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## Investment Returns Analysis

How “at risk” are different property investments to an economic downturn? To address this question, we examined a variety of simplified investment profiles. Specifically, we simulated the returns for an 8-year hold period for 3 hypothetical multifamily investments: a class A property with a low yield and high NOI growth in a Gateway market (“Gateway A”); a class A property with a mid-range yield and medium NOI growth in a secondary market (“Secondary A”); and a class B property with a high yield, but low NOI growth, in a tertiary market (“Tertiary B”). We chose to model multifamily because of the simplicity of market-to-market rents, though our insights can be generally applied to other property types. Each investment is analyzed for a Base Case with constant (but different for each property) NOI growth. For all investments, we assume a purchase price of \$100 million, cash flow margins of 83% of NOI (reflecting on-going capex), and exit transaction fees of 3%.

The Gateway market A investment has a going-in cap rate of 4%, NOI growth of 4% per annum for 8 years, and an exit cap rate of 4.5%. The Secondary market A investment has a going-in cap rate of 6%, NOI growth of 2.5% per annum, and an exit cap rate of 6.5%. The Tertiary market B investment has a going-in cap rate of 7.5%, NOI growth of just 1.5% per annum, and an exit cap rate of 8%. For each property, we overlay 3 leverage scenarios: no leverage, 50% LTV, and 75% LTV. This yields a total of 9 “Base Case” scenarios. In both the 50% and 75% LTV scenarios, we assume 10-year debt with a 3.5% interest rate and 30-year amortization.

We also simulated how returns and (interest and debt) coverage ratios are affected by reduced NOI growth due to a cyclical downturn. We refer to these 9 scenarios as the “Realistic” scenarios, as NOI never grows smoothly upward forever. These scenarios assume -6% NOI growth in years 3 and 4 (that is, an aggregate 11.6% NOI decline spread over 2019 and 2020) of the investment horizon. Thereafter, the originally modeled growth rates resume through year 8. In total, we simulated 18 investment scenarios and their corre-

sponding return profiles: 3 different investments, with 3 leverage ratios and 2 economic environments.

While highly simplified, this analysis is fairly realistic and provides insights on the impacts of leverage, property type, and the economy. As to leverage, as long as original pro-forma growth occurs, increased leverage increases both the equity IRR and the equity multiple. For example, the Gateway A property generates an equity IRR of 5.2% with no leverage, 6.3% with 50% leverage, and 8.5% with 75% leverage, while the equity multiple increases from 1.4x to 1.6x to 2.0x over the 8 year hold.

One noteworthy impact of leverage is that higher leverage notably reduces the proportion of IRR derived from annual cash flows. This is particularly true for the Gateway A investment, where high leverage converts this low-yield investment into a pure residual bet. The Secondary A property sees its proportion of return due

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Hypothetical Investment Analysis: Multifamily Performance Metrics									
Assumptions					Results				
Market	LTV	Economy*	Going-in Cap Rate	Residual Cap Rate	Equity IRR	Equity Multiple	% of Return from Cash Flow	Average Interest Coverage	Average Debt Coverage
Gateway A	0%	Base	4.0%	4.5%	5.2%	1.44	21.0%	n/a	n/a
Gateway A	50%	Base	4.0%	4.5%	6.3%	1.60	11.0%	2.9x	1.7x
Gateway A	75%	Base	4.0%	4.5%	8.5%	1.98	-4.0%	1.9x	1.1x
Secondary A	0%	Base	6.0%	6.5%	6.0%	1.50	29.0%	n/a	n/a
Secondary A	50%	Base	6.0%	6.5%	8.0%	1.71	25.0%	4.1x	2.4x
Secondary A	75%	Base	6.0%	6.5%	11.6%	2.22	20.0%	2.7x	1.6x
Tertiary B	0%	Base	7.5%	8.0%	6.6%	1.53	34.2%	n/a	n/a
Tertiary B	50%	Base	7.5%	8.0%	9.1%	1.78	34.5%	4.9x	2.9x
Tertiary B	75%	Base	7.5%	8.0%	13.9%	2.36	33.7%	3.3x	1.9x
Gateway A	0%	Realistic	4.0%	4.5%	2.5%	1.19	22.0%	n/a	n/a
Gateway A	50%	Realistic	4.0%	4.5%	1.2%	1.10	9.0%	2.5x	1.5x
Gateway A	75%	Realistic	4.0%	4.5%	-0.1%	0.99	-25.0%	1.6x	1.0x
Secondary A	0%	Realistic	6.0%	6.5%	3.7%	1.28	30.0%	n/a	n/a
Secondary A	50%	Realistic	6.0%	6.5%	3.6%	1.28	26.0%	3.6x	2.1x
Secondary A	75%	Realistic	6.0%	6.5%	4.1%	1.35	18.0%	2.4x	1.4x
Tertiary B	0%	Realistic	7.5%	8.0%	4.5%	1.34	35.3%	n/a	n/a
Tertiary B	50%	Realistic	7.5%	8.0%	5.2%	1.39	36.6%	4.4x	2.6x
Tertiary B	75%	Realistic	7.5%	8.0%	7.3%	1.57	37.2%	2.9x	1.7x

*Source: Linneman Associates*  
 Base case economy assumes constant positive NOI growth rates in each scenario.  
 Realistic case economy assumes -6% NOI growth in years 2 and 3. All other years match the Base case.  
 Coverage ratios are based on NOI.

figure 1

to a cash flow drop by one-third with high leverage. But because of high positive leverage, the Tertiary B property experiences essentially an unchanged Base Case return share from cash flow. This greater cash flow return greatly reduces risk, as it is money in your pocket rather than remaining at risk until exit. Even though debt coverage ratios (before cap ex) are above “1.0x” in all scenarios, in the Base Case, the ratio only averages 1.1x

at a 75% LTV. However, assuming capital expenditures of 17% of NOI for multifamily, the cash flow-to-debt service coverage ratio averages just 0.9x over the 8-year period for the Realistic case. That is, the highly levered low-yield investment cannot always cover debt from cash flow even when debt is very cheap.

Our simulations indicate that in the Realistic Case, higher leverage does not always translate into higher

Base Case Economy	NOI Growth Rate Assumptions						
	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Gateway A	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Secondary A	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Tertiary B	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Realistic Case Economy	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Gateway A	4.0%	-6.0%	-6.0%	4.0%	4.0%	4.0%	4.0%
Secondary A	2.5%	-6.0%	-6.0%	2.5%	2.5%	2.5%	2.5%
Tertiary B	1.5%	-6.0%	-6.0%	1.5%	1.5%	1.5%	1.5%

figure 2

IRRs and higher equity multiples. Specifically, in the Realistic Case, the Gateway A property generates an equity IRR of 2.5% with no leverage, declining to a 1.2% IRR with 50% leverage, and a -0.1% IRR with 75% leverage. This occurs because the Gateway A property has a lower going-in yield, and absent growth, its cash flows are unable support the debt service associated with 75% leverage in the recession years. The equity multiples also decline for the Gateway A property in Realistic conditions as leverage rises. In fact, in this scenario the return is totally dependent on value appreciation. In the Realistic scenario, the Secondary A property exhibits modestly increased IRRs and notably decreased cash flow return shares as leverage increases from 0% to 75%. Interestingly, the Realistic scenario with 50% leverage for the Secondary A property generates almost identical returns to the no-leverage scenario. That is, the equity IRRs and the equity multiples are roughly equal with both no leverage and 50% leverage.

The Tertiary B property exhibits strong increases in both the equity IRR and equity multiple as the LTV increases due to its high positive leverage. Specifically, higher going-in yields provide a cushion against the 2-year decline in NOI. For this property, the proportion of return derived from operating cash flow is relatively constant at about 35-37% regardless of leverage or state of the economy.

Evaluating returns across property types, the Tertiary B property outperforms Gateway A and Secondary A properties over the longer hold. That is, in both economies, the highest equity IRRs are generated by the Tertiary B property, regardless of leverage or economy. Similarly, the Tertiary B property also generates the highest percentage share of return from operating cash flows, reducing its risk by making it less dependent on value appreciation. This is due to the higher going-in yield generating high cash-on-cash returns, particularly at higher leverage. In contrast, when comparing properties under similar economic conditions, the least

attractive scenario generating the lowest comparable returns is the highly leveraged Gateway A investment, particularly in a Realistic case, where you bet on high growth which fails to occur.

It is important to bear in mind that this analysis fails to capture the fact that the Tertiary B property has the lowest liquidity. Hence, exit (or refinancing) at the modeled cap rates may not be possible, particularly during the cyclical downturn. Nonetheless, this analysis reflects the power of high yields in a low-interest rate environment — even with slow growth.

We also calculated how far NOI growth must decline in years 3 and 4 in order to yield a 0% IRR for each scenario. Not surprisingly, as leverage rises, a less severe downturn is required to result in a 0% IRR. In other words, leverage increases investment risk because higher debt service drains cash flow. In order for the Gateway A investment to achieve a 0% IRR, NOI would have to decline for 2 consecutive years by 14.7% with no leverage, 8.2% with a 50% LTV, and just 6.0% with a 75% LTV. For the Secondary A investment, NOI would have to drop by 18.2%, 11.9%, and 9.6%, respectively, while the Tertiary B investment would require comparable NOI declines of 20.2%, 14.2%, and 11.9%. Thus, high yield-slow growth investments can survive notably steeper NOI declines.

We then ran a similar analysis to determine how far NOI must decline in the Realistic Case before interest and debt coverage fall below 1.0x (Figure 190). That is, how bad can the economy get before an investor is forced into default, even before any capital

<b>2-Yr NOI Decline Needed for 0% IRR in Realistic Case</b>			
	<b>Unlevered</b>	<b>50% LTV</b>	<b>75% LTV</b>
Gateway A	-14.7%	-8.2%	-6.0%
Secondary A	-18.2%	-11.9%	-9.6%
Tertiary B	-20.2%	-14.2%	-11.9%

figure 4

<b>Year 3 NOI Decline Resulting in Insufficient Interest Coverage or Debt Coverage in Realistic Case*</b>				
	<b>50% LTV</b>		<b>75% LTV</b>	
	<b>Interest Coverage</b>	<b>Debt Coverage</b>	<b>Interest Coverage</b>	<b>Debt Coverage</b>
Gateway A	-60.0%	-35.3%	-40.0%	-3.0%
Secondary A	-72.9%	-56.2%	-59.4%	-34.4%
Tertiary B	-78.1%	-64.6%	-67.2%	-47.0%

\* "Insufficient" is defined as coverage ratios less than 1.0x.

figure 3

Residual Cap Rate Needed for Uniform IRR (Benchmark: Gateway A, 0% LTV)							
	Orig. Residual Cap Rate	Base Economy			Realistic Economy		
		0% LTV	50% LTV	75% LTV	0% LTV	50% LTV	75% LTV
Gateway A	4.5%	4.5%	4.8%	5.0%	4.5%	4.2%	4.2%
Secondary A	6.5%	7.0%	7.5%	8.0%	7.3%	6.8%	6.8%
Tertiary B	8.0%	9.2%	10.0%	10.7%	9.9%	9.2%	9.1%
<b>Equity IRR Benchmark</b>		<b>5.2%</b>	<b>5.2%</b>	<b>5.2%</b>	<b>2.5%</b>	<b>2.5%</b>	<b>2.5%</b>

figure 5

expenditures are made? As previously discussed, the Tertiary B property cash flows are more insulated than the Secondary A cash flows, which in turn, are more insulated than the Gateway A cash flows. Therefore, the Tertiary B investment can withstand the largest NOI declines before defaulting. The good news is that for all except one scenario, significant declines in NOI would have to occur before coverage problems arise. For example, with 50% leverage, debt coverage would be insufficient only if NOI declined by 35% for the Gateway A property, 56% for Secondary A property, and 65% for the Tertiary B property. The only scenario that is truly at risk of not covering debt service is the Gateway A property with 75% leverage, where only a 3% NOI decline is needed before default.

Our final analysis examined what exit cap rate is necessary to produce the same equity IRRs for the

different investments and LTVs (Figure 192). We used Gateway A with 0% leverage as our benchmark in each economy. Specifically, we targeted an IRR of 5.2% in the Base Case and 2.5% in the Realistic Case. To produce the same IRR in the Base Case economy (constant NOI growth) as the Gateway A property with no leverage, both the Secondary A and Tertiary B investments require a much higher exit cap rate than in the original exercise. Additionally, as leverage rises in the Base economy, exit cap rates required to achieve the baseline unlevered IRR target also rise. This indicates that as leverage increases, more weight is given to the residual value in order maintain a constant IRR. However, in the Realistic case, the opposite is true: to maintain a constant IRR, required exit cap rates decrease as leverage increases, re-emphasizing the fact that the residual value becomes increasingly important when NOI declines.

### About Dr. Peter Linneman

Dr. Linneman, who holds both Masters and Doctorate degrees in economics from the University of Chicago, is the Principal of Linneman Associates. For over 30 years he has provided strategic and financial advice to leading corporations. Through Linneman Associates, he provides strategic and M&A analysis, market studies, and feasibility analysis to a number of leading U.S. and international companies. In addition, he serves as an advisor to and a board member of several public and private firms.

Dr. Linneman is the author of the leading real estate finance textbook, *Real Estate Finance and Investments: Risks and Opportunities*, now in its fourth edition. His teaching and research focuses on real estate and investment strategies, mergers and acquisitions, and international markets. He has published over 100 articles during his career. He is widely recognized as one of the leading strategic thinkers in the real estate industry, and was named among the top 30 “Most Influential People in Real Estate” by Commercial Property Executive in 2013.

He also served as the Albert Sussman Professor of Real Estate, Finance, and Business and Public Policy at the Wharton School of Business at the University of Pennsylvania until his retirement in 2011. A member of Wharton’s faculty since 1979, he served as the founding chairman of Wharton’s Real Estate Department and the Director of Wharton’s Zell-Lurie Real Estate Center for 13 years. He is the founding co-editor of *The Wharton Real Estate Review*.

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