UNIT 2 · WHAT'S WRONG AND WHAT TO MEASURE

IRR: Definition, Biases, and Limitations

Session 6 · The dominant private market return metric and its problems

Samir Asaf, PhD, CFA, CMA, CTP, CM&AA

Senior Partner, Regent Financial LLC, New York

Former Finance Instructor, Stanford University

Primary Text: Liquidity Illusion (Forthcoming, 2026)

Graduate Finance Course · Spring 2027 · Session 6 of 32

What we'll cover today

1. **IRR: formal definition**
   What the math actually says
2. **Why IRR is dominant in PE**
   Industry conventions
3. **Bias 1: Cash flow timing**
   Reinvestment assumption
4. **Bias 2: Reporting choices**
   Cumulative vs. since-inception
5. **Bias 3: Multi-fund aggregation**
   Pooled vs. arithmetic IRR

Recap: Session 5 in five points

Term structure of premium and where we are after Unit 1:

π(L,T) calibrated	$\alpha + \beta \cdot L + \gamma \cdot L^2$ with three coefficients per horizon
Two dimensions matter	State (L) and horizon (T) — DCF captures neither
0.94 R^2 fit	Secondary market data fits well across regimes and vintages
Unit 1 done	We've diagnosed DCF; built OU process; explained term structure
Unit 2 starts	Measurement & metrics — IRR, PME, and their corrected versions

Pivot from theory/diagnosis (Unit 1) to measurement/practice (Unit 2).

IRR: the formal definition

Internal Rate of Return — the discount rate that sets NPV to zero:

$$\sum_{t=0}^{T} \frac{CF_t}{(1+IRR)^t} = 0$$

Where:

CF_0	Initial capital call (negative)
CF_t, t in (0,T)	Periodic cash flows (calls negative, distributions positive)
CF_T	Final cash flow (distributions + terminal NAV)
IRR	The discount rate that solves the equation
T	Time horizon (typically 10+ years for closed-end PE)

IRR worked example: a typical PE fund

Hypothetical 10-yr PE fund: $100M commitment, calls drawn 2017-2020, distributions 2021-2027.

Year	Calls	Distributions	Net Cash Flow	Cumulative
2017	-$25M	$0	-$25M	-$25M
2018	-$30M	$0	-$30M	-$55M
2019	-$25M	$5M	-$20M	-$75M
2020	-$20M	$10M	-$10M	-$85M
2021	$0	$15M	+$15M	-$70M
2022	$0	$30M	+$30M	-$40M
2023	$0	$45M	+$45M	+$5M
2024	$0	$60M	+$60M	+$65M
2025	$0	$50M	+$50M	+$115M
2026	$0	$25M	+$25M	+$140M
2027	$0	$10M	+$10M	+$150M

Why IRR dominates private market reporting

REASON 1

Captures both cash and timing

Unlike simple multiples (TVPI), IRR incorporates time-value of money. A 2.5× over 5 years is different from 2.5× over 10 years.

→ Math: IRR ≠ f(TVPI) alone

REASON 2

Familiar from corporate finance

Standard CFA / MBA training. Investment committees understand 'IRR' even when they don't understand PE-specific issues.

→ Network effect: everyone uses it

REASON 3

Industry GIPS standard

Global Investment Performance Standards mandate IRR reporting. Regulatory and institutional infrastructure built around it.

→ Sunk-cost lock-in

None of these are mathematically defensible reasons. They are sociological reasons.

The full PE metric vocabulary

IRR is one of many. Each captures something different:

Metric	Full name	What it measures	Strengths	Weaknesses
IRR	Internal Rate of Return	Annualized return	Time-aware	Reinvest assumption
MIRR	Modified IRR	Adjusted for reinvest rate	Honest reinvest	Picks rate exogenously
TVPI	Total Value / Paid In	Total multiple	Simple, robust	Ignores timing
DPI	Distributions / Paid In	Cash returned multiple	Realized only	Misses NAV
RVPI	Residual Value / Paid In	Unrealized multiple	Forward-looking	Depends on NAV mark
PME	Public Market Equivalent	Vs. S&P 500 alternative	Opportunity cost	Index-dependent

Bias 1: The reinvestment assumption

IRR implicitly assumes distributions are reinvested at the IRR rate itself.

If your fund's IRR = 18%, IRR-math says: 'Treat all distributions as if you could redeploy them at 18% until fund maturity.'

But realistically:

LP in PE-of-PE funds	Redeploys early distributions to other PE funds at similar IRRs — assumption ~holds
LP in pension context	Redeploys to public markets at ~7-8% — assumption far overstated
LP in continuation vehicle	May NOT redeploy at all (returned to general portfolio) — assumption invalid
LP in late-vintage position	Cannot redeploy at 18% — distributions go to lower-return alternatives

Modified IRR (MIRR) corrects this by specifying explicit reinvestment rate. Rarely used in industry.

Bias 1: how much does the reinvestment assumption matter?

Same fund cash flows, three reinvestment rate assumptions:

18.4%	12.1%	14.8%	6.3 pp
Stated IRR	**MIRR @ 8%**	**MIRR @ 12%**	**Maximum gap**
Implicit reinvest at IRR	*Realistic LP context*	*Patient LP with PE deploy*	*18.4% → 12.1%*

A 6 percentage point gap on a 'reported' return is material.

Bias 2 & 3: Reporting choices and aggregation

BIAS 2

Cumulative vs. since-inception

Cumulative IRR (since inception)

Best of both worlds for early-vintage funds on a strong run

Net (after fees) vs. gross

Some GP marketing reports gross. Investor cost-of-capital is net.

Rolling window vs. since-inception

Rolling 5-yr IRR can look very different from since-inception

BIAS 3

Multi-fund aggregation

Pooled IRR

Combine cash flows across all funds, compute one IRR. Weighted by dollar volume.

Average IRR (arithmetic)

Compute IRR per fund, take simple mean. Weights all funds equally.

Typical gap

Pooled IRR may exceed average IRR by 2–5 pp (size and reinvest effects)

Bias 3 worked example: three-fund aggregation

Same three funds, two aggregation methods, very different results:

Fund	Size	IRR	Contribution to pooled	Contribution to avg
Fund A	$500M	25%	Large weight in pooled	1/3 in average
Fund B	$100M	5%	Small weight in pooled	1/3 in average
Fund C	$50M	-5%	Very small weight	1/3 in average
–	–	–	–	–
Pooled IRR	$650M total	—	≈ 21.5%	—
Average IRR	—	—	—	8.3%
Gap	—	—	+13.2 pp	

Always ask which aggregation method when comparing GP track records.

Real-world examples of IRR manipulation

Documented practitioner cases where IRR was used to obscure rather than inform:

Early-distribution gaming	GP distributes a quick win early, IRR boosted by reinvestment math, fund still underperforms long-term
J-curve hiding	Funds report TVPI without IRR during J-curve years to mask negative cash returns
Vintage-year cherry-picking	Marketing materials choose vintages with most favorable IRR; selective disclosure
NAV smoothing	Quarterly NAV marks dampened to reduce IRR volatility for institutional clients
Continuation fund recycling	Old fund's IRR locked in artificially via continuation vehicle at GP-set price

The next session (S7) introduces metrics that resist these games.

Why IRR persists despite known biases

> *Every LP analyst I've met knows IRR is broken. But the moment we propose using anything else, we're told it'd be 'confusing for the IC' — even though the IC is the one being misled.*
>
> **— Senior LP at $20B endowment, off the record**

The institutional inertia is real. Session 7 builds the alternatives anyway.

Bridge to Session 7: alternatives to IRR

We've critiqued IRR. What replaces (or complements) it?

S6 established

IRR has 4+ systematic biases · all real and quantified

S7 covers

PME (Kaplan-Schoar) · LA-IRR (Asaf) · LA-PME (Asaf)

None replaces IRR

Each fixes a different defect

Use together

PME + LA-PME + IRR triangulate true performance

Reading

Book Ch. 7 · alternative metrics

Action item

Have one fund's CF schedule ready for S7 worked example

Session 6 summary

What we accomplished today

1. IRR is the dominant return metric in private markets — definition is NPV = 0 discount rate
2. Three structural reasons IRR dominates: math, familiarity, GIPS standard
3. Three structural biases: reinvestment assumption, reporting asymmetry, aggregation method
4. These collectively can move reported IRR by 200-500 bps — material at the asset class level

Next session

Session 7: PME, LA-IRR, LA-PME — the metrics that compete with IRR