

Private Real Estate Cash Flows Income: Alternatives Move Into the Mainstream

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Motivation

- Low yields in the bond market make investors search for other income producing assets to ensure they can meet future liabilities
- The search for higher yield comes with an expectation of higher risk
- Private investments they envision are tempting but the answer to the question “how much more risk” is not clear
- The pandemic of 2020 escalated these dynamics
- It also posed questions of the directional behavior of private assets
- Commercial Real Estate is a prime target for exploration as it is both a long term income producing asset *and* a private asset

Northfield and Commercial Real Estate

- In 2005 Northfield created the first factor risk model for directly owned commercial real estate in the industry
- Since then we have evolved to cover approximately 3000 different global markets defined by property type and location
- The idea of our factor risk model is to take snapshot of the uncertainty of repricing. This done at the usual horizon at which a multi-asset class investor wants to estimate price risk similarly to public markets – annually.
- We have accumulated data for many rental markets, tenant profiles, typical building characteristics, and much more granular data for the property markets we cover – the GERARD database.
- Our unique approach has been a preference of economic rationale and market drivers over that of accounting assumptions and appraisal based indices.

What is New

- We have targeted two new objectives with the evolution of investor demand
- First, we recognize the importance of cash flows and income to Liability Driven Investors like pension funds, insurance asset managers, and endowment management
- Secondly, we recognize the importance of Future Value risk of the asset class, rather than short term repricing (i.e. Present Value risk) for investors who buy and hold for the long term
- Consequently, we recognize that modeling cash flows dynamics over the life of a commercial real estate investment is key to serving both of these objectives
- On the following slides we give you examples how this works

Modeling Cash Flows

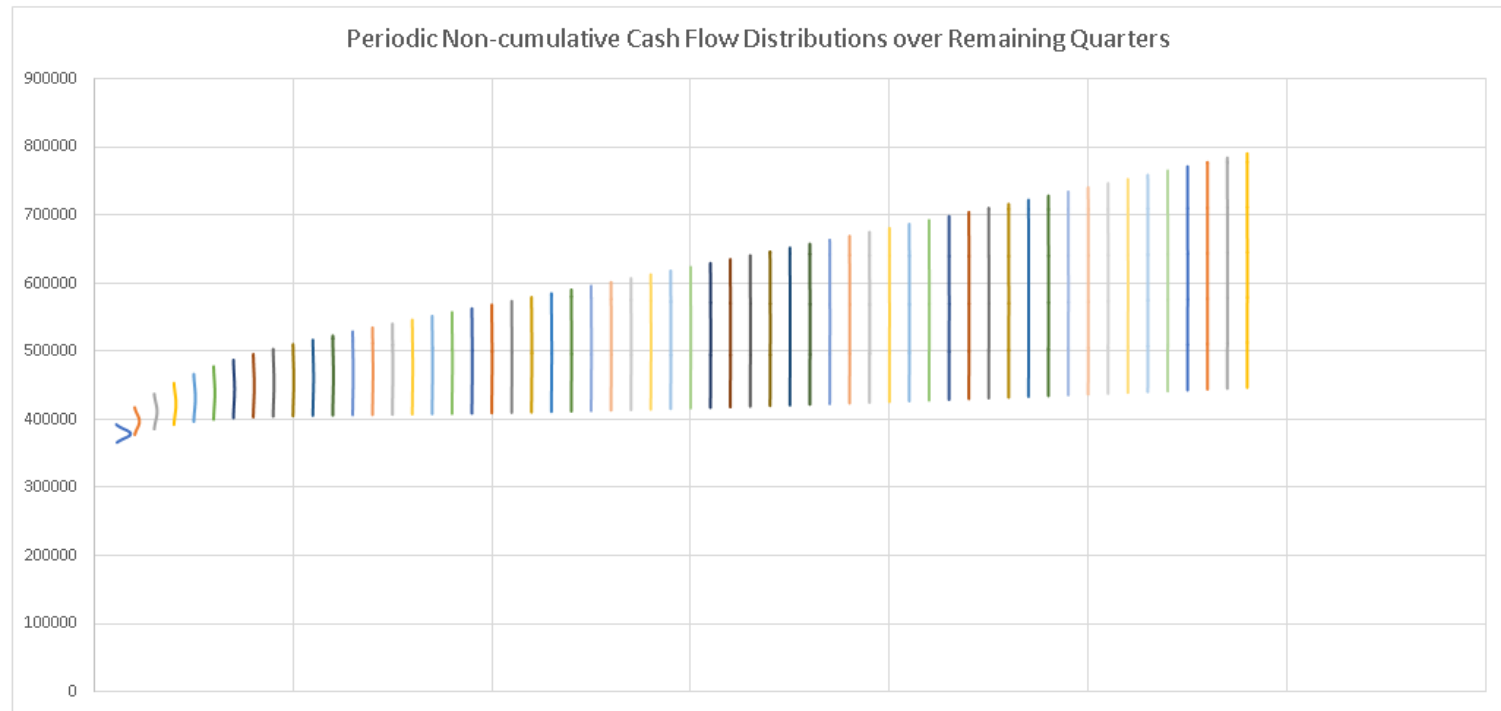
- Northfield has joined forces with private asset valuation firm Aspequity to deliver unprecedented capability in this area to our clients.
- The CF models operate on three broad sets of parameters – projected growth, pacing of cash flow yield, and volatility. Aspequity provides robust proprietary models of cash flow pacing and Northfield provides the means to estimate the uncertainty of the cash flows using its risk models. Both forecasts are integrated in one delivery.
- Growth can be based on the macro forecasts, economist predictions, and scenarios
- The cash flow yield of a directly owned portfolio is more stable than that of a private fund. Both need robust estimation.
- Volatility of cash flows should account for the fact that leases reset periodically

Cash Flow Forecast Examples

- *Boston Retail*
- *New York Office*
- *Houston Industrial*
- *Mixed Metro Portfolio*
- *US Diversified under moderate and stagnant growth scenarios*
- *This is a snippet of what we can offer as part of our coverage of 3000 markets globally*

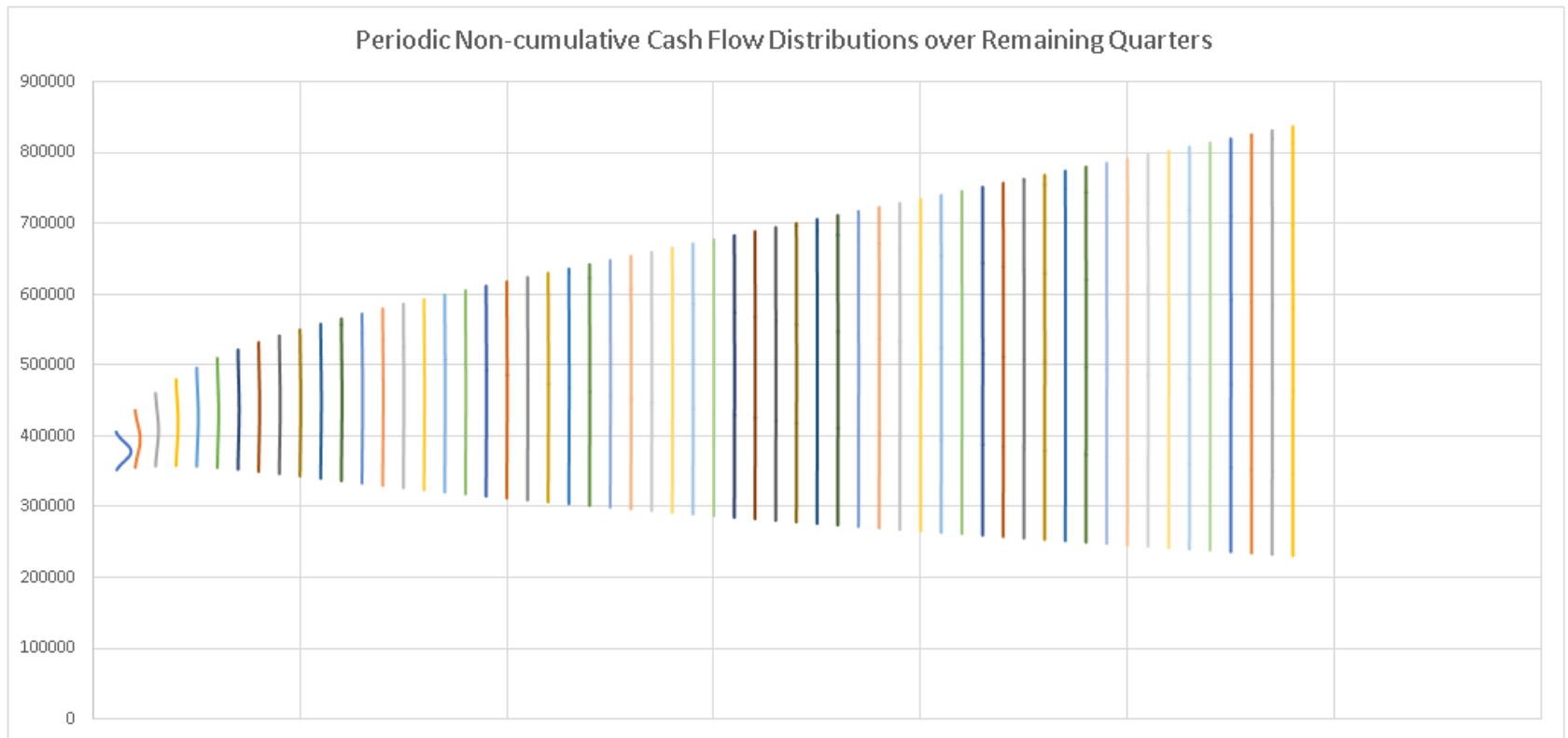
Boston Retail

Cash Flow Forecast



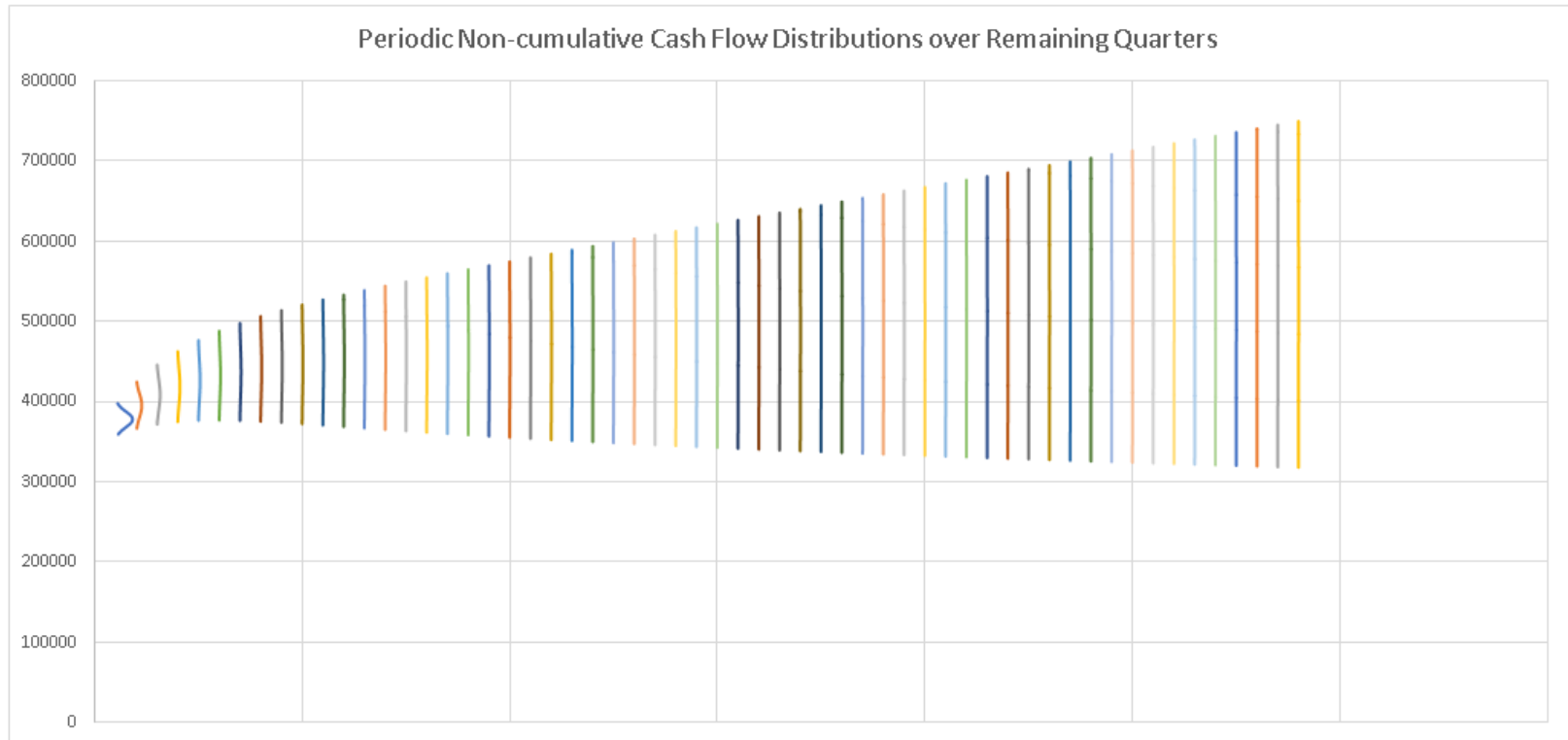
New York Office

Cash Flow Forecast



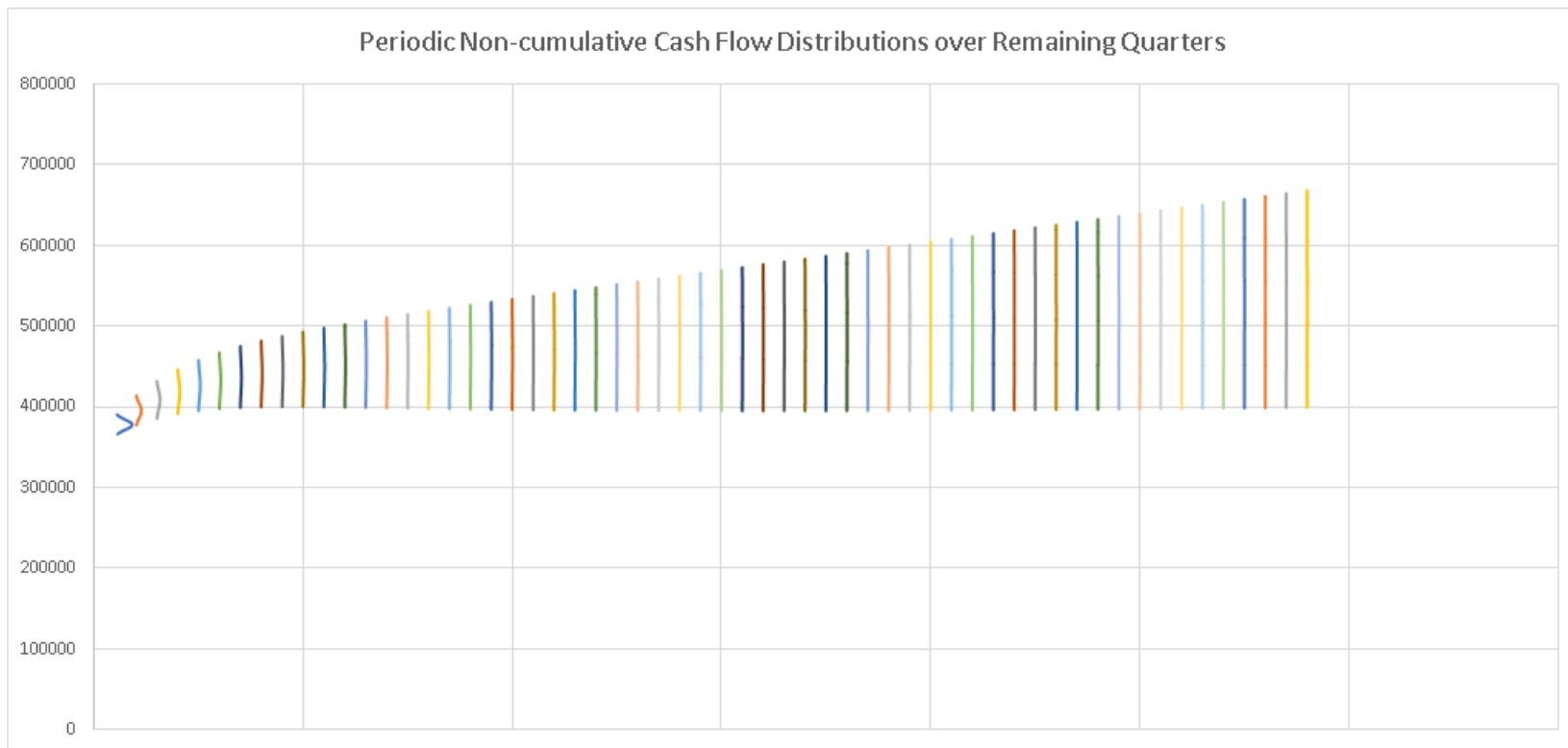
Houston Industrial

Cash Flow Forecast



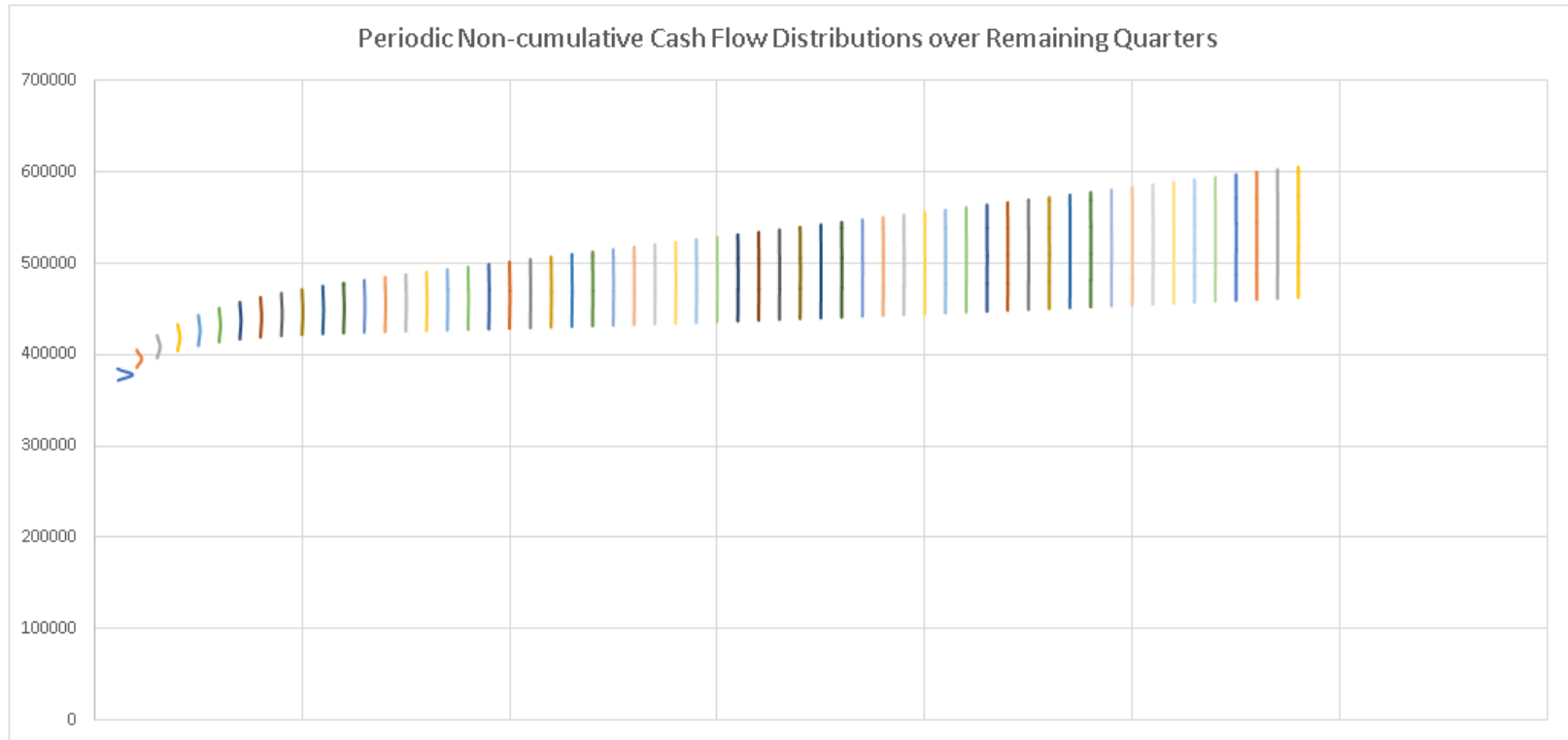
Metro Mixed

Cash Flow Forecast



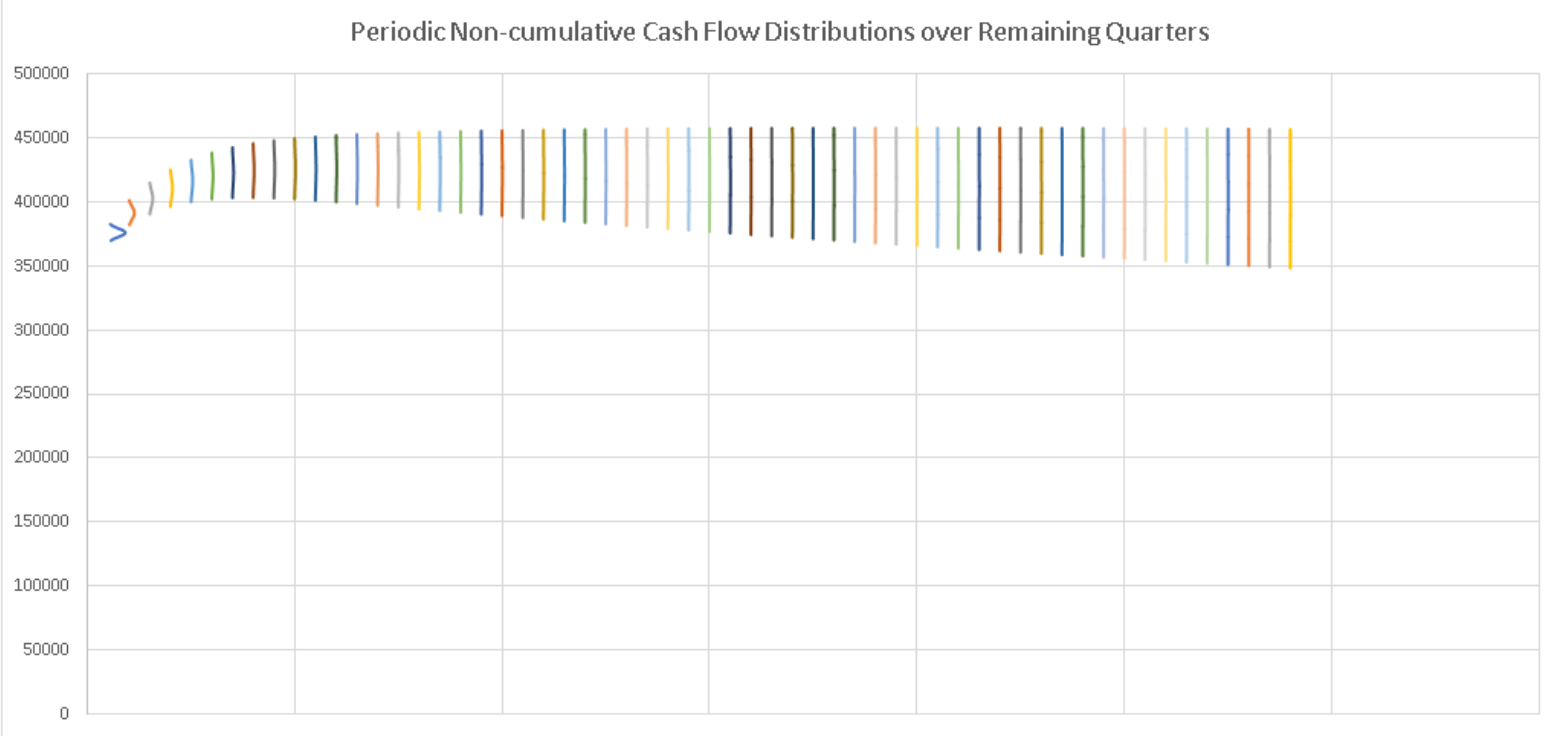
US Diversified

Cash Flow Forecast



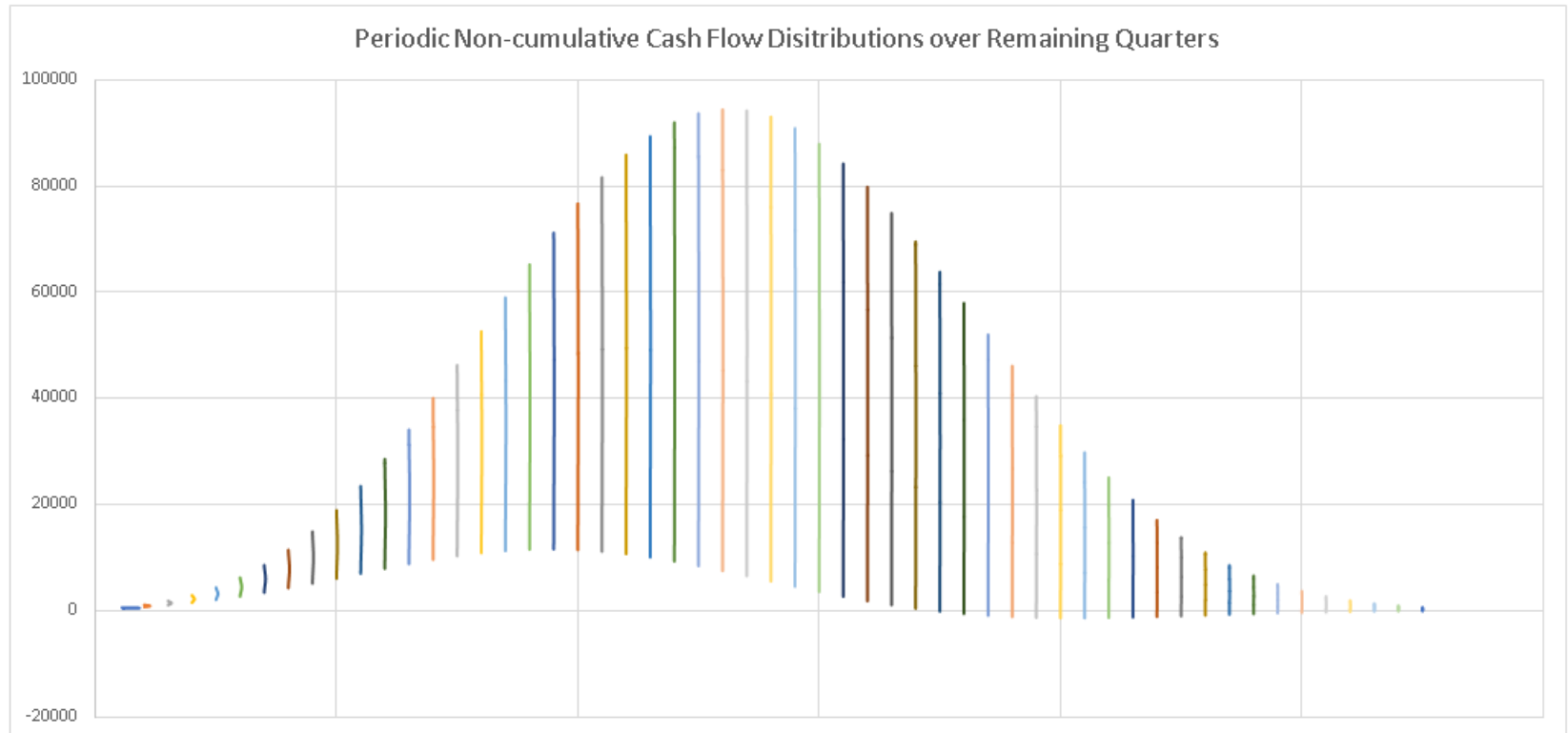
US Diversified – stagnant growth

Cash Flow Forecast



Limited Partnership Fund Investment

Cash Flow Forecast



US Diversified – Moderate vs. Low Growth

Cash Flow Forecast Details - US Diversified

Period	low 99%	low 95%	low 90%	low 75%	high 75%	high 90%	high 95%	high 99%	average
1	372,029.00	372,914.00	373,799.00	375,569.00	379,993.00	381,763.00	382,648.00	383,976.00	377,831.00
2	386,177.00	387,922.00	389,231.00	392,068.00	398,176.00	401,013.00	402,322.00	404,285.00	395,147.00
3	396,902.00	399,222.00	401,045.00	404,358.00	412,312.00	415,791.00	417,448.00	419,933.00	408,354.00
4	404,827.00	407,627.00	409,728.00	413,789.00	423,171.00	427,092.00	429,193.00	431,993.00	418,426.00
5	410,751.00	413,851.00	416,207.00	420,796.00	431,462.00	436,051.00	438,531.00	441,631.00	426,143.00
6	414,965.00	418,460.00	421,052.00	426,124.00	438,072.00	443,144.00	445,849.00	449,343.00	432,111.00
7	418,041.00	421,894.00	424,809.00	430,329.00	443,241.00	448,865.00	451,780.00	455,633.00	436,797.00
8	420,303.00	424,487.00	427,601.00	433,537.00	447,551.00	453,487.00	456,698.00	460,785.00	440,555.00
9	422,087.00	426,397.00	429,791.00	436,211.00	451,161.00	457,489.00	460,883.00	465,285.00	443,650.00
10	423,384.00	427,996.00	431,564.00	438,351.00	454,187.00	460,974.00	464,542.00	469,241.00	446,279.00
11	424,422.00	429,318.00	433,136.00	440,191.00	456,957.00	464,095.00	467,830.00	472,726.00	448,583.00
12	425,370.00	430,459.00	434,435.00	441,910.00	459,404.00	466,879.00	470,855.00	476,024.00	450,666.00
13	426,132.00	431,485.00	435,615.00	443,415.00	461,769.00	469,569.00	473,699.00	479,128.00	452,601.00
14	426,836.00	432,443.00	436,722.00	444,912.00	464,022.00	472,138.00	476,417.00	482,098.00	454,438.00
15	427,509.00	433,362.00	437,859.00	446,283.00	466,127.00	474,622.00	479,048.00	484,901.00	456,213.00
16	428,241.00	434,264.00	438,902.00	447,625.00	468,257.00	476,980.00	481,688.00	487,711.00	457,949.00
17	428,904.00	435,162.00	439,939.00	449,023.00	470,287.00	479,371.00	484,216.00	490,474.00	459,663.00
18	429,575.00	436,063.00	440,977.00	450,347.00	472,365.00	481,735.00	486,715.00	493,137.00	461,363.00
19	430,327.00	436,974.00	442,088.00	451,739.00	474,367.00	484,082.00	489,196.00	495,843.00	463,060.00
20	431,028.00	437,897.00	443,142.00	453,071.00	476,425.00	486,354.00	491,662.00	498,531.00	464,755.00
21	431,747.00	438,772.00	444,209.00	454,472.00	478,481.00	488,683.00	494,120.00	501,206.00	466,453.00
22	432,484.00	439,724.00	445,289.00	455,820.00	480,474.00	491,005.00	496,570.00	503,810.00	468,154.00
23	433,296.00	440,689.00	446,440.00	457,178.00	482,526.00	493,323.00	499,015.00	506,467.00	469,859.00

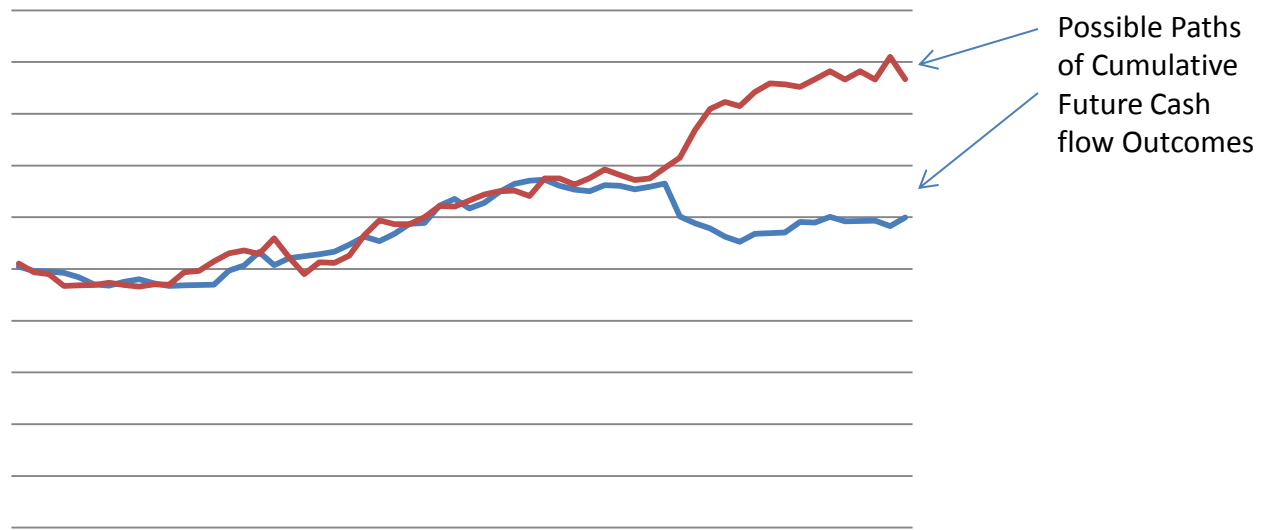
Cash Flow Forecast Details - US Diversified Low Growth

Period	low 95%	low 90%	low 75%	high 75%	high 90%	high 95%	high 99%	average
1	371,067.00	371,952.00	373,722.00	378,146.00	379,916.00	380,801.00	382,129.00	375,984.00
2	384,179.00	385,482.00	388,305.00	394,385.00	397,208.00	398,511.00	400,465.00	391,370.00
3	393,537.00	395,342.00	398,625.00	406,505.00	409,952.00	411,593.00	414,056.00	402,584.00
4	399,969.00	402,040.00	406,045.00	415,297.00	419,164.00	421,235.00	423,997.00	410,618.00
5	401,451.00	404,195.00	406,508.00	411,012.00	421,482.00	425,986.00	428,421.00	416,261.00
6	403,377.00	406,791.00	409,323.00	414,279.00	425,953.00	430,909.00	433,552.00	420,128.00
7	404,454.00	408,201.00	411,036.00	416,403.00	428,961.00	434,429.00	437,265.00	422,693.00
8	404,713.00	408,763.00	411,777.00	417,523.00	431,085.00	436,831.00	439,939.00	424,315.00
9	404,490.00	408,642.00	411,911.00	418,095.00	432,495.00	438,591.00	441,860.00	425,261.00
10	403,783.00	408,204.00	411,624.00	418,130.00	433,312.00	439,818.00	443,238.00	425,730.00
11	402,817.00	407,489.00	411,131.00	417,862.00	433,856.00	440,666.00	444,229.00	425,868.00
12	401,759.00	406,591.00	410,366.00	417,462.00	434,072.00	441,168.00	444,943.00	425,776.00
13	400,521.00	405,579.00	409,481.00	416,851.00	434,191.00	441,561.00	445,463.00	425,529.00
14	399,225.00	404,498.00	408,521.00	416,221.00	434,188.00	441,819.00	445,842.00	425,178.00
15	397,903.00	403,380.00	407,587.00	415,468.00	434,036.00	441,983.00	446,124.00	424,760.00
16	396,635.00	402,243.00	406,562.00	414,684.00	433,892.00	442,014.00	446,398.00	424,295.00
17	395,305.00	401,103.00	405,530.00	413,946.00	433,648.00	442,064.00	446,553.00	423,804.00
18	393,986.00	399,968.00	404,499.00	413,138.00	433,438.00	442,077.00	446,669.00	423,295.00
19	392,742.00	398,841.00	403,532.00	412,388.00	433,148.00	442,062.00	446,754.00	422,775.00
20	391,455.00	397,726.00	402,515.00	411,581.00	432,903.00	441,969.00	446,815.00	422,248.00
21	390,187.00	396,570.00	401,510.00	410,834.00	432,647.00	441,916.00	446,856.00	421,719.00
22	388,938.00	395,484.00	400,515.00	410,037.00	432,325.00	441,847.00	446,878.00	421,187.00
23	387,760.00	394,412.00	399,585.00	409,246.00	432,052.00	441,765.00	446,886.00	420,655.00
24	386,546.00	393,353.00	398,612.00	408,513.00	431,719.00	441,671.00	446,879.00	420,122.00
25	385,349.00	392,307.00	397,652.00	407,735.00	431,433.00	441,516.00	446,861.00	419,590.00
26	384,166.00	391,274.00	396,701.00	407,012.00	431,148.00	441,402.00	446,832.00	419,058.00

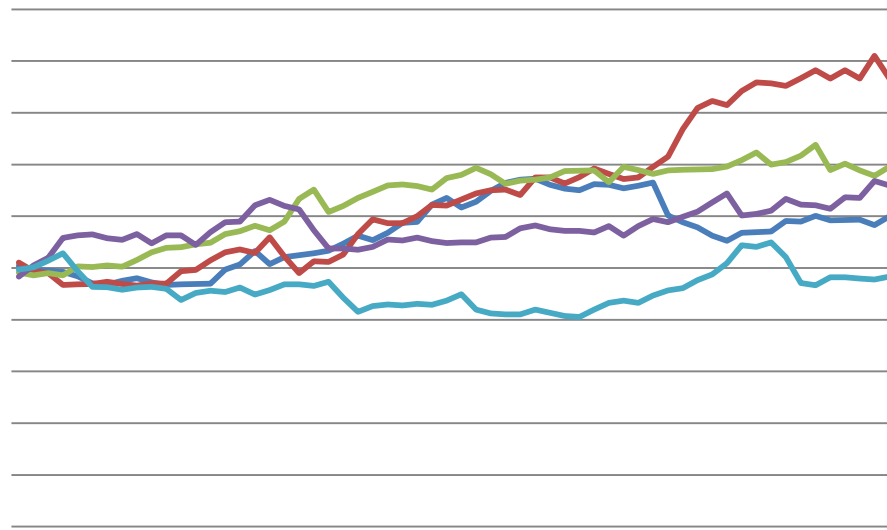
Future Value Risk

- As noted, Long Term Investors are less interested in short term PV repricing Risk
- LT Investors *may be* interested in interim periodic Cash Flow Risk
- But what LT Investors are *certainly* interested in is the outcome probability distribution of their investment's **Future Value**.
- Using Aspequity's unique cash flow simulation engine which is fed the Northfield real estate cash flow risk model as an input, we simulate **10²¹ different outcomes** of future value along cash flow paths spanning 10 to 20 years, quarterly.
- The result is a practically continuous (rather than sampled) statistical distribution of Future Value for the real estate investment, or any investment for that matter.

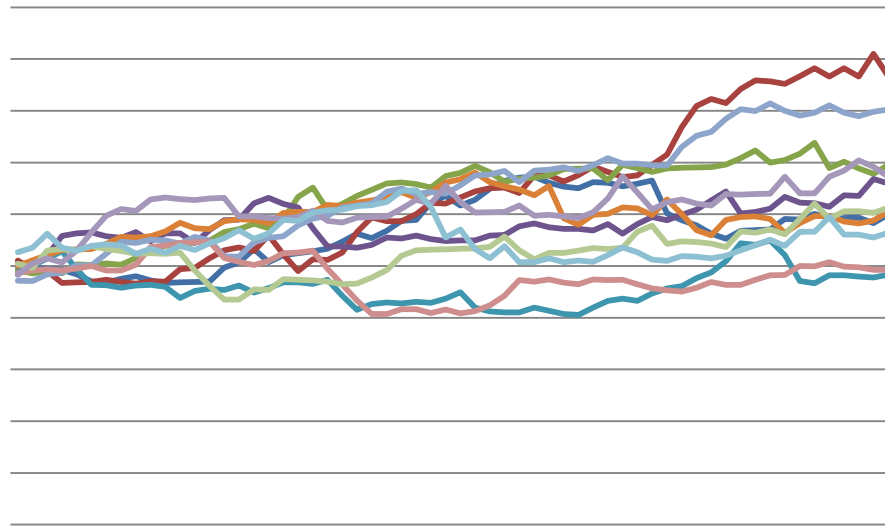
Future Value Paths Illustrated



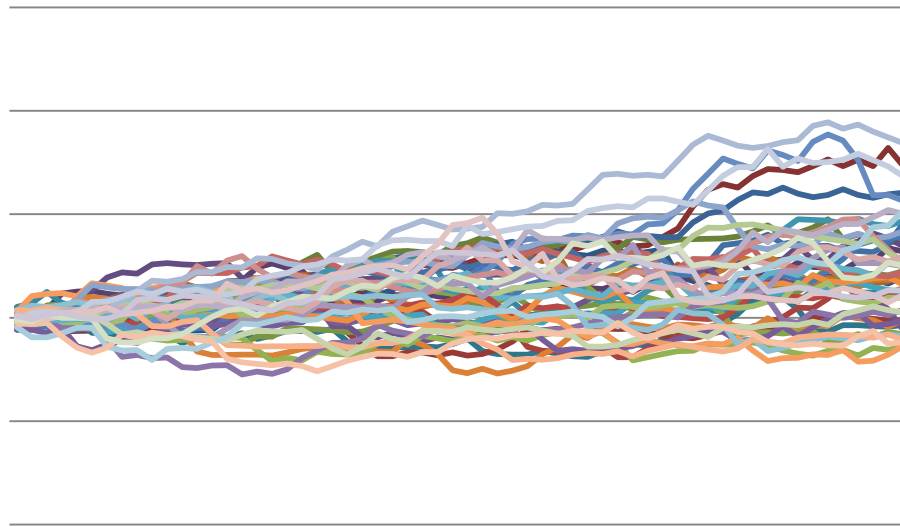
Simulating More Cash Flow Paths...



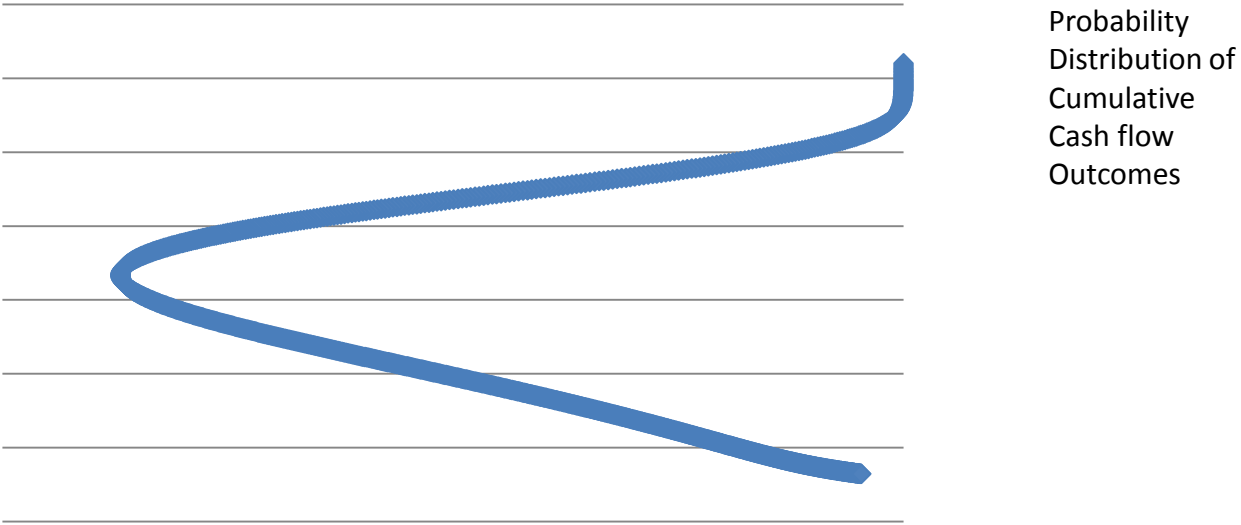
More Paths...



...more paths...



Our Solution



Using 10^{21} cash flow paths provides a continuous probability distribution which immensely reduces sampling error of Monte Carlo simulations

Future Value Risk Applications

- On its own, Future Value risk is a useful metric for Risk Management
- As we have shown in prior webinars, it is also a key input in Multi-Period Portfolio Optimization inclusive of private assets
- We have also shown that Future Value simulation is the central to finding long term correlations between asset classes
- An example follows showing the long term buy and hold future value correlations of a sample portfolio of US real estate with other asset classes

Long Term Correlations of CRE

Horizon	Global Bonds	US Equity	Global Equity x US
3 years	0.12	0.32	0.32
5 years	0.11	0.31	0.31
7 years	0.11	0.30	0.30
10 years	0.10	0.28	0.28
15 years	0.09	0.26	0.26

Summary

- Our Cash Flow analytics approach addresses the needs of Liability Driven Investors
- Future Value risk estimation addresses the needs of Long Term Investors
- Both sides of this toolset build on transparent and reliable global dataset developed over 15 years
- We use innovative and precise simulation technology and forecasting models
- Our approach shows the level of diversification which the asset class offers to multi-asset class investors at various time horizons
- With minor modifications the model can be applied to real estate backed private debt
- It is an important facet of our arsenal of private asset analytics, alongside private equity, private debt, and infrastructure, all of which blend seamlessly in Total Fund portfolio analytics alongside public asset classes

Question and Answer Session

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