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IAS EXECUTIVE SUMMARY

TO ROLL OR NOT TO ROLL (FORWARD)

LP NAV Estimation for Private Equity and Real Estate

CIOs often grapple with obtaining timely net asset values (NAVs) of their private fund shares for reporting, risk management and rebalancing purposes. Many CIOs, as limited partners (LPs), rely on NAVs reported by their general partners (GPs). Yet, timely GP-supplied NAVs can be elusive, prompting LPs to lean on their own estimates using the prior quarter's GP-supplied NAVs and recent financial data.

Market volatility brings this issue to the fore. When public markets see a 20% dip, should LPs mark their NAVs down accordingly? Such times prompt discussions on the accuracy and relevance of LP-estimated NAVs especially as different LPs may follow different valuation methods.

For a valuation method, some CIOs wait for the next GP report (which we label the "M1" approach) or adjust the prior GP-supplied NAVs for interim cash flows (M2). CIOs may also employ a "roll forward" approach by adjusting prior GP-supplied NAVs for public market movements (M3). So, which approach has performed the best?

We give CIOs empirical data for each NAV estimation method by examining how well each approach matched historically the subsequently reported GP-supplied NAV. Our performance metric is the Mean Absolute Percentage Error (MAPE), the average absolute percentage difference between the LP-estimated and the GP-supplied NAV.

Surprisingly, for **private equity** we find that, on average, rolling forward with the public markets (M3) and not rolling forward (M2) have exhibited similar accuracy on a quarterly basis. However, in down markets rolling forward has produced relatively larger quarterly estimation errors *vs.* not rolling. In contrast, in up-markets rolling has yielded better estimates. We also examined how well each approach performed for small and large funds and by vintage age.

PE Average Absolute Quarterly Percentage Errors (MAPE), in %
(Vintages: 2000-2018, Market Proxy: S&P 500, Q1 2004 – Q3 2022)

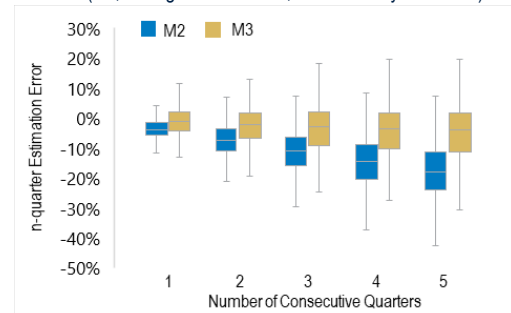
Method	All Quarterly Periods	Volatile Periods with at least ±10% Public Return	UP Periods with +10% or better Public Return	DOWN Periods with -10% or worse Public Return
M1	6.09%	6.90%	4.71%	10.55%
M2	4.81%	6.29%	6.16%	6.49%
M3 "Roll-forward"	4.45%	7.85%	5.96%	11.00%

A MAPE of 6.09% means that, on average, the LP-estimated NAV deviates from the to-be-reported GP-supplied NAV by 6.09% of the GP-supplied NAV. In a portfolio context, given, say, a 20% portfolio allocation to private equity, a 6.09% MAPE corresponds to an average absolute error of 1.2% of the total portfolio value.

Rolling vs. not rolling involves tradeoffs. While not rolling (M2) helps mitigate the overall volatility of a portfolio's value, rolling (M3) dampens the "denominator effect" whereby public market declines (increases) lead to increased (decreased) PE portfolio allocations. For some investors, this may lead to unnecessary portfolio rebalancing trades at inopportune times.

For CIOs who wish to follow a consistent LP estimation approach over time, we measured cumulative estimation errors over multiple quarters. On a multi-quarter basis, allowing positive errors in some quarters to offset negative errors in others, rolling forward has had consistently smaller cumulative errors and might be considered the better approach – at least from an estimation perspective.

Mean Absolute Cumulative Percentage Error over n-Consecutive Quarters (M2 & M3), in %
(PE, Vintages: 2000-2018, Market Proxy: S&P 500)



In contrast to private equity funds, rolling forward for **private real estate** funds performed significantly worse on a quarterly basis – in both up and down markets – compared to not rolling. We suspect this is mainly driven by the intrinsic differences in the valuation process between the two asset classes. While private real estate valuations may hinge more on transactions – largely absent during stressed markets – private equity can always lean on the readily-observable public equity market.

RE Average Absolute Quarterly Percentage Errors (MAPE), in %
(Vintages: 2000-2018, Market Proxy: NAREIT, Q1 2004 – Q3 2022)

Method	All Quarterly Periods	Volatile Periods with at least ±10% Public Return	UP Periods with +10% or better Public Return	DOWN Periods with -10% or worse Public Return
M1	6.45%	7.20%	5.39%	9.90%
M2	3.77%	4.94%	4.54%	5.55%
M3 "Roll-forward"	8.03%	15.87%	13.90%	18.84%

Recently, public markets have been volatile while private markets much less so. We evaluate the recent relative performance of the three valuation methods using data from Q1 2018 to Q2 2023. The recent period's results mirror the patterns observed for our extended study.

PE Average Absolute Quarterly Percentage Errors (MAPE), in %, Recent Years
(Vintages: 2006-2018, Market Proxy: S&P 500, Q1 2018 – Q2 2023)

Method	All Quarterly Periods	Volatile Periods with at least ±10% Public Return	UP Periods with +10% or better Public Return	DOWN Periods with -10% or worse Public Return
M1	6.30%	9.21%	6.02%	13.46%
M2	5.34%	7.14%	7.40%	6.80%
M3 "Roll-forward"	5.19%	8.20%	5.82%	11.37%

RE Average Absolute Quarterly Percentage Errors (MAPE), in %, Recent Years
(Vintages: 2006-2018, Market Proxy: NAREIT, Q1 2018 – Q2 2023)

Method	All Quarterly Periods	Volatile Periods with at least ±10% Public Return	UP Periods with +10% or better Public Return	DOWN Periods with -10% or worse Public Return
M1	6.08%	6.85%	4.75%	9.60%
M2	3.02%	3.13%	3.20%	3.04%
M3 "Roll-forward"	8.39%	14.44%	11.88%	17.77%

Source: Burgess, Datastream, PGIM IAS. As of 30 September 2022. For illustrative purposes only.

For a CIO, the right approach may rest on the asset type, market environment, fund characteristics and investment goals. While many factors are at play, our results may help support the CIO's decision.

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