. Non-mall retailers currently comprise 27% of the CMBX.6 collateral on a defeasance-adjusted basis, compared with regional class A malls at 6% and regional class B malls at 11%.

It's important not to paint all retail with the same brush. While the department stores, specialty soft-goods retailers and apparel retailers typically found in an enclosed regional mall shrank their footprint in 2018, non-mall retailers saw the opposite trend. That said, we've used conservative assumptions to develop our base case expectations for pro forma occupancy and rents across non-mall retail.

For example, we expect consolidation in the drugstore industry to eventually lead to store closures. And we expect e-commerce and price competition in the grocery industry—particularly from discount warehouses—to continue to weigh on smaller regional operators' margins. That too could lead to some store closures. While these pressures aren't as great as those on apparel retailers, they're likely to weigh on future occupancy and rent levels for power centers and community shopping centers. That will significantly impede their cash flow.

DISPLAY 5: NON-MALL RETAIL COMPRISES MORE THAN HALF OF THE CMBX.6'S RETAIL EXPOSURE

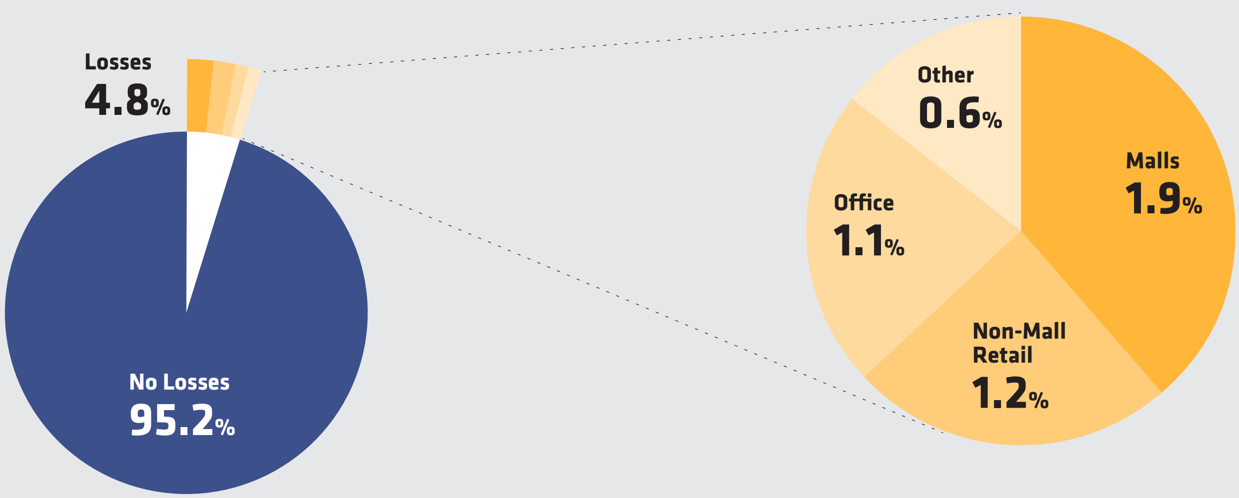
Share of Defeasance-Adjusted Weight



As of June 30, 2019
Numbers may not sum due to rounding; loans that have defeased, amortized or been paid off are not included.
Source: Trepp and AB

DISPLAY 6: BREAKING DOWN OUR 4.8% BASE CASE LOSS PROJECTION

CMBX.6 Projected Losses by Property Type



As of June 30, 2019
Source: Trepp and AB

The takeaway? As our base case scenario, we expect 17% of the non-mall retail loans in the CMBX.6 to default with a material loss. Our estimate is higher than the historical CMBS retail default rate of 10.1%. However, because of the pool's lower-than-average leverage, this means that **non-mall retail loans are likely to contribute only 1.2% to our base case expected losses** on the series (*Display 6*).

We used restrictive underwriting standards to arrive at our estimates. For example, we applied an average 15% distressed capitalization rate on the cash flow of loans with expected material losses. That's almost double the loan origination cap rate of 8%. This results in an average reduction to collateral value of 50% from origination value, and an average loan loss severity of 30%. The latter figure is lower than the long-term average of 41% because of the unusually high ratio of debt amortization structured into loan terms at origination.

Collectively, our analysis results in a higher default rate than what non-mall retail loans have experienced historically. And they are not showing material signs of distress, either. Nonetheless, when we combine this estimate with our similarly conservative underwriting of the regional mall sector in the CMBX.6 (*see* "The Analysis," *page 22*), **our loss estimates on total retail loans are remarkably low, at 3.1% of the collateral pool.**

ARE REGIONAL MALLS REALLY DYING?

At 1.9 percentage points of an expected 4.8% in total pool losses, we believe the largest contributor to losses in the CMBX.6 will be regional malls. These are the properties that warrant the most scrutiny. This is also where buyers and sellers of protection in the index have highly divergent views. Some of these views have been perpetuated so often in the industry and in the media that they've taken on the status of myths.

Myth: All goods will be sold online.

Reality: Retailers are discovering the benefits of combining brick-and-mortar stores with online sales in an omnichannel distribution strategy.

“Physical stores are still key in retailers’ distribution strategies”

Retailers have modernized their distribution channels over the last several years, working toward an optimal balance between physical and online stores. Consumers, particularly millennials, enjoy shopping in both channels. They appreciate the convenience of purchasing goods online and having them shipped to their home or to a physical store for pickup. Multiple return options make the shopping experience even more enjoyable.

Retailer margins vary by distribution channel, as does revenue potential. Studies show that the in-store conversion rate—that is, the portion of browsers who become paying customers—is rising, despite the headwind of a continued decline in in-store traffic. Already a significantly greater portion of in-store traffic than online traffic is converted into sales (*Display 7*).

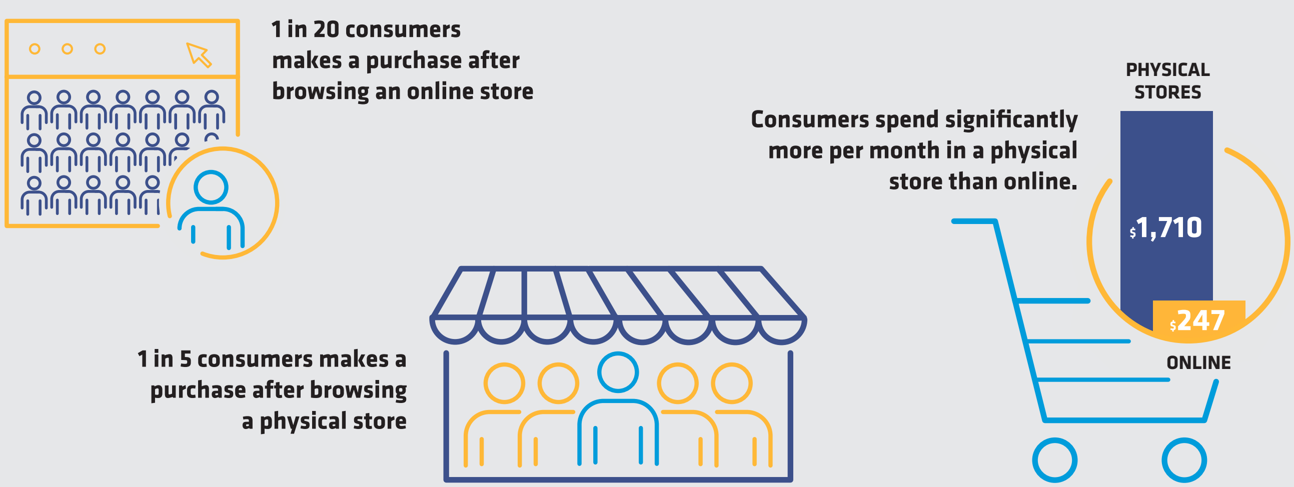
In addition, the value of a customer’s average purchase—known as basket size—from physical stores is 7× that from online stores, due to ad hoc and impulse buys. In comparison, without the option of in-store pickup, online-only retailers not only suffer lower sales and margins but also must pay the full cost of last-mile delivery charges.

Retailers have recognized a need to modernize their infrastructure to support sales in both in-store and online channels by optimizing their commitments to technology and space. This may mean material investment in online fulfillment centers and leasing more warehouse space and less retail floor space. But not necessarily. The cost gap between modern warehouse space and mall rents is narrowing as industrial rents rise and retail rents fall. We’ve also seen inventory-management systems effectively convert retail space into warehousing by filling online orders from inventory in physical stores (*see* “The Omnichannel Virtuous Cycle,” *page 10*).

Given the above conversion rates, apparel retailers are trending toward an omnichannel distribution strategy of 30%–35% online sales and 65%–70% physical-store sales. Notably, many soft-goods retailers are already close to their targets, while others are making the necessary tech and logistics upgrades. This shift toward optimization has been under way for years; in 2017, around 22% of retail apparel sales were online.

(*Continued on page 11*)

DISPLAY 7: BRICK-AND-MORTAR ADVANTAGE: MORE LIKELY TO BUY AND TO BUY MORE



As of June 2018
Source: International Council of Shopping Centers

THE OMNICHANNEL VIRTUOUS CYCLE

Many retailers are committing to investment in cutting-edge inventory management systems (IMS), which can not only solve fulfillment challenges but also assist in creating a virtuous cycle between a retailer's online and physical stores.

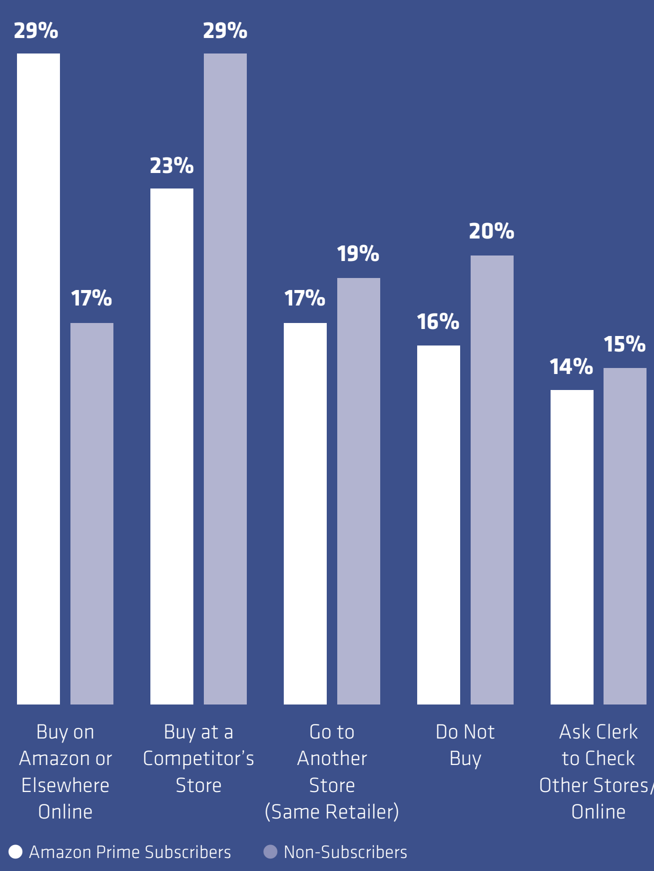
Without a strong IMS, a shopper will often make a trip into a store only to find his or her selection out of stock. This is especially likely to happen when inventories need to be kept lean to maintain profit margins. A recent study by IHL found that 29% of online retail sales can be traced to customers who first tried to shop in a brick-and-mortar store but found their selection was out of stock. Frequently, the online sale went to a competitor (*Display*). According to the study, this resulted in a 3% loss in in-store sales.

Thankfully, with the appropriate IMS to prevent "out of stocks," brick-and-mortar stores can recapture significant online market share. For example, a blue Ralph Lauren Oxford shirt may not be available in the right size at a particular Macy's, but the salesperson can see on his sales register screen that it is available in inventory. He can order it from the register without having to call other stores or the warehouse. The shirt can then ship from its current location directly to the customer, free of charge. This seamless experience helps keep the shopper from buying the shirt from a competitor, either in the mall or online.

Later, if the shirt doesn't satisfy the customer, she can opt to return it by mail. Or she can return it to the store, which is more likely to result in a replacement purchase and which promotes a virtuous cycle. Yet another aspect of the virtuous cycle arises from the interplay between consumers' online and in-store visits. For example, many consumers research and price their options online before visiting a brick-and-mortar store to make their purchase. Sometimes, this interplay even occurs in real time, inside the store.

WHEN AN ITEM'S OUT OF STOCK, CUSTOMERS WALK

Share of US Households



As of June 30, 2018
Source: IHL

(*Continued from page 9*)

As retailers expand their online offerings, consumer budgets are increasingly spent online—as much as 10% or more. Amazon Prime, arguably representative of millennials, may be the best indicator of shopping trends over the coming years. Nearly 11% of its members' budgets goes toward online purchases, and their online spend on apparel is 30%.

In their move toward optimization, many retailers will need to close their less productive stores to manage fixed costs and increase the productivity of their remaining brick-and-mortar stores. In aggregate, these closures will likely constitute 10%–15% of store fleets. We've incorporated the resulting higher vacancy rates and rent compression into our base underwriting of the mall loans.

Myth: All mall stores are going bankrupt.

Reality: We're likely more than halfway through the retailer bankruptcy wave that's putting weaker malls at risk.

Retailers that are saddled with too much debt or that don't add value to middle market consumers may indeed threaten weaker class B malls. But the picture is more complex than the myth of a bankrupt retail industry suggests.

Optimistic about the booming tech economy of the 1990s, private-equity firms acquired multiple retailers in the 1990s through leveraged buyouts. Unfortunately, these retailers lacked the leadership and—because of the debt they'd been saddled with—the financial flexibility to compete in a rapidly evolving retail environment (*see* "A Brief History of the American Mall," *page 12*). Now, many have declared bankruptcy.

Some retailer bankruptcies are still in progress, but the ones that took place from 2017 through mid-2019—particularly the liquidation bankruptcies—have done their worst already. We expect more bankruptcies, including for behemoths Sears and Kmart. However, mall owners that track sales productivity for brick-and-mortar stores generally think we're now more than halfway through the wave. They also expect more bankruptcy restructurings than outright liquidations on their tenant watchlists. Furthermore, tenant watchlists are shorter and the number of stores per listed tenant is fewer.

Most national retailers have healthy EBIT margins and are not on the brink of bankruptcy. The 2018 tax cuts have been especially beneficial. Retailers historically paid a relatively high corporate income tax rate; recent tax laws reduced this to 21%.

National and superregional tenants have historically occupied 70% or more of malls' lease rolls. If a mall is overly dependent on an insolvent national or superregional tenant, it will struggle. Thanks to extreme inflation in the cost of healthcare, childcare and tuition, in combination with wage stagnation among middle-income households, the class B–, C and D malls that service this market aren't likely to generate enough sales per square foot to increase rents. In turn, that will make their repositioning impossible.

In contrast, B malls with enough market share, internal cash flow and owner sponsorship will have the opportunity to reposition themselves as regionally dominant middle market malls. (Notably, even though B malls have lower sales productivity and command lower rents than class A malls, they've historically been successful in generating free cash flow and value appreciation.) With the right mix of shops and venues, they could even consolidate tenants from failing C and D malls. Twenty-nine of the 37 malls in the CMBX.6 show this potential.

Myth: There are no buyers for declining regional malls.

Reality: Thirty-seven malls have sold since the start of 2018, totaling $750 million in sales.

Because malls are large assets, and because there are only 1,100 malls in the US, transaction volume for malls is lower than for other property types. But that doesn't mean sales are nonexistent.

According to Newmark Knight Frank, 24 malls sold in 2018, totaling $411 million. This year, we've seen an increase in the number of transactions and the dollar amount of sales. Year to date through July, 13 malls sold, for a total of $339 million. That's more than 80% of the prior year's total sales.

As expected, recent sellers of mall properties were typically lenders. In contrast, the 2019 buyer pool is diverse. It includes institutional, private-equity, high-net-worth and international investors, as well as regional owners.

From 2018 to July 2019, class B malls' sales cap rate averaged 14% and ranged from 10% to 20%, illustrating significant dispersion. The dispersion results from highly variable NOI, which reflects the market view of each mall's "highest and best use" as a going concern or of its possible alternative use. During bid construction, buyers consider a variety of

(*Continued on page 14*)

A BRIEF HISTORY OF THE AMERICAN MALL

The enclosed shopping mall with its department store anchor dates to the 1950s and the development of suburbs and planned communities. Suburban shoppers wanted to avoid driving into the city to shop. A resident of Cook County or Westchester County preferred shopping locally to wading through downtown traffic to reach Chicago's Marshall Field's or Manhattan's Macy's.

The first-ever enclosed regional mall, Southdale Center in Edina, Minnesota, was built in 1956. The concept spread across the country like wildfire; malls sprang up in every location where strong demographics and household incomes would support them. Highly productive class A malls' higher price points appealed to higher-income households. A middle market customer base supported a class B mall.

Malls of all price points continued to appear throughout the 1950s and 1960s. With the soft economic growth of the 1970s, mall development slowed—only to resume in earnest in the 1980s and 1990s, spurred by rapid real income growth, the tech boom, and the ensuing demand for apparel and lifestyle brands. Private-equity firms, which acquired retailers and expanded locations in pursuit of quick profits, added fuel to the fire.

Meanwhile, a new dynamic was brewing that would dramatically change the course of the American mall industry. In the 1950s, when the first enclosed shopping malls were introduced to America's burgeoning suburbs, their core market was suburban homemakers and mothers. These women shopped not only for themselves but also for their families. The apparel model was rigorously defined: there was clothing suitable for wearing in the home, clothing for being seen in town at midday or in school, dress clothes for work, and dress clothes for different kinds of social occasions. A high proportion of discretionary income went toward apparel. It made sense for the regional malls and department stores of the time to focus on soft goods.

In contrast, today's dress codes are much more relaxed, both at work and socially. A work wardrobe may require one or two suits, compared to four or five just a few years ago. What's worn in the morning is likely still appropriate for a dinner out. There's simply less need for multiple wardrobes. As social conventions have relaxed, soft-goods sales have suffered. To make matters worse for the apparel industry, people also have less time to shop. Today, 62% of married couples with children are dual income. Lastly, catalogue and online purchases increase convenience.

Soft-goods retailers have also come under pressure as middle-income households have lost ground (*Display*) to stagnant wages. At the same time, critical household expenditures such as rent, energy, healthcare, childcare and college tuition have far exceeded overall inflation. For example, from 1996 through 2016, while consumer goods prices collectively rose 55%, the cost of tuition and textbooks, childcare, and healthcare climbed 200%, 125% and 120%, respectively. That has dramatically shrunk middle-income households' discretionary income for apparel.

These factors have all contributed to the shuttering of store locations that are no longer productive. From 2017 through 2018, while hard-goods retailers netted 18% more store openings, department stores and soft-goods retailers saw net store closings of 11% and 29%, respectively, according to IHL. These store closures are painful for malls located in mall-crowded trade areas. It's particularly troubling for class C and D malls, which fall in the bottom quartile of productivity in the mall industry and therefore aren't likely to get life-saving fresh investment.

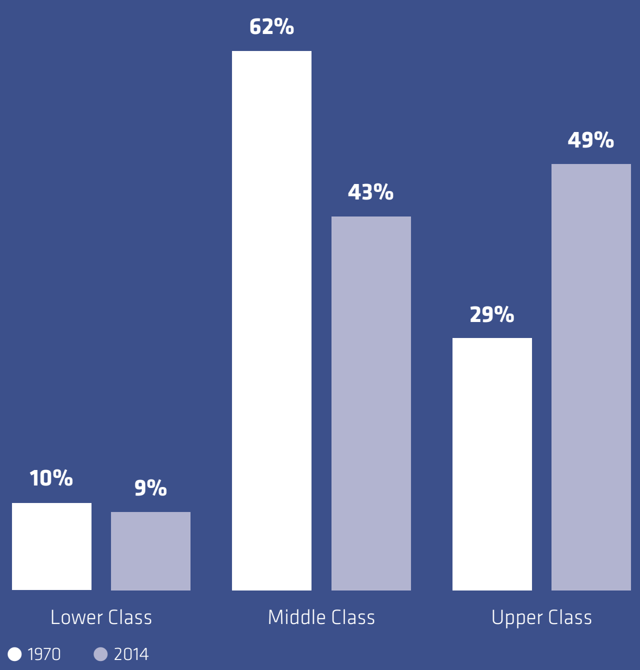
While some analysts have concluded that retailers are headed toward an online-only presence or that a store fleet's footprint is too small to support any but the most productive class A malls, there's much more to this story. We see surviving malls adapting to contemporary needs and interests, taking on capital programs that enhance the shopping experience with fresh concepts, and upgrading and redesigning stores. We especially see evidence of this evolution in malls ranked below A.

Malls are also reducing their reliance on apparel to reflect today's demographic and spending patterns. With millennial consumers entering their higher-spending child-rearing years, many mall owners are investing in their assets to make them the preferred forum not only for apparel, but also for dining, entertainment and lifestyle, such as health and fitness. In addition, most retailers are now embracing omnichannel rather than online-only shopping and are enjoying positive sales growth (though below equity analysts' expectations).

As the shopping-mall industry works through this current phase, many malls will indeed fall by the wayside. But others will win the evolutionary race for survival of the fittest. The question is, which ones?

THE DISAPPEARING WEALTH OF THE MIDDLE CLASS

Share of US Aggregate Household Income



As of December 9, 2015
Source: Pew Research Center

DISPLAY 8: DINING OUT, TRAVEL AND MAKEUP ARE GROWING FASTER THAN APPAREL AND HOUSEHOLD GOODS

Growth in Aggregate US Retail Sales (July 2012–January 2017)*

As of February 7, 2017
* As reported by merchants (latest publicly available data)
Source: Deutsche Bank

(*Continued from page 11*)

factors: sales per square foot, anchor and inline tenant risk, co-tenancy provisions, and potential to sell outparcels or for alternative use.

Financing outside of the CMBS conduit market has been available to buyers on reasonable terms. Debt funds, insurance companies, high-yield and hard-money lenders, and banks have recently provided buyers with 50%–75% leverage and charged interest rates ranging from 5% to 12%, depending on the credit quality of the mall. The CMBS market has been selectively open to well-structured and appropriately leveraged deals.

Myth: There are no tenants to fill vacant mall space.

Reality: Successful malls ensure that their tenant mix is more diversified and experiential than just apparel stores.

Mall owners' current dilemma is finding optimal tenants for their vacant spaces. Historically, more than 70% of a regional mall's revenue came from apparel sales, with home goods and in-mall dining contributing the remainder of the revenue. That mix is unsustainable today, and mall owners know it.

Millennial households are the backbone of the consumer economy. These households spend more of their discretionary income on experiences than on apparel, as evidenced by recent lodging productivity and restaurant spending (*Display 8*).

Today's mall owners are repositioning their tenant mixes accordingly. They're looking to achieve a town center vibe that will bring customers inside not only for clothes shopping or online returns, but also for a meal, movie, concert, makeover, yoga or fitness class, or visit to a video arcade, day spa, or even a dentist.

CMBX.6 mall owners have told us that they're moving apparel concepts into corridors often grouped by category—such as athletic wear, junior apparel or women's clothing. Meanwhile, they are putting their higher-paying national tenants in the premium space at the mall center. They are also consolidating smaller inline shops between the mall center and the anchor spaces to accommodate discount retailers or entertainment and restaurant tenants with larger floor plans. While rent trends in the center of the mall are generally stable to declining, this is offset by the higher rents and maintenance fees paid by big-box stores such as Burlington Stores or Dick's Sporting Goods, relative to the department store anchors they're replacing.

Moving tenants around, building and knocking down demising partitions, adding stove ventilation and wet spaces for restaurants, and making the mall center more attractive with updated flooring and lighting is expensive, and not every mall owner can afford to do it.

For those that can, the positive net result of the changing tenant mix is a more diversified base and, in many cases, higher occupancy rates—upward of 85%, on average—and often higher rents on former department store boxes. Downsides include lower average rents on consolidated inline shops, fewer credit leases, shorter lease terms and modestly lower revenue. Capitalization rates[7] are higher, but most of the assets will be sustainable over the long term because they're adapting to a changing consumer spending model.

7 Capitalization rate (or cap rate) is the ratio of net operating income to current market value.

Mall owners' dilemma is finding the optimal tenant mix"

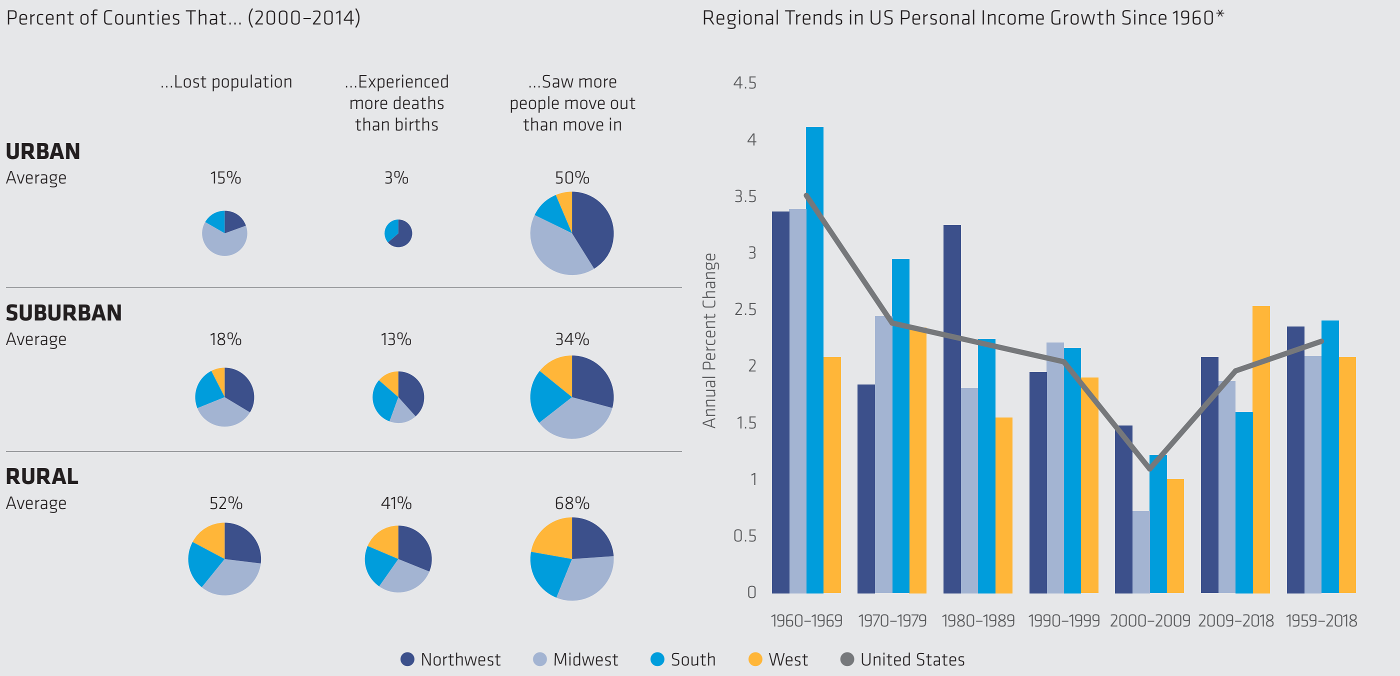
Which mall owners can afford to make this shift? Public REITs and multi-asset regional operators have the advantage. These owners have more diversified income sources as well as more leverage with national or regional tenants that rent from them across multiple locations. About 80% of regional malls in the CMBS universe are owned by a public REIT or large mall-portfolio owner; that figure rises to 86% for CMBX.6 malls. These owners won't necessarily have a better outcome than private mall owners, but they are more likely to be sufficiently capitalized to negotiate maturing leases, support capex, manage tenant-turnover costs, and provide move-in incentives to prospective tenants. Given the new economics of the mall, we're pricing in lower rents and higher cap rates, which have risen from 7%–9% for productive B malls a few years ago to 10%–16% today. This suggests that many seasoned loans on B malls are now overleveraged. Some will need to be recapitalized, which will contribute to trust losses.

Myth: No one visits the mall anymore.

Reality: Today's demographics and technological advances create headwinds, but largely for former industrial regions.

Since the Great Recession of the late 2000s and early 2010s, national and regional economic and demographic trends have created a perfect storm for malls in vulnerable areas of the country. Continued job losses in the manufacturing sector and stagnant or declining regional income growth have led to unfavorable population shifts as job seekers have relocated and the remaining population has aged (*Display 9*). Many older suburban markets and malls, particularly

DISPLAY 9: MIDWEST COUNTIES HAVE SUFFERED WIDESPREAD POPULATION LOSSES



County data as of May 22, 2018, and personal income data as of May 31, 2019
***** Real per capita personal income growth determined using the Chain-Weight Implicit Price Deflator for Personal Consumption (2012 = 1.00)
Source: Pew Research Center and United States Regional Economic Analysis Project

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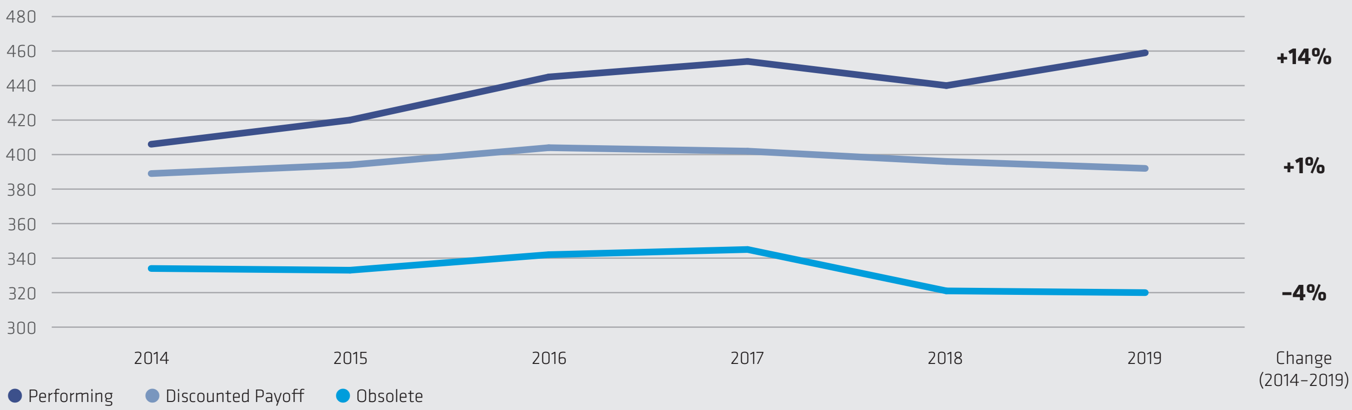
DISPLAY 10: MALL SALES GROWTH IS CORRELATED WITH PROJECTED LOSSES

Annual Same-Store Sales per Square Foot (USD)



Through May 31, 2019
Source: Trepp and AB

those in former industrial regions in the country's heartland, were left behind. These are mostly class C and D malls.

Meanwhile, industries consolidated operations around metropolitan areas to gain efficiencies and remain close to talent pools. Accordingly, malls in regions with favorable demographics and rising income have seen growth in sales.

We have seen the effects of this dispersion across the malls in the CMBX.6. Since the 2013 Census, we have observed that the 19 malls that are unlikely to experience material losses (i.e., performing malls) have seen their annual same-store sales per square foot climb 14% over five years, from an average of $406 to $459 (*Display 10*). The malls that could see moderate losses (discounted-payoff malls) increased a modest 1%, from $389 to $392 per square foot. And the malls we expect will suffer material losses (obsolete malls) lost an average of 4%, from $334 to $320 per square foot.

Myth: Co-tenancy clauses will be triggered as department stores go extinct, putting the final nail in the mall coffin.

Reality: Modernized co-tenancy clauses reduce the impact of shuttering department stores.

A co-tenancy clause in a retail lease contract allows a tenant to reduce its rent should key tenants vacate or if the mall reaches a predetermined vacancy threshold.[8] Regional malls historically had two to four broadline department store anchor tenants, comprising 45% of the mall's total square footage. A typical co-tenancy clause defines a triggering event as fewer than two anchors remaining open. Once triggered, the clause allows smaller inline tenants to request a lower rent or other remedy for up to 12 months before affirming, rejecting or renegotiating their leases.

When a co-tenancy clause is triggered, cash flow deteriorates. However, the impact on cash flow isn't uniform, because the economics of co-tenancy vary according to the terms of each tenant's lease. In fact, depending on the mall's productivity, a triggered clause can mean a temporary reduction in cash flow or can send the mall into a tailspin from which it cannot recover.

8 In some cases, the tenant is required to demonstrate an impact on sales.

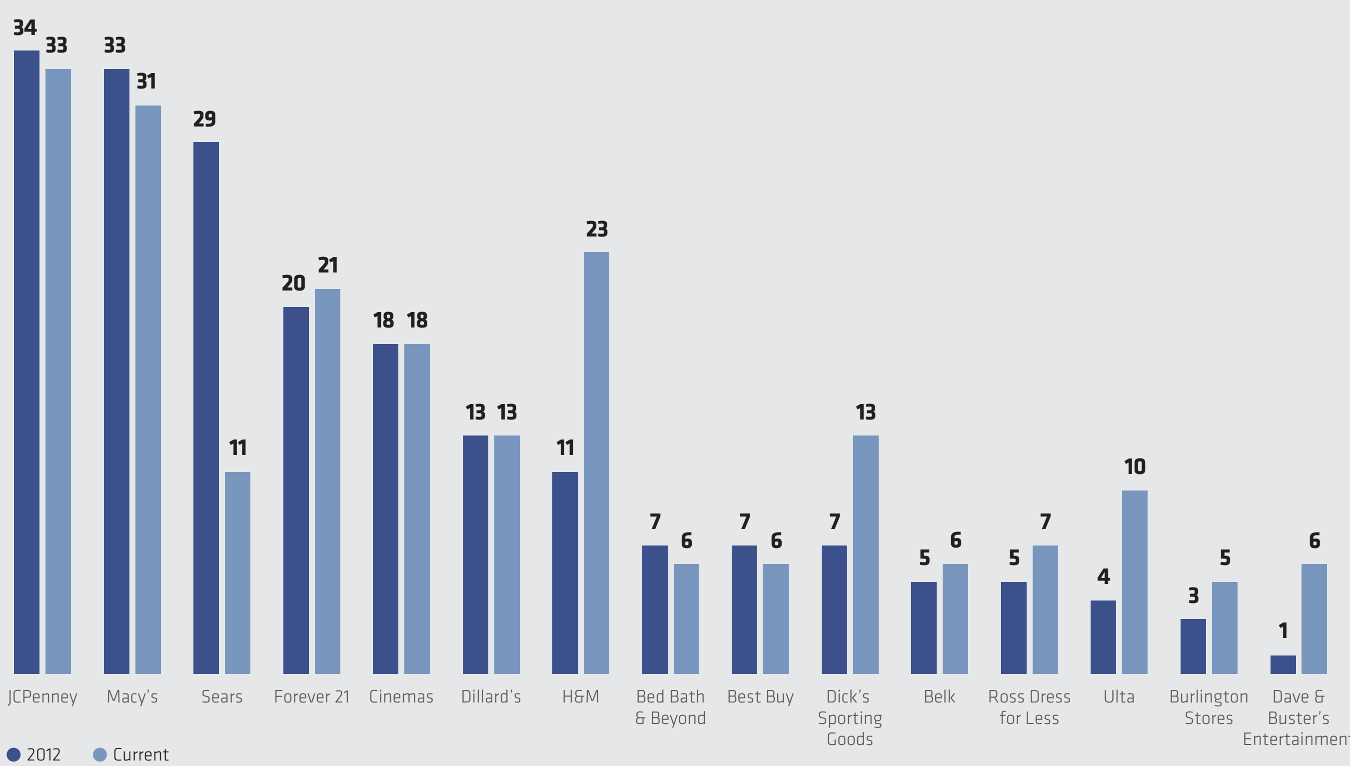
Over the past five years, landlords have been adjusting co-tenancy clauses in recent leases to omit specific anchor names such as Sears and Macy's, while substituting a reference to junior anchors, which typically occupy half the space of a department store (*see* "Toward a Modernized Co-Tenancy Model," *page 20*). While this has helped to diminish co-tenancy risk, we still consider it a near-term concern, particularly for the weakest malls.

Accordingly, we monitor the health and viability of the traditional broadline anchor stores of the 37 malls in the CMBX.6 and assess the risk that a co-tenancy clause could be triggered.

Display 11 compares the number of anchors at the CMBX.6 malls in 2012 to the number remaining today. Notably, Sears-related risk is lower today than at mortgage origination, as the company now has just 11 stores in the mix versus its original 29. On the other hand, there has been an increase in H&M, Dick's Sporting Goods, Ulta Beauty, Dave & Buster's and others. Some of these new tenants

DISPLAY 11: THE MALL ANCHOR LANDSCAPE HAS SHIFTED SINCE 2012

Number of Anchor Stores in the CMBX.6's Regional Shopping Malls



As of May 31, 2019

Source: Trepp, loan origination documents, mall store directories and AB will fulfill co-tenancy clauses specifying space greater than 50,000 square feet. For example, Pennsylvania REIT's Capital City Mall near Harrisburg benefited from replacing Sears with Dick's Sporting Goods in 2017 and Dave & Buster's in 2018; Capital City Mall subsequently defeased in April 2019.

Twenty-six of the 37 malls in the CMBX.6 universe have more than the critical two department store anchor tenants. Twenty-three of these anchor leases will mature within three years. Even if none of these leases renew and all the Sears locations close, only seven malls would fall below the historical two-anchor co-tenancy threshold. Nineteen of the 37 malls would remain above the two-anchor trigger. Indeed, out of an abundance of caution, we've assumed that all Sears locations will close by 2020, even though Sears is working through its restructuring plan and has approximately 200 stores still open around the country.

In this context, we also consider JCPenney a risk. While we've seen JCPenney renew a lease as recently as November 2018 for another five years (Emerald Square mall in Massachusetts), the company's management instability has thrown into question its viability and profitability. Although it will not have more lease maturities prior to the maturing of the CMBX.6 in 2023, store closings are possible.

With respect to co-tenancy risk, we've identified seven malls with only two traditional anchors of which one is a JCPenney (*Display 12*). We've labeled four of these malls "performing" because of their overall productivity and the owner's ability to find alternative anchors that are likely to draw as much traffic as or more traffic than a closed anchor.

One of these is CBL Properties' Jefferson Mall in Louisville, Kentucky. Jefferson Mall recently opened a 50,000-square-foot Round One Entertainment facility as an anchor, thereby offsetting its co-tenancy risk from JCPenney. The headline anchor count may have decreased to only two stores in these malls, but the Jefferson Mall example illustrates that alternative and junior anchor tenants are filling the gaps.

The remaining three of seven JCPenney-exposed malls we've labeled "obsolete," with estimated recovery reflecting only the land value.

DISPLAY 12: A CLOSER LOOK AT MALLS WITH HEIGHTENED CO-TENANCY RISK

CMBX.6 Malls with Two Anchors, of Which One Is JCPenney

Performing

Obsolete

Jefferson Mall
Louisville, KY
Dillard's, JCPenney

Louis Joliet Mall
Joliet, IL
JCPenney, Macy's

Southland Center Mall
Taylor, MI
JCPenney, Macy's

Visalia Mall
Visalia, CA
JCPenney, Macy's

Towne Mall
Elizabethtown, KY
JCPenney, Belk

Pierre Bossier Mall
Bossier City, LA
Dillard's, JCPenney

Crystal Mall
Waterford, CT
JCPenney, Macy's

As of June 30, 2019
Source: Trepp and AB

TOWARD A MODERNIZED CO-TENANCY MODEL

While upscale luxury department stores continue to flourish, the balance of department stores has come under significant pressure as consumer preferences have changed. Consumers now spend more of their free time and money enjoying experiences and services like restaurants and game rooms, as well as off-price retailers. For example, Sears has struggled for years to find its footing in the face of low-cost competitors such as Walmart and Amazon. Both upscale and lower-price-point department stores have responded to these challenges by consolidating stores (*Display*) in overlapping trade areas and by shrinking store fleets to drive up same-store sales.

These closures are problematic because of traditional mall economics. The mall of the 1950s centered around the department store, which drew consumer traffic to the mall's smaller local stores. To even obtain financing to build a mall, a developer would need to line up a suite of department store anchors with long-term leases. Landlords and department stores would agree to below-market rents with multi-decade extension options, ensuring the department stores' continued presence in the mall.

Smaller tenants, which often lacked strong credit profiles, signed shorter leases[9] with the expectation of benefiting from department stores' continued presence. These leases typically included a co-tenancy clause that would allow smaller tenants to reduce their rent if key department store anchors or a certain number of stores left the mall.

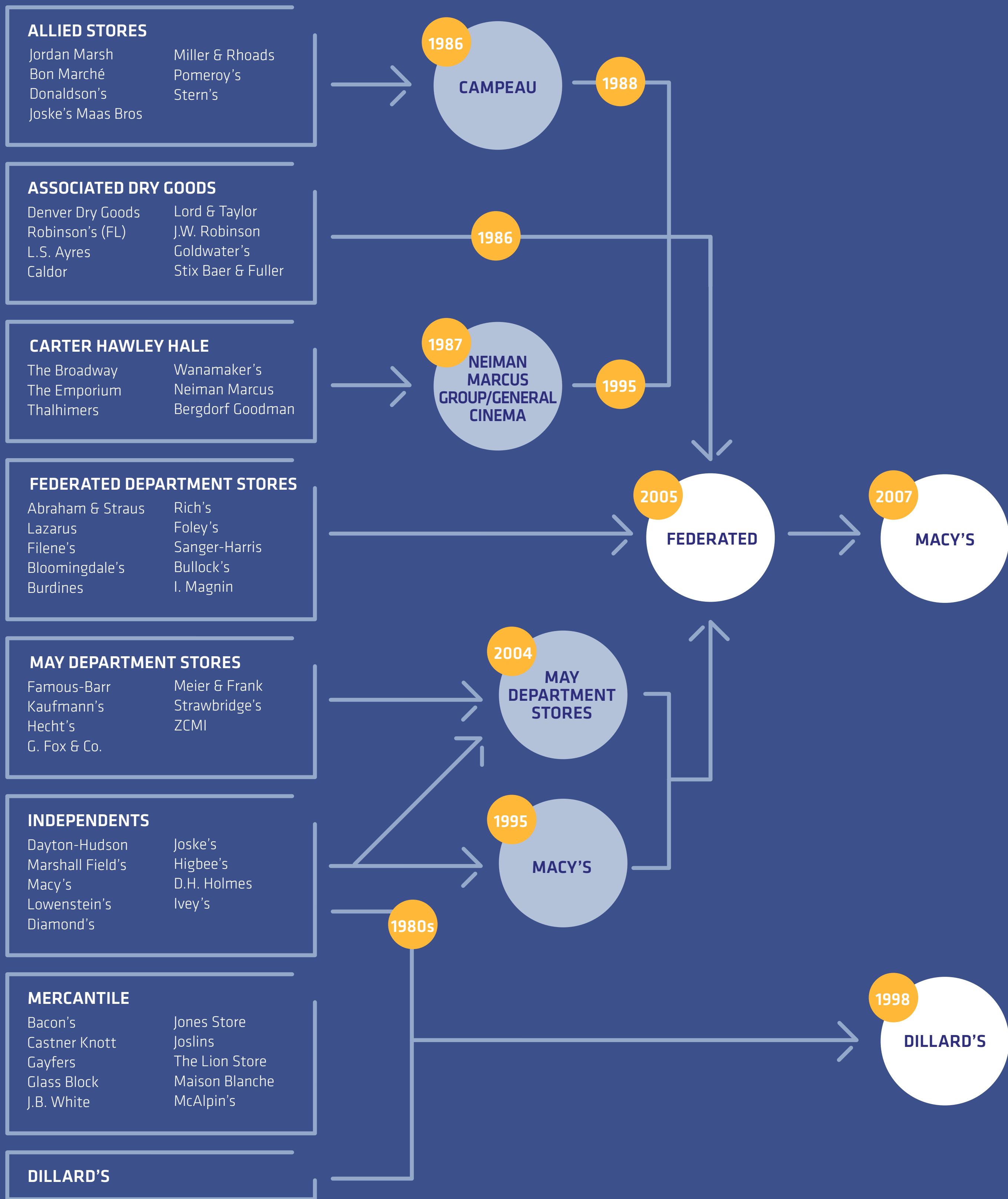
In general, recent leases contain updated co-tenancy rules encompassing fewer anchors and referencing overall occupancy, gross mall sales figures or smaller junior anchors as co-tenants. For comparison, an older clause might require a minimum of two traditional broadline department stores exceeding 100,000 square feet, while a modern co-tenancy clause typically references tenants occupying 50,000 square feet or more.

This makes sense, given that today's department stores are no longer as relevant as they once were. Despite the sizable square footage occupied by department store anchors, their rent contributes only a tiny fraction of the landlords' total rent collection—sometimes as little as 10%. The core of the mall generates the bulk of rent and is the key area to analyze to determine a CMBS loan's expected performance.

Although mall leases are moving toward a modernized co-tenancy model, there remains a legacy overhang of traditional co-tenancy agreements. On the one hand, we expect to see the proportion of modern to traditional clauses continue to shift over time. On the other hand, old lease agreements are often extended rather than fully renegotiated. With that in mind, we have conservatively simulated our CMBS credit scenarios with the assumption that co-tenancy will continue to be a critical revenue factor for a mall over the medium term.

9 Leases for smaller tenants typically have three- to seven-year terms.

CONSOLIDATION HAS DRAMATICALLY RESHAPED THE DEPARTMENT STORE LANDSCAPE



As of May 2016
Source: General Growth Properties (GGP) and Brookfield Property REIT (BPR)

THE ANALYSIS

Our analysis places the malls in the CMBX.6 into three buckets: performing malls that are mostly class A and B; transitional class B malls that are overleveraged but have potential for repositioning and loan modification; and obsolete class B and C malls (*Display 13*).

Contrary to market misconceptions about collateral quality in the CMBX.6, C malls comprise only one percentage point of the defeasance-adjusted 17% weight that is regional malls. There are no class D malls in the series at all. In fact, while C and D malls—those

(*Continued on page 26*)

DISPLAY 13: A BROAD RANGE OF EXPECTATIONS FOR CMBX.6 MALLS, FROM PERFORMING TO OBSOLETE

Category	Type of Sponsor	Sponsor	Number of Malls	Mall Name	CMBX Weight (Percent)	Defeasance-Adjusted CMBX Weight (Percent)	Current Loan Balance (USD Millions)
PERFORMING			19		8.6	9.8	2,117
	PUBLIC REIT		14		5.6	6.5	1,290
		CBL Properties (CBL)	4		1.5	1.8	294
				Arbor Place (GA)	0.6	0.7	108
				Jefferson Mall (KY)	0.3	0.4	63
				Northwoods Mall (SC)	0.3	0.4	64
				Southpark Mall (VA)	0.3	0.3	59
		Brookfield Properties Retail Group (BPR)	7		2.9	3.4	762
				Bellis Fair (WA)	0.3	0.4	82
				Chesterfield Towne Center (VA)	0.5	0.7	100
				Greenwood Mall (KY)	0.4	0.4	61
				Northridge Fashion Center (CA)	0.9	1.0	230
				Southland Center (MI)	0.3	0.3	70
				RiverTown Crossings (MI)	0.3	0.3	144
				Visalia Mall (CA)	0.2	0.3	74
		Pennsylvania REIT (PEI)	1	Cumberland Mall (NJ)	0.3	0.3	43
		Simon Property Group (SPG)	2		0.9	1.0	191
				Battlefield Mall (MO)	0.6	0.7	116
				Midland Park Mall (TX)	0.3	0.4	75
	JOINT VENTURE REIT		4		1.8	1.9	544
		CBL/TIAA	1	West County Center (MO)	0.7	0.7	188
		SPG/KanAm Grund	1	Concord Mills (NC)	0.4	0.4	235
		Starwood Retail Partners/ Unibail-Rodamco-Westfield (URW)	2		0.7	0.8	122
				Chicago Ridge Mall (IL)	0.3	0.3	80
				Louis Joliet Mall (IL)	0.4	0.4	42

Category	Type of Sponsor	Sponsor	Number of Malls	Mall Name	CMBX Weight (Percent)	Defeasance-Adjusted CMBX Weight (Percent)	Current Loan Balance (USD Millions)
	REGIONAL OWNER		1		1.2	1.4	282
		Pyramid Management Group	1	Crossgates Mall (NY)	1.2	1.4	282
DISCOUNTED PAYOFF			10		4.1	4.7	1,089
	PUBLIC REIT		4		1.6	1.8	409
		BPR	2		0.6	0.6	136
				Animas Valley Mall (NM)	0.2	0.2	46
				Florence Mall (KY)	0.4	0.4	90
		SPG	1	Town Center at Cobb (GA)	0.8	0.9	193
		Washington Prime Group (WPG)	1	Dayton Mall (OH)	0.3	0.3	80
	JOINT VENTURE REIT		2		0.8	1.0	213
		SPG/CPP/TIAA	1	Emerald Square (MA)	0.4	0.5	108
		Starwood Retail Partners/URW	1	Solano Town Center (CA)	0.4	0.59	105
	REGIONAL OWNER		2		1.2	1.5	358
		Pyramid	1	Poughkeepsie Galleria (NY)	0.3	0.4	148
		Wilmorite Properties	1	Eastview Mall (NY)	0.9	1.1	210
	PRIVATELY OWNED		2		0.4	0.4	110
		Time Equities	1	Newgate Mall (UT)	0.2	0.2	58
		Brixton Capital	1	Rogue Valley Mall (OR)	0.2	0.2	52
OBSOLETE			8		1.8	2.0	371
	PUBLIC REIT		4		1.0	1.2	212
		CBL	1	WestGate Mall (SC)	0.2	0.2	33
		BPR	2		0.8	0.9	158
				Pierre Bossier Mall (LA)	0.2	0.2	43
				The Shoppes at Buckland Hills (CT)	0.6	0.7	115
		Macerich (MAC)	1	Towne Mall (KY)	0.1	0.1	21
	JOINT VENTURE REIT		1		0.4	0.4	87
		SPG/NYSTRS/J.P. Morgan Fleming	1	Crystal Mall (CT)	0.4	0.4	87
	PRIVATELY OWNED		3		0.4	0.4	72
		Namdar Realty Group	1	Fashion Square (MI)	0.2	0.2	35
		Private Third Party	1	Salem Center (OR)	0.2	0.2	30
		Lexington Realty International	1	Westgate Mall (MN)	0.0	0.1	7
Totals			37		14.4	16.5	3,576

As of June 30, 2019
Source: Trepp and AB

INSIDE DAYTON MALL: HOW ON-SITE VISITS ENRICH THE VIEW

From a distance, the Dayton Mall in Ohio might not look like a performer. On paper, it doesn't present all that well either. Dayton competes with newer nearby developments Austin Landing and The Greene—properties built for "work, live, play." It also competes with a sister property, The Mall at Fairfield Commons, less than 20 miles away. Can the Dayton suburbs—with a population of 720,000 within a 15-mile radius—support four large retail centers?

Dayton Mall's current store sales of $340 per square foot garner it a Green Street rating of C+. Since loan origination, NOI has declined 16%—more recently, it fell 9% in 2017 and another 6% in 2018. While occupancy has increased from 92% to 95% over the life of the loan, recent occupancy trends do not look positive. Financial statements show that Dayton Mall's occupancy declined 5% in 2017, recovering just 2% in 2018. Based on these trajectories, our assessment for the mall was a 40%–60% loss at loan maturity.

It would be easy to write off this mall. Unless you've been to the mall itself.

A 1.4-million-square-foot indoor shopping mall, Dayton Mall is owned and operated by Washington Prime Group (WPG), a public retail REIT spun off from Simon Property Group in 2014 and owner of 110 assets in total. We met with WPG at its Columbus, Ohio, headquarters prior to the mall's general manager giving us a guided tour of several local assets.

As we drove around Dayton Mall's Mall Ring Road, we could see that the property did not have as much curb appeal as its competition. It appeared to be a 1970s relic, with outdated facades in need of a revamp.

On the day of our tour, local patrons were mourning the recent loss of Elder-Beerman department store and the announcement of Sears' imminent closing. But Seritage Growth Properties, the owner of the Sears space and its neighboring outparcel, had opened an Outback Steakhouse on the former site of Sears Auto Center. Hand & Stone Massage and Facial Spa, we were told, had also recently opened at the mall. These were two early indicators that the mall had been successful in replacing traditional tenants with experiential retail.

As we entered, we were impressed to see a fresh-looking H&M. The clothing store, whose lease runs until 2025, had replaced smaller inline tenants as well as some storage space in Dayton Mall in 2014. We were already starting to see that the mall's reported sales numbers didn't tell the whole story.

Though inline occupancy is currently robust at 95%, we noticed the two vacant anchor spaces and wondered aloud if the loss of Elder-Beerman and Sears would result in a significant deterioration in foot traffic. The manager noted that the traditional anchor stores had become less of a traffic driver than in years past.

We observed that the mall seemed healthy despite these closings, contradicting its recent financial trends. For example, off-price brand Ross Dress for Less signed a lease for the space vacated by the bankrupt hhgregg, with an anticipated opening in the third quarter of this year. The yearlong vacancy had hurt Dayton Mall's financials. But if Ross pays rent of just $10 per square foot, the 30,000-square-foot location will give the property a bump in revenue of $300,000 annually.

Additionally, home-goods retailer The RoomPlace had recently begun construction on its 51,000 square foot new-to-market location within the Dayton Mall. A store of this size gives the mall owner flexibility in leases to counter co-tenancy clauses citing the loss of larger anchor tenants as triggers. Rent from these two junior anchors—Ross Dress for Less and The RoomPlace—will likely offset the current decline in NOI observed in the mall's financial statements.

Lastly, WPG has reaffirmed its commitment to the Dayton Mall—on the order of another $8–$10 million—by shouldering the cost of relocating five inline tenants (as well as renegotiating and extending leases) to decrease overall mall vacancy.

Dayton Mall must also be seen in the context of the larger community. Its general manager is active in the community and involved in redevelopment discussions for the area. During our walkthrough, we noticed local sponsorship marketing throughout the mall, such as a sponsored play area. The sponsors, all local hospitals, were apparently very active in the community and even competed at times for sponsorship at Dayton Mall.

The city of Miamisburg, the Dayton township in which the mall is located, also continues to assist in rebranding the mall and its surrounding areas. It recently adopted a master plan for the district and is calling for more than $200 million in investment. Promisingly, has also completed construction on roads surrounding the mall to improve the flow of traffic, spending $1.8 million.

Overall, our outlook for the mall was more positive after our visit than before it. WPG is creatively repurposing space to meet its clients' needs. We even heard anecdotes about former tenants leaving the mall for competing mixed-use properties, only to regret their move. We now believe that, as a traditional retail property, the Dayton Mall is well positioned to evolve with the times. Our current forecasts put terminal NOI in the range of $6–$9 million a year, for a debt-service coverage ratio (DSCR) range of 1.3× to 1.6×. That suggests a modest 0%–20% loss to the loan, not a dire 40%–60% loss.

(*Continued from page 22*)
most at risk due to low productivity—represent 38% of the total mall universe, these weaker assets are not proportionately represented in the CMBS market to begin with (*Display 14*).

Components of our analysis include assessments of ownership, competitive positioning, rent potential, sales productivity and future cash flows. (For further details on our methodology for loan analysis, please see the Appendix, *page 49*.)

Based on these factors, our assessment of the 19 "performing" malls suggests that these assets will most likely pay off in full at or close to the loan maturity date. Even after applying substantial haircuts to current NOI and correspondingly conservative cap rates, these assets have an average terminal LTV under 70%.

We've modeled another 10 malls with discounted payoffs. We consider all 10 of these to be viable, ongoing concerns as regional malls with a continued market presence. However, they're now overleveraged and may pay off at a negotiated discount, which would result in a loss to the CMBS trust. The special servicer may be inclined to offer a loan modification to reduce loss severity.

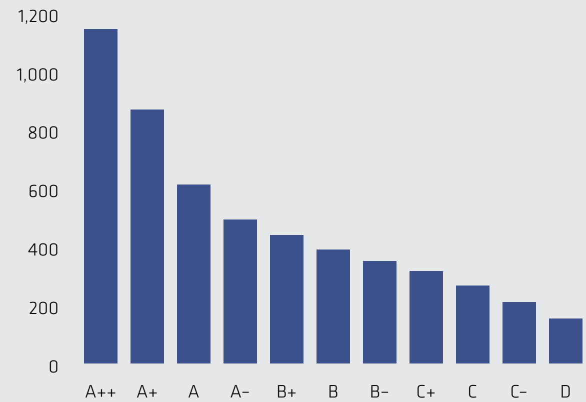
Lastly, the eight malls we rank as obsolete we have awarded only land value (*see* "Assessing Land Value," *page 50*, in the Appendix).

OWNERSHIP

Institutional sponsorship is critically important to CMBS loans, even though these mortgages are nonrecourse. Institutional owners, such as public-equity REITs, have access to external capital and a broad cash flow stream supported by an entire portfolio of assets. This means that these multi-asset owners can negotiate leases with tenants across their portfolios, rather than at the individual property level.

In addition, if the mortgage market experiences a disruption, an institutional owner is more likely to have the financial flexibility to refinance an asset using an alternative liquidity source, such as a line of credit. While some very large REITs such as Simon Properties could walk away from select noncore B-mall assets, the REITs that specialize in middle market malls consider B malls to be critical revenue contributors to their core operations.

DISPLAY 14: LOWER-RATED MALLS GENERATE LOWER SALES...
Annual Sales per Square Foot (USD)



As of May 3, 2019
***** CMBS issued from 2010 through May 3, 2019;
† CMBS and CMBX.6 contain no D-rated malls
Source: Green Street Advisors

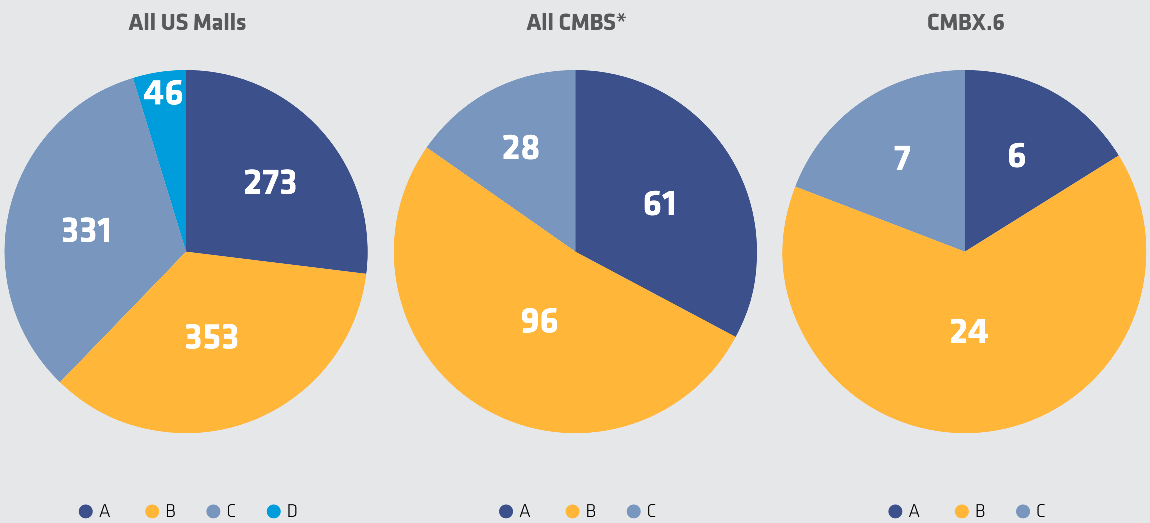
Indeed, Pennsylvania REIT noted in its fourth-quarter 2018 earnings report that it would use its line of credit to unencumber and defease the Capital City Mall mortgage referenced in the CMBX.6, and subsequently did so. And institutional owners are more likely than private owners to have capital available to invest in asset repositioning and will work with special servicers to provide a reasonable outcome for the asset.

The CMBX.6 mall assets have strong ownership, with 32 of the 37 malls—16 percentage points of the defeasance-adjusted 17% CMBX weight—owned by a large institutional owner.

“Half the malls in the CMBX.6 will likely pay off their loans in full”

...AND ARE RELATIVELY SCARCE IN THE CMBX.6

Number of Malls by Mall Rating



C- and D-Rated† Malls
Of all malls: 38%
Of all CMBS: 15%
Of CMBX.6: 16%

COMPETITION

We also analyze the competitive landscape for each regional mall in the CMBX.6. Within their respective trade areas, the 19 malls we consider to be “performing” are generally the first or second in a four-mall market.

Most of the 10 malls we’ve modeled with discounted payoffs are also the first or second most productive mall assets in the surrounding comparative set.

The exception is the Dayton Mall in Ohio, ranked third out of four malls in its market. While that’s a strike against Dayton, Washington Prime (WPG) has indicated its intention to invest $8–$10 million in renovations, to be completed before year-end. WPG currently ranks Dayton as a Tier 1 mall within its portfolio, with sales at $340 per square foot as of fourth-quarter 2018. Therefore, assuming its only value is the land it’s built on would be overly conservative (*see* “Inside Dayton Mall: How On-Site Visits Enrich the View,” *page 24*).

Two other malls in the discounted payoff category are the Animas Valley Mall in New Mexico and Rogue Valley Mall in Oregon. Both are the only malls within 100 miles, making them the only game in town (*Display 15, page 28*). We expect them to survive based on a combination of demographics, relatively stable metrics and lack of competition.

In contrast, the eight malls we have assessed to be obsolete and have modeled to land value rank second or third in a market of three to four competitors.

(*Continued on page 32*)

DISPLAY 15: HOW DOES THE COMPETITION STACK UP?

PERFORMING MALLS

Mall	Green Street Grade	Only Game in Town?	Sales PSF	Occupancy	Market Rank	Competitor	Distance (Miles)	Sales PSF	Competitor Quality (Green Street)
Arbor Place	B–	⊗	$359	99%	2 (out of 3)	Greenbriar Mall	15	$210	C–
						Town Center at Cobb	22	$435	B+
Battlefield Mall	B+	⊗	$475	92%	1 (out of 3)	Tanger Outlets Branson	36	$430	B
						Branson Landing	36	$415	B+
Bellis Fair	B	⊗	$370	91%	3 (out of 4)	Cascade Mall	23	$300	C
						Everett Mall	62	$465	B–
						Alderwood	67	$610	A
Chesterfield Towne Center	B	⊗	$390	89%	2 (out of 5)	Stony Point Fashion Park	4	$485	A–
						Regency Square	7	$225	C–
						Virginia Center Commons	14	$210	C–
						Southpark Mall	21	$365	B–
Chicago Ridge Mall	B+	⊗	$555	71%	1 (out of 4)	Ford City Mall	3	$380	C
						North Riverside Park Mall	9	$340	B–
						The Promenade Bolingbrook	13	$355	B+
Concord Mills	A–	⊗	$500	100%	2 (out of 4)	Northlake Mall	8	$390	B+
						Charlotte Premium Outlets	20	$420	B+
						Carolina Place	22	$525	B+
Crossgates Mall	A–	⊗	$545	90%	1 (out of 3)	Colonie Center	2	$475	B+
						Lee Premium Outlets	40	$485	A–
Cumberland Mall	C+	⊗	$371	88%	2 (out of 5)	Hamilton Mall	21	$365	B
						Gloucester Premium Outlets	25	$425	B+
						Harbor Square	26	$200	D
						Voorhees Town Center	29	$165	C–

Mall	Green Street Grade	Only Game in Town?	Sales PSF	Occupancy	Market Rank	Competitor	Distance (Miles)	Sales PSF	Competitor Quality (Green Street)
Greenwood Mall	B–	⊗	$315	98%	2 (out of 4)	RiverGate	48	$295	C
						Lebanon Outlet Marketplace	54	$425	B+
						Governor's Square Mall	54	$245	B
Jefferson Mall	B	⊗	$382	95%	3 (out of 4)	Mall St. Matthews	8	$400	B+
						Oxmoor Center	8	$540	A
						Green Tree Mall	13	$370	B–
Louis Joliet Mall	B	⊗	$505	87%	1 (out of 4)	The Promenade Bolingbrook	12	$355	B+
						Fox Valley Mall	12	$310	B
						Yorktown Center	20	$365	B
Midland Park Mall	B+	✓	$480	99%	1 (out of 1)	N/A			
Northridge Fashion Center	A–	⊗	$480	98%	4 (out of 5)	Westfield Topanga & The Village	4	$640	A
						Panorama Mall	6	$335	B–
						Westfield Fashion Square	9	$580	A–
						Westfield Valencia Town Center	12	$541	A–
Northwoods Mall	B	⊗	$402	93%	3 (out of 4)	Tanger Outlets Charleston	4	$425	B+
						Citadel Mall	10	$165	C–
						Shelter Cove Towne Centre	66	$385	B+
RiverTown Crossings	A–	⊗	$505	97%	1 (out of 3)	Tanger Outlets Grand Rapids	6	$420	B+
						Woodland Mall	9	$450	A–
Southland Center	B–	⊗	$415	93%	1 (out of 5)	Fairlane Town Center	8	$360	B
						Westland Shopping Center	12	$370	B–
						Laurel Park Place	15	$331	B–
						The Mall of Monroe	19	$280	C–

Mall	Green Street Grade	Only Game in Town?	Sales PSF	Occupancy	Market Rank	Competitor	Distance (Miles)	Sales PSF	Competitor Quality (Green Street)
Southpark Mall	B-	✗	$387	90%	2 (out of 4)	Chesterfield Towne Center	21	$385	B
						Regency Square	26	$225	C-
						Virginia Center Commons	30	$210	C-
Visalia Mall	B+	✗	$495	98%	1 (out of 5)	Tulare Outlets	6	$285	B-
						Hanford Mall	20	$335	C+
						Sierra Vista Mall	40	$290	C
						Manchester Mall	42	$165	C-
West County Center	A-	✗	$430	98%	3 (out of 5)	Plaza Frontenac	3	$635	A
						Saint Louis Galleria	6	$530	A
						Chesterfield Mall (MO)	7	$300	C+
						Chesterfield Outlets (MO)	9	$360	B-

DISCOUNTED PAYOFF MALLS

Mall	Green Street Grade	Only Game in Town?	Sales PSF	Occupancy	Market Rank	Competitor	Distance (Miles)	Sales PSF	Competitor Quality (Green Street)
Animas Valley Mall	B	✓	$355	87%	1 (out of 1)	N/A			
Dayton Mall	C+	✗	$340	96%	3 (out of 4)	The Greene Town Center	7	$470	A-
						Towne Mall (OH)	8	Closed	D
						The Mall at Fairfield Commons	12	$360	B-
Eastview Mall	A-	✗	$415	90%	2 (out of 4)	The Marketplace Mall	14	$390	B+
						The Mall at Greece Ridge	21	$415	B+
						Waterloo Premium Outlets	31	$348	B-
Emerald Square	B+	✗	$415	87%	2 (out of 5)	Providence Place	9	$565	A
						Swansea Mall	15	Closed	C-
						The Silver City Galleria	16	$330	C
						Warwick Mall	17	$375	B-
Florence Mall	B-	✗	$395	92%	1 (out of 4)	Northgate Mall (OH)	18	$255	C
						EastGate Mall	22	$365	B-
						Tri-County Mall	23	$235	C

Mall	Green Street Grade	Only Game in Town?	Sales PSF	Occupancy	Market Rank	Competitor	Distance (Miles)	Sales PSF	Competitor Quality (Green Street)
Newgate Mall	C+	✗	$355	92%	2 (out of 3)	Layton Hills Mall	8	$361	B–
						Trolley Square	31	$320	B
Poughkeepsie Galleria	B+	✗	$460	90%	1 (out of 5)	Newburgh Mall	11	$165	C–
						Jefferson Valley Mall	22	$360	B–
						Hudson Valley Mall	24	$230	C–
						Galleria at Crystal Run	26	$365	B
Rogue Valley Mall	B	✓	$375	78%	1 (out of 1)	N/A			
Solano Town Center	B+	✗	$325	87%	2 (out of 5)	Vacaville Premium Outlets	9	$348	B–
						Napa Premium Outlets	14	$381	B
						Sunvalley Shopping Center	20	$560	A–
						Somersville Towne Center	21	$285	C
Town Center at Cobb	B+	✗	$450	98%	2 (out of 3)	The Outlet Shoppes at Atlanta	8	$425	B+
						Cumberland Mall (GA)	11	$460	A–

OBSOLETE MALLS

Mall	Green Street Grade	Only Game in Town?	Sales PSF	Occupancy	Market Rank	Competitor	Distance (Miles)	Sales PSF	Competitor Quality (Green Street)
Crystal Mall	B	✗	$385	86%	3 (out of 5)	Westbrook Outlets	17	$225	C+
						Clinton Crossing Premium Outlets	21	$381	B
						The Shops at Somerset Square	34	$480	B+
						Westfield Meriden	36	$279	C+
Fashion Square	C	✗	$255	79%	4 (out of 4)	Bay City Town Center	15	$295	C–
						Midland Mall	24	$310	C+
						Genesee Valley Center	41	$370	B
Pierre Bossier Mall	B	✗	$375	82%	1 (out of 3)	Louisiana Boardwalk Outlets	2	$285	B–
						Mall St. Vincent	4	$300	C+

Mall	Green Street Grade	Only Game in Town?	Sales PSF	Occupancy	Market Rank	Competitor	Distance (Miles)	Sales PSF	Competitor Quality (Green Street)
Salem Center	B	⊗	$375	86%	2 (out of 4)	Heritage Mall	22	$230	C–
						Bridgeport Village	34	$305	A–
						Clackamas Town Center	41	$515	B+
The Shoppes at Buckland Hills	B	⊗	$380	98%	3 (out of 4)	The Promenade Shops at Evergreen Walk	1	$455	A
						The Shops at Somerset Square	7	$480	B+
						Enfield Square	13	$285	C
Towne Mall	C	⊗	$245	90%	3 (out of 3)	Jefferson Mall	30	$384	B
						Green Tree Mall	41	$370	B–
Westgate Mall (MN)	C–	⊗	$205	71%	2 (out of 2)	Crossroads Center	62	425	B+
WestGate Mall (SC)	C+	⊗	$339	82%	2 (out of 5)	Gaffney Outlet Marketplace	19	$353	B–
						Cleveland Mall	35	$215	C–
						Blue Ridge Mall (NC)	38	$230	C–
						Anderson Mall	47	$200	C

As of June 30, 2019
Source: Green Street Advisors, Trepp and AB

(Continued from page 27)

RENT POTENTIAL

We assess a mall's rent potential by reviewing current sales trends, occupancy and occupancy costs.[10] Our 2019 estimates for rent potential reflect current retailer stress: continued apparel retail bankruptcies, a limited number of large users to backfill anchor spaces and expectation of rent growth materially below forecasted inflation levels.

Accordingly, we've lowered inline occupancy to reflect our view that apparel retailers will shrink their store fleets by another 10%–15%. We've also reduced tenant occupancy costs to below 8%–10% to forecast stressed rents over the intermediate term. Specifically, we expect the center of the mall to continue to maintain a premium 12%–14% occupancy cost,[11] offset by an occupancy cost of 5%–8% for junior anchor tenants such as discount retailers, furniture stores and entertainment spaces.

While some mall owners may be able to right-size operating expenses as occupancy and revenues decline, we assume a constant annual expense increase and reduced rent and occupancy. Even so, we find it remarkable how much internal cash flow the majority of the CMBX.6 malls continue to generate.

10 A tenant's all-in occupancy cost is figured as a percentage of the location's gross annual sales.
11 As reported by mall owners.

FUTURE CASH FLOW

Given this significant free cash flow, we expect a limited number of term defaults, as well as the possibility of some upside if the borrower successfully allocates this free cash flow for asset repositioning. Indeed, the driving assumption behind the speculative short on the CMBX.6 is that there will be massive—and immediate—losses to the regional malls. This is highly unlikely, particularly in terms of timing (*see* "Assessing Potential Losses to CMBX.6 Tranches," *page 40*).

For the 19 performing malls, we expect an estimated average annual free cash flow of $6 million, with a DSCR of 1.9×, after our rent and occupancy haircuts. This is very strong, considering that most of the mall loans in the calculation are amortizing. From 2019 to 2022, when the loans mature, these assets will generate, on average, a stressed cumulative free cash flow above $20 million, ending the term with an average DSCR greater than 1.8× (*Display 16*).

Furthermore, even under these cautious occupancy and rent haircuts, we expect the terminal value of these assets to be greater than the terminal loan balance. We therefore assume that the terminal loan balances will be repaid at or close to par, either at the loan's maturity date or through some form of extension if there is a high residual LTV (*see* "Sugarloaf Mills: A Case Study in Loan Modifications," *page 44*).

In our discounted payoff category of malls, we expect moderate annual free cash flow and stable debt service. As we've already noted, these borrowers will most likely work with a special servicer to reduce the loan amount relative to current market value. On average, these assets generate an annual free cash flow of around $2.8 million and a DSCR of 1.5×, after our rent and occupancy haircuts. From 2019 to 2022, they will generate a cumulative free cash flow of $11 million and end the term with a 1.4× DSCR, on average.

Our analysis suggests a discounted payoff or possibly a note sale of the maturing loan balance. This assumes the special servicer would demand a quick resolution. In reality, special servicers have indicated to us that if the borrower faces appraisal risk at maturity on a functional asset, servicers are more inclined to extend the loan with a prolonged amortization period—typically as much as 3–5 years—to bring the loan balance down to a refinanceable scale.

(*Continued on page 35*)

DISPLAY 16: MOST CMBX.6 MALLS CAN EXPECT SUFFICIENT CASH FLOWS TO PAY THE (DEBT) BILLS

	Base Case Excess Cash Flow Projection (USD Mil.)						Base Case DSCR Projection				
	2018	2019E	2020E	2021E	2022E	Total	2018	2019E	2020E	2021E	2022E
PERFORMING MALLS											
Arbor Place	$6–$9	$3–$6	$3–$6	$3–$6	$3–$6	$12–$15	1.75–2	1.25–1.5	1.25–1.5	1.25–1.5	1.25–1.5
Battlefield Mall	$9–$12	$6–$9	$6–$9	$3–$6	$3–$6	$20–$25	2–3	2–3	1.75–2	1.5–1.75	1.5–1.75
Bellis Fair	$6–$9	$3–$6	$3–$6	$6–$9	$6–$9	$20–$25	2–3	1.5–1.75	1.5–1.75	1.75–2	2–3
Chesterfield Towne Center	$3–$6	$3–$6	$3–$6	$3–$6	$3–$6	$12–$15	1.5–1.75	1.25–1.5	1.25–1.5	1.25–1.5	1.25–1.5
Chicago Ridge Mall	$6–$9	$6–$9	$6–$9	$9–$12	$9–$12	$30–$35	3–4	2–3	2–3	2–3	3–4
Concord Mills	$25–$30	$25–$30	$20–$25	$20–$25	$20–$25	$80–$100	3–4	3–4	3–4	3–4	3–4
Crossgates Mall	$6–$9	$6–$9	$6–$9	$3–$6	$3–$6	$20–$25	1.25–1.5	1.25–1.5	1–1.25	1–1.25	1–1.25
Cumberland Mall	$3–$6	$0–$3	$0–$3	$0–$3	$0–$3	$6–$9	2–3	1.5–1.75	1.25–1.5	1–1.25	1–1.25

	Base Case Excess Cash Flow Projection (USD Mil.)						Base Case DSCR Projection				
	2018	**2019E**	**2020E**	**2021E**	**2022E**	**Total**	**2018**	**2019E**	**2020E**	**2021E**	**2022E**
Greenwood Mall	$3–$6	$6–$9	$6–$9	$6–$9	$3–$6	$25–$30	2–3	2–3	2–3	2–3	2–3
Jefferson Mall	$0–$3	$0–$3	$0–$3	$0–$3	$0–$3	$6–$9	1.5–1.75	1.25–1.5	1.25–1.5	1.25–1.5	1.25–1.5
Louis Joliet Mall	$0–$3	$6–$9	$3–$6	$3–$6	$3–$6	$20–$25	2–3	2–3	2–3	2–3	2–3
Midland Park Mall	$9–$12	$6–$9	$6–$9	$6–$9	$6–$9	$25–$30	2–3	2–3	2–3	2–3	2–3
Northridge Fashion Center	$9–$12	$6–$9	$6–$9	$6–$9	N/A*	$25–$30	1.5–1.75	1.5–1.75	1.25–1.5	1.25–1.5	N/A
Northwoods Mall	$3–$6	$3–$6	$3–$6	$3–$6	$3–$6	$12–$15	2–3	1.75–2	1.75–2	1.5–1.75	1.5–1.75
RiverTown Crossings	$9–$12	$6–$9	$6–$9	$6–$9	N/A	$20–$25	2–3	1.5–1.75	1.5–1.75	1.5–1.75	N/A
Southland Center	$3–$6	$3–$6	$3–$6	$3–$6	$3–$6	$12–$15	2–3	1.5–1.75	1.5–1.75	1.25–1.5	1.25–1.5
Southpark Mall	$3–$6	$3–$6	$3–$6	$3–$6	$3–$6	$15–$20	1.75–2	1.25–1.5	1.5–1.75	1.75–2	1.5–1.75
Visalia Mall	$6–$9	$6–$9	$6–$9	N/A	N/A	$12–$15	3–4	3–4	3–4	N/A	N/A
West County Center	$9–$12	$6–$9	$6–$9	$6–$9	$6–$9	$30–$35	2–3	1.75–2	1.5–1.75	1.75–2	1.75–2
Performing Mall Average	**$6–$9**	**$6–$9**	**$6–$9**	**$6–$9**	**$3–$6**	**$20–$25**	**2–3**	**2–3**	**1.75–2**	**1.75–2**	**1.75–2**
DISCOUNTED PAYOFF (DPO) MALLS											
Animas Valley Mall	$0–$3	$0–$3	$0–$3	$0–$3	$0–$3	$3–$6	1.5–1.75	1.25–1.5	1–1.25	1–1.25	1–1.25
Dayton Mall	$3–$6	$0–$3	$0–$3	$0–$3	$3–$6	$9–$12	1.5–1.75	1.5–1.75	1.25–1.5	1.5–1.75	1.5–1.75
Eastview Mall	$3–$6	$3–$6	$3–$6	$3–$6	$3–$6	$15–$20	1.5–1.75	1.25–1.5	1.25–1.5	1.25–1.5	1.25–1.5
Emerald Square	$3–$6	$0–$3	$0–$3	$0–$3	$0–$3	$6–$9	1.25–1.5	1–1.25	1–1.25	1–1.25	**0.9–1.1**
Florence Mall	$6–$9	$3–$6	$3–$6	$3–$6	$3–$6	$15–$20	2–3	2–3	1.75–2	1.5–1.75	1.5–1.75
Newgate Mall	$3–$6	$0–$3	$0–$3	N/A	N/A	$3–$6	2–3	2–3	2–3	N/A	N/A
Poughkeepsie Galleria	**-$1–$0**	**-$1–$0**	**-$1–$0**	**-$1–$0**	N/A	**-$1–$0**	**0.9–1.1**	**0.9–1.1**	**0.9–1.1**	**0.9–1.1**	N/A
Rogue Valley Mall	$0–$3	$0–$3	$0–$3	$0–$3	$0–$3	$3–$6	1.5–1.75	1.25–1.5	1.25–1.5	1.25–1.5	1.25–1.5
Solano Town Center	$6–$9	$3–$6	$6–$9	$6–$9	$6–$9	$20–$25	2–3	2–3	2–3	2–3	2–3
Town Center at Cobb	$3–$6	$3–$6	$0–$3	$3–$6	$3–$6	$12–$15	1.25–1.5	1–1.25	1–1.25	1–1.25	1–1.25
DPO Mall Average	**$3–$6**	**$0–$3**	**$0–$3**	**$3–$6**	**$0–$3**	**$9–$12**	**1.75–2**	**1.5–1.75**	**1.25–1.5**	**1.25–1.5**	**1.25–1.5**

	Base Case Excess Cash Flow Projection (USD Mil.)						Base Case DSCR Projection				
	2018	2019E	2020E	2021E	2022E	Total	2018	2019E	2020E	2021E	2022E
OBSOLETE MALLS											
Crystal Mall	$0–$3	**-$1–$0**	**-$1–$0**	**-$1–$0**	**-$1–$0**	**-$1–$0**	1.25–1.5	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**
Fashion Square	$0–$3	$0–$3	**-$1–$0**	**-$1–$0**	**-$1–$0**	$0–$3	1.25–1.5	1–1.25	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**
Pierre Bossier Mall	$0–$3	**-$1–$0**	**-$1–$0**	**-$1–$0**	**-$1–$0**	**-$1–$0**	**1–1.25**	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**
Salem Center	$0–$3	$0–$3	N/A	N/A	N/A	$0–$3	1.25–1.5	1–1.25	N/A	N/A	N/A
The Shoppes at Buckland Hills	$0–$3	**-$1–$0**	**-$1–$0**	**-$1–$0**	**-$1–$0**	**-$1–$0**	1.25–1.5	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**
Towne Mall	$0–$3	$0–$3	**$0–$3**	**$0–$3**	**-$1–$0**	$0–$3	1.5–1.75	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**
Westgate Mall (MN)	$0–$3	$0–$3	**$0–$3**	**$0–$3**	**-$1–$0**	$0–$3	**1.75–2**	1–1.25	1–1.25	**0.5–1.1**	**0.5–1.1**
WestGate Mall (SC)	$0–$3	$0–$3	**$0–$3**	**$0–$3**	**-$1–$0**	$0–$3	1.5–1.75	1–1.25	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**
Obsolete Mall Average	$0–$3	**$0–$3**	**$0–$3**	**$0–$3**	**-$1–$0**	$0–$3	1.25–1.5	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**	**0.5–1.1**

As of June 30, 2019
***** No data due to maturity
Source: Trepp and AB

(*Continued from page 33*)

In contrast, a forced liquidation would result in a below-market asset recovery, which is clearly less preferable. Indeed, between 2000 and 2007, 6% of CMBS collateral loans were resolved past the loan maturity date.[12]

While we are not using this assumption for our projected bond cash flows, it does represent potential upside to the protection seller. That's because a loan extension both reduces the loan balance and potential losses and prolongs the period for receiving the prorated CMBX coupon. Conversely, the same scenario would be detrimental to the protection buyer.

Lastly, the eight malls we deem obsolete have an annual average free cash flow shortfall and an average stressed DSCR of less than 1×. These averages are skewed downward by certain malls that we expect to experience significant cash flow deterioration over the next few years. We expect major occupancy and base rent declines as these assets become obsolete. Loss severity for these loans is likely to be very high.

12 Wells Fargo, "The 2019 CMBS Default and Loss Study," March 21, 2019.

PUNITIVE EXPECTED CAPITALIZATION RATES

We base our terminal values for the malls on significantly reduced NOI and materially higher cap rates than the origination cap rates of 6%–10%. The recent trend of replacing apparel tenants with regional retailers or service providers is eroding tenant credit quality. Also, shorter lease terms increase tenant turnover risk. These higher risk factors are reflected in mall capitalization rates, which we have raised.

Our terminal or maturity cap rates, which we apply to the loans in all three categories—performing, discounted payoff and obsolete—average 9%, 11% and 15%, respectively. Because we anticipate a continued decline in NOI through the term of the loan, our terminal asset value equates to materially higher mark-to-market cap rates (*Display 17*)—averaging 10%, 13% and 25%, respectively—when we use current NOI.

COMPLICATIONS AROUND DEFAULTING MALLS

For malls that do default, we believe that liquidations may not be as swift as some protection buyers anticipate. As long as the DSCR is above 1.0×, most owners will likely continue to make their debt-service payments until the loan's maturity. That helps delay what could be a meaningful tax bill, which would occur with an involuntary foreclosure or a voluntary deed in lieu of foreclosure.

When a borrower defaults on a nonrecourse mortgage such as a CMBS loan, the IRS treats the resulting deed transfer as a sale. The owner then must recognize a gain if the defaulted loan balance is greater than the borrower's tax basis.

(*Continued on page 38*)

DISPLAY 17: OUR ANALYSIS INCORPORATES PUNITIVELY HIGH MARK-TO-MARKET CAP RATES

			Capitalization Rate			
Category	Mall	CMBX Weight	Origination	Terminal	Mark to Market	CMBX Weight (Defeasance-Adjusted)
PERFORMING MALL	Arbor Place	0.6%	7.4%	10.0%	11.0%	0.7%
	Battlefield Mall	0.6%	6.8%	9.0%	12.1%	0.6%
	Bellis Fair	0.3%	7.6%	10.0%	10.6%	0.3%
	Chesterfield Towne Center	0.5%	6.6%	9.0%	10.7%	0.7%
	Chicago Ridge Mall	0.3%	8.3%	8.5%	7.6%	0.3%
	Concord Mills	0.4%	6.9%	8.0%	9.7%	0.4%
	Crossgates Mall	1.2%	6.1%	8.0%	9.2%	1.4%
	Cumberland Mall	0.3%	7.1%	10.0%	9.6%	0.3%
	Greenwood Mall	0.4%	7.9%	8.3%	8.7%	0.4%
	Jefferson Mall	0.3%	7.1%	10.0%	10.1%	0.3%
	Louis Joliet Mall	0.4%	7.6%	8.0%	10.3%	0.4%
	Midland Park Mall	0.3%	6.9%	9.0%	11.1%	0.3%
	Northridge Fashion Center	0.9%	6.5%	8.0%	8.4%	1.0%
	Northwoods Mall	0.3%	7.6%	10.0%	12.1%	0.4%
	RiverTown Crossings	0.3%	7.1%	9.0%	11.2%	0.3%
	Southland Center	0.3%	7.4%	10.0%	10.5%	0.3%
	Southpark Mall	0.3%	7.2%	10.0%	10.1%	0.3%
	Visalia Mall	0.2%	7.2%	9.0%	10.0%	0.3%

Category	Mall	CMBX Weight	Capitalization Rate: Origination	Capitalization Rate: Terminal	Capitalization Rate: Mark to Market	CMBX Weight (Defeasance-Adjusted)
	West County Center	0.7%	6.7%	8.5%	9.7%	0.7%
TOTAL/AVERAGE		**8.6%**	**7.1%**	**9.1%**	**10.1%**	**9.8%**
DISCOUNTED PAYOFF	Animas Valley Mall	0.2%	7.3%	12.0%	15.1%	0.2%
	Dayton Mall	0.3%	7.7%	11.3%	12.1%	0.3%
	Eastview Mall	0.9%	5.9%	8.0%	9.1%	1.1%
	Emerald Square	0.4%	7.7%	12.0%	14.4%	0.5%
	Florence Mall	0.4%	7.5%	9.7%	12.2%	0.4%
	Newgate Mall	0.2%	8.5%	12.0%	12.1%	0.2%
	Poughkeepsie Galleria	0.3%	6.7%	12.0%	13.2%	0.4%
	Rogue Valley Mall	0.2%	7.9%	12.0%	14.5%	0.2%
	Solano Town Center	0.4%	7.7%	8.5%	10.5%	0.5%
	Town Center at Cobb	0.8%	6.2%	10.8%	11.4%	0.9%
TOTAL/AVERAGE		**4.1%**	**7.3%**	**10.8%**	**12.5%**	**4.7%**
OBSOLETE	Crystal Mall	0.4%	7.4%	14.0%	21.2%	0.4%
	Fashion Square	0.1%	10.1%	17.0%	34.4%	0.2%
	Pierre Bossier Mall	0.2%	7.7%	18.0%	18.9%	0.2%
	Salem Center	0.2%	9.0%	10.0%	27.9%	0.2%
	The Shoppes at Buckland Hills	0.6%	6.8%	12.0%	24.5%	0.7%
	Towne Mall	0.1%	7.6%	20.0%	20.8%	0.1%
	Westgate Mall (MN)	0.0%	8.4%	12.0%	28.1%	0.0%
	WestGate Mall (SC)	0.1%	9.0%	18.0%	25.1%	0.2%
TOTAL/AVERAGE		**1.8%**	**8.3%**	**15.1%**	**25.1%**	**2.0%**
TOTAL WEIGHT/AVERAGE CAP RATE		**14.4%**	**7.7%**	**10.8%**	**14.5%**	**16.5%**

As of June 30, 2019
Source: Trepp and AB

DISPLAY 18: MOST OF THE DISCOUNTED-PAYOFF MALLS ARE VIABLE ASSETS

Mall	Projected NOI Change at Term	Terminal Cap Rate	Cumulative Excess Cash Flows (USD Mil.)	Projected ROE to Maturity	Ownership	Terminal Value (USD Mil.)	Value Haircut from Origination
Animas Valley Mall	–21%	12%	$5	14%	RSE Capital Partners	$34	–54%
Dayton Mall	–6%	11%	$11	20%	WPG	$71	–46%
Eastview Mall	–9%	8%	$19	12%	Wilmorite	$165	–55%
Emerald Square	–17%	12%	$7	10%	SPG/CPP/TIAA	$72	–57%
Florence Mall	–26%	10%	$16	23%	GGP	$82	–48%
Newgate Mall	–22%	12%	$5	20%	Time Equities	$49	–41%
Poughkeepsie Galleria	–9%	12%	$0	0%	Pyramid	$99	–58%
Rogue Valley Mall	–17%	12%	$6	17%	Brixton	$38	–53%
Solano Town Center	–7%	9%	$25	29%	WFD/STWD	$110	–42%
Town Center at Cobb	–6%	11%	$12	8%	SPG	$148	–54%
Average	**–14%**	**11%**	**$11**	**15%**		**$87**	**–51%**

As of June 30, 2019
***** Debt yield is the ratio of the property's NOI to the total loan amount.
Source: Trepp and AB

(*Continued from page 36*)

In general, an owner's real estate tax basis is reduced by depreciating the cost of the asset over a 39-year period.[13] Many of the malls in this category have materially depreciated over the many years since their tax basis was first established. While improvements to the property during the holding period are added to the owner's basis, the improvements are also depreciated according to the same schedule. The defaulted loan balance less the owner's tax basis in the property could therefore result in a significant income-tax liability.[14] Therefore, an onerous potential tax bill is a huge deterrent to a voluntary default.

Some mall owners have an additional deterrent to swift default. As a pass-through vehicle, a public REIT must distribute 90% of this noncash gain to its shareholders. This would be costlier to the REIT than to another owner-entity that would be subject to a 21% tax rate. Notably, five of the eight obsolete malls in the CMBX.6 collateral pool are owned by a public REIT.

For CMBX.6 protection sellers, if the collateral has sufficient cash flow to cover its debt service payment, any delay in resolution is positive. That's because they will continue to collect interest payments and the loan itself will continue to amortize down over time, decreasing loss severity.

Although we think extensions are more likely than not, we have assumed that both term and maturity defaults for these eight malls will result in land value recovery less foreclosure costs.

ESTIMATING PARTIAL LOSSES ON A SUBSET OF CMBX.6 MALLS

Between our top performers and obsolete assets are 10 malls in the CMBX.6 that we believe could have a more variable outcome. These malls comprise the discounted payoff category. Rather than being valued as raw land at maturity, these viable malls will likely be valued as retail assets.

13 The degree to which depreciation affects the tax basis may be difficult to determine for a public REIT, whose tax basis may differ from what is reported for GAAP purposes.
14 If this were a recourse mortgage, the asset recovery value would be part of the tax liability calculation. That is not the case with a nonrecourse loan.

Terminal Net Operating Income (USD Mil.)	Maturity Balance (USD Mil.)	Refinance 60%–70% LTV New Loan (USD Mil.)	New Debt Yield*	New Annual Debt Service (USD Mil.)	Free Cash Flow after Debt Service (USD Mil.)	New Equity (USD Mil.)	Return of New Equity per Annum	New Loan's DSCR
$16	$170	$89	18%	$6	$10	$59	17%	2.7x
$11	$105	$66	16%	$4	$6	$44	15%	2.5x
$14	$210	$116	12%	$8	$6	$50	12%	1.8x
$12	$135	$60	20%	$4	$8	$40	20%	3.0x
$9	$93	$43	20%	$3	$6	$29	20%	3.0x
$7	$90	$49	15%	$3	$4	$33	13%	2.3x
$5	$48	$23	20%	$2	$3	$15	20%	3.0x
$5	$58	$29	16%	$2	$3	$19	14%	2.4x
$4	$41	$21	20%	$1	$3	$14	20%	3.0x
$8	$75	$43	19%	$3	$5	$28	18%	2.8x
$9	**$103**	**$54**	**18%**	**$4**	**$5**	**$33**	**17%**	**2.7x**

But there's a hitch. At maturity, the outstanding loan will be too large to receive sufficient new loan proceeds to achieve full payoff at maturity. Because of the variability around possible outcomes, we run conservatively biased credit scenarios. Our approach does more than take a simplistic haircut or apply a uniform loss ratio; instead, we leverage specific knowledge of these assets and their sponsors.

We base our loan loss estimates on an underlying asset valuation that reflects stressed cash-flow forecasts, punitive terminal cap rates and a negotiated discounted payoff by the original borrower (or third-party investor). This haircut represents an average decline of 51% in the malls' value since loan origination. To arrive at the discounted payoff estimate and subsequent loan loss severity, we determine the maximum achievable loan proceeds from a replacement loan and impose a high return hurdle on the incremental equity capital needed to fill the gap between the replacement loan and the asset's fair market value.

For these 10 discounted-payoff malls, our first task is to confirm that the malls will continue to be viable retail assets at maturity. After applying a reasonable average 14% haircut to current NOI due to expected rent reductions, occupancy reductions, and increasing operating and leasing expenses, these malls would still produce an average of more than $10 million in cumulative excess cash flows through maturity—a figure that owners are unlikely to walk away from during the loan term. On an original cost basis, this equates to a cumulative 15% return. In sum, we find that most of these 10 malls are ongoing and viable and are likely to continue to make their debt-service payments through maturity (*Display 18, page 38*).

The most conservative assumptions to make are that the special servicer will foreclose and liquidate the asset at maturity. This may be difficult in a state in which foreclosure must be adjudicated in court or when it's difficult to obtain third-party interest or debt capital. Furthermore, if the servicer chooses to foreclose, the best recovery is likely to be the market value of the asset less the loan workout costs (referred to as its fair market value). These costs might be as much as 10%–15% of the asset value.

For these reasons, the special servicer may negotiate a discounted payoff with the current owner. This would help protect the recovery value against friction costs such as legal, brokerage and receiver fees. If the special servicer can achieve a payoff equivalent to the mall's fair market value and is able to avoid a protracted workout with potential downside risk, it has likely performed its duty to achieve the highest possible recovery for bondholders.

We assume that when these 10 mall loans mature, the special servicer will have to reduce the maturity loan balances by 5%–30%, netted against the stressed fair market value of the malls; the remaining unamortized loan balance will need to be repaid with a combination of debt and equity capital. We further assume that malls rated below A– will get new takeout loans with only a 60% LTV ratio on expected cap rates,[15] a coupon of 5.25% and a 30-year amortization schedule. Our takeout loans' DSCR hurdle of 2.5× is more than 40% higher than that on new-issue conduit CMBS deals.

With these punitive underwriting standards, we conclude that most of these loans would require an equity infusion of between $14 million and $60 million to reach the 60% LTV hurdle. The question is, would a mall operator or another potential investor be willing to contribute that incremental equity?

The answer is likely yes. These discounted payoff malls will generate a very attractive average return on equity (ROE) of 17% on the incremental new equity under our base case scenario—even after an additional 14% haircut to NOI.

Losses attributed to the Discounted payoff loans represent the shortfall between the owed terminal balance on the maturing loan in the CMBX.6 and the maximized CMBS loan repayment. The latter potentially stems from a combination of replacement financing and a new equity contribution from the owner (or a third-party investor). This is equivalent to the market value of the asset and would therefore satisfy the special servicer's mandate to maximize bondholder returns.

Additional bondholder protection comes from the operating advisor—a supervisory function created after the global financial crisis to ensure that the special servicer represents bondholder interests. An operating advisor would likely replace a special servicer that was deemed lax about maximizing recovery value for bondholders. According to the pooling and servicing agreement, the operating advisor "must act, in its sole discretion, to replace the special servicer if it finds that the special servicer is not performing its duties with respect to special serviced loans."

CMBX.6 protection buyers should note that we have assumed that the special servicer would have the leverage to demand a resolution at the loan's maturity or to foreclose on the property and sell it at market value when the loan matures.

In practice, however, the special servicer faces a moral hazard when it grants a borrower a discounted payoff, because it sets a precedent for future borrower defaults. The servicer may therefore be more inclined to extend the loan for three to five years until incremental loan amortization brings the loan into a refinanceable range. This is especially likely if the servicer has the confidence that the owner can competently operate the asset or implement any needed tenant changes or capital improvements. These are generally more efficient for the sponsor to execute than the servicer.

Extending the life of the loan would reduce or eliminate loan losses to the trust below our projected loss estimates. This extension scenario would also keep CMBX.6 bonds outstanding for a further period, costing the protection buyer additional monthly prorated coupon payments payable to the protection seller until the loans are resolved. In addition, the protection buyer may realize materially lower principal loss payments from the protection seller should any of the 10 loans be successfully refinanced at the end of the extension period.

ASSESSING POTENTIAL LOSSES TO CMBX.6 TRANCHES

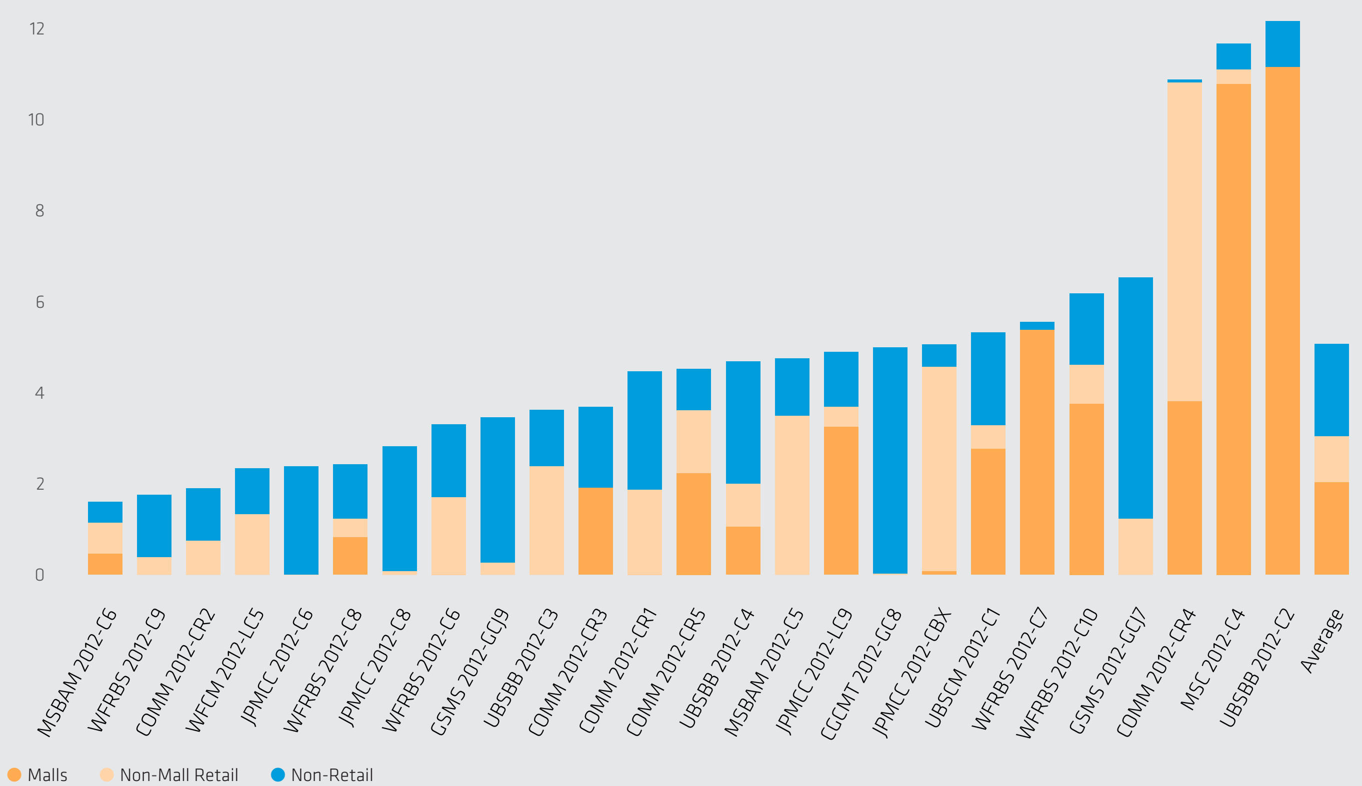
At an average weight of 44% of the CMBX.6's defeasance-adjusted collateral pool, retail is the largest property type and contributes the most—3.1 percentage points—to total deal-level projected losses of 4.8%. Regional B and C malls comprise a small share of the

15 Compared to the historical 65% LTV ratio based on 2012 capitalization rates.

> Projected loan losses vary widely across CMBX.6 deals

DISPLAY 19: PROJECTED LOSSES VARY SIGNIFICANTLY BY DEAL

Projected Deal-Level Losses (Percent)



As of June 30, 2019
Source: Trepp and AB

pool's weight at 11%, but their loss contribution (from obsolete and discounted payoff malls) is significant. On average, we forecast a loss of 1.9 percentage points for the subset of retail that is regional malls.

Display 19 shows the large dispersion in projected losses, illustrating the importance of loan-level underwriting. Our proprietary credit model projects minimum deal-level losses of 2%, with a maximum of 12%. This high dispersion across deal quality belies a strong skew toward higher-quality deals.

In addition, no losses rise above 3% until 2021, with most deal losses coming in 2022 or later. When we overlay the current credit enhancement for the A, BBB– and BB tranches, we see a picture of when deal losses are likely to affect bonds (*Display 20, page 43*).

For example, the first deal to breach the BB credit enhancement, COMM 2012-CR4, does so in late 2020. The next BB bond, UBSBB 2012-C2, is not affected until late 2021. And only in 2022 does MSC 2012-C4, the last BB bond, take a loss. Given this timing for the three write-downs, the protection seller continues to collect a 5% BB coupon for every year over the next two years; the coupon then declines to 4.8% in 2021, 4.7% in 2022 and, as loans extend, 2.6% in 2023. The decline in coupon simply represents the write-down of these three BB deals—each representing 4% of the total index—as it occurs.

Our timing assumptions range from 12 to 24 months, depending on the loan size and default type. For all the maturity defaults, we assume resolution within 12 months. That's very conservative, considering loans can take up to five years to resolve.

For example, Fashion Outlets of Las Vegas defaulted on its loan payoff date in August 2017. The special servicer anticipates resolution in December 2021, more than four years after maturity.[16] If this is any indication of resolution time for the defaulted loans in the CMBX.6, that's substantially longer than the 12 to 24 months that we modeled for our expected base case.

Lastly, during any resolution period, the servicer continues to advance appraisal-adjusted principal and interest payments on the defaulted loan; interest payments flow to the trust, and principal further amortizes down the loan amount, effectively lowering the LTV and reducing the potential for loan losses. This provides an upside scenario to our base case for CMBX.6 cash flows and for our return expectations.

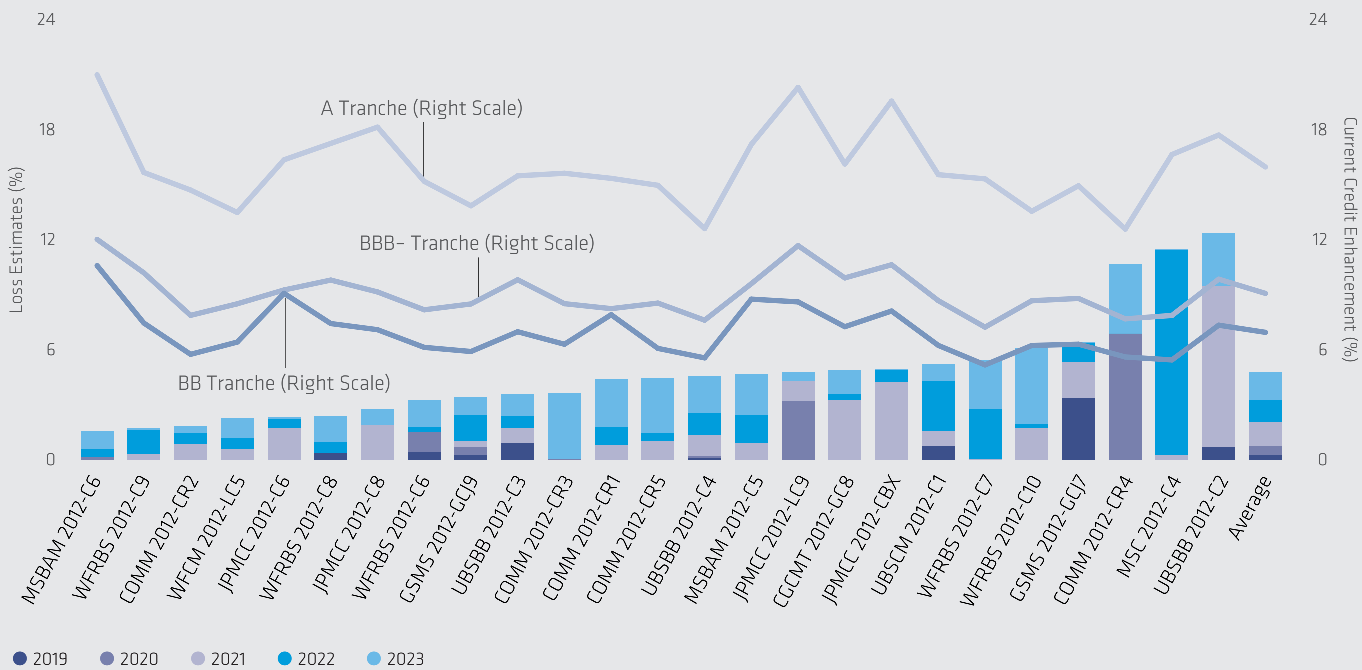
We've used our proprietary credit model to create 17 scenarios addressing a huge range of potential downside risks for protection sellers of the CMBX.6. What if a recession occurs today? In three years? Twice in the next six years? Tomorrow? At loan maturity? Could mall operators negotiate a 25% payoff discount at maturity? Or a 60% payoff discount?

Such extensive scenarios allow us to paint a clear and nuanced picture of the loss-adjusted yields on the CMBX series, as well as the timing of expected losses. We explain four of these scenarios, including our base case, in greater detail below.

16 We have not included the outlet center Fashion Outlets of Las Vegas in our regional mall category. However, because it is a leasehold with no potential land recovery value, we have assigned a 100% loss severity to this loan.

DISPLAY 20: CMBX.6 PROJECTED DEAL LOSSES ARE NEITHER ENORMOUS NOR IMMINENT

Projected Losses by Deal and Date of Loss vs. Credit Enhancement* by Tranche



*Not defeasance-adjusted
As of June 30, 2019
Source: Trepp and AB

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SUGARLOAF MILLS: A CASE STUDY IN LOAN MODIFICATION

Sugarloaf Mills, formerly Discover Mills, is located just 26 miles outside downtown Atlanta. Owned by Simon Property Group (SPG), the 1.2-million-square-foot regional mall caters to the 5.6 million residents of the Atlanta metropolitan area, where there's no shortage of competition.

At origination of the loan in 2006, SPG secured a total $158.7 million of debt against the mall's appraised asset value of $210 million. The debt was structured into two parts: a senior, interest-only, five-year note with a 6.08% coupon (the A note), which was securitized in the JPMCC 2006-LDP9 CMBS trust, and a co-terminus subordinate note for $23.7 million with a 7.30% coupon (the B note), which was held outside of the trust.

In December 2011, the senior loan was transferred to a special servicer when it defaulted at maturity. Today's protection buyers imply that the only possible outcome on this high LTV loan would be an accelerated foreclosure followed by asset liquidation and resulting in high loan loss severity. But regional malls are large assets with relatively few qualified buyers. That means that unless there is immediate third-party interest at fair market value, a special servicer isn't likely to pursue a foreclosure that would result in unwarranted losses to the CMBS trust.

Sugarloaf Mills generates more than $7 million annually in excess cash flow net of its debt-service payments. Why would SPG hand over the keys to a lucrative asset to the special servicer? And why would the special servicer force a foreclosure that would create a material loss to the CMBS trust when the asset is currently functional, has strong cash flows and is well managed?

Fortunately, the pooling and servicing agreements allow the special servicer to extend a loan for up to five years—possibly longer if the parties execute waivers. And the Pooling and Servicing Agreement of a CMBS trust ensures that a special servicer can extend a loan when liquidation would not be advantageous to bondholders.

Indeed, the special servicer in this case extended the loan term from December 2011 to December 2013 (*Display*) and returned the loan to the master servicer. Per the modification documents, excess cash flow was to be used to pay down the principal balances on a pro rata, pari passu basis with the subordinate debt.

In 2013, the Sugarloaf Mills asset had a DSCR of 1.5×, but it struggled to refinance again at the end of its extension period in December. The special servicer extended the loan another five years, while reducing the appraised value by 27%, from $210 million to $152 million. The special servicer maintained its stance that "the modification keeps a premier manager of malls [sic] assets in charge of the property operations while locking all cash flows away from the borrower and [using them] for the sole purpose of servicing and repaying the outstanding debt."

Diversion of net free cash flow to pay down principal is referred to as hyperamortization. It has been a very effective strategy for Sugarloaf Mills. As of June 2019, the original outstanding A note balance of $135 million had amortized down 26%, to $100 million, while the original outstanding B note balance of $23.7 million had amortized down to $17.5 million. Based on recent monthly remittance reports, the principal on the A note continues to pay down at an annualized $7.5 million.

In 2018, the special servicer agreed to another three-year extension with a terminal date in 2021, after which time the A note is expected to have amortized down by a cumulative $56 million—42% of the original balance—to $82 million, with a terminal B note balance of $10 million. The asset's value would more than adequately cover the residual loan balances. With so much more of the balance amortized, refinancing in 2021 is probable. And if the loans do not get refinanced, additional hyperamortization extension periods are possible.

Sugarloaf Mills continues to be a productive mall asset, well positioned in a growing market with material upside traffic potential. For example, a 200-unit apartment complex is in its initial planning phase nearby, and a 110-room Aloft hotel is proposed for an adjacent outparcel. A second hotel is already under construction. In addition, Sugarloaf Mills continues to consolidate its market share. A Dave & Buster's recently closed a competing location five miles from Sugarloaf Mills, making the Sugarloaf Dave & Buster's the only location within a 30-mile radius.

The special servicer's decision to modify and extend rather than to foreclose and liquidate at a material loss refutes protection buyers' claims that immediate liquidations are the likely resolution for high LTV malls.

SUGARLOAF MILLS MALL: WHY DEFAULTS DON'T ALWAYS SPELL DISASTER FOR BOND INVESTORS

A History of Loan Extensions

	2006	2011	2013	2018	2021
	Securitization	**Loan Extension (Feb 2012)**	**Loan Extension**	**Loan Extension**	**Scheduled Maturity**
Loan Performance Commentary	5-year interest-only loan originated. Mall occupancy at 96%	Maturity default. Loan extension through December 2013. All excess cash applied toward repayment of principal	Maturity default. Loan extension through December 2018. Loan continues to perform and pay down principal (pari passu between A and B note)	Maturity default. Loan extension through December 2021. Loan continues to perform and pay down principal (pari passu between A and B note)	Estimating % of additional principal paid down and effective LTV
Occupancy	96%	79%	84%	85%	85%
Loan Balance	$135,000,000	$135,000,000 (0% principal paydown)	$130,000,000 (4% principal paydown)	$103,000,000 (24% principal paydown)	$82,000,000 (40% principal paydown)
Appraised Value	$210,000,000	$210,000,000	$152,000,000	$152,000,000	$152,000,000
NOI	$13,100,000	$15,300,000	$15,500,000	$17,370,000	$17,370,000
Implied Cap Rate	6.2%	7.3%	10.2%	11.4%	11.4%
LTV	64%	64%	86%	68%	54%

As of June 30, 2019
Source: Trepp and AB

MANY SCENARIOS, ONE DIRECTION

DOWNSIDE RISKS: CO-TENANCY TRIGGER AND SEVERE RECESSION

Our first potential scenario reflects the risk that two or more anchors will vacate, triggering co-tenancy agreements with inline tenants. This would result in inline tenants paying lower rent to compensate for the loss in sales stemming from reduced foot traffic. In this scenario, we cut every mall's inline occupancy to 70% and reduce rents by 10% to immediately stress cash flows.

Next, we ran a scenario involving an imminent and severe recession. Under this scenario, which we term the "stress case," every loan under every property type is stressed with immediate haircuts to occupancy and rent. This translates to a 15%–20% haircut to NOI. This scenario closely resembles the global financial crisis of 2008–2009.

Nevertheless, the aggregated loss-adjusted yields under both these scenarios are comparable to those under our base case (*Display 21*). The A tranche remains very consistent under both scenarios, while the BBB– and BB tranches earn slightly lower yields from the perspective of the protection seller. Both trades are attractive compared to comparable corporates under these scenarios.

DISPLAY 21: HOW WILL CMBX.6 TRANCHES REACT UNDER STRESS?

Index Tranche	Coupon	Spread	Current Credit Enhancement
CMBX.6.A	2%	196 b.p.	16%
CMBX.6.BBB–	3%	656 b.p.	9%
CMBX.6.BB	5%	1,314 b.p.	7%

As of June 30, 2019
Co-tenancy projections assume that two or more anchors will vacate, triggering rent reductions for tenants. Severe recession projection models a situation similar to the financial crisis, in which every loan in every property type experiences rent and occupancy losses.
Source: Trepp and AB

UPSIDE POTENTIAL: EXTENSION

We also consider the potential for upside. When underwriting, we generally assume a 12- to 24-month resolution on defaulted loans. But in practice, the special servicer can make loan modifications to extend the maturity date another three to five years. It's especially likely to do this in a tight credit market for retail properties, like today's.

A loan with a 30-year amortization schedule and a 5% coupon pays down roughly 2% of its principal on average annually during the first 10 years, increasing thereafter, for a cumulative 19% paydown in principal by the end of 2022. Another five-year extension at a paydown rate of nearly 3% would imply 14% more principal paid down, effectively lowering the LTV significantly—to the point where the loan can be refinanced. This reduces losses to the trust.

The actual experience of these loans to date—appreciation of non-retail assets, low default rates and low loss rates—confirms the likelihood of back-ended and less severe losses. In fact, the loans in the CMBX.6 have benefited so much from commercial property appreciation that the current realized loss rate is a mere 13 basis points. Contrast that with the average current defeasance-adjusted credit enhancement on the BB tranche, at 8.2%.

	Projected Loss-Adjusted Spread			Projected Loss-Adjusted Yield		
Current Credit Enhancement (Defeasance Adjusted)	Base Case Scenario	Co-Tenancy Scenario	Stress Case Scenario	Base Case Scenario	Co-Tenancy Scenario	Stress Case Scenario
19%	200 b.p.	180 b.p.	200 b.p.	3.5%	3.3%	3.5%
11%	430 b.p.	250 b.p.	300 b.p.	6.0%	4.0%	4.5%
8%	900 b.p.	500 b.p.	500 b.p.	10.0%	6.5%	6.5%

OUR BASE CASE SCENARIO

Even though we think extension is likely, we do not include it in our conservative base case scenario. This expected scenario incorporates our cash-flow modeling, a moderate recession in 2020, our regional mall underwriting and a material shock to the retail sector.

To develop our base case scenario, we perform detailed recessionary loan-level analysis, assessing both term and default risk on each of the more than 1,300 underlying loans. The resulting loss-adjusted yields look attractive.

Under this scenario, a protection seller of the A tranche would earn a loss-adjusted yield of more than 3.5%. For the BBB– tranche, that figure rises to close to 6%. And lastly, the CMBX.6 BB trade would earn a protection seller a loss-adjusted yield north of 10%. And this assumes that the trade does not use leverage. Because any CMBX trade generally requires up to a 10% initial margin, the levered loss-adjusted yield can be as much as 10 times its unlevered yield.

KEY TAKEAWAYS

The popular narrative of the dying American mall and the next "big short" that profits from it conceals a far less bleak and much more nuanced reality. It's true that as many as a third of American malls won't survive transformational shifts in the retail sector. But the remaining American malls aren't dying at all—they're evolving to meet modern consumer demands. Here are the other key takeaways from our research into the CMBX.6:

+ Short selling the CMBX.6, which holds less than half of one percent of malls in the US, to express a view that the regional mall is dying is inefficient.
+ Most of the series is backed by non-retail assets. Retail, and the subset of retail that consists of B and C malls, represents a fraction of the entire loan pool.
+ The broader collateral enjoys material growth in net operating income, meaningful commercial real estate appreciation since the year of origination, and more defeased loans than usual.
+ The regional mall is not dying. Mall owners often support their assets. That's especially true if a mall is regionally dominant. Such a mall has the potential to consolidate tenants when other, obsolete competitors exit its landscape.
+ The 37 regional malls represented in the CMBX.6 are mostly dominant within their trade areas, produce ample or sufficient internal cash flow or have enough sponsor equity that they can reposition to meet evolving consumer demands.
+ Mall closures and loan losses among the 37 malls are well below short sellers' assumptions—and are highly likely to remain so. The regional malls in the CMBX.6 are likely to fully or at least partially pay off their loans at maturity.
+ Loan losses may not occur as quickly as short sellers anticipate. Tax codes and high LTVs favor extensions and modifications of loans, rather than forced high-severity liquidations.
+ Thanks to the composition of the CMBX.6's underlying assets, the loan losses on the entire CMBX.6 collateral pool will likely be modest, with more significant tranche-level losses concentrated in specific deals.
+ Loss-adjusted yields on the CMBX.6 are very attractive—not only in our conservative base case scenario, which incorporates a moderate recession, a material shock to the retail sector and rapid liquidations of assets, but also in extremely stressful scenarios.

These characteristics and our analysis support the protection seller of the CMBX.6, not the short seller. We believe that by viewing the story of the regional mall and the CMBX.6 in its full color and complexity, investors are better able to assess the risks and rewards of investing in a story of survival and resilience.

APPENDIX: METHODOLOGIES AND ASSUMPTIONS

Our credit model and underwriting protocol help us accurately assess the credit risk and the convexity risk of every tranche in a CMBS trust and allow us to develop loss-adjusted potential returns for each tranche under a comprehensive range of scenarios. This informed methodology is highly preferable to predicting returns based on either a CMBX series' price momentum or a default probability model.

We arrive at loss-adjusted expected returns through a rigorous process that forecasts annual recessionary cash flows for every loan in a CMBS. We begin by running every loan in a CMBS pool through our proprietary CMBS credit model. The assigned analyst then makes any appropriate adjustments to the model output, based on servicer notes, market updates and so on. As an additional layer of analysis, at least once per quarter our credit committee reviews the credit profile and cash flows of the large loans—including all regional shopping malls—in the pool. From these analyses we derive both loss severity and timing, which we enter into a cash-flow model.

CMBS CREDIT MODEL AND METHODOLOGY

Our CMBS credit model determines whether the collateral property will provide sufficient net cash flow to service its debt over the long term and whether there will be sufficient cash flow to get take-out financing at maturity. The model pinpoints when losses and recovery will most likely occur, then feeds that information into the Trepp cash-flow model.

This allows us to determine the net impact on the various tranches issued by a CMBS trust and to identify the payoff date or date of loss experience, depending on where the bond is positioned in the deal's cash-flow waterfall structure. The same model also estimates the projected default rate on each of the roughly 1,300 loans underlying the CMBX series and aggregates loan-level cash flows to its 25 underlying bonds, by tranche.

When our CMBS team constructs future cash flows for loan collateral, it looks to our fixed-income and equity analysts in lodging, healthcare, retail, industrials and macroeconomics to better understand the key drivers for tenants in the relevant regions.

Thus, multiple sources of data drive our pro forma recessionary and nonrecessionary estimates for commercial property occupancy, rent, expense rate and cap rate at the Metropolitan Statistical Area (MSA) level. We next perform loan-level stress tests to determine the levels at which cash-flow shortfalls lead to default triggers.

This analysis reconciles the actual year-over-year lease maturity profile of each property with tenant turnover costs, free rent periods, annual capital expenditures, stress rents, stress occupancy levels, brokerage leasing costs, rising operating costs and debt amortization payments. The analysis also assumes higher cap rates and loan constants on maturity.

We feed the resulting projected losses, recoveries and payoff dates for each deal's underlying collateral into the Trepp cash-flow model for each scenario. This provides us with the loss-adjusted weighted average life (WAL) of each bond tranche in the deal structure. In turn, it allows us to assign a Z-spread[17] that reflects the term structure of each bond's cash flow at a given price.

Our model enables us to reasonably assess the risk/reward of both the credit and the convexity risk inherent in every CMBS bond tranche.

UNDERWRITING PROTOCOL FOR REGIONAL MALLS

Because the economics of a successful class B mall are changing, it's important not to use an underwriting lens more suitable for the old mall model. Features of the new mall business model include a more segmented rent roll, shorter average lease terms and higher breakeven occupancy levels. The need for a new underwriting template that differs from the old model is especially pronounced in B malls, where the redevelopment hazard and shifting tenant profile are reflected in higher cap rates. While the perceived risk may be overstated for some assets, we don't think the risk premia will shrink until tenancy and productivity metrics stabilize.

This means that, for now, elevated cap rates and tighter credit terms will be the norm. However, assets that have the potential to lead in their trade areas will ultimately benefit from

17 A Z-spread, or zero-volatility spread, is the required incremental yield on a CMBS (or other mortgage-backed security) over the zero-coupon Treasury yield curve when discounting cash flows to current price.

repositioning—particularly as some malls become defunct and owners of more productive assets consolidate tenancy. This is a slow process. It may take years before many of the so-called zombie malls become obsolete, since they still have enough free cash flow to cover operating expenses and debt service.

For these reasons, it's critical for investors to determine which malls have the potential to evolve and get sponsor investment and which ones will decline in the changing environment and eventually close their doors. Our ability to conduct in-depth, loan-level underwriting on the regional mall sector is supported by monthly servicer reports, public REIT disclosures and estimates by Green Street Advisors for local demographics, competitors and productivity.

We also leverage our relationships developed out of our other investments as an asset manager—public REIT equity, REIT debt, private placements and commercial real estate loans—to conduct due diligence on constituent properties. This involves on-site visits of the CMBX.6 malls, of which 86% are owned by public REITs.

During these visits, we meet with the owner's management team, including the regional and local asset manager. We gain a full understanding not only of sales productivity trends, rent levels and tenancy, but also of the owner's master repositioning plan, expected tenant turnovers, their tenants' capital plans for their store units, maturing and new leases, and immediate and long-term capital improvement plans. Owner-guided tours through 20 of the weaker CMBX.6 malls in the second half of 2018 provided an accurate assessment of each mall's likelihood of executing on its master plan.

Our underwriting protocol begins by determining each mall's market position and potential to defend and grow its market share. We consider good internally generated cash flow, relative occupancy, sales per square foot, owner sponsorship and surrounding income demographics. We assess the trade area, examining demographic and demand factors such as household income, population density and the health of local employers. We then look to the built environment to assess transportation thoroughfares and main retail corridors.

Next, we assess near-term productivity terms. We consider the mall's store mix, occupancy and tenant sales per square foot. We compare in-place rents to market level and adjust accordingly, and we flag lease expirations during the loan term, as well as tenants of concern. While some mall owners may be able to right-size operating expenses as occupancy and revenues decline, we assume a constant annual expense increase. Importantly, although we assess any redevelopment or repositioning strategies by the owner or local municipality, our base case does not credit any expected cash flows until reported by the servicer.

ASSESSING LAND VALUE

Once we determine that a mall will not be viable during the term of the loan, we assess the asset's land value, excluding building improvements. This reflects our assumption that potential buyers will value the asset for a lower-cost, alternative use, thus discounting the premium attached to retail zones. Examples of alternative uses include a warehouse facility or a single- or multifamily home community. These typically have lower land values than fully entitled retail.

CMBX.6 loss-adjusted yields look compelling even in high-stress scenarios

We review recent land or alternative use sales and assign a value between \$0 and \$20 per square foot, depending on the location and alternative-use plans.

MEASURING RELATIVE VALUE

To compare the value of a CMBX tranche to other bonds, we translate the loss-adjusted spread of the CMBX into a bond-equivalent Z-spread using the following formula:

$$100/[(1 + r_{(1,2)} + z)^\wedge t_{(1,2)}] = [(1 - P_{d(1,2)}) \cdot 100 + P_{d(1,2)} \cdot R]/(1 + r_{(1,2)})^\wedge t_{(1,2)}$$

Where $P_{d(1,2)}$ is the default probability between period 1 and 2;

$t_{(1,2)}$ is the time between period 1 and 2;

R is recovery value;

$r_{(1,2)}$ is the forward rate between period 1 and 2; and

z is the Z-spread.

This formula allows us to compare the CMBX spread under various scenarios to the loss-adjusted spread of the equivalent cash bond. For example, the CMBX.6 BBB– tranche had a modified duration of 2.8 years on June 30, 2019. To arrive at a synthetic bond yield, we add 2.1%—the yield on a Treasury of that duration—to the Z-spread. If we instead want to model the underlying loans to default at maturity, with 24 months of resolution, that lengthens the implied modified duration, and we would choose a corresponding Treasury yield for our calculations.

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