

A Framework for Benchmarking Private Equity (and venture capital)

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Overview

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- Why is benchmarking PE different
- Why do we use IRR
- How to benchmark
- Sources of Benchmarks
- Comparing IRRs and public market returns

Why do we use IRR

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- Timing matters
- Decision maker matters

Timing Matters

QUIZ TIME

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Date	Return			
12/31/17				
12/31/18	10%			
12/31/19	20%			
12/31/20	-30%			
12/31/21	50%			

WHAT IS THE AVG ANNUAL RETURN from 12/31/14 to 12/31/18?

The math we learned in Kindergarten

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$$FV = PV(1 + r)^N$$

$$r = \left(\frac{FV}{PV} \right)^{(1/n)} - 1$$

FV=Future value, PV=Present Value, r rate of return, n=number of periods

So we build an index and find
Annualized return is timing-agnostic

Date	Index	Return		
12/31/17	1000			
12/31/18	1100	+10%		
12/31/19	1320	+20%		
12/31/20	924	-30%		
12/31/21	1386	+50%		

WHAT IS THE ANNUAL RETURN From 12/31/17 to 12/31/21?

8.5%

So we build an index and find Annualized return is timing-agnostic

Date	Index	Return		
12/31/17	1000			
12/31/18	700	-30%		
12/31/19	1050	+50%		
12/31/20	1260	+20%		
12/31/21	1386	+10%		

WHAT IS THE ANNUAL RETURN From 12/31/17 to 12/31/21?

8.5%

In time-weighted returns, timing doesn't matter

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Date	Return			
12/31/17				
12/31/18	-30%			
12/31/19	50%			
12/31/20	20%			
12/31/21	10%			

WHAT IS THE AVG ANNUAL RETURN from 12/31/17 to 12/31/21?

8.5%

Typical Question

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- ▶ “Our/Some Fund Has a Return of 300 Percent”
- ▶ Is that good?
- ▶ Depends?

Depends on What?

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- ▶ Over What Time period
 - ▶ Over Two Years -- great at 173% per year
 - ▶ Over Ten? --- hmmm!! At 11.61%
- ▶ Is it return on the investments the fund made or is it the return to the investors in the fund.
- ▶ Time Weighted/IRR/Realization/Horizon?

Let's take a cashflow example

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- ▶ Invest \$1.5 million
- ▶ Worth \$5 million
- ▶ What is the return?

What is the Return?

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- ▶ Invest \$1.5 million
- ▶ Worth \$5 million
- ▶ What is the return?
- ▶ $5/1.5=333\%$ Total Return
or percentage change of 233%
- ▶ Note – we haven't defined a time period

Let's add time to this

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- ▶ Invest \$1.5 million
- ▶ Worth \$5 million **five years later**
- ▶ What is the return?

Same cashflow, but now have some info to annualize

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- ▶ Invest \$1.5 million
- ▶ Worth \$5 million five years later
- ▶ What is the return?
- ▶ $5/1.5 = 333\%$ Total Return
- ▶ Lets annualize with formula
 $(\text{total return})^{(1/5)} - 1 = 27.2\%$
- ▶ This is the annual rate of return (compound annual growth rate, Geometric average return, Time weighted return, etc)

Now let's take same cashflow but spread out the investments

- ▶ Invest .5 in three years
 - ▶ .5 at the beginning of year 1 (i.e. end of year 0)
 - ▶ .5 at the beginning of year 2 (i.e. end of year 1)
 - ▶ .5 at the beginning of year 3 (i.e. end of year 2)
- ▶ Worth \$5 million at the end of year five

What's The difference?

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- ▶ First two examples are just examining two points in time. i.e. .today and some point in the past.
- ▶ No transactions or cashflows occurred in the in between.
- ▶ The third example, complicated the calculations because we didn't invest the \$1.5 all at once.
- ▶ Notice that stock indices use the first approach-you only calculate returns at two points in time – assumes that you buy and hold.
- ▶ The third has shortened the average investment holding period so the time value of money says that the return is higher other things being equal.

What's The difference?

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- ▶ Gets even more complicated if we measure returns for an investment where we also take money out over a period of time as well as put money in over a period of time.

Why The difference?

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- ▶ Same with your savings account – if you put money in at one point and take it out at another point, you can calculate the return for that period of time which will be the APR,
- ▶ but if you put money in, take money out over a period time,
- ▶ the actual return over the life of your investment getting is not the APR but something different that depends on the average time you held the money.
- ▶ The APR assumes you put money in a lump and hold it
- ▶ But the real world isn't that simple

What's The difference?

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- ▶ You have the same complications if you measure the return to an investment manager/mutual fund in public stocks --money goes in at different points in time, and is taken out at different points in time by the investor. – more on this later.
- ▶ Don't have this complication with a simple stock index – you are just measuring values at two points in time – no transactions in the middle, so you can use time weighted/total return calculations

Ok, let's calculate an IRR

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- ▶ Invest .5 in three years
 - ▶ .5 at the beginning of year 1 (i.e. end of year 0)
 - ▶ .5 at the beginning of year 2 (i.e. end of year 1)
 - ▶ .5 at the beginning of year 3 (i.e. end of year 2)
- ▶ Worth \$5 million and the end of year 5
- ▶ What is the return?
 - ▶ $5/1.5 = 333\%$ Total Return
 - ▶ IRR = 34.2% annual IRR
 - ▶ Compare to return on example 2 of 27.2% annualized

So what do we do?

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- ▶ So with investments either in private equity or any investment manager, if you have cashflows in and out of an investment simple percentage change/total return calculations can no longer be done to get the true Return on investment. So we turn to IRR, a form of ROI that takes the time value of money into account as it accounts for the timing of the transactions in the investment.

We have established that with multiple cashflows IRR is best

- ▶ Three Inputs to calculate this
 - ▶ Paid-in capital (negative cashflow)
 - ▶ Distributions adjusted by carried interest (positive cashflow)
 - ▶ Reporting period Net asset value adjusted by management fee (positive cashflow)

LP Cashflow Example

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Date	Paid In Capital	distribution	Annual Mgt Fee	Carried Interest	NAV	Cashflow
6/3/2013	10,000,000				10,000,000	(10,000,000)
12/31/2013		-	375,000		9,625,000	-
5/1/2014	10,000,000	-			19,625,000	(10,000,000)
12/31/2014		-	375,000		20,250,000	-
12/31/2015		-	375,000		20,175,000	-
9/10/2016	5,000,000	15,000,000		100,000	10,175,000	9,900,000
12/31/2016		-	375,000		11,000,000	-
11/22/2017		250,000		1,667	10,750,000	248,333
12/31/2017		-	375,000		11,825,000	-
12/31/2018		-	375,000		13,250,000	-
3/31/2019		12,500,000		83,333	15,750,000	12,416,667
12/31/2019		-	375,000		25,875,000	-
6/10/2020		1,600,000		10,667	35,275,000	1,589,333
12/31/2020		-	375,000		35,900,000	-
12/14/2021		-			38,400,000	-
12/31/2021		-	375,000		38,025,000	38,025,000
Total	25,000,000	29,350,000	3,375,000	195,667		
					IRR	19.7%
					DPI	1.17
					RVPI	1.52
					TVPI	2.69

Other reason we use IRR:
Decision maker matters

Choosing performance measures

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- ▶ Question: How do we choose a performance measure
- ▶ Answer: Depends on the Decision you are trying to evaluate?

Decisions, Decisions

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A performance measure should reward/penalize the decisions made under the control of the decision maker.

Naïve Manager Example

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- ▶ I have a choice to invest in either investment A or investment B in any amount
- ▶ A naïve manager would invest 50% in A and 50% in B
- ▶ Any decision that I make should be compared to the above decision and should be superior if I'm to be rewarded for my decision making.

Who has control?

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- ▶ LP has control over which managers to pick
- ▶ LP has control over the amount / when to commit
- ▶ GP has control over timing capital calls, exits, distributions
- ▶ IRR rewards/penalizes timing
- ▶ TWR is timing agnostic
- ▶ So GP should be rewarded/penalized for their timing decisions – **thus the IRR**

Ok, how do we
benchmark then?

What's a benchmark?

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- ▶ There are several reference in the literature on formal definitions, criteria thereof and what makes an “adequate benchmark”
- ▶ Beyond the scope of this presentation
- ▶ But basically you are comparing a measure to some standard.

I used to charge my analysts a quarter if they ever confused returns with performance

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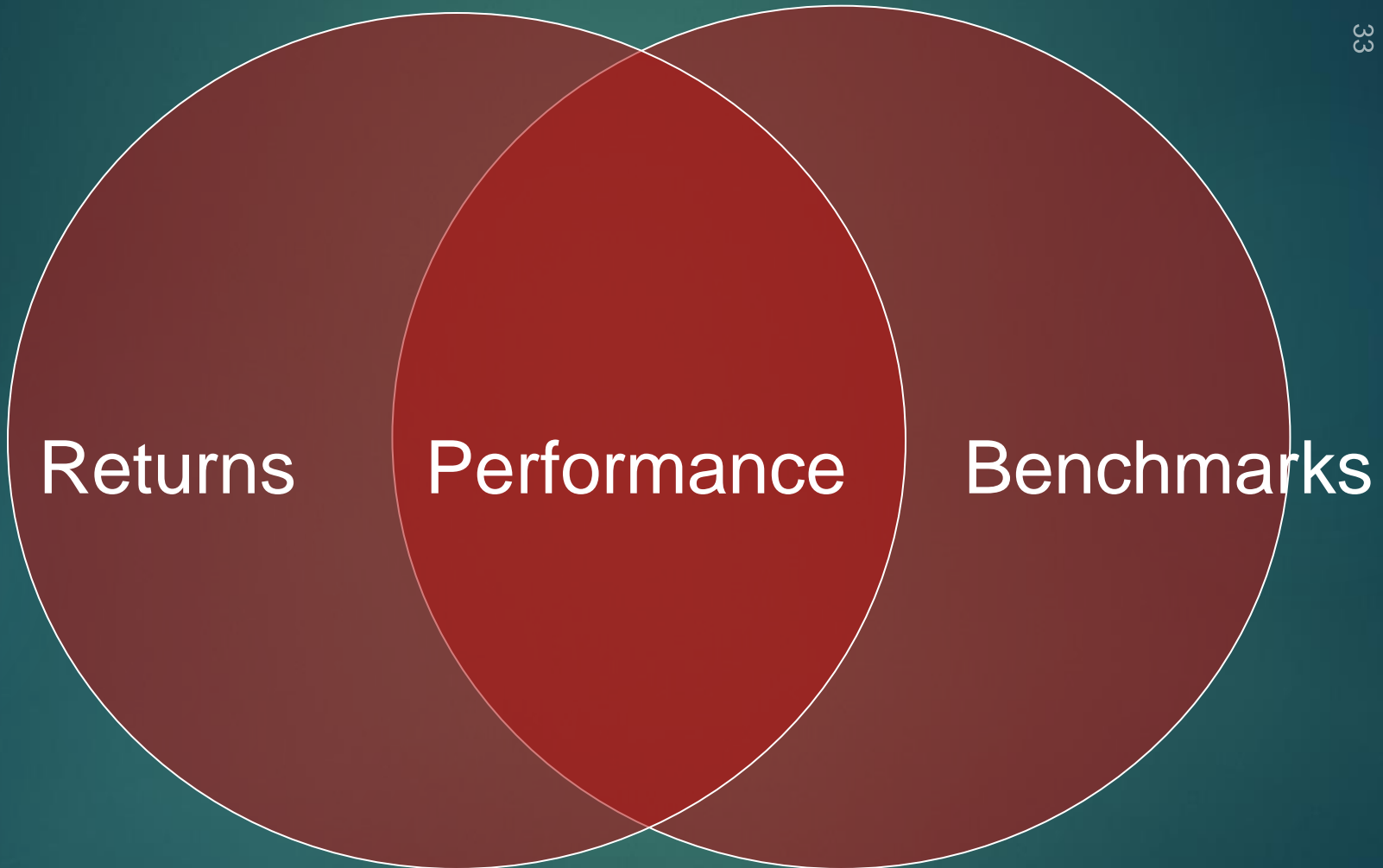


Returns



Performance

You only get performance when you compare returns to a benchmark.



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Everything I learned about benchmarking I learned in Boy Scouts

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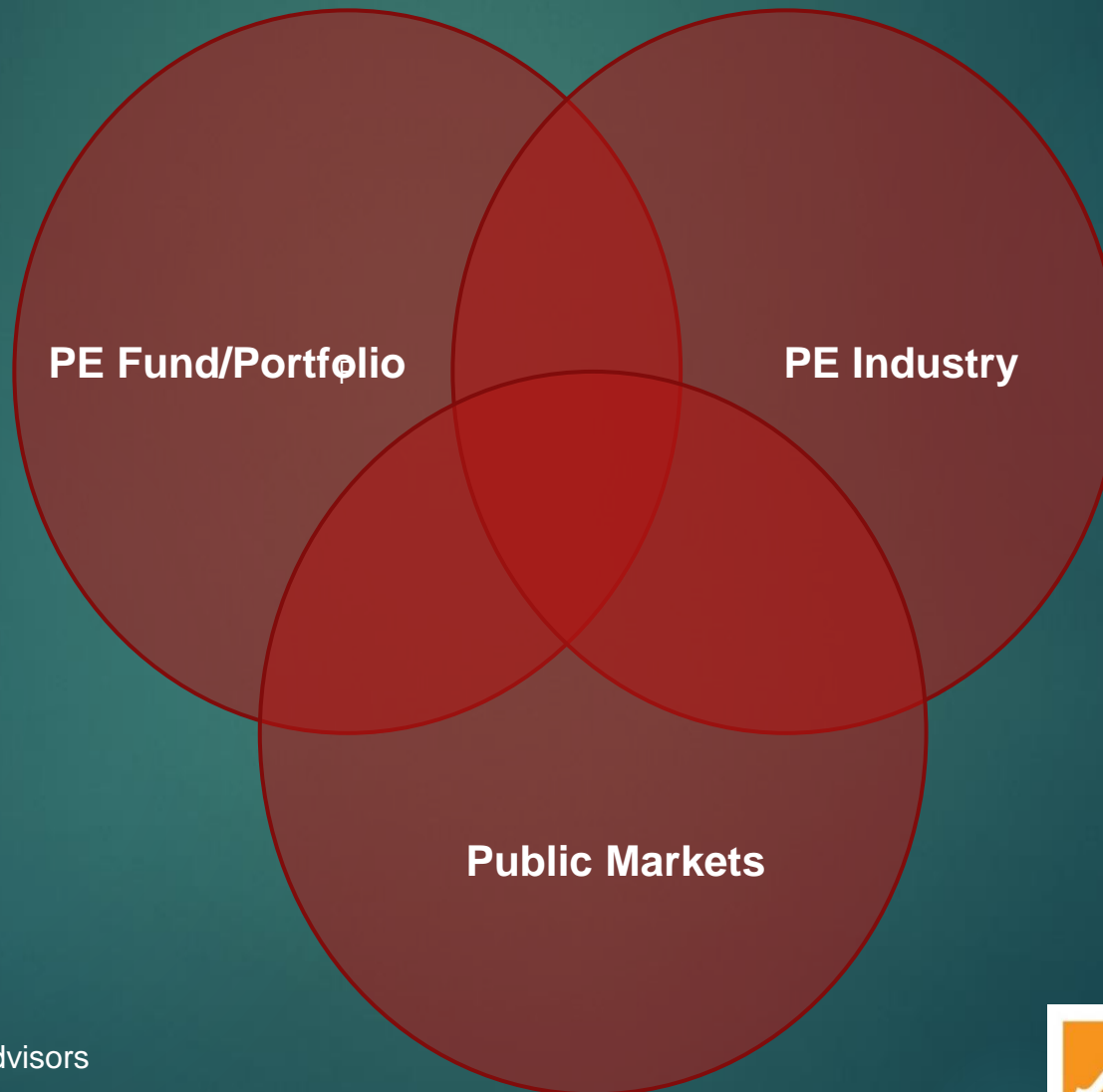
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So what is a benchmark?

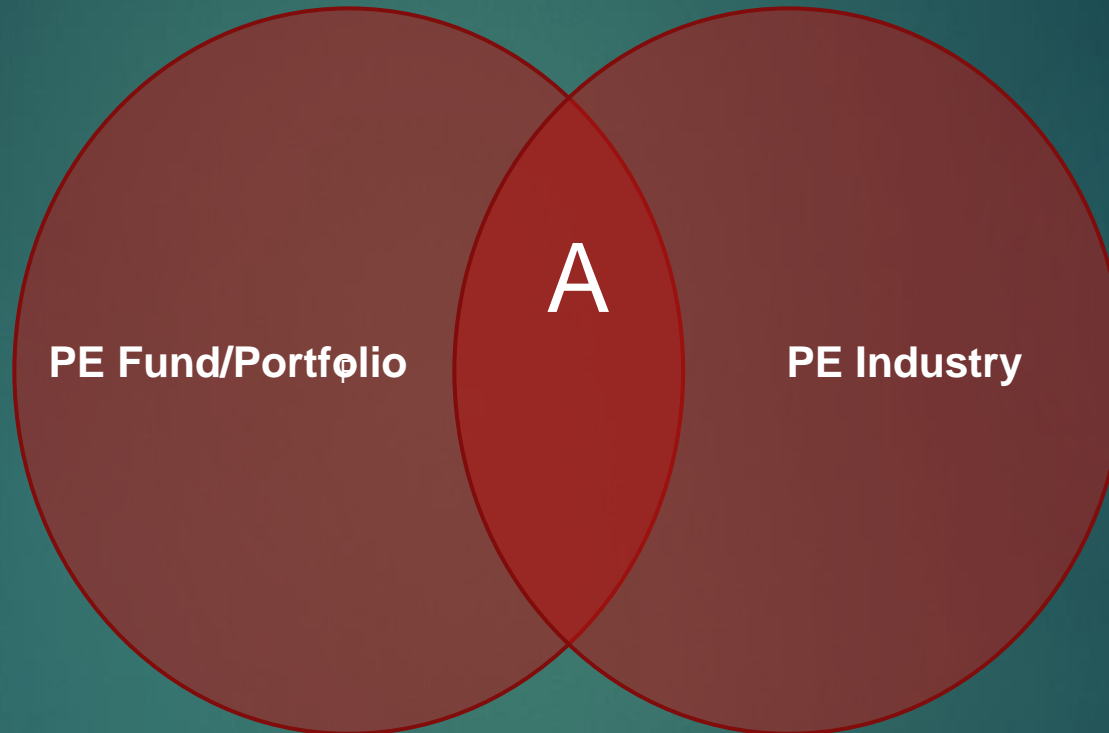


A benchmark is a point whose position is known to a high degree of accuracy and is normally marked in some way

Sources of PE Benchmarks

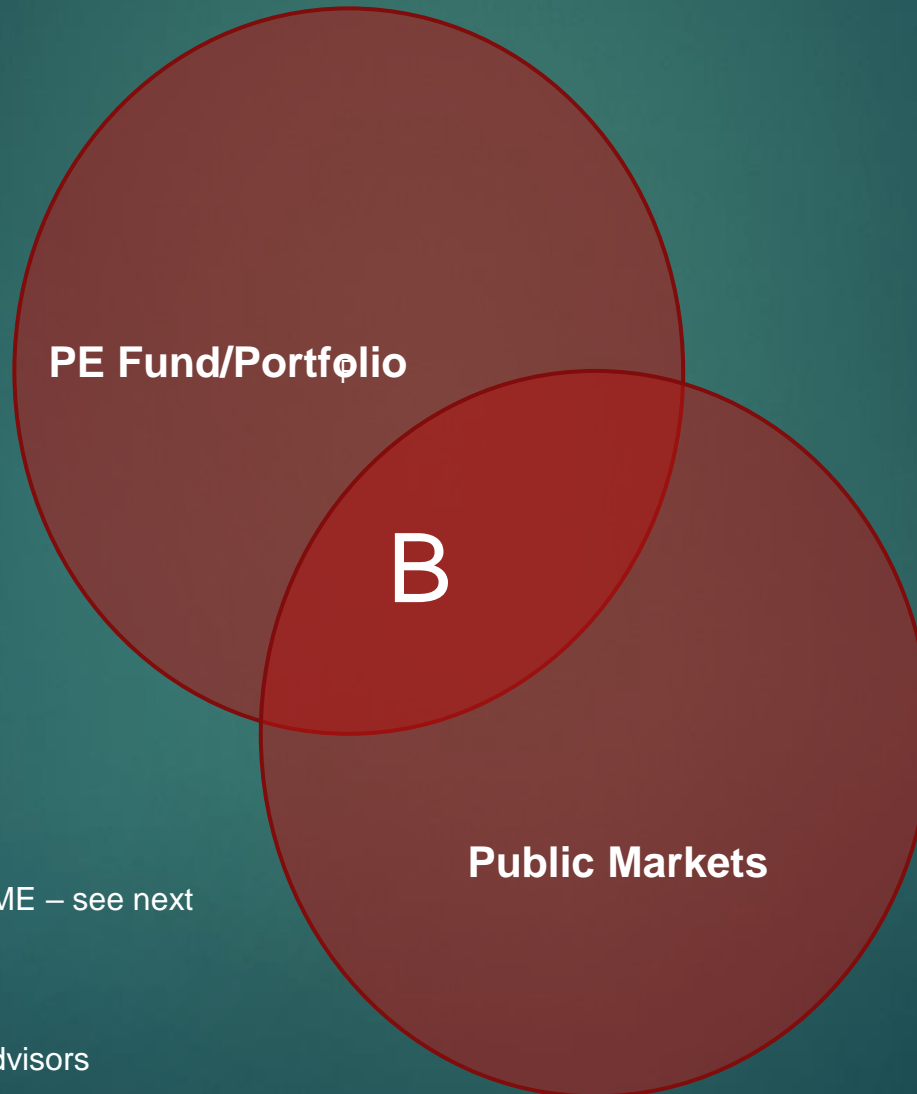


How well you did vs the industry



Sources of benchmarks: PE Industry benchmarks from cambridge Associates, Burgiss, pitchbook, et all

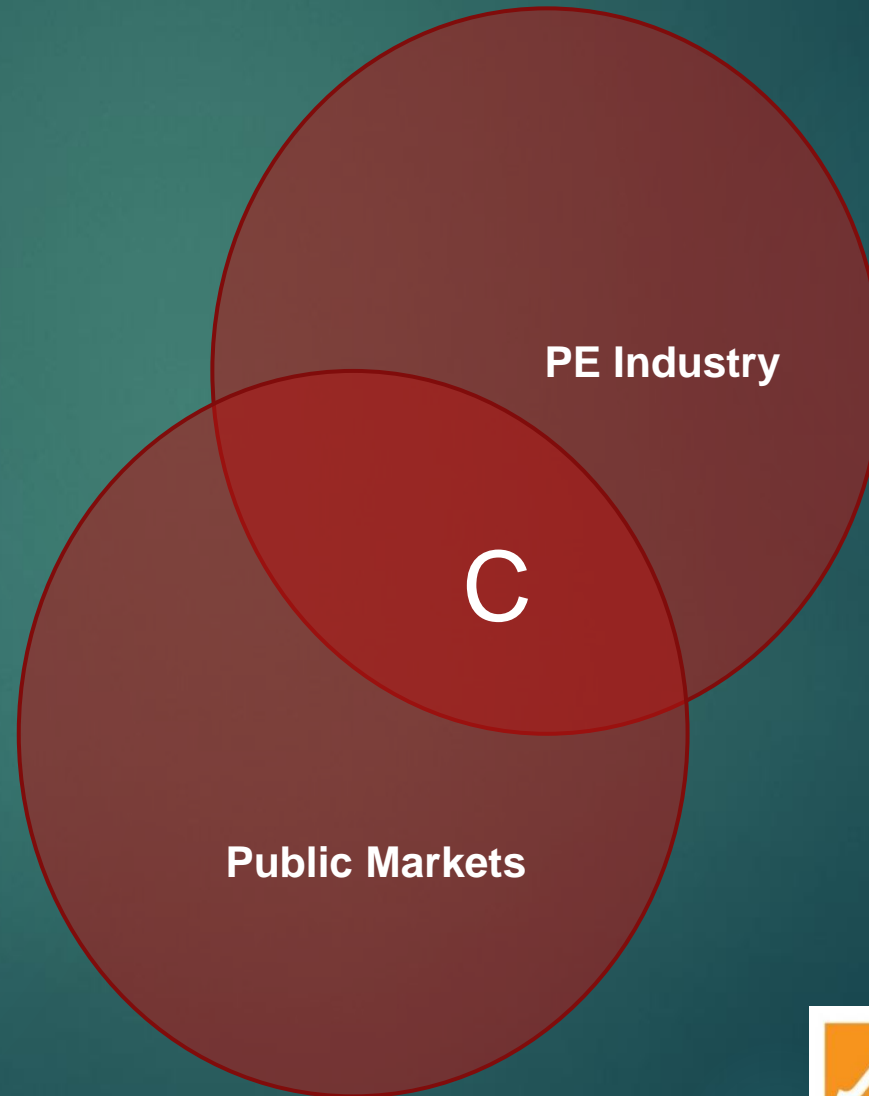
How well you did vs the public markets



Sources of benchmarks: PME – see next section

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Source; Alignment Capital

How well the industry did vs the public markets

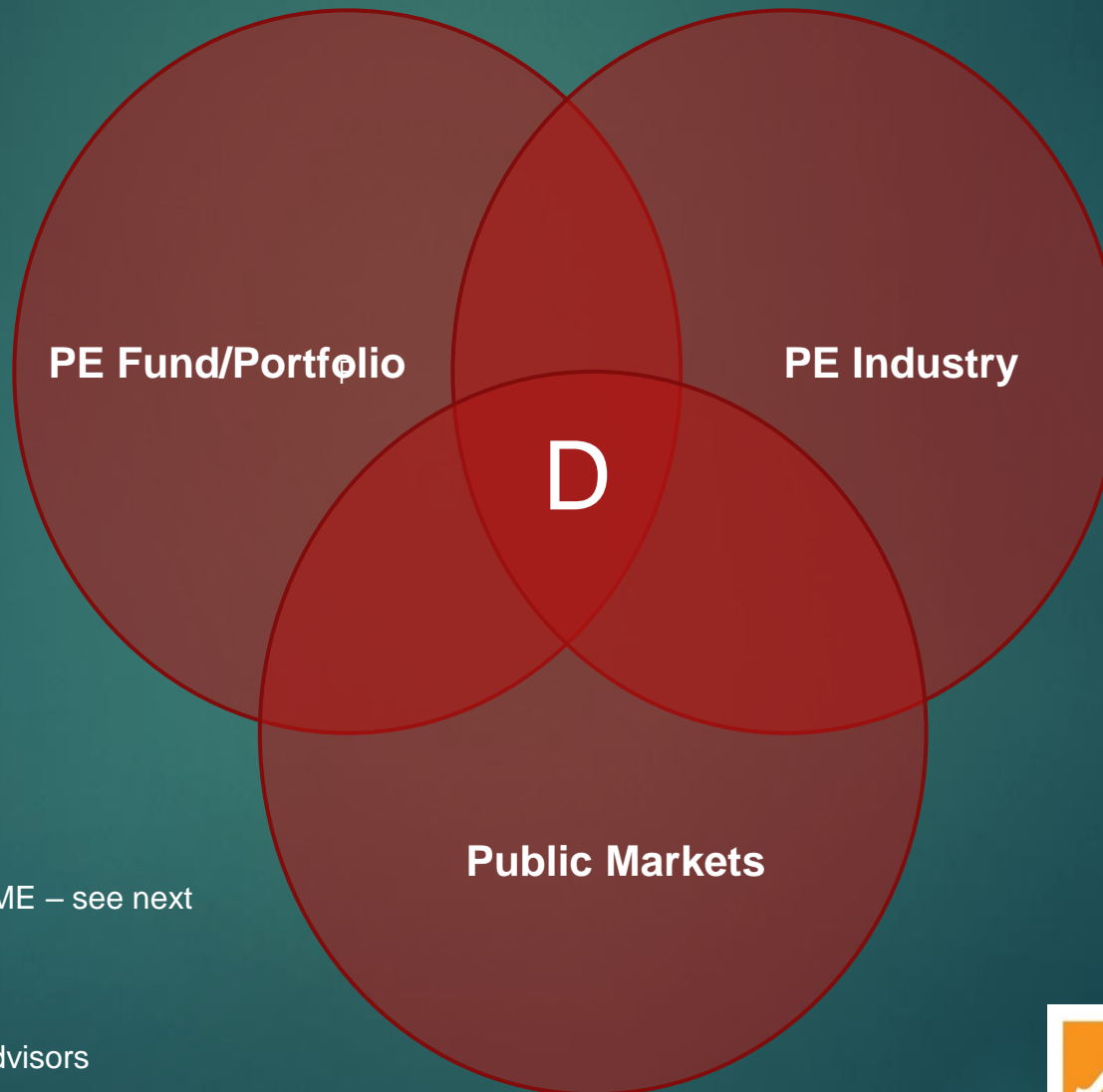


Sources of benchmarks: PME – see next section

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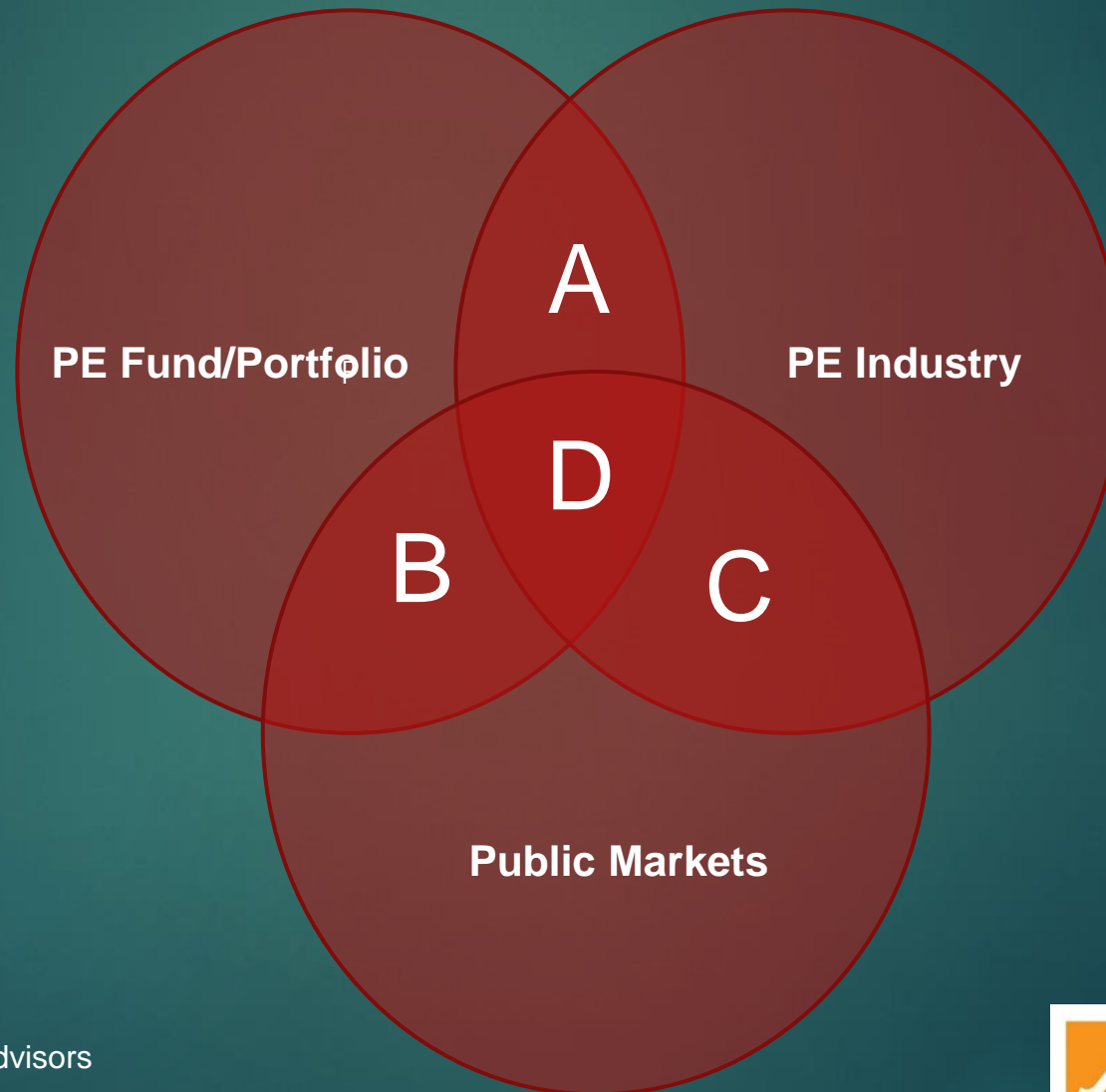
How well you did versus the public markets compared to how well the industry did versus the public markets



Sources of benchmarks: PME – see next section

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Sources of PE Benchmarks



Comparing public / private equity

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- ▶ IRRs and TWR are incommensurable
 - ▶ Reinvestment rate assumption?
 - ▶ IRR – timing matters, TWR – timing doesn't
- ▶ Public Equity/Private equity have different valuation schema
 - ▶ Public equity has a contemporaneous price
 - ▶ Private equity is an appraisal asset with significantly lagged values
- ▶ So how does and investor compare public/private equity
- ▶ Enter the Public Market Equivalent

Public Market Equivalents (PME)

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- ▶ Rather than calculate TWR for public equity, create a synthetic IRR for public equities
- ▶ First formulation independently developed by:
 - ▶ Coller / Reyes (investor/researcher) in 1993 (Public Market Equivalent or PME)
 - ▶ Long / Nickels (Alignment capital) in 1996 (called ICM “index comparison method”)
 - ▶ Bannock/BVCA (industry association) in 1994 (called comparators)
- ▶ Idea is to invest the cashflows from private equity into an index and then create a synthetic cashflow from that investment and calculate an IRR which can be compared to the original IRR
- ▶ When it works, it works great, but does create some mathematical dominance stability issues under certain circumstances

Public Market Equivalent History

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- ▶ Original PME developed independently by Reyes/Collier Long/Nickels, Bannock/BVCA/EVCA (1992-1996)
- ▶ Long and Nickels created an Adjusted ICM to deal with negative NAV (1998)
- ▶ Roubinez and Kubr (investment managers) patented a PME method called PME+ which tries to remediate the stability issue (2003)
- ▶ Kaplan and Schoar (academic researchers) created another method which isn't a return but is a multiple (2005)
- ▶ Recently, Cambridge Associates created mPME to further address stability issues (2013)
- ▶ New "Direct Alpha" method developed by researchers at Landmark Partners tries to address some of the issues of the original PME while providing a direct comparison that doesn't need an intermediate step (2014)
- ▶ Global Endowment Foundation independently created same formula as Direct Alpha (2014)
- ▶ Bison has created a version of PME as well. (2015)

PME+

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PME+ Calculation Example

Cashflow Period	Outflows	Inflows	FMV	Nominal Cashflow	Stock Index	Index Units Bought	Index Units Sold	Final shares	lambda adjusted Index Units Sold	PME Cashflow new
12/31/2006	\$200	-		(200)	124.8	1.603	-		-	(200.000)
12/31/2007	\$0	-		-	131.0	-	-		-	-
12/31/2008	\$300	-		(300)	121.8	2.463	-		-	(300.000)
12/31/2009	\$0	-		-	109.6	-	-		-	-
12/31/2010	\$75	-		(75)	104.2	0.720	-		-	(75.000)
12/31/2011	\$0	500		500	119.8	-	4.174		3.063	366.864
12/31/2012	\$0	-		-	140.1	-	-		-	-
12/31/2013	\$0	-		-	142.9	-	-		-	-
12/13/2014	\$0	-		-	150.1	-	-		-	-
12/31/2015	\$0	-	300	300	174.1	-	-	1.723	-	300.000
Totals						4.7860	4.1744		3.0629	91.8641
				IRR --> 7.02%			Lambda---->			2.89%
				Index TWR-->	3.77%					

Kaplan & Schoar PME

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Kaplan & Schoar PME Calculation

Cashflow Period	Outflows	Inflows	FMV	Nominal Cashflow	Stock Index	FV Outflows	FV Inflows & NAV
12/31/2006	200	-		(200)	124.8	279	-
12/31/2007	-	-		-	131.0	-	-
12/31/2008	300	-		(300)	121.8	429	-
12/31/2009	-	-		-	109.6	-	-
12/31/2010	75	-		(75)	104.2	125	-
12/31/2011	-	500		500	119.8	-	727
12/31/2012	-	-		-	140.1	-	-
12/31/2013	-	-		-	142.9	-	-
12/13/2014	-	-		-	150.1	-	-
12/31/2015	-	-	300	300	174.1▲	-	300
Total	575	500				833	1,027
		1.39				K&S PME-->	1.232

Direct Alpha

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Direct Alpha Method

Cashflow Period	Capital Calls	Distribution	Net Asset Value	Nominal Cashflow	Stock Index	FV Capital Calls	FV Distribution & NAV	PME Cashflow
12/31/2006	\$200	\$0		(200)	124.8	279	-	(279)
12/31/2007	\$0	\$0		-	131.0	-	-	-
12/31/2008	\$300	\$0		(300)	121.8	429	-	(429)
12/31/2009	\$0	\$0		-	109.6	-	-	-
12/31/2010	\$75	\$0		(75)	104.2	125	-	(125)
12/31/2011	\$0	\$500		500	119.8	-	727	727
12/31/2012	\$0	\$0		-	140.1	-	-	-
12/31/2013	\$0	\$0		-	142.9	-	-	-
12/13/2014	\$0	\$0		-	150.1	-	-	-
12/31/2015	\$0	\$0	\$300	300	174.1▲	-	300	300
Total	575	800				833	1,027	
			Fund IRR -->	7.02%			Direct Alpha-->	4.74%

Pros-cons of PME methods

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- ▶ **Original Long-Nickles**
 - ▶ **Pros**
 - ▶ Intuitive
 - ▶ Directly comparable to other returns
 - ▶ **Cons**
 - ▶ Can get mathematical dominated which creates problems like “incalculability” or lack of intuitive interpretation
- ▶ **PME+**
 - ▶ **Pros**
 - ▶ Doesn't have dominance problems of original L-N – always calculable
 - ▶ **Cons**
 - ▶ Complicated and method not intuitive
 - ▶ Scaling is criticized as an artifice

Pros-cons continued

▶ Kaplan & Schoar

▶ Pros

- ▶ Easier to calculate
- ▶ No mathematical dominance problem so always calculable
- ▶ Academics tend to prefer this

▶ Cons

- ▶ Is a ratio instead of a return
- ▶ Nothing to really compare it too – it's a binary answer

▶ Direct Alpha

▶ Pros

- ▶ Looks like L-Nickels
- ▶ Rarely has mathematical dominance problems so almost always calculable

▶ Cons

- ▶ Not intuitive – it's expressed as a delta return above or below the public market so sometimes confusing to interpret

So which PME should I use

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- ▶ Academics prefer Kaplan & Schoar ratio
- ▶ Industry (and I) prefer Direct Alpha
- ▶ For more comprehensive analysis, will make PME benchmarking article written by myself and Austin Long available via Spaulding Group

Takeaways

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- ▶ Use IRR for private equity returns because
 - ▶ Timing matters
 - ▶ Decision maker matters
- ▶ Benchmarking
 - ▶ Industry benchmarks for direct comparisons
 - ▶ Public Market Comparables for public market comparisons

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