

BAI – WEBINAR

PRIVATE MARKET BENCHMARKS FOR PORTFOLIO / RISK MANAGEMENT AND REGULATED INSTITUTIONAL INVESTORS

Speaker:

Abhishek Gupta, Head of Business and Product, Scientific Infra & Private Assets (SIPA)

Jegor Tokarevich, CEO, SOF (Substance Over Form Ltd.)

Date: **February 5, 2026**

Time: **11:00 a.m. – 12.00 p.m. (CET)**

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Abhishek Gupta

Head of Business and Product, Scientific Infra & Private Assets (SIPA)

- more than 10 years of experience in asset management and alternative investments including stints at Goldman Sachs and Partners Group
- holds a Masters of Science in Financial Engineering from Nanyang Business School and a Bachelor of Technology from the Indian Institute of Technology.



Jegor Tokarevich

*CEO at SOF (Substance Over Form Ltd.)
Co-CEO at RiskConcile Group*

- responsible for reporting services including ESG for institutional clients such as insurers, banks, pension institutions, asset managers and (Third Party) AIFMs for alternative investments (infrastructure, real estate, private equity, private debt)
- member of different reporting and LP regulations working groups and initiator and lecturer for the professional education program „CAS Alternative Investments & ESG“ at the University of Oldenburg.

Opening Remarks & Moderation

Presentation - *Abhishek Gupta, SIPA*

- How should private infrastructure funds and managers be benchmarked to provide meaningful and comparable insights for investors

- Better decision-making in infrastructure investing: Best practices, emerging challenges, and tools

Presentation - *Jegor Tokarevich, SOF*

- Private market benchmarks in the regulatory context of CRR, Solvency 2, AnIV investors

Q & A

- **Alternative Investor Conference**, Kap Europa Frankfurt, 27.04. - 29.04.2026:
- **BAI – Webinar: PwC - SFDR 2.0: From Transparency to Categories - What's changing, what's unclear, and how to prepare**, 11 February 2026, 2:00 - 3:00 p.m. (CET)
- **BAI – Webinar: apoBank - Ausblick 2026 – Wachstum schlägt Geopolitik**, 25 February 2026, 11:00 - 12:00 a.m. (CET)
- **BAI – Webinar: Prime Capital AG, European Investment Fund, PhotoVolta GmbH - Growth-Capital-Strategien für SMEs in Infrastruktur – Diversifikation durch Kontinentaleuropa**, 12 March 2026, 11:00 - 12:15 a.m. (CET)





Private Market Benchmarks

For portfolio and risk management, and regulated institutional investors

Abhishek Gupta, Head of Product
BAI Webinar, February 5, 2026

Quantifying Private Markets
London | Singapore

ABOUT US

Scientific Infra & Private Assets Ltd was born from the research developed at the EDHEC Business School and has been an index and data provider since 2019, serving numerous prestigious clients representing hundreds of billions of dollars of private equity and infrastructure assets under management.

We offer a solution to the main data challenge investors face in private markets: an endemic lack of risk and performance data restricting best practices and obfuscating investment decisions.

Data and Index Provider

Since 2019

Private Asset Classes

Infra & PE

Global Team

40+ employees

Scientific DNA

An EDHEC Venture

Aligned with Global Standards

**BMR, IFRS, IOSCO,
TICCS, PECCS, TCFD**

OUR CLIENTS

Trusted by sophisticated investors around the world since 2019

USD33Tr

Client AUM

USD1Tr

Client Private Equity AUM

USD700bn

Client Infrastructure AUM



Goldman Sachs



BLACKROCK

Allianz 
Global Investors



ADIA



ARES

CBRE Investment Management

SIPA PRODUCTS OVERVIEW

3

Asset Classes

-  Infrastructure Equity
-  Infrastructure Debt
-  Private Equity

2

Data Solutions

-  Indices & Benchmarks
Time-weighted, market-level returns, updated monthly
-  Investment Comparables
Asset-level metrics, valuation multiples, risk factor exposures, derived from transactions.

4

Access Channels

-  Web Application
-  Excel Add-In
-  Python API
-  SFTP Delivery

AGENDA

1. Benchmarking in private markets
2. SIPA methodology
3. Practical use cases

BENCHMARKING MATTERS

A fair benchmark is a representative benchmark

Benchmark [Oxford Dictionary]: “A standard or point of reference against which things may be compared.”

→ To have a **fair** benchmark, **representativity** is paramount.

- Representativity of the asset class
- Representativity of the strategy adopted

BENCHMARKING MATTERS

Representative means **ROBUST** *and* **GRANULAR**

- Representativity of the **asset class** = **fair value and risk (ROBUSTNESS)**
 - Requires marked-to-market valuations to capture market prices and volatility
 - Reflects risk-adjusted performance in a manner that is comparable with other assets
- Representativity of the **strategy adopted** in terms of **TICCS tilts**, geography, etc (**GRANULARITY**)
 - Requires enough data to capture the risk factors found in a given style e.g., a *Core* strategy includes more *contracted* infrastructure.

BENCHMARKING MATTERS

Fairness is good for the whole team

- For the provider of the investment **mandate** (CIO or LPs) the fairness of the benchmark means measuring the **ability to deliver a strategy** (effective deployment of capital or betas) and **to add value** (alpha) by the investment team or manager.
- For the investment **team**, a fair benchmark means that performance and outperformance are **not just a matter of dumb luck...**
 - Benchmarks based on arbitrary (absolute return) or inadequate (listed) metrics are either too easy or too difficult to beat, or just random (see examples in next sections).
 - In a volatile rate and market environment, **absolute or listed benchmarks have become a liability...**

BENCHMARKING MATTERS

It matters even more in the regulatory context

Regulatory Context

For insurers & regulated investors.

- **VAG / Solvency II**
- **Fair value required**
- **Realistic risk measures**
- **Representative benchmarks**

Traditional benchmarks

Traditional benchmarks don't represent private markets.

- **CPI+ \neq market returns**
- **Listed \neq private risk**
- **Hidden equity beta**
- **Quartiles mislead**

Importance for Supervisors

Benchmarking errors lead to:

- **Misstated risk**
- **Distorted Sharpe ratios**
- **Excessive capital allocation**
- **Forced rebalancing effects**

MARKET BENCHMARKS

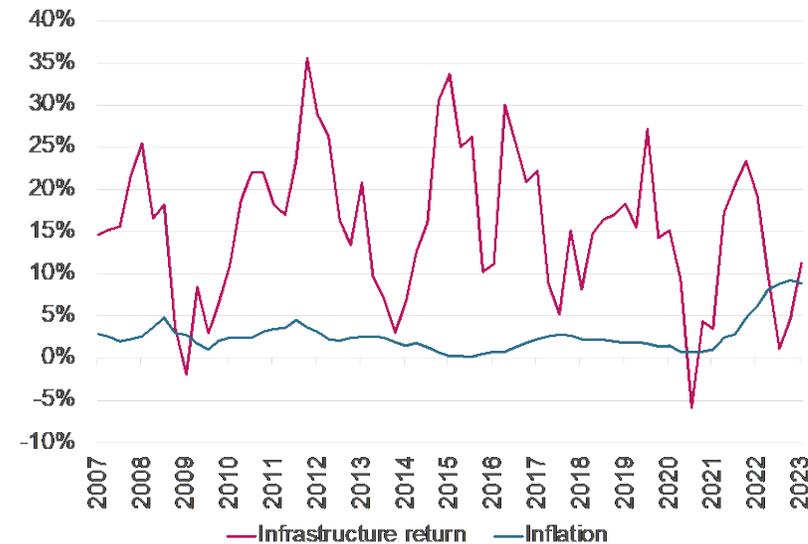
Absolute returns benchmarks are not representative (of anything)

Infrastructure expected returns vs. inflation (UK)



- **Ex ante**, a CPI+X benchmark is not representative expected returns in the market.
- The correlation w/ inflation is about 20%.

Infrastructure realised returns vs. inflation (UK)



- **Ex post**, the benchmark is either very easy or impossible to beat depending on the period
- The correlation w/ inflation is zero.

MARKET BENCHMARKS

Listed indices are not representative either

- Strong bias towards large electricity and gas utilities in North America.
- Highly concentrated in a few stocks that are often not 'just infrastructure.'
- Lack of clear definition.

Top 10 Weights – S&P Global Listed Infrastructure	
China Gas Holdings	7.2%
Nextera Energy	5.6%
Guangdong Investment	5.0%
Enbridge	4.9%
China Resources Gas Group	4.5%
Enel	3.4%
Dominion Energy	3.2%
Duke Energy	3.2%
Southern	3.1%
TC Energy	3.0%
Sum	43.1%

S&P Global Listed Infrastructure - Regional weights vs. the unlisted universe

	S&P Global Listed Infra	Over/under-weight	Unlisted Infrastructure Universe*
North America	65.1%	171%	24.0%
Europe	21.8%	-49%	43.0%
AustralAsia	3.6%	-76%	15.0%
Latin America	4.0%	-67%	12.0%
Asia	5.5%	-8%	6.0%

S&P Global Listed Infrastructure - Sector weights vs. the unlisted universe*

	S&P Global Listed Infra	Over/under-weight	Unlisted Infrastructure Universe*	
Power	46.7%	211%	15%	
Oil and Gas Equipment and Services	19.3%	N/A	0%	
Gas, Water Multi-utilities	19.7%	-38%	32%	
Transport	13.1%	-38%	21%	
Other	1.2%	-96%	Renewables	18%
			Social infrastructure	4%
			Data Infrastructure	7%
			Environmental Services	2%

MARKET BENCHMARKS

Quartiles create more confusion

Infrastructure Fund IRR quartiles from different contributed data sources

Vintage	2012			
	# of funds	Top quartile	Median	Bottom quartile
Burgiss	20	14.8%	10.1%	5.7%
Pitchbook	11	12.1%	9.9%	8.9%
Preqin	27	13.7%	9.3%	6.8%
Vintage	2015			
	# of funds	Top quartile	Median	Bottom quartile
Burgiss	17	15.3%	9.0%	3.5%
Pitchbook	17	12.4%	9.1%	5.0%
Preqin	32	14.4%	10.6%	8.0%
Vintage	2018			
	# of funds	Top quartile	Median	Bottom quartile
Burgiss	25	18.3%	10.7%	7.7%
Pitchbook	35	16.8%	9.2%	6.0%
Preqin	34	16.4%	9.8%	7.3%

A spread between 190 and 290 basis points depending on the vintage
→ Who is top quartile?

Don't try to look at individual styles (Core vs. Core+, regions, etc.)
→ not enough data!

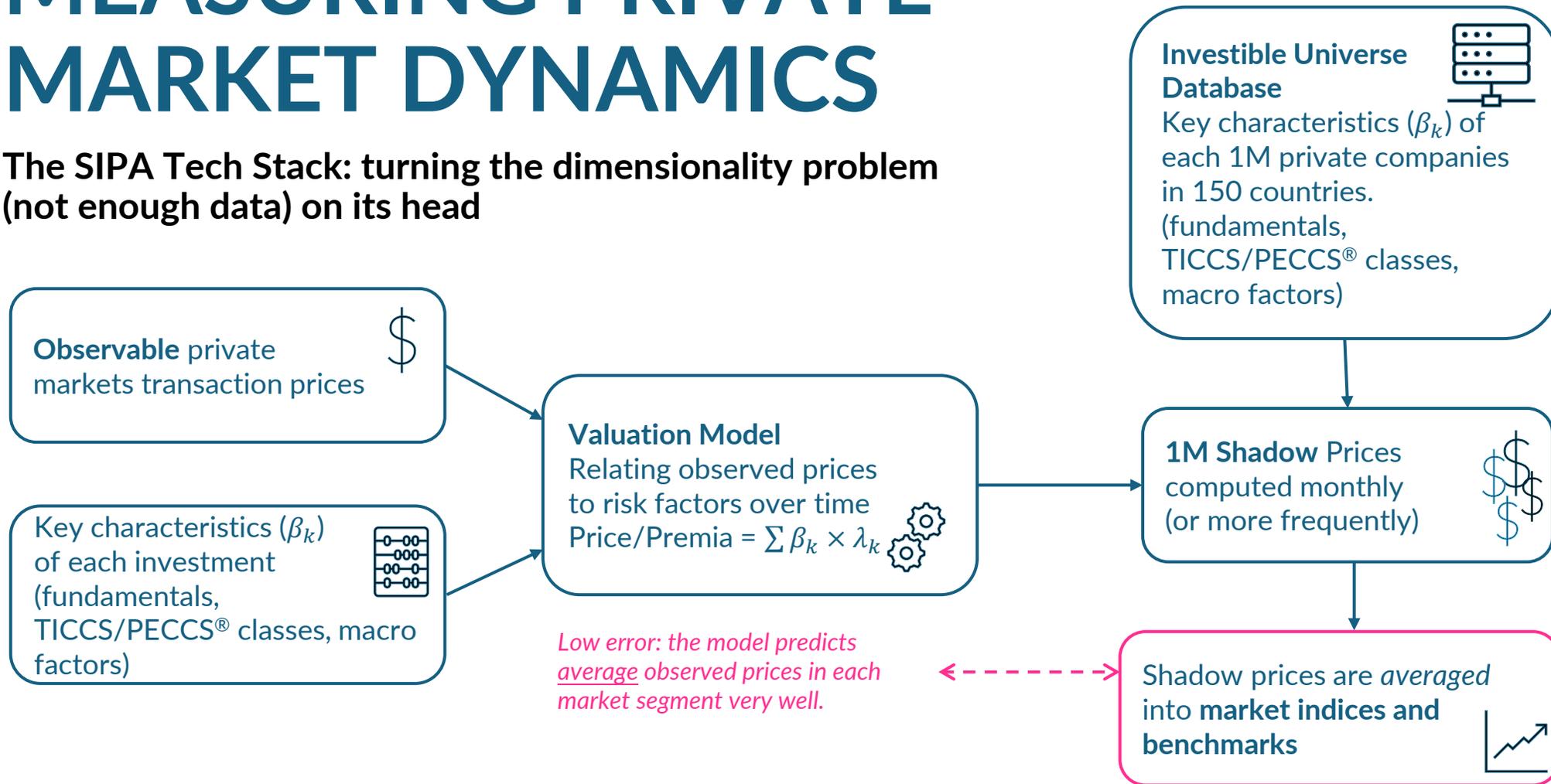
MARKET BENCHMARKS

The infraMetrics Data: asset-level, marked-to-market

- infraMetrics is a **bottom-up database of asset-level financials** used to produce revenue and dividend forecasts for hundreds of asset.
- It is also a database of **transaction prices** used to calibrate a risk-premia model as deals take place over time.
- For each asset, future dividends are discounted using an asset-specific discount rate: term structure of int. rates + risk premia capturing exposure to systematic risk factors.
- These computations are re-calibrated **monthly**
- infraMetrics does **what everyone else does**: compute a NAV using a DCF with the latest available data.
- Our computations are just (much) **more up to date than quarterly/yearly appraisals**

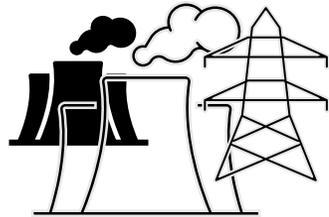
MEASURING PRIVATE MARKET DYNAMICS

The SIPA Tech Stack: turning the dimensionality problem (not enough data) on its head



INFRASTRUCTURE RISK FACTORS

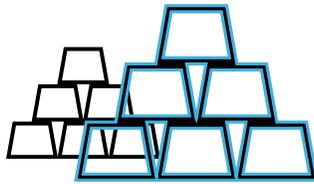
Common factors: why do investors pay more or less to buy infrastructure companies?



- **Size:** when infrastructure companies are relatively larger, they are more illiquid, more complex, *controlling for everything else*, they should be a little **cheaper** (have a higher equity discount rate).
- **Leverage:** when infrastructure companies have more senior debt, *controlling for everything else*, they are more likely to default and not pay dividends, making future dividends riskier. Hence, they should be a little **cheaper** as well.
- **Investment:** when infrastructure companies sink more capex in a project, *controlling for everything else*, they face greater risks of delay and cost overruns than once capital investments have been completed. Hence, they should be a little **cheaper**...

INFRASTRUCTURE RISK FACTORS

Common factors: why do investors pay more or less to buy infrastructure companies?



- **Profit:** when infrastructure companies make more profits, *controlling for everything else*, they are more likely to pay dividends in the future (the risk of the cash flows is a little lower) and they should be a little **more expensive** (have a lower equity discount rate)



- **Business model:** when infrastructure companies have a merchant business model, *controlling for everything else*, they are less their future dividends are more uncertain and they should be a little **cheaper**.



- **Country risk:** when infrastructure companies are in countries with a more uncertain economic outlook, they are less likely to pay dividends and should be a little **cheaper**.



- Sector effects, technologies, etc.

OUR QUANT APPROACH

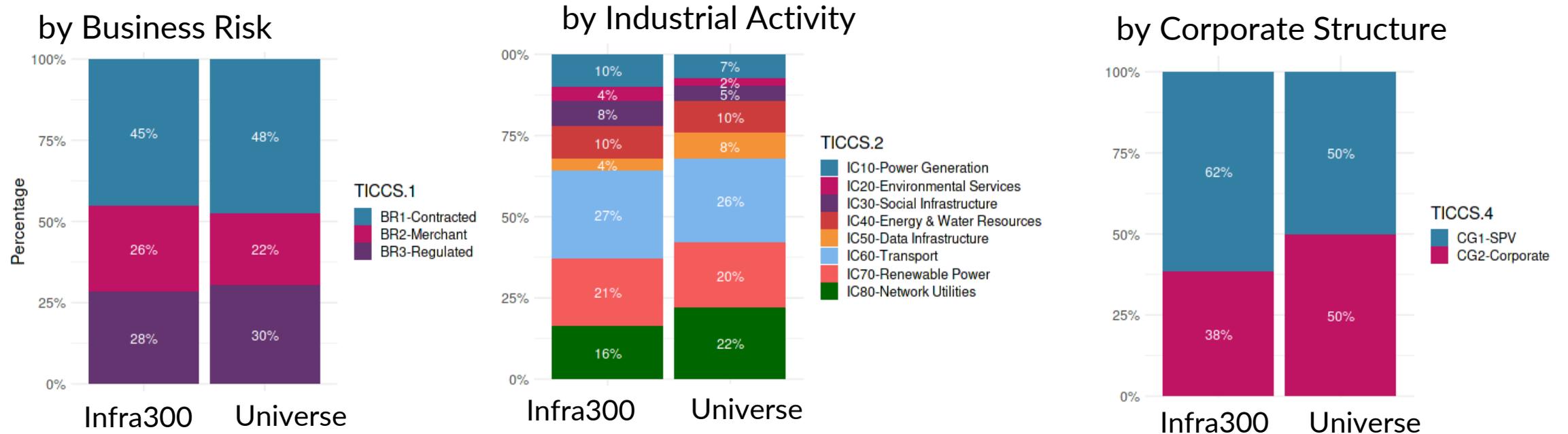
In summary:

1. With this approach, we **only use exit values that represent actual market prices**, not appraisals that are a mixed bag of smoothed values.
2. We extract systematic market signals from these transaction prices and remove the idiosyncratic noise to **achieve precise market segment-level predictions** (see appendix on model structure and robustness).
3. We use this signal to **shadow-price a much larger universe** that is representative of private markets.
4. We then aggregate these shadow prices at the segment level to build **robust comparables and indices** that are, by construction, accurate at the market segment level.

INFRAMETRICS MARKET INDICES

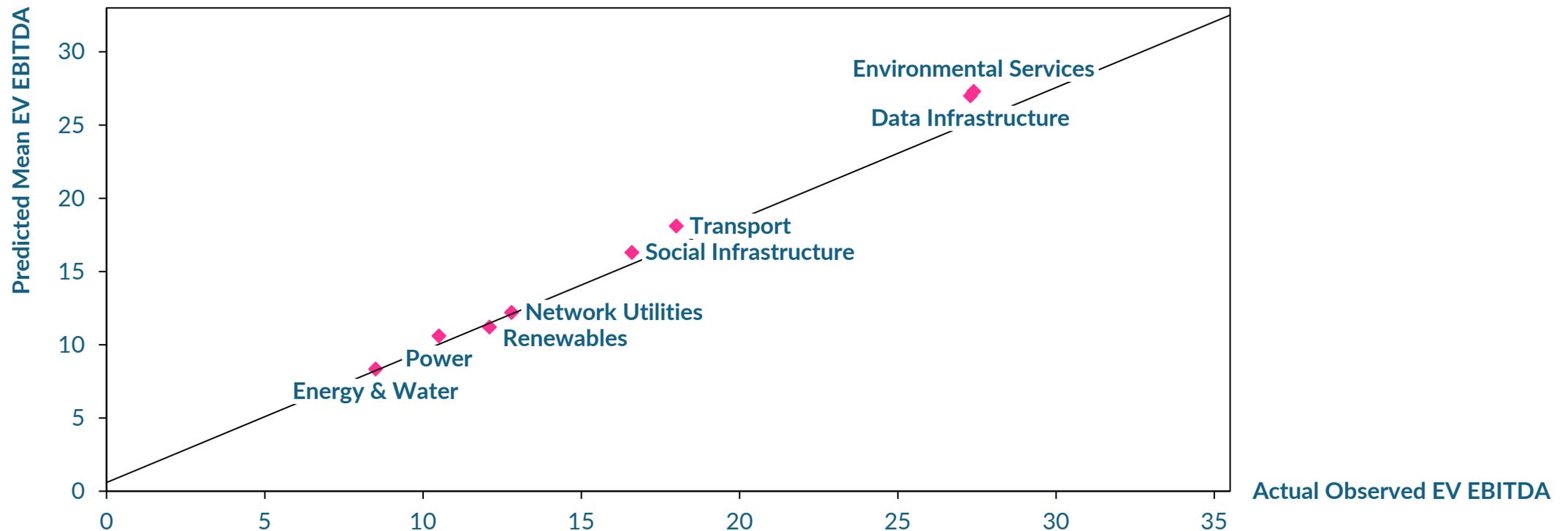
Proof of concept: representativity through GRANULARITY

Against a documented universe of 9,000 investible private infrastructure companies in 27 countries, the broad market index infra300® is a good (albeit imperfect) match by TICCS segment.



infraMetrics® MODEL ROBUSTNESS

Model-predicted and transaction EBITDA multiples by TICCS® segment
1.2k transactions 2000-2024 (source: Pitchbook, Capital IQ, infraMetrics®)



SIPA PRIVATE MARKET INDICES

Measure Private Market Dynamics

- Market indices registered with ESMA and IOSCO compliant
- Used by investors representing hundreds of USDT of AUM
- Realistic risk-return profile of private markets
- Private Equities & Private Infrastructure

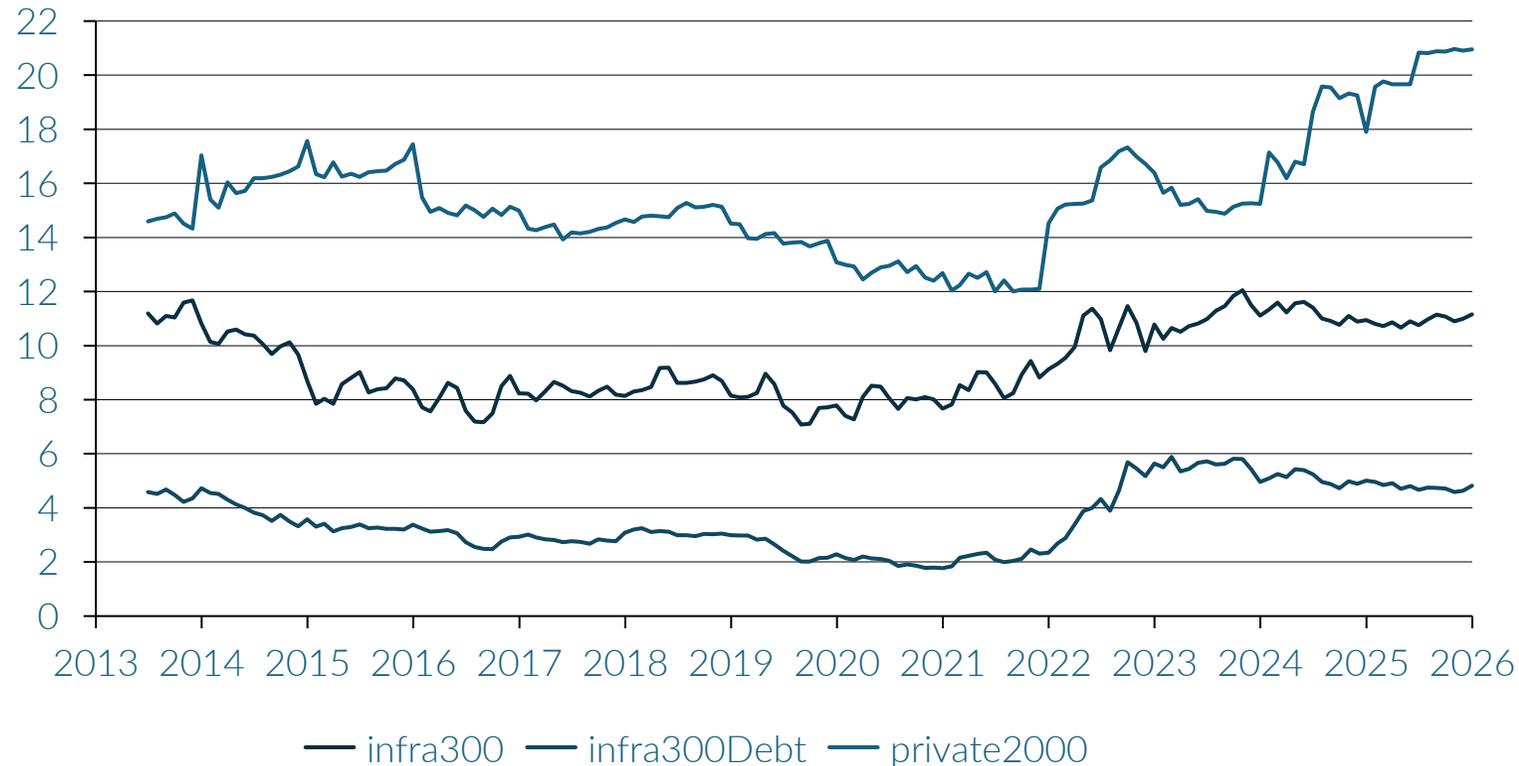
SIPA MARKET INDICES HISTORICAL PERFORMANCE



Index	3M Return	2024 Return	5Y Ann. Return	10Y Ann. Return	5Y Ann. Volatility	10Y Ann. Volatility
private2000	1.38%	4.13%	8.58%	14.98%	15.15%	18.77%
infra300	-0.53%	7.85%	8.57%	8.65%	10.23%	10.24%

EXPECTED RETURNS

Expected returns of private markets estimated from observed deals



- These are market-implied expected returns, **not fund IRRs and not manager forecasts.**
- Being consistent across asset classes, makes **comparisons easier and fair.**

CASE #1: BENCHMARKING A MANDATE

Private markets mandate properly benchmarked

Who

UK Pension Fund needing to benchmark their mandate with a specialised infrastructure manager.

Problem

The mandate strategy is too niche and requires very granular data to represent the strategy.

What SIPA Enables

- Customised benchmark using asset-level data
- 25 years of history to enable long-term comparison of the mandate
- Compare investment opportunities and benchmark new deals in the mandate

Result

A fair comparison of the manager's performance and mandate strategy.

SIPA Benchmarks

- Official market indices registered with ESMA: infra300®, private2000, infra300 Debt
- 450 segment indices by TICCS and PECCS
- Customised benchmarks built using 1 million private companies

CASE #2: GERMAN BANKING NETWORK

Private Market Risk, Standardised

Who

German service provider supporting a network of savings banks

Problem

Private market risk was hard to benchmark consistently across institutions

What SIPA Enables

- Shared, market-based risk benchmarks
- Consistent analytics across a bank working group
- Scalable licensing as the network grows

Result

Private market risk assessment aligned across multiple German banks

SIPA Risk Analytics

- Monthly indices
- 25 years of history in infrastructure and 12 years in private equity
- Hundreds of index analytics including Volatility, Value-At-Risk, and Max Drawdown

CASE #3: EUROPEAN ASSET MANAGER

Mark-to-market infrastructure valuations

Who

Large European asset manager with significant infrastructure exposure

Problem

Appraisal-based valuations lagged market conditions

What SIPA Enables

- Asset-level discount rates and risk premia
- Dynamic, market-aligned valuations
- Greater consistency across portfolios

Result

More transparent, defensible infrastructure valuations—now spreading across Europe.

SIPA Comparables

- 80+ metrics including valuation multiples, expected returns, and financials
- Customisable by TICCS and PECCS
- Customisable by risk factors such as size, leverage, profitability, etc.

CASE #4: LARGE AUSTRALIAN PENSION

Capital allocation under regulatory scrutiny

Who

One of the world's largest pension funds

Problem

Tighter regulatory oversight and increasing allocations demanded stronger benchmarking across private markets.

What SIPA Enables

- Cross-asset risk-return comparisons
- Sector-level infrastructure benchmarking
- Clearer inputs into allocation framework

Result

More disciplined capital allocation and efficient portfolio construction with private markets.

SIPA Solution

- Meaningful Sharpe Ratios and Correlations in private markets
- Long history to provide robust estimates
- Capital Market Assumptions in line with the industry

CASE #5: GLOBAL ASSET MANAGER

Alpha insight into fund and manager performance

Who

Leading global asset manager

Problem

Need to monitor fund and manager performance objectively and rank them.

What SIPA Enables

- League tables of infrastructure and private equity funds and managers
- Performance split into alpha and beta components
- Customised benchmarks for each fund's strategy and allocation

Result

A clear and transparent view into a fund's outperformance against the market and attribution into risk-return drivers.

SIPA Private Alpha

- Ranking of 70+ Infrastructure GPs and 500+ Infrastructure Funds.
- 150+ buyout GPs and 600+ buyout funds
- Detailed fund and GP analytics including alpha, beta, cash flows, and alpha persistence.

KEY TAKEAWAYS

Time to pick a fair benchmark for the team

- **Historically**, the performance benchmarking of private markets has not been ideal... most benchmarks used were not fair benchmarks.
- **Today**, it has become unsustainable: high and volatile rates, inflation and capital markets make previous choices very unappealing.
- This is **normal** as the asset class matures: better data and standards become available, and **practices evolve**.
- **SIPA performance benchmarks are fair** and an opportunity for sophisticated investors to stay leaders in the market.

CONTACT US

Start Your Private Asset 2.0 Journey Today

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Institutional Investment Risk Management Regulatory Requirements



Prudent Investment Management

- Prudent Person Principle (**PPP**) – *Solvency 2 (insurers)*
- Prudent Person Rule (**PPR**) – *IORP 2 (pension funds)*
- Internal Capital Adequacy Assessment Process (**ICAAP**) – *CRD 4 (banks)*

Internal Risk Assessment

- Own Risk and Solvency Assessment (**ORSA**) – *Solvency 2*
- Own Risk Assessment (**ORA**) – *IORP 2*
- Internal Capital Adequacy Assessment Process (**ICAAP**) – *CRD 4*



Value at Risk

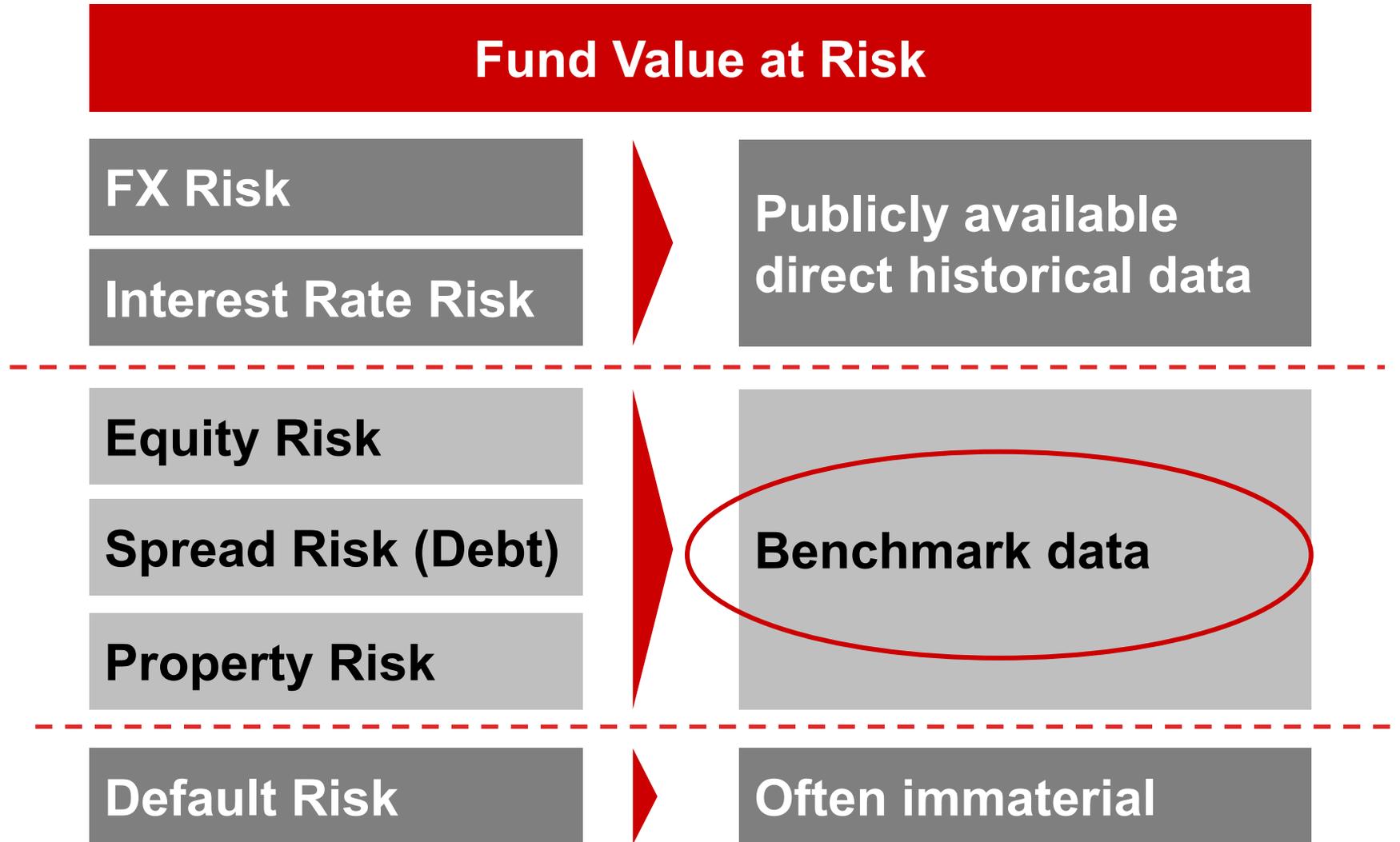
*maximum loss in a certain period of time with a certain confidence
(e.g. annual VaR with 99.9% confidence = 35% of fund NAV)*

Calculation Methods

- Historical
- Variance-covariance (incl. Cornish Fisher)
- Monte Carlo Simulation

Input Data (= historical returns)

- From the actual asset
- From a comparable asset (= benchmark)



=> Further factors: correlations, fund level leverage, options etc.

What is a Representative Benchmark?

Benchmark

300 assets

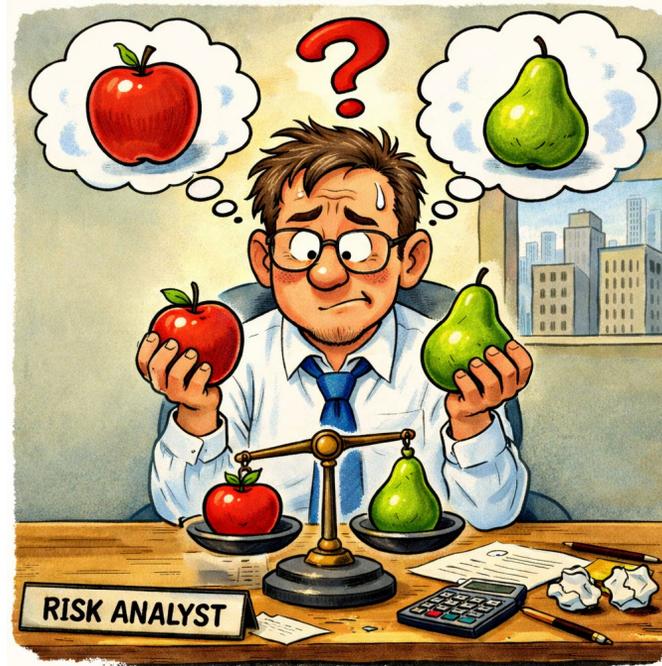
27% Transport
 20% Renewables

69% EU

60% Project
 40% Corporate

75% contracted
 25% merchant

?



Renewables Fund

3 assets

100% Renewables

100% DE + FR

100% Project

100% contracted

2.5x leverage

Valuation Date	Fund VaR 1year 99.9%	Annualized Fund Performance	Backtesting Result
Q1 25	-36%	-1%	<input checked="" type="checkbox"/>
Q2 25	-38%	+4%	<input checked="" type="checkbox"/>
Q3 25	-37%	+6%	<input checked="" type="checkbox"/>
Q4 25	-41%	+0.5%	<input checked="" type="checkbox"/>

Conclusion

Actual Performance always >>> VaR
=> Benchmark sufficiently conservative

Equity Benchmarks

Example:

Benchmark VaR = 30%

-> apply directly to market value of equity investment

Debt Benchmarks

Example:

- Identify peer group based on rating and duration
-> *internal ratings not always available*
- Calculate stressed market values for different rating upgrades and downgrades
-> *multiple calculations / indices required*
- Aggregate based on rating transition matrices
-> *rating transition matrices not always available*