

Appendix A

A.1. A model of CMBS securitization and hypothesis building

In this section, we first develop a simple model of CMBS securitization without and with B-piece buyers' access to funding from CRE CDOs and show how that access changes B-piece buyers' ex ante screening and the performance of the CMBS deal.

A.1.1. CMBS securitization without CDO

Consider a competitive CMBS issuer who can originate one dollar of new loans at cost $(1 + c)$. Moreover, let us assume that loan origination is completely financed by the proceeds from the securitization. In the CMBS deal, cash flows from the loan are split into two tranches: (1) a senior, investment-grade bond with interest rate r_a which makes up $\beta < 1$ of the capital structure by par value and (2) a first-loss B-piece, making up $1 - \beta < 1$ of the capital structure by par value and pays interest rate r_b . Without loss of generality, assume r_a is chosen such that the senior tranche is sold at par, and r_b is determined by the pass-through nature of the securitization deal.¹ Assuming the CMBS issuance process is competitive, x , the price of the B-piece with respect to par, is determined as:

$$\beta + (1 - \beta)x = 1 + c \quad (1)$$

where $1 + c$ is the cost of origination of the loan, β is the proceeds from the sale of investment-grade bond, and $(1 - \beta)x$ is the proceeds from the sale of the B-piece. For simplicity, and to be consistent with the first-loss position of the B-piece in the capital structure, assume that either the B-piece security performs and pays back in full or the B-piece defaults and has zero value. p is defined as the probability that the underlying loan defaults. The B-piece buyer is able to observe p directly, but investors in the senior bond are only able to make an estimate of p through the level of credit enhancement to the senior bond $(1 - \beta)$, which is set by a credit rating agency.

¹ That is:

$$1 + r_{loan} = \beta(1 + r_a) + (1 - \beta)(1 + r_b),$$

where r_{loan} is the interest rate on the underlying commercial mortgage and therefore the left-hand side is the total payment of the loan under no-default. The right-hand side is the total payment to the investment-grade tranche and the B-piece tranche in the no-default state.

Assuming an opportunity cost of r_f for the B-piece buyer, the participation constraint for the B-piece buyer is:

$$(1 - p)(1 + r_b) \geq x(1 + r_f). \quad (2)$$

And therefore, the maximum probability of default that is acceptable for a B-piece buyer without access to CDO funding p_{Sec}^{Max} is:

$$p_{Sec}^{Max} = 1 - \frac{1+r_f}{1+r_b} x. \quad (3)$$

This constraint illustrates that the B-piece incentives for risk-taking are inversely proportional to its skin-in-the-game, represented by x , as well as the potential upside of the investment relative to the risk-free rate of interest.² While senior investors would typically not be aware of the price paid by the B-piece buyer x , they either know or could reasonably estimate the determinants of x , which include β and c , which means that p_{Sec}^{Max} is effectively observable to senior investors. In this simple model where the B-piece is retained, there is not necessarily mis-measurement nor mispricing of risk by the senior investor.

A.2.1. CMBS securitization with B-piece buyer access to CRE CDO funding

Now assume that the B-piece buyer has the option of packaging its B-pieces into a CDO, while taking a first-loss position in the CDO deal. For simplicity, assume that the assets underlying each CDO consist of two B-pieces of two separate CMBS deals. Moreover, assume that the cash flow from these B-pieces is then divided into a junior tranche and a senior tranche and, for simplicity, that each tranche has the par value of $(1 - \beta)$ and the interest rate of r_b . Therefore, the senior tranche defaults if and only if both underlying B-pieces default and have zero value; otherwise, the tranche pays back in full. On the other hand, the junior CDO tranche defaults as long as at least one of the underlying CMBS B-pieces defaults.

² Note that in the model, r_a is also determined by the zero-profit condition for the investors in the investment-grade bond:

$$\beta(1 + r_f) = [(1 - p)\beta + pRR](1 + r_a),$$

where RR is the recovery rate of the loan underlying the CMBS deal in the case of default.

Let us define q as the probability that both B-pieces default; this is equal to $p[p + (1 - p)corr]$, assuming for simplicity the same probability of default for the underlying B-pieces and the correlation between the default of the B-pieces as equal to $corr$. Let us also define γ as the probability that none of the B-pieces default, which is equal to $(1 - p)[1 - p(1 - corr)]$. Consistent with the B-piece buyer being the informed agent, we assume the B-piece buyer knows the correct values of q and γ while the investor in the senior tranche of the CDO has an estimate of q that is equal to \hat{q} . In this case, the zero-profit condition for the investor in the senior CDO tranche can be written as:

$$\theta(1 + r_f) = (1 - \hat{q})(1 + r_b), \quad (4)$$

where θ is the price of the senior CDO bond with respect to par and $(1 - \hat{q})$ is the expectation of the investors that the senior bond does not default. This equation defines θ .

Therefore, the new participation constraint for the B-piece buyer is:

$$\theta(1 + r_f) + \gamma(1 + r_b) \geq 2x(1 + r_f), \quad (5)$$

where $\theta(1 + r_f)$ is the proceeds from the sale of the senior CDO bond and $\gamma(1 + r_b)$ is the expected payoff of the junior CDO tranche. Using the senior CDO bond investor zero-profit condition (Eq. (4)), the left-hand side of Eq. (5) can be simplified to:

$$\begin{aligned} & [(1 - q + \gamma) + (q - \hat{q})](1 + r_b) \\ & = [2(1 - p) + (q - \hat{q})](1 + r_b). \end{aligned}$$

And therefore the participation constraint of a B-piece buyer with access to CDO funding can be written as:

$$p \leq 1 - \frac{1+r_f}{1+r_b}x + (q - \hat{q})/2, \quad (6)$$

While this is not a closed-form solution for p , it is a convenient way to express the solution relative to the solution for p without a CDO market. In particular, comparing the participation constraint for a B-piece buyer with access to CDO funding and a B-piece buyer without access to CDO funding shows that, keeping the price of the B-piece (x) and the B-piece interest rate (r_b)

constant, CDO funding results in excessive risk taking that is a function of the underestimation of default risk for the senior CDO bond (i.e., $(q - \hat{q})$). Note that senior CDO bond default risk can be underestimated either because of underestimation of the correlation risk or as a result of the underestimation of the probability of default of the underlying loans.

Moreover, if one assumes that the investment-grade investors in CMBS deals are not aware of either this new funding opportunity for the B-piece buyers or the mispricing of the senior CDO bonds, then it is straightforward to show that B-piece price (x), B-piece interest rate (r_b), and investment-grade bond interest rate (r_a) remain the same as before³ and therefore the maximum probability of default that is acceptable for a B-piece buyer with access to CDO funding $p_{CDO,sec}^{Max}$ is:

$$p_{CDO,sec}^{Max} = p_{Sec}^{Max} + (q - \hat{q})/2. \quad (7)$$

The equation above illustrates that the B-piece buyer is willing to accept loans of lower credit quality (higher p) when there is underestimation of risk by senior investors, measured by $(q - \hat{q}) > 0$, in the CRE CDO market.

This simple model shows how mispricing of the risk in the CDO market affects the probability of defaults for the investment-grade investors in the CMBS market. Interestingly, this effect on the probability of default of loans in the CMBS deal makes the underlying B-pieces of the CDO deal even riskier than before, which exacerbates the initial mispricing of the risk. The model also predicts that as long as the equity investor of CDOs has the ability to independently evaluate the risk of securities, the sale of B-pieces to unaffiliated CRE CDOs is not associated with a lower performance of the CMBS deal.

³ This assumption is also consistent with our empirical finding that BBB tranche prices and coupon rates are not correlated with the percentage of the B-piece that was sold to CRE CDOs.

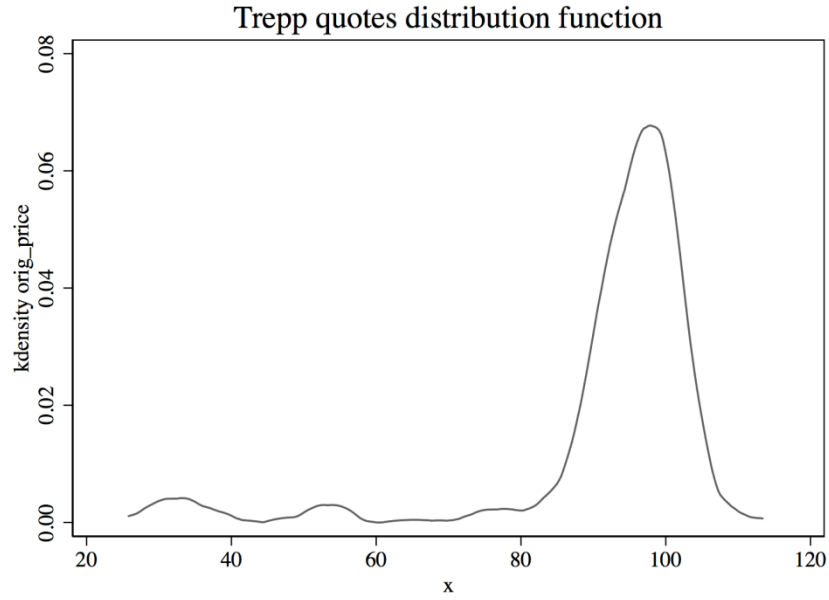


Fig. A1. Trepp quotes distribution function. The above graph shows the distribution function of market price quotes from Trepp for the most junior BBB tranche of CMBS deals originated between 2000 and 2007.

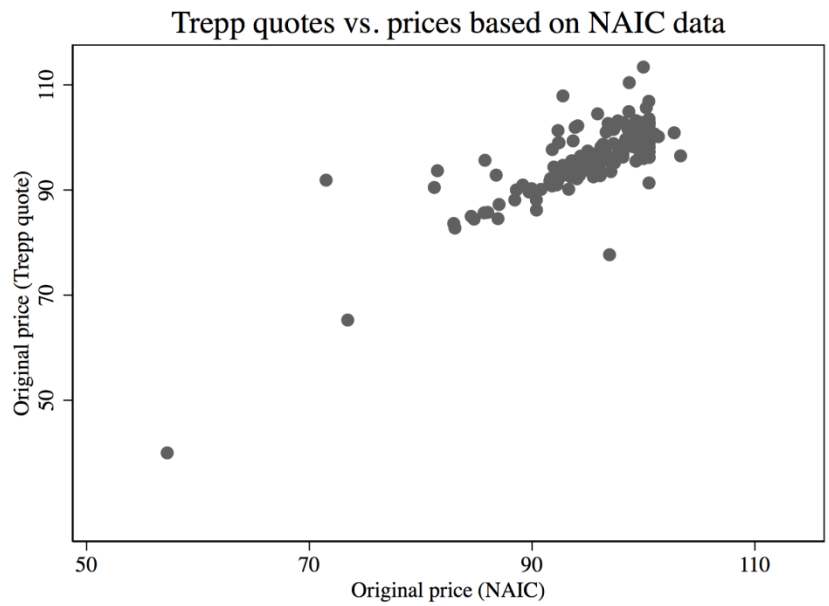


Fig. A2. Trepp quotes vs. price paid by insurance companies. The above graph shows the scatterplot of the Trepp quotes vs. the average price paid by insurance companies for the most junior BBB tranche of 159 conduit CMBS deals. These deals are included in the Trepp quotes and were also acquired by insurance companies.

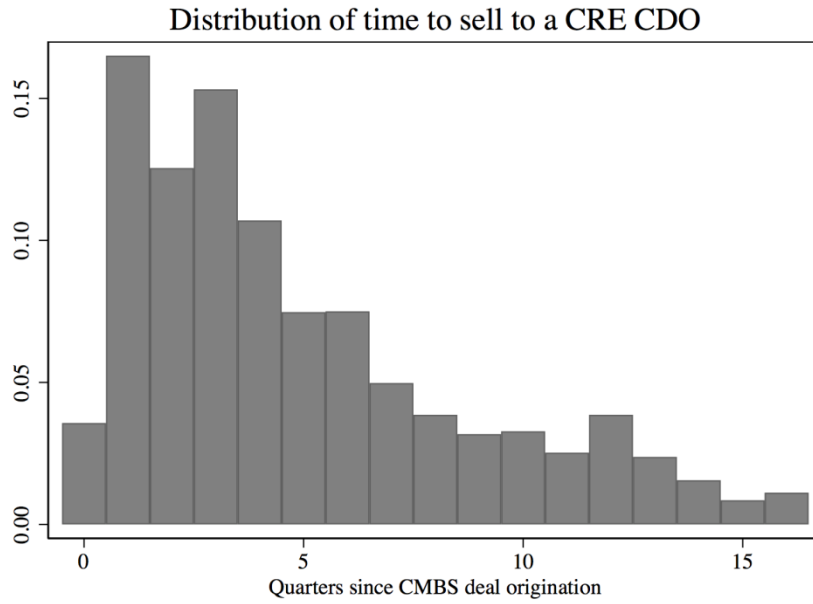


Fig. A3. Distribution of quarters between the origination of CMBS deal and sale to CRE CDOs. The above figure shows the distribution of number of quarters between origination of the CMBS deal and the sale of a tranche to CRE CDOs.

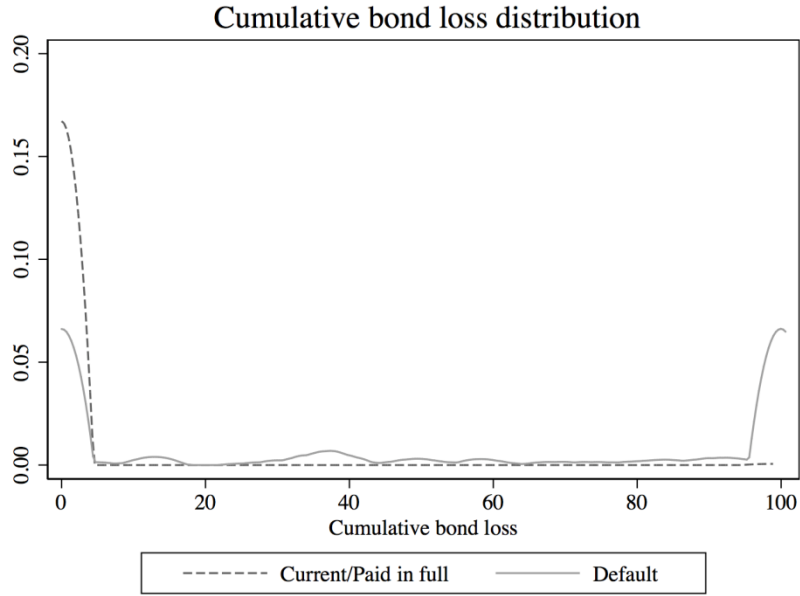


Fig. A4A. Cumulative bond losses vs. bond default status. The above figure shows the distribution of cumulative bond losses for current bonds vs. bonds in default. Cumulative bond loss is the total principal loss of a tranche as a percentage of the original balance and it is measured as of December 2013. The data are provided by Trepp.

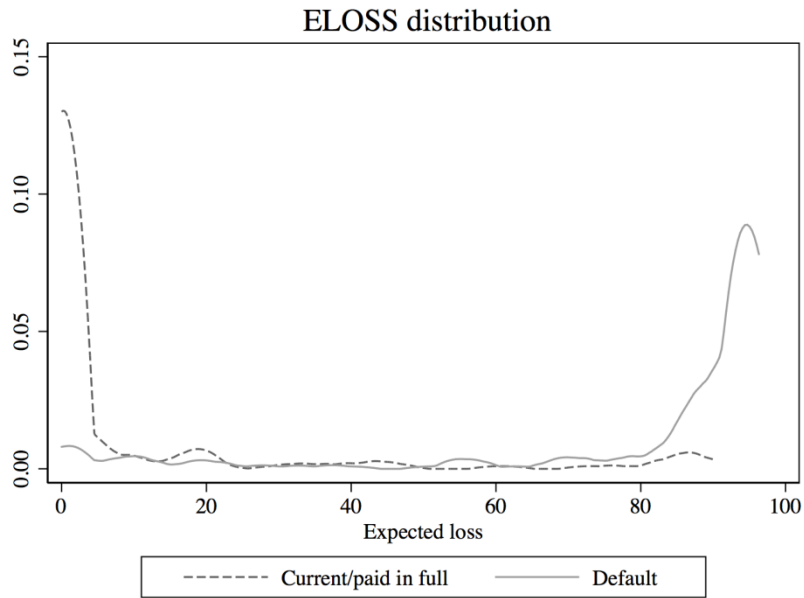


Fig. A4B. Expected loss distribution vs. bond default status. The above figure shows the distribution of expected losses for current bonds vs. bonds in default at the end of 2011. Expected loss figures are estimated by BlackRock and provided by NAIC. Default status is from Bloomberg.

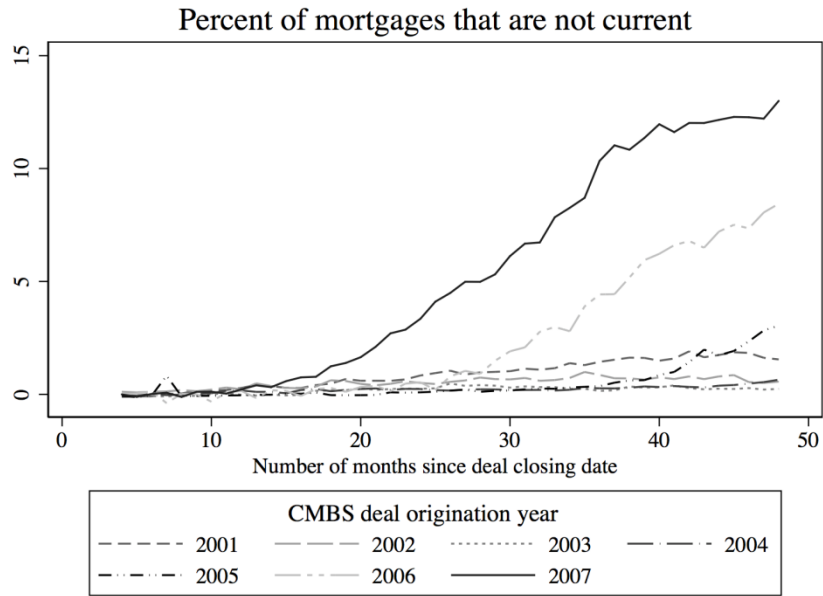


Fig. A5. Percentage of non-current mortgages over time. The above graph shows the evolution of percentage of mortgages that are not current—i.e., missed at least one payment—over time and for different cohorts of CMBS origination. Data source is Trepp.

Table A1*Panel A: Conduit CMBS B-piece buyers by firm*

Panel A of this table reports the names of B-piece buyers in our data as well as some information about each B-piece buyer. Number of deals is the total number of deals purchased by a B-piece buyer in the data. Notional value of deals is the total notional value for all deals underlying a B-piece purchase by a B-piece buyer in the data. Notional value of B-piece is the total notional value for all B-piece purchases by a B-piece buyer in the data. Mean percentage of B-piece sold (within a year) is the mean percentage of the notional B-piece value sold to a CDO (within a year). Column 6 of Panel A reports the CRE CDO issuer affiliated with each B-piece buyer, if an affiliated CRE CDO exists. Panel B breaks down the annual distribution for deals missing B-piece buyers.

	(1)	(2)	(3)	(4)	(5)	(6)
B-piece buyer name	Number of deals	Notional value of deals (bn\$)	Notional value of B-Piece (bn\$)	Mean percentage of B-piece sold	Mean percentage of B-piece sold within a year	Affiliated CRE CDO issuer
LNR	89	170.61	6.28	0.84	0.58	LNR
ARCAP	52	68.02	2.68	0.78	0.45	Aracap
ALLIED	29	33.93	1.86	0.71	0.38	
CW CAPITAL	28	75.34	2.39	0.82	0.36	CWCapital
ANTHRACITE	27	52.52	1.49	0.64	0.59	Anthracite
GMAC	23	22.92	1.37	0.8	0.49	G-Force
JER	22	50.98	1.4	0.87	0.82	JER
ING	19	30.49	1.05	0.48	0.12	Ansonia
CENTERLINE	17	45.75	1.06	0.23	0.23	Centerline
HYPERION	16	34.75	1.09	0.21	0.09	
AMCAP	16	52.85	1.56	0.7	0.42	
BANC ONE	10	13.56	0.51	0.23	0.15	
CITIGROUP	8	11.88	0.35	0.07	0.05	
REDWOOD	5	16.85	0.43	0.3	0.3	
INSIGNIA	4	3.43	0.17	0.2	0.06	
PRESIDIO	4	11.33	0.3	0.06	0.06	
ORIX	1	0.78	0.07	0.17	0	
CBRE	1	0.95	0.02	1	1	
PRINCIPAL	1	0.6	0.03	0	0	
FIVE MILE	1	2.98	0.09	0	0	
FIRST UNION	1	1.15	0.11	0.6	0	
Missing	20	16.96	1.08	0.46	0.24	
Total	394	718.63	25.39	0.65	0.42	

Panel B: Distribution of missing B-piece buyers

Year	Number of deals	Notional value of deals (bn\$)	Notional value of B-piece (bn\$)	Mean percentage of B-piece sold	Mean percentage of B-piece sold within a year
2000	7	4.89	0.43	0.51	0.21
2001	7	7.58	0.49	0.51	0.33
2002	2	0.92	0.07	1	0.5
2003	1	0.82	0.02	0	0
2005	1	0.72	0.01	0	0
2007	2	2.03	0.05	0	0

Table A2

External validity of Trepp quotes as a price measure

The table reports the relationship between our primary measure of price at issuance, which is based on quotes provided by Trepp, and an alternative measure of prices based on reported acquisition costs of insurance companies that purchased the most junior BBB tranche within three months from issuance of the deal. Each observation corresponds to the most junior BBB tranche of a conduit CMBS deal originated between 2000 and 2007. Standard errors clustered at the quarter level are reported in parentheses. Asterisks denote significance levels (***=1%, **=5%, *=10%). Note that the number of observations is significantly less than the universe of conduit CMBS deals originated between 2000 and 2007 because insurance companies acquired less than half of the originated BBB tranches.

	(1)	(2)	(3)
	<i>Original price (Trepp)</i>		
Original price (NAIC)	0.98*** (0.19)	0.42** (0.16)	0.40** (0.19)
Percent of BBB tranche sold			0.94 (0.86)
BBB tranche original spread			0.54 (1.52)
Original loan-to-value			-0.17* (0.09)
Top ten loan share			2.45 (1.55)
BBB tranche original subordination			1.14*** (0.39)
BBB tranche original rating			-0.53 (0.83)
Quarter fixed effect	N	Y	Y
Observations	159	159	158
R-squared	0.63	0.82	0.84

Table A3**B-piece buyer skin-in-the-game and the performance of CMBS deals, probit results**

The table reports estimates of average marginal effects of a probit model for default of the most junior BBB tranche. Each observation refers to a CMBS deal that is originated between 2000 and 2007. Percent of B-piece sold within (after) 12 months is the percentage of B-piece tranches that were sold to CRE CDOs within (after) 12 months from the issuance of the CMBS deal. Controls include percentage of the most junior BBB tranche that was sold into CRE CDOs, coupon rate of the most junior BBB tranche and its price at issuance, subordination below the BBB tranche, top ten loan share, initial rating of the tranche, and the average loan-to-value of the underlying commercial mortgages at origination. Standard errors are adjusted for clustering for observations in each quarter and reported in parentheses. Asterisks denote significance levels (***=1%, **=5%, *=10%). The reason for the significantly lower number of observations in the probit regressions is that there were many quarters in which none of the junior BBB tranches issued in those quarters defaulted, and therefore, the quarter fixed effect perfectly predicts those observations.

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Default of the most junior BBB tranche</i>					
Percent of B-piece sold within 12 months	0.19** (0.08)	0.16* (0.09)	0.15** (0.07)	0.12 (0.07)	0.10 (0.09)	0.06 (0.08)
Percent of B-piece sold after 12 months	0.02 (0.08)	0.01 (0.08)				
Percent of BBB tranche sold		-0.00 (0.07)	0.00 (0.07)	-0.00 (0.07)	0.05 (0.08)	0.06 (0.09)
BBB tranche original spread		0.29** (0.11)	0.29** (0.11)	0.29** (0.12)	0.45*** (0.13)	0.44*** (0.13)
Original loan-to-value		0.02* (0.01)	0.02* (0.01)	0.02** (0.01)	0.02** (0.01)	0.02** (0.01)
Top ten loan share		0.47*** (0.13)	0.47*** (0.13)	0.44*** (0.15)	0.34** (0.16)	0.28* (0.17)
BBB tranche original subordination		-0.03 (0.04)	-0.03 (0.04)	-0.00 (0.05)	-0.05 (0.04)	-0.01 (0.05)
Original price		-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Quarter fixed effects	Y	Y	Y	Y	Y	Y
Deal issuer fixed effects	N	N	N	Y	N	Y
B-piece buyer fixed effects	N	N	N	N	Y	Y
Observations	286	273	273	256	250	236

Table A4

B-piece buyer skin-in-the-game, market structure, and risk pricing

This table repeats the analysis conducted in Table 2 but on different variations of the dependent variable. Columns 1–6 report coefficient estimates from regressions of deal characteristics on the percentage of B-piece sold into affiliated CRE CDO within a year. Columns 7–12 report coefficient estimates from regressions of deal characteristics on the percentage of the B-piece of neighboring deals owned by the same B-piece buyer sold into a CRE CDO within a year, which is our first instrumental variable. Columns 13–18 report coefficient estimates from regressions of deal characteristics on a dummy equal to one if a B-piece buyer is the issuer of a CRE CDO within a year from CMBS origination, which is our second instrumental variable. Coupon spread is the difference between the tranche coupon rate and the 10-year T-bill. Original price (Trepp quote) and Original price (NAIC) are the original prices of the tranche as reported in Trepp and NAIC, respectively. Original loan-to-value is the weighted average of the loan-to-value for underlying loans of the deal at origination. Deal average spread is the weighted average of the spread with respect to the 10-year T-bill for the deal's underlying loans. Top ten percent loan share is the sum of the loan balance of the ten largest loans in a deal divided by the sum of the total loan balance in that deal. BBB tranche original subordination is the level of subordination below the BBB tranche. Standard errors are clustered at the quarter level and are reported in parentheses. Asterisks denote significance levels (*** = 1%, ** = 5%, * = 10%).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
<i>Panel A: Market structure</i>	Percentage of B-piece sold into affiliated CRE CDO within a year						Percentage of B-piece of neighboring deals with same B-piece buyer sold within 12 months						Dummy equal to one if B-piece buyer is the issuer of a CRE CDO within a year from CMBS origination					
Original loan-to-value	-0.01 (0.01)						0.00 (0.00)						-0.00 (0.01)					
Deal average spread		0.03 (0.08)						-0.07 (0.06)						-0.20* (0.11)				
Top ten percent loan share			-0.05 (0.17)						0.06 (0.08)						0.11 (0.21)			
BBB tranche original subordination				-0.05** (0.02)						-0.01 (0.01)							-0.05** (0.02)	
Percent of BBB tranche sold					0.05 (0.08)						0.08* (0.05)							0.06 (0.10)
Quarter fixed effect	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	372	374	374	374	374		367	369	369	369	369	369	372	374	374	374	374	374
R-squared	0.26	0.25	0.25	0.27	0.26		0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29	0.28	0.28
<i>Panel B: Risk pricing</i>	<i>Coupon spread</i>		<i>Original price (Trepp quote)</i>		<i>Original price (NAIC)</i>		<i>Coupon spread</i>		<i>Original price (Trepp quote)</i>		<i>Original price (NAIC)</i>		<i>Coupon spread</i>		<i>Original price (Trepp quote)</i>		<i>Original price (NAIC)</i>	
Percentage of B-piece sold into affiliated CRE CDO within a year	-0.02 (0.03)	-0.03 (0.03)	0.19 (1.31)	0.30 (1.33)	0.83 (0.87)	1.10 (0.85)												
Percentage of B-piece of neighboring deals with same B-piece buyer sold within 12 months							-0.03 (0.06)	-0.01 (0.05)	0.14 (1.46)	0.36 (1.49)	-0.33 (0.71)	-0.79 (0.92)						
Dummy equal to one if B-piece buyer is the issuer of a CRE CDO within a year from CMBS origination													0.04* (0.02)	-0.02 (0.02)	-0.59 (0.66)	-0.36 (0.65)	0.88 (0.54)	0.85 (0.50)
Original loan-to-value		0.00 (0.01)		0.00 (0.11)		0.30* (0.17)		0.00 (0.01)		0.00 (0.11)		0.34* (0.18)		0.00 (0.01)		0.00 (0.11)		0.29 (0.18)
Deal average spread		0.74*** (0.12)		5.81*** (1.99)		3.75 (2.62)		0.73*** (0.12)		5.85*** (2.02)		3.11 (2.67)		0.73*** (0.12)		5.77*** (1.97)		3.83 (2.65)
Top ten percent loan share		0.08 (0.09)		2.32 (2.03)		3.03 (2.03)		0.08 (0.09)		2.29 (2.04)		2.61 (1.98)		0.08 (0.09)		2.33 (2.02)		3.08 (1.96)
BBB tranche original subordination		-0.01 (0.02)		0.26 (0.42)		-0.17 (0.47)		-0.01 (0.02)		0.23 (0.42)		-0.40 (0.51)		-0.01 (0.02)		0.22 (0.42)		-0.20 (0.50)
Quarter fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	374	372	369	367	154	154	369	367	365	363	151	151	374	372	369	367	154	154
R-squared	0.82	0.86	0.75	0.76	0.74	0.78	0.82	0.86	0.75	0.76	0.74	0.78	0.82	0.86	0.75	0.76	0.74	0.78

Table A5

Individual B-piece tranches sale patterns

The table reports the relationship between the percentage of each tranche of a B-piece sold to CRE CDOs and the rating of that tranche as well as percentage of other tranches of the same deal that was sold to affiliated and unaffiliated CRE CDOs. Each observation corresponds to a tranche in a B-piece of a CMBS deal originated between 2000 and 2007. The ratings of these tranches vary from BB+ to B-. BB+ rating is the omitted group. Bartik (1991) pct affiliated (unaffiliated) is defined as the percentage of other tranches of the B-piece in the same deal that was sold to affiliated (unaffiliated) CRE CDOs. Standard errors clustered at the quarter level are reported in parentheses. Asterisks denote significance levels (***=1%, **=5%, *=10%).

	(1)	(2)	(3)	(4)
	<i>Percentage of tranche sold to affiliated CRE CDOs within a year</i>		<i>Percentage of tranche sold to unaffiliated CRE CDOs within a year</i>	
Rating = BB	0.04** (0.02)	0.04* (0.02)	-0.00 (0.02)	-0.00 (0.02)
Rating = BB-	0.08*** (0.02)	0.09*** (0.02)	-0.04** (0.01)	-0.04** (0.02)
Rating = B+	0.12*** (0.02)	0.14*** (0.03)	-0.10*** (0.02)	-0.11*** (0.02)
Rating = B	0.10*** (0.02)	0.12*** (0.03)	-0.12*** (0.02)	-0.14*** (0.02)
Rating = B-	0.08*** (0.02)	0.10*** (0.03)	-0.14*** (0.02)	-0.16*** (0.02)
Bartik pct affiliated		0.95*** (0.01)		-0.03*** (0.01)
Bartik pct unaffiliated		-0.01 (0.01)		0.80*** (0.04)
Quarter fixed effect	Y	Y	Y	Y
Observations	2,341	2,341	2,341	2,341
R-squared	0.21	0.78	0.12	0.43

Table A6

Timing of the B-piece sale and performance of CMBS deals

The table reports coefficient estimates from linear probability models of the default of the most junior BBB tranche. Each observation corresponds to a CMBS deal that was originated between 2000 and 2007. Percent of B-piece sold within (after) 12 months is the percentage of B-piece tranches that was sold to CRE CDOs within (after) 12 months of the issuance of the CMBS deal. Controls include percentage of the most junior BBB tranche that was sold into CRE CDOs, coupon rate of the most junior BBB tranche and its price at issuance, subordination below the BBB tranche, top ten loan share, initial rating of the tranches, and the average loan-to-value of the underlying commercial mortgages at origination. Standard errors clustered at the quarter level are reported in parentheses. Asterisks denote significance levels (***=1%, **=5%, *=10%).

	(1)	(2)	(3)	(4)
	<i>Default of the most junior BBB tranche</i>			
Percent of B-piece sold within 6 months	0.16*** (0.06)	0.12** (0.06)	0.10* (0.06)	0.11 (0.09)
Percent of B-piece sold between 6 months and 12 months	0.16 (0.10)	0.18** (0.08)	0.17** (0.08)	0.17 (0.10)
Percent of B-piece sold after 12 months	0.04 (0.07)	0.04 (0.07)	0.06 (0.08)	0.08 (0.10)
Percent of BBB tranche sold		-0.00 (0.05)	0.01 (0.05)	0.01 (0.05)
BBB tranche original spread		0.18** (0.07)	0.17** (0.07)	0.20*** (0.07)
Original loan-to-value		0.02** (0.01)	0.02** (0.01)	0.02** (0.01)
Top ten loan share		0.40*** (0.12)	0.38*** (0.13)	0.27** (0.12)
BBB tranche original subordination		-0.03 (0.03)	-0.01 (0.03)	-0.03 (0.03)
BBB tranche original rating		0.02 (0.06)	0.13 (0.10)	0.19* (0.12)
Original price		-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Quarter fixed effects	Y	Y	Y	Y
Deal issuer fixed effects	N	N	Y	N
B-piece buyer fixed effects	N	N	N	Y
Observations	394	378	378	365
R-squared	0.02	0.09	0.08	0.06

Table A7**B-piece buyer skin-in-the-game and property types**

This table studies the relation between different measures of risk retention and the breakdown of loan type for underlying loans in CMBS deals. Each observation corresponds to a CMBS deal originated between 2000 and 2007. Percent retail is the percent of underlying loans, weighted by loan value, made for retail properties. Percent office is the percent of underlying loans, weighted by loan value, made for office properties. Percent multifamily is the percent of underlying loans, weighted by loan value, made for residential multifamily properties. Standard errors are clustered at the quarter level and are reported in parentheses. Asterisks denote significance levels (***) = 1%, ** = 5%, * = 10%).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Percentage of B-piece sold into CRE CDO within a year			Percentage of B-piece sold into affiliated CRE CDO within a year			Percentage of B-piece of neighboring deals with same B-piece buyer sold within 12 months			Dummy equal to one if B-piece buyer is the issuer of a CRE CDO within a year from CMBS origination		
Percent retail	0.03 (0.09)			0.02 (0.08)			0.02 (0.05)			0.02 (0.09)		
Percent office		0.02 (0.09)			-0.01 (0.08)			0.00 (0.06)			0.01 (0.09)	
Percent multifamily			- 0.31* (0.17)			-0.22 (0.23)			-0.13 (0.11)			-0.10 (0.23)
Quarter fixed effect	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	394	394	394	374	374	374	369	369	369	374	374	374
R-squared	0.32	0.32	0.33	0.25	0.25	0.26	0.27	0.27	0.28	0.28	0.28	0.28

Table A8

B-piece buyer skin-in-the-game and the performance of CMBS deals—controlling for property type

The table reports coefficient estimates from linear probability models of the default of the most junior BBB tranche. Each observation corresponds to a CMBS deal that was originated between 2000 and 2007. Percent of B-piece sold within (after) 12 months is the percentage of B-piece tranches that was sold to CRE CDOs within (after) 12 months of the issuance of the CMBS deal. Controls include percentage of the most junior BBB tranche that was sold into CRE CDOs, coupon rate of the most junior BBB tranche and its price at issuance, subordination below the BBB tranche, top ten loan share, initial rating of the tranche, and the average loan-to-value of the underlying commercial mortgages at origination. Property type controls are percentage of retail, office, and multifamily properties in the CMBS deal. Standard errors clustered at the quarter level are reported in parentheses. Asterisks denote significance levels (***=1%, **=5%, *=10%).

	(1)	(2)	(3)	(4)
	<i>Default of the most junior BBB tranche</i>			
Percent of B-piece sold within 12 months	0.14** (0.06)	0.13** (0.05)		
Percent of B-piece sold into an affiliated CRE CDO within 12 months			0.14** (0.06)	0.13** (0.05)
Percent of B-piece sold into an unaffiliated CRE CDO within 12 months			0.01 (0.11)	-0.03 (0.11)
Controls	Y	Y	Y	Y
Property type controls	Y	Y	Y	Y
Property type controls X Year FE	N	Y	N	Y
Quarter fixed effects	Y	Y	Y	Y
Observations	378	378	365	365
R-squared	0.09	0.36	0.10	0.39