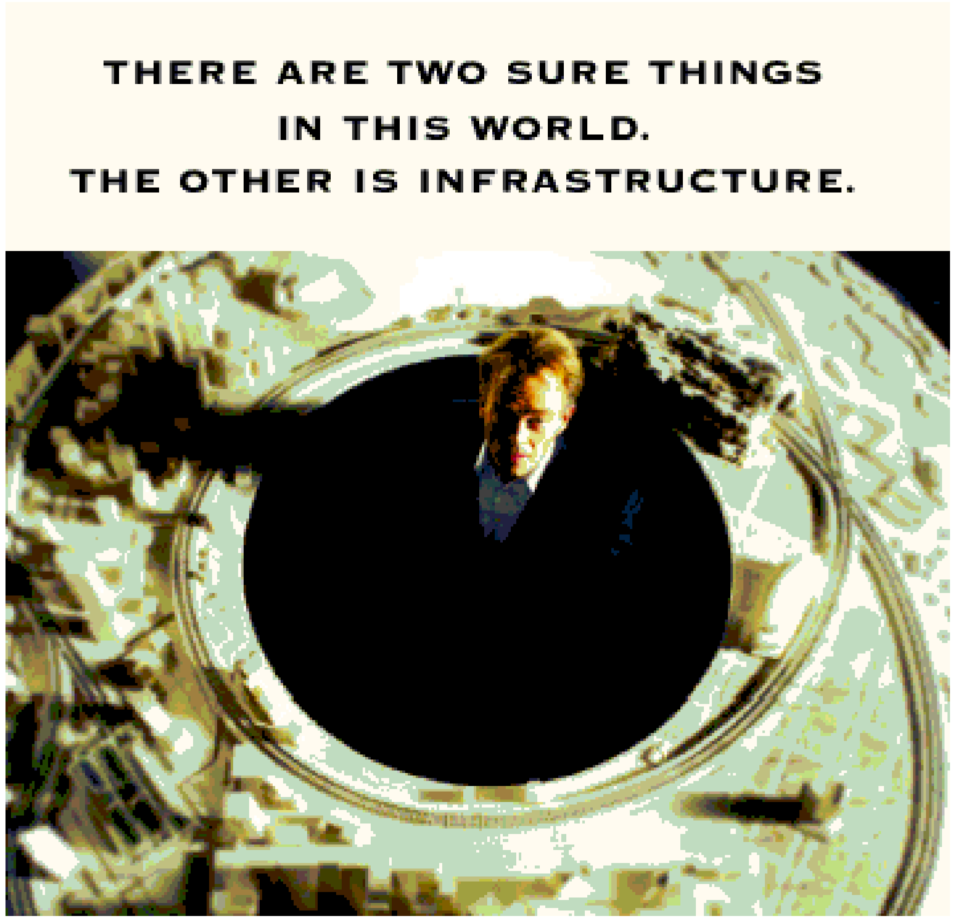
Infrastructure: Opportunities in a world of uncertainty

Presentation by Jim Miller

IAAust BIENNIAL CONVENTION 2003

Institute of Actuaries of Australia


THERE ARE TWO SURE THINGS
IN THIS WORLD.
THE OTHER IS INFRASTRUCTURE.

Some ideas to consider

- "Capitalism competes advantages (and returns) away."

  - Jeremy Grantham

- Consider:
  - Airlines
  - Internet
  - Telco's etc etc

THESIS: Monopolistic infrastructure is a unique and beneficial asset class

Agenda

- → **Characteristics of infrastructure investments**
- → The market for infrastructure
- → Infrastructure performance
- → Valuation basics
- → Prospects for infrastructure

Overview

- Broad characteristics include:
  - Infrastructure assets meet the basic needs of society, hence demand is relatively inelastic, and often driven more by demographic factors than changes in GDP
  - The monopoly nature of the assets provides pricing power (subject to regulation)
  - The assets have low operating leverage

Infrastructure assets are relatively insensitive to economic conditions…

- Demand is often very inelastic for infrastructure.
- Demand is often more dependent upon demographic factors and individual wealth than current economic conditions.
- Example: Toll road traffic behaviour is quite predictable and closely follows population and the usage of cars.
  - Large traffic drops are usually the result of large toll increases.
  - International data shows that there is limited traffic volume declines during recessions

…and offer a hedge against inflation

- → Infrastructure can provide a hedge against inflation:
  - → Regulated assets are usually allowed price increases in line with inflation less an efficiency factor.
  - → Patronage assets are usually subject to concession deeds which provide protection against inflation.
  - → However, as with all assets, infrastructure assets will be affected by changes in real interest rates.

Summary

- Putting it another way…

Characteristics	Infrastructure
Monopoly Asset	Yes
Stability of Demand	Yes
Low Downside Correlation to General Economy	Yes
Low Diversifiable Risk	Yes
Inflation Protected	Yes
Interest Rate Protected	Yes
Operational Risk	Limited

- An infrastructure investment may be characterised as a relatively high yield, inflation protected security with equity style returns.

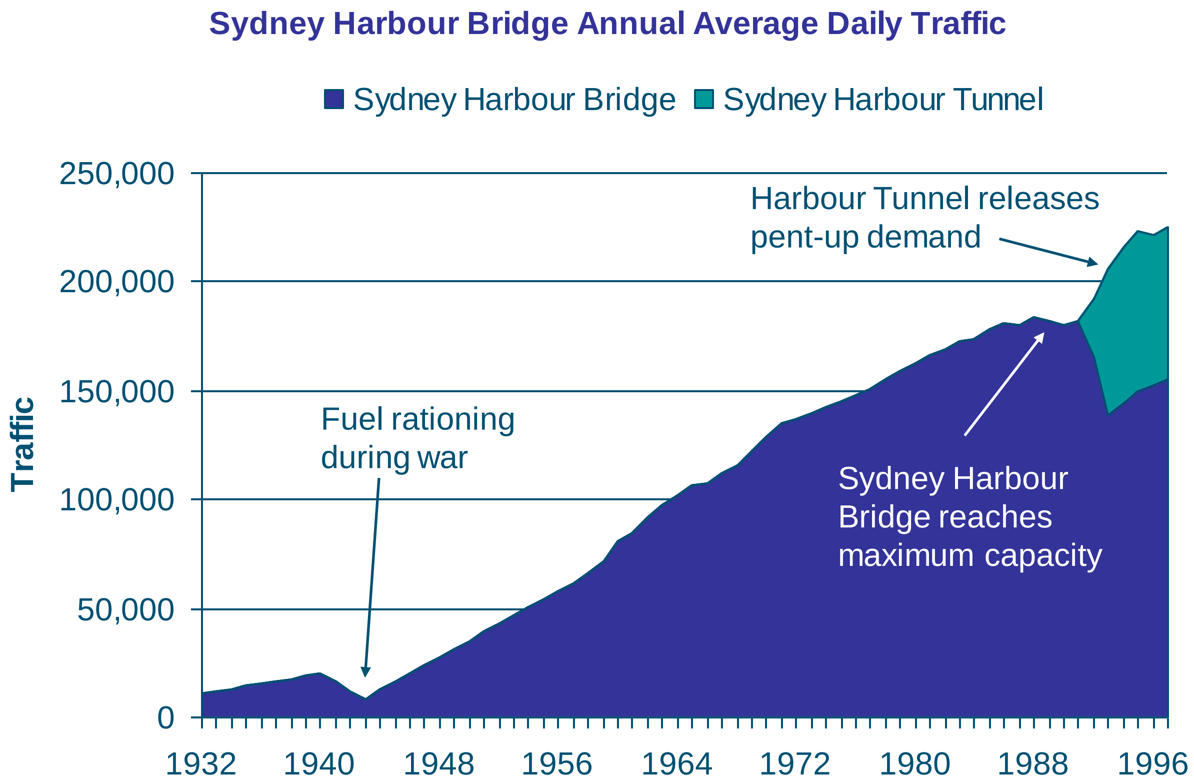
Infrastructure Classifications

Range of expected returns to equity:

0% - 25% Commodity Risk Assets	12% - 15% Regulated Assets	8% - 16% Patronage Assets	10% - 16% Social Infrastructure
Power Generation	Power Distribution/ Transmission	Broadcast Transmission	
Power Retail	Gas Distribution/ Transmission	Water & Sewerage Treatment	
	Airports		
		Toll Roads	Hospitals
		Ports	Schools
		Rail	Prisons

Toll Roads Review

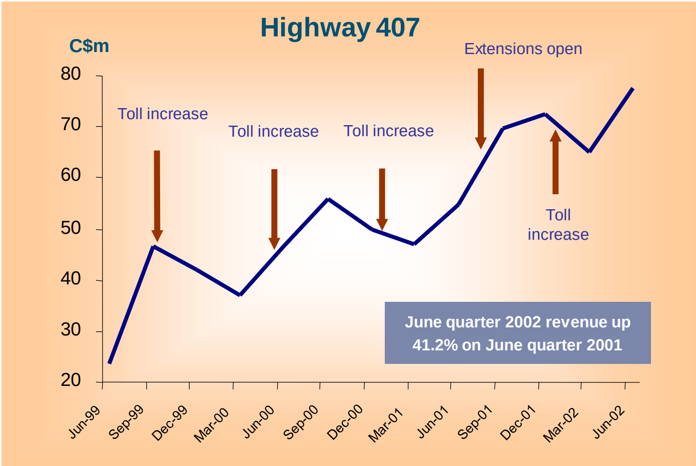
Sydney Harbour Bridge illustrates the potential for long-term growth of cashflows

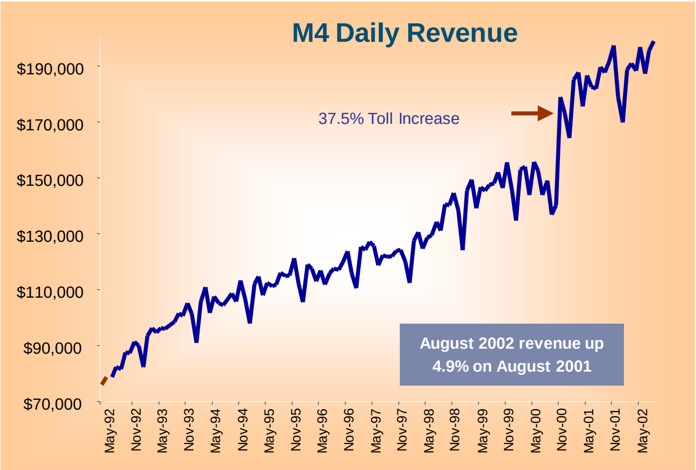


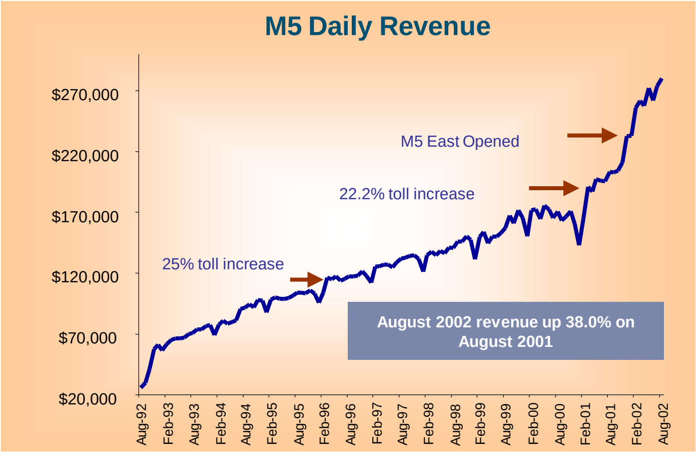
Source: Macquarie analysis

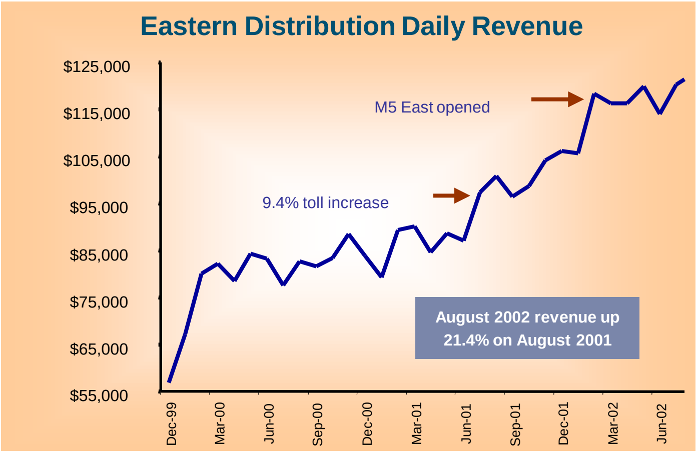
Toll Roads Review cont…

→ Other examples of consistent earnings growth uncorrelated with the broader market









Regulated Assets Review

- The allowable revenue is based on recovery of costs + a return on investment.
- Revenue built up through a building block approach

Opex	Compensate owner for forecast costs
Capex and depreciation	Return for system reinvestment
Tax	Regulatory tax payments
Efficiencies	Reward owner for efficient operations
Return on Asset Base	WACC x ODRC (Regulatory Asset Base)

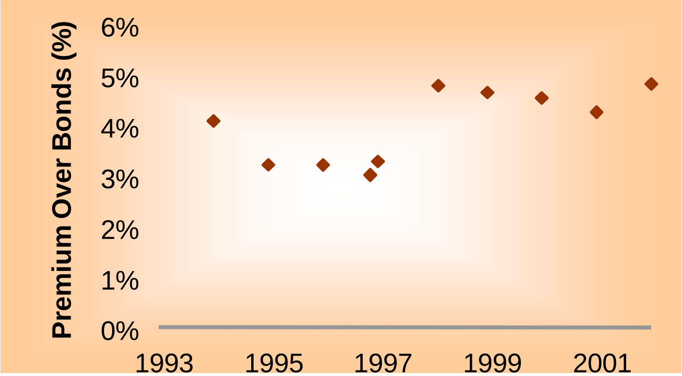
Regulated Assets Review cont…

Regulated assets provide inflation linked returns at a significant premium to inflation indexed bonds:

- → The primary difference between a regulated asset and index linked bond is that the regulatory asset base also decreases by depreciation and increases by capital expenditure.

- → The addition of growth capex to the system is analogous to a bond investor buying more bonds.

Premium of regulatory returns to real bonds



Source: Macquarie analysis

Infrastructure assets are not without risks

- Contractual foundation
- Legal structure
- Financial leverage
- Technology, construction, and operations
- Regulatory changes

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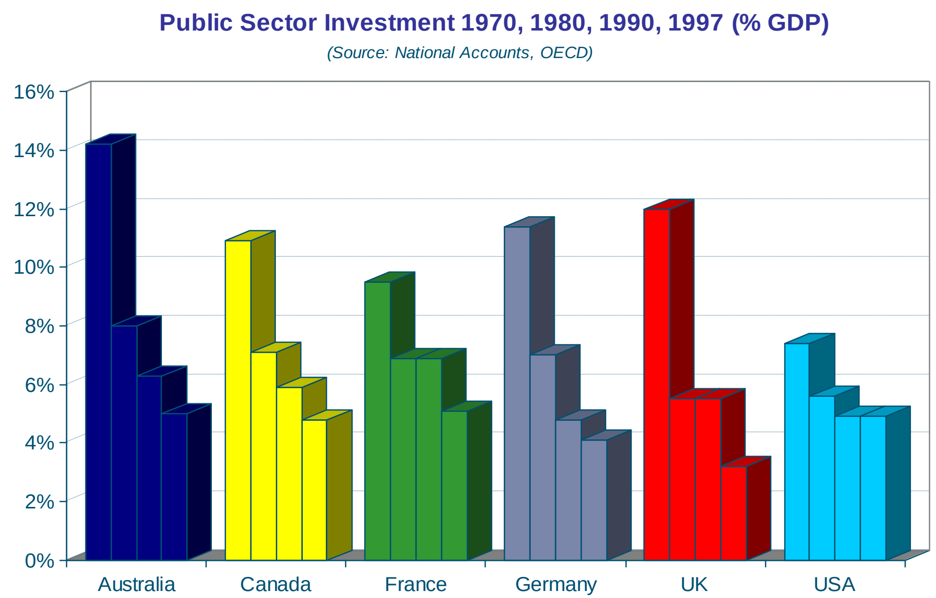
A global decline in public spending…

- → Government spending on infrastructure is falling around the world

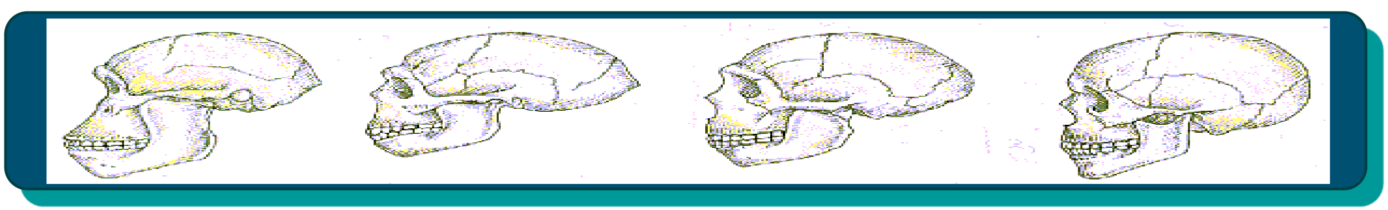


- → Increased requirement for Private Sector Funding
- → Private sector can offer:
  - →Risk transfer
  - →Specialised asset knowledge.
  - →Innovative financing and delivery solutions.

…has prompted the evolution of infrastructure investors…

Investors have evolved:

	First Epoch 1987	Third Epoch 2003
Equity:	Private placements Small $ 25% after tax	Public listings /infra funds Large $ 12 / 15% after tax
Debt:	Banks only High margins and restrictive terms	Banks versus capital markets Significantly improved terms and conditions
Risk:	No revenue risk accepted	Revenue risk accepted



…and an associated risk transfer

Project	Year	Construct Risk	Traffic Volume	Tax Risk	Financial Risk
Gateway Bridge	1983	≈	✗	✗	✗
Sydney HarbourTunnel	1986	✓	✗	≈	≈
M4 Motorway	1988	✓	✓	✓	≈
M5 Motorway	1990	✓	✓	✓	≈
M2 Motorway	1994	✓	✓	✓	✓
Melbourne City Link	1996	✓	✓	✓	✓
Eastern Distributor	1997	✓	✓	✓	✓

Increasing risk transfer to private sector

Major lessons from the Australian experience

- Private sector investors will accept very high levels of project risk:
  - It was a gradual process.
  - Education and competition are the keys.
- Competitive tendering brought better than expected outcomes for Governments.
- Financial structuring proved to be a key driver in the competitive processes.

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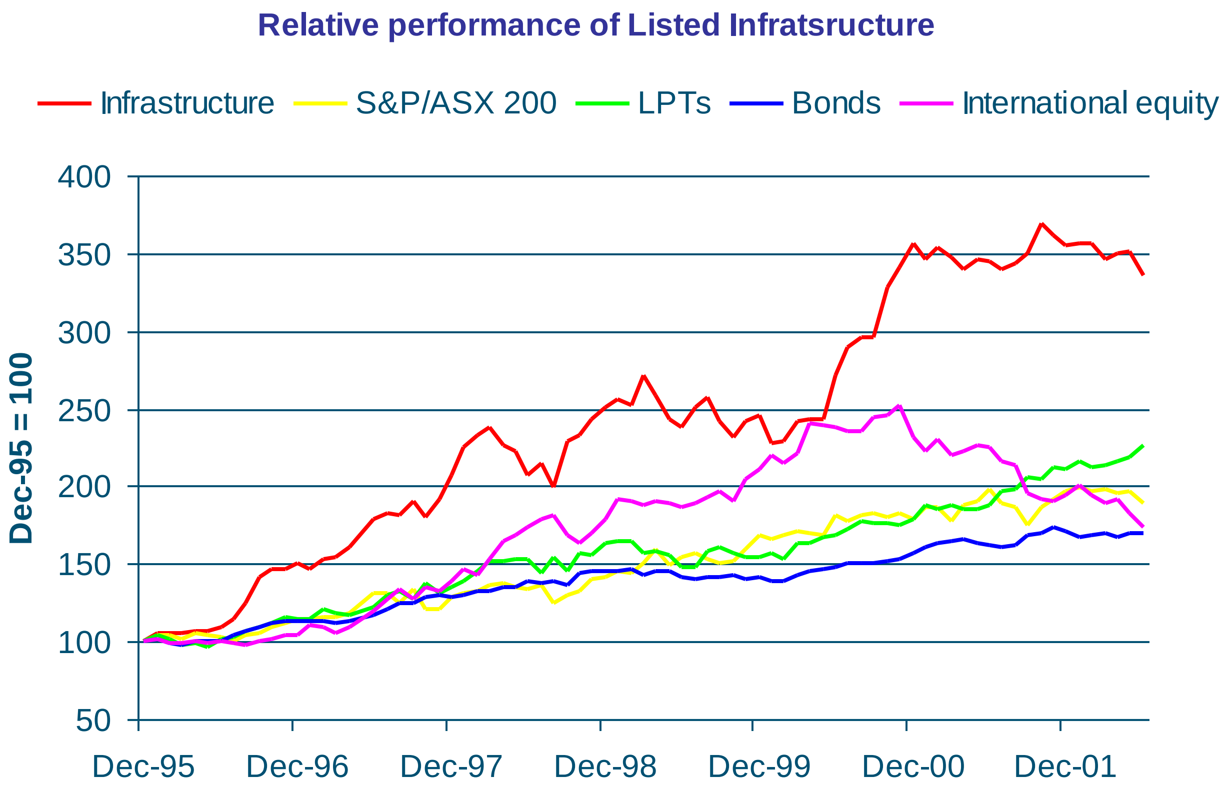
Listed infrastructure assets have outperformed



Source: IRESS, Accumulation indices from December 1995 to June 2002. Note that infrastructure index (XIUAI) ceased on 30 June 2002

Listed infrastructure assets have outperformed (cont'd)…

	Infra. (XIUAI)	Equity (XJOAI)	Property (XJPAI)	Cash	Bonds (UBSW)	Int'l Equities (MSWA)
Average return	23.9%	11.9%	14.1%	5.2%	9.4%	14.6%
Standard deviation	21.2%	7.1%	8.8%	0.6%	6.6%	19.6%
Correlation with infrastruct.		0.41	0.62	0.50	0.79	0.29

Source: IRESS, Accumulation indices from December 1995 to June 2002. Note that infrastructure index (XIUAI) ceased on 30 June 2002

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Standard deviation of return	21.2%	7.1%	8.8%	0.6%	6.6%	19.6%
Correlation with infrastructure		0.41	0.62	0.50	0.79	0.29
Sharpe ratio	0.86	0.88	0.96	(0.90)	0.56	0.45
Skewness	0.26	(0.07)	(0.48)	0.58	(0.34)	(0.28)

Source: IRESS, Accumulation indices from December 1995 to June 2002. Note that infrastructure index (XIUAI) ceased on 30 June 2002

Unlisted infrastructure funds have also outperformed

- Different to listed equity
  - Private transactions
  - Less direct equity market impact
  - Less liquidity
- Based on analysis of seven years of data for unlisted infrastructure equity (“UIE”), the infrastructure sector has:
  - Outperformed listed equities in Australia.
  - Shown lower volatility than listed equities in Australia, both in a nominal and relative sense.
  - Shown a negative correlation to property trusts.
- UIE provides significant return enhancement and diversification benefits

The data set used in the analysis is representative of the sector…

- → UIE is comprised of the following equally weighted investments
  - → Development Australia Fund Infrastructure Unit (“DAF”)
  - → Utilities Trust of Australia (“UTA”)
  - → Macquarie Infrastructure Group (“MIG”)
    - → Though listed, NTA has been used as a proxy for unlisted value
- → This group of fund exposures has been chosen as it:
  - → is representative of the overall market, investing in multiple sectors
  - → has performance data covering seven to eight years, representing a fair evaluation period for an economic cycle
  - → is representative of the major manager groups operating in the Australian market

…and performed well over the period

Pre-tax, Post-fees Performance

	UIE Index	DAF	UTA	MIG
Annual Return (compound)	19.2%	17.0%	14.4%	25.5%
Std Dev of Annual Return	6.5%	9.7%	10.7%	19.4%

Correlation

	UIE Index	DAF	UTA	MIG
UIE Index	1.00	0.49	0.62	0.48
DAF		1.00	0.82	(0.49)
UTA			1.00	(0.37)
MIG				1.00

Note: MIG return from 1996; all others from 1995

UIE has outperformed other Australian asset classes…

	UIE	Aust Equities	Aust Bonds	Property (listed)	Int. Equities (A$)	Aust Cash
Annual Return (Average)	19.4%	11.1%	9.6%	13.1%	10.0%	5.7%
Std Dev of Annual Return	6.5%	10.4%	5.8%	8.9%	22.1%	1.1%
Sharpe Ratio	2.10	0.51	0.67	0.82	0.45	-
Skewness	0.36	(0.13)	0.76	0.80	(0.27)	1.03

- → On a risk-adjusted basis, UIE has significantly outperformed other major asset classes
- → Volatility measures suggest that the risk of UIE falls between domestic bonds and equities, comparable to property or real estate investment·
- → Distribution of UIE returns is positively skewed showing added benefit when compared to Australian Equities

Source: IRESS; Macquarie analysis of seven-year data for unlisted funds and MIG

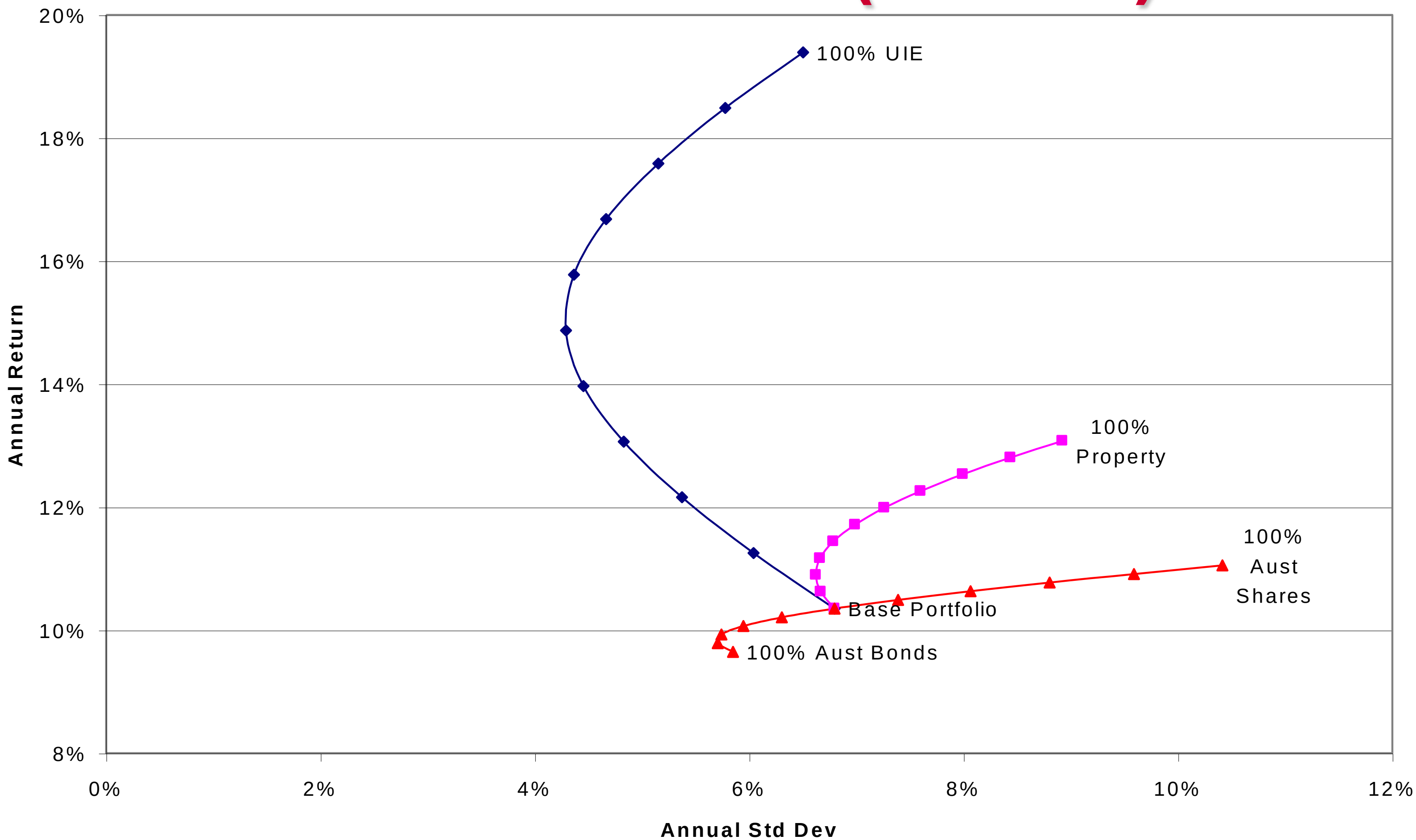
…and offers significant diversification benefits

	UIE	Aust Equities	Aust Bonds	Property (listed)	Int. Equities (A$)	Aust Cash
UEI	1.00	-0.04	-0.32	-0.54	-0.28	-0.02
Aust Equities		1.00	0.35	0.38	0.44	0.56
Aust Bonds			1.00	0.65	0.57	0.43
Property (listed)				1.00	0.22	0.01
Int. Equities (A$)					1.00	0.12
Aust Cash						1.00

→ The negative correlation of UIE to other major asset classes in Australia may make it particularly useful in portfolio construction

Source: IRESS; Macquarie analysis of seven-year data for unlisted funds and MIG

...and offers significant diversification benefits (cont'd)



Note: Base portfolio consists of 50% Aust Equities and 50% Aust Bonds

Source: IRESS; Macquarie analysis of seven-year data for unlisted funds and MIG

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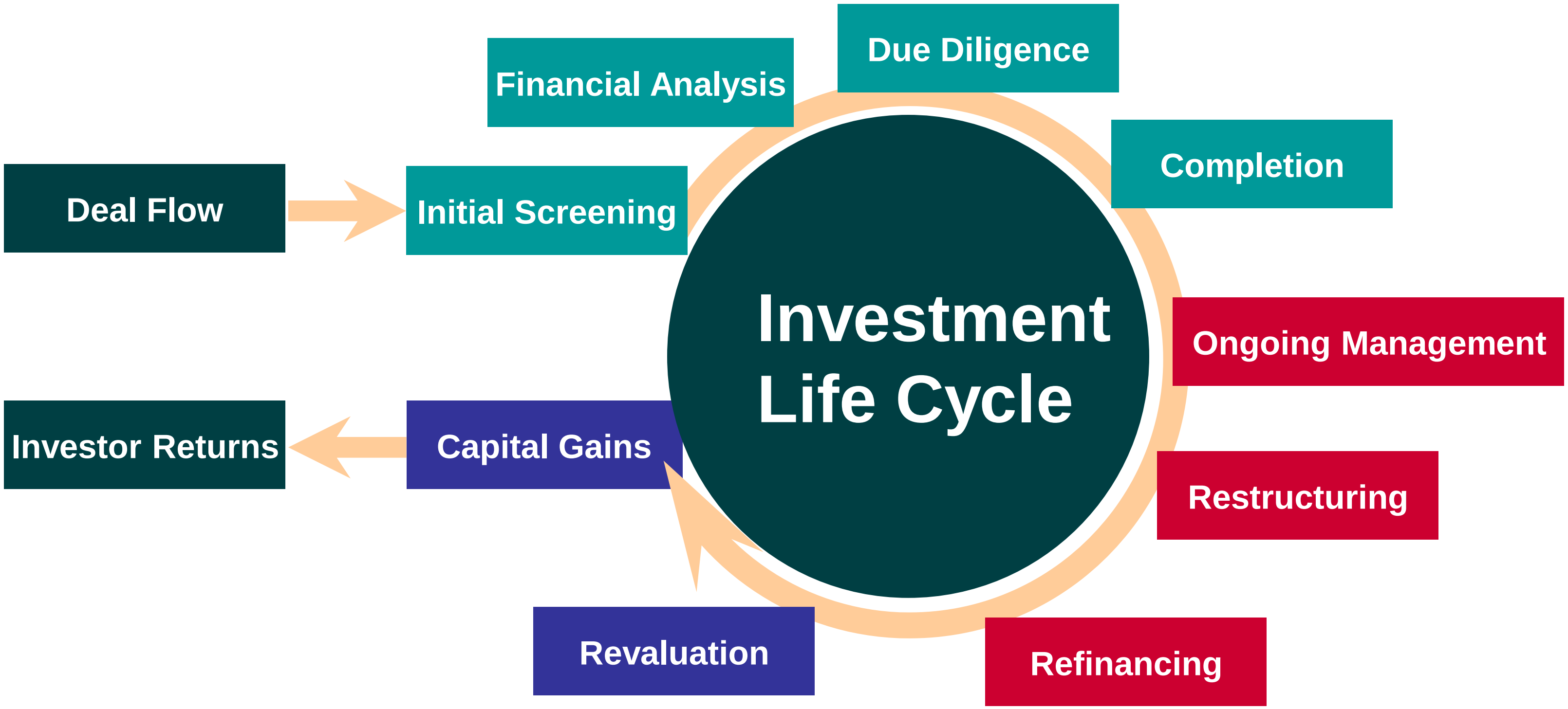
Valuing infrastructure

- Very different from usual company valuation.
- Industrial companies valued on yield and accounting earnings growth.
- Infrastructure assets best valued on:
  - internal rate of return (IRR) or.
  - net present value (NPV) basis.
- **WHY?**
  - infrastructure assets have very high growth in dividends.
  - over time, a reduction in the level of risk in the project.
  - accounting results do not allow for time value of money.
- Difficult to capture the value of these two points in yield valuation.
- IRR/NPV valuation takes into account the value of future cashflows.

Value of infrastructure asset changes as they become more established…

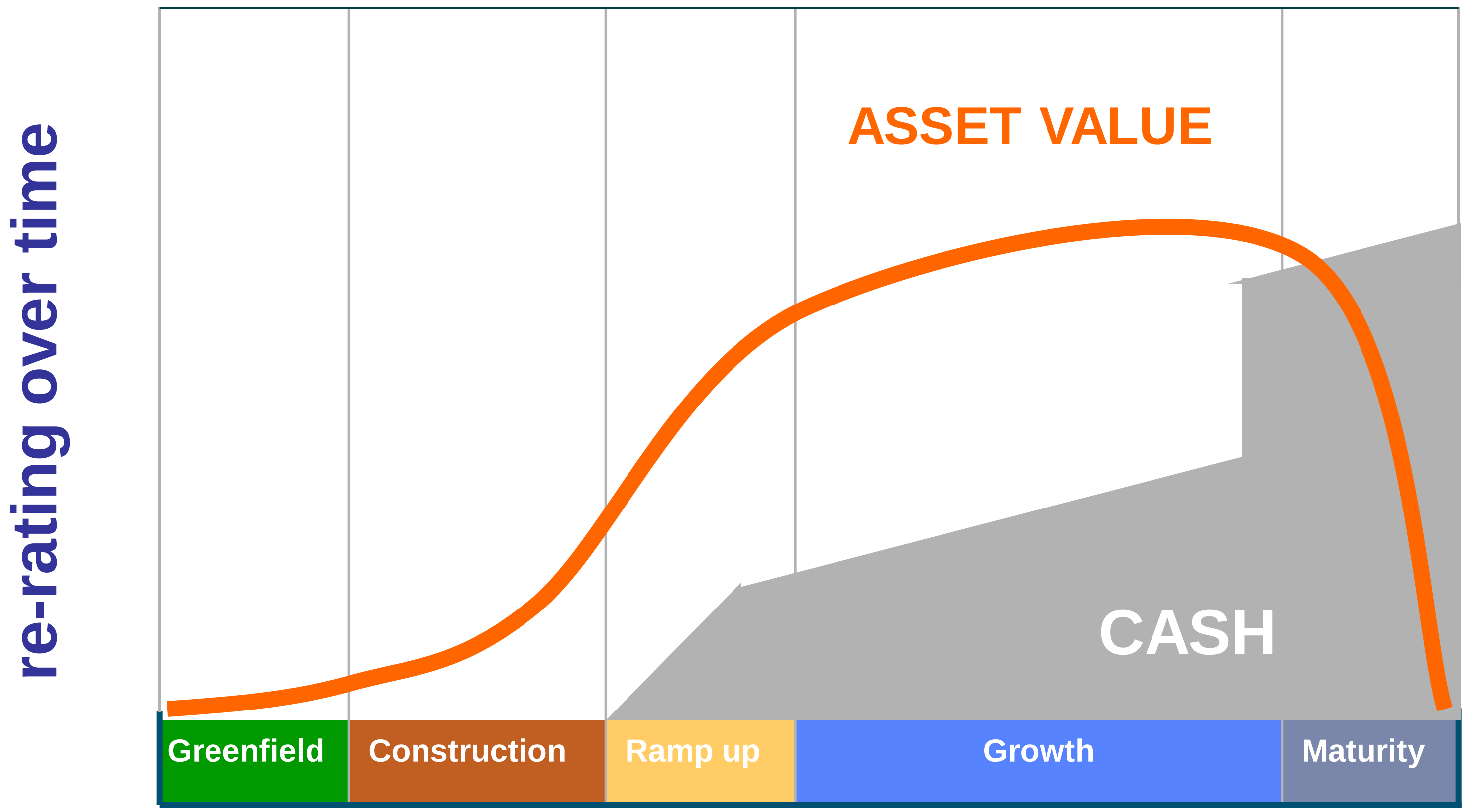


Changing Risk Profile - Roads

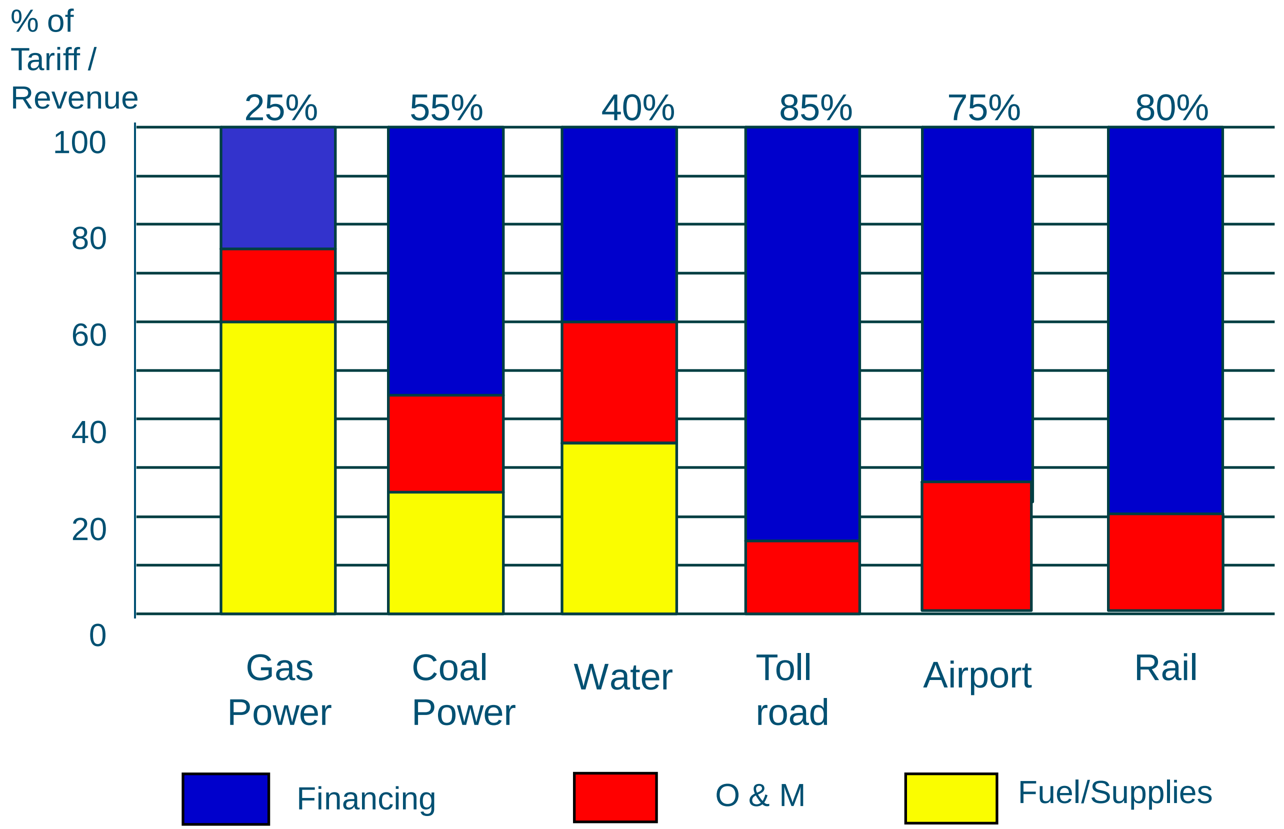
Construction	Ramp Up	Full Operations
Risks Construction Time Construction Costs Initial Traffic Ramp Up Rate Natural Traffic Level	**Risks** Ramp Up Rate Natural Traffic Level	**Risks** Impacts on Traffic
Risk Premium 6 – 8%	**Risk Premium** 3 - 5%	**Risk Premium** 1 - 2%

Assets increase in value as they mature

…and more cash is available for distribution

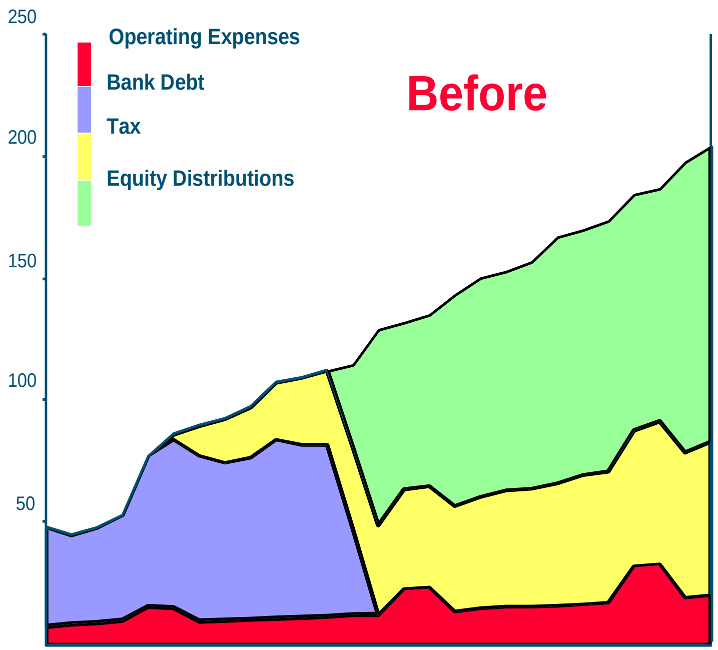


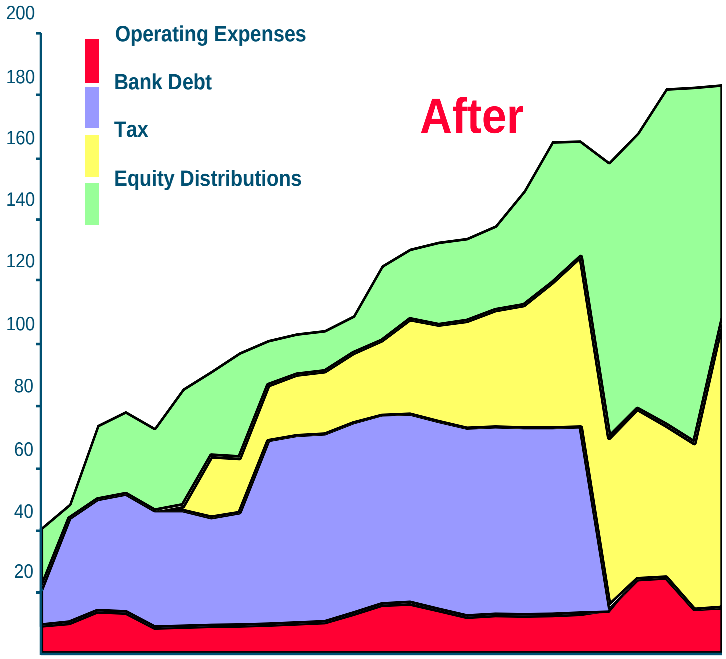
Financing mix is dependent on asset type and associated risk…



…and key to the value proposition

- Refinancing can add substantial value to equity investors.
- Interlink Roads (M5, Sydney) refinancing.





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Current economic climate suggests a short-term defensive weighting

- Continuing disappointment in economic growth and corporate earnings:
  - Unstable consumer sentiment.
  - Struggling recovery in capital spending.
  - Earnings downgrades.
- Continuing war on terror:
  - Risk aversion.
- Reduced forecast equity returns
  - A number of forecasts for < double digit returns in the medium term
- Alternative asset class to property
  - Infrastructure investments compare favorably as an alternative to property investments which have recently strongly outperformed

Infrastructure assets are an ideal defensive play

Sample Alternative Investment Cascade

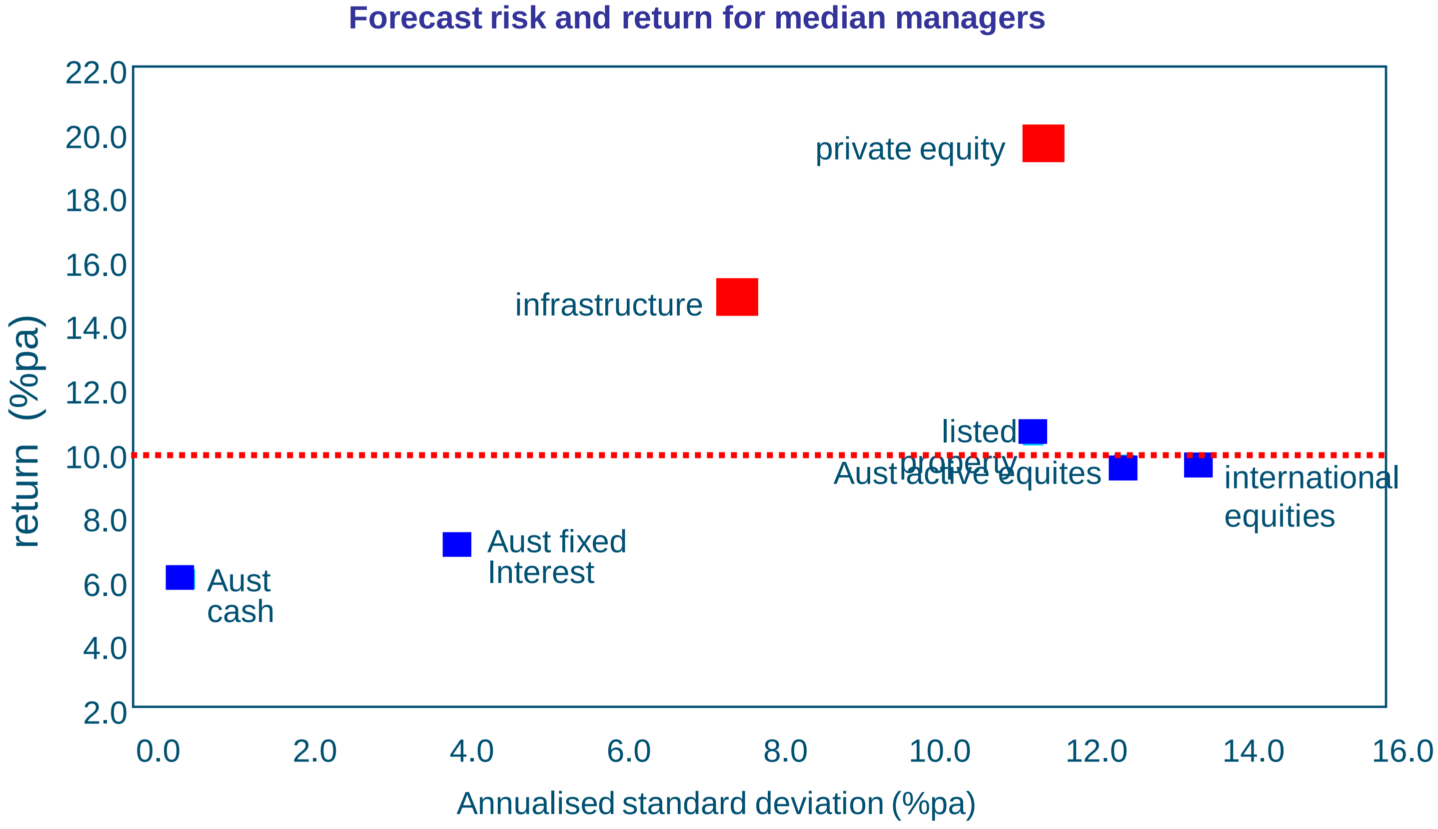
Indicative Returns		Indicative Risk (1-10)	Performance outlook
35-40%	Venture capital	10+	Under
30-35%	Emerging markets equity	10	Neutral
25-35%	Private equity	7	Under
10-25%	Infrastructure	1-2	Over
18-22%	Real estate equity	4	Under / neutral
18-20%	Distressed debt	5	Over
15-20%	Corporate mezzanine	5	Neutral
15-20%	Hedge fund	3	Neutral / Over
13-18%	Real estate mezzanine	2	Over

Source: Macquarie Estimates

Unlisted v Listed infrastructure

Unlisted	Listed
Lower volatility	Higher short term volatility- linked to underlying market conditions
Predictable yields	Less predictable - subject to market conditions
Greater management control	Less direct control
Greater flexibility in reporting	Subject to listing requirements
Less liquidity	Greater liquidity
Low correlation to bond yields/equities	Greater correlation to bond yields/equities

Forecast risk and return for alternative assets



Data source: Macquarie Funds Management, Macquarie estimates

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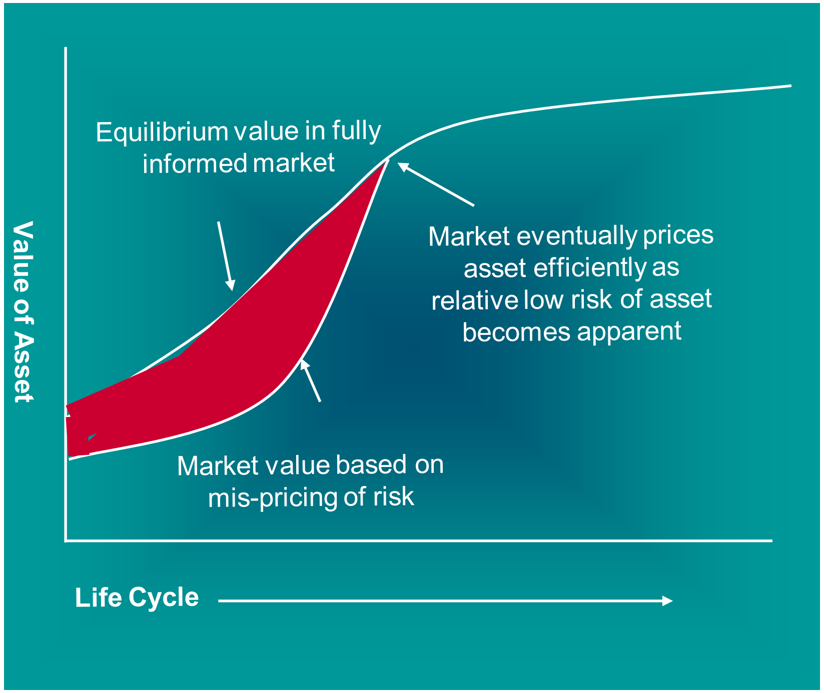
Market underdevelopment provides scope for information arbitrage

- The private market for infrastructure is developed in some markets, but relatively new in most
- Consequently, the investment characteristics of infrastructure assets are poorly understood and hence there exists an opportunity for an information arbitrage.



Conclusions

- Infrastructure is a strong performing, relatively poorly understood asset class
  - Performance and growth suggests it is worthy of an asset allocation in its own right
  - Viable alternative to property investments
- Attractive investment, especially in current climate:
  - Risk profile
  - Long-dated returns
  - Diversification benefits

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