



PUBLIC PRIVATE PARTNERSHIPS PRINCIPLES AND PRACTICE

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1. Principles of Public Private Partnerships (PPPs)

Glossary of terms

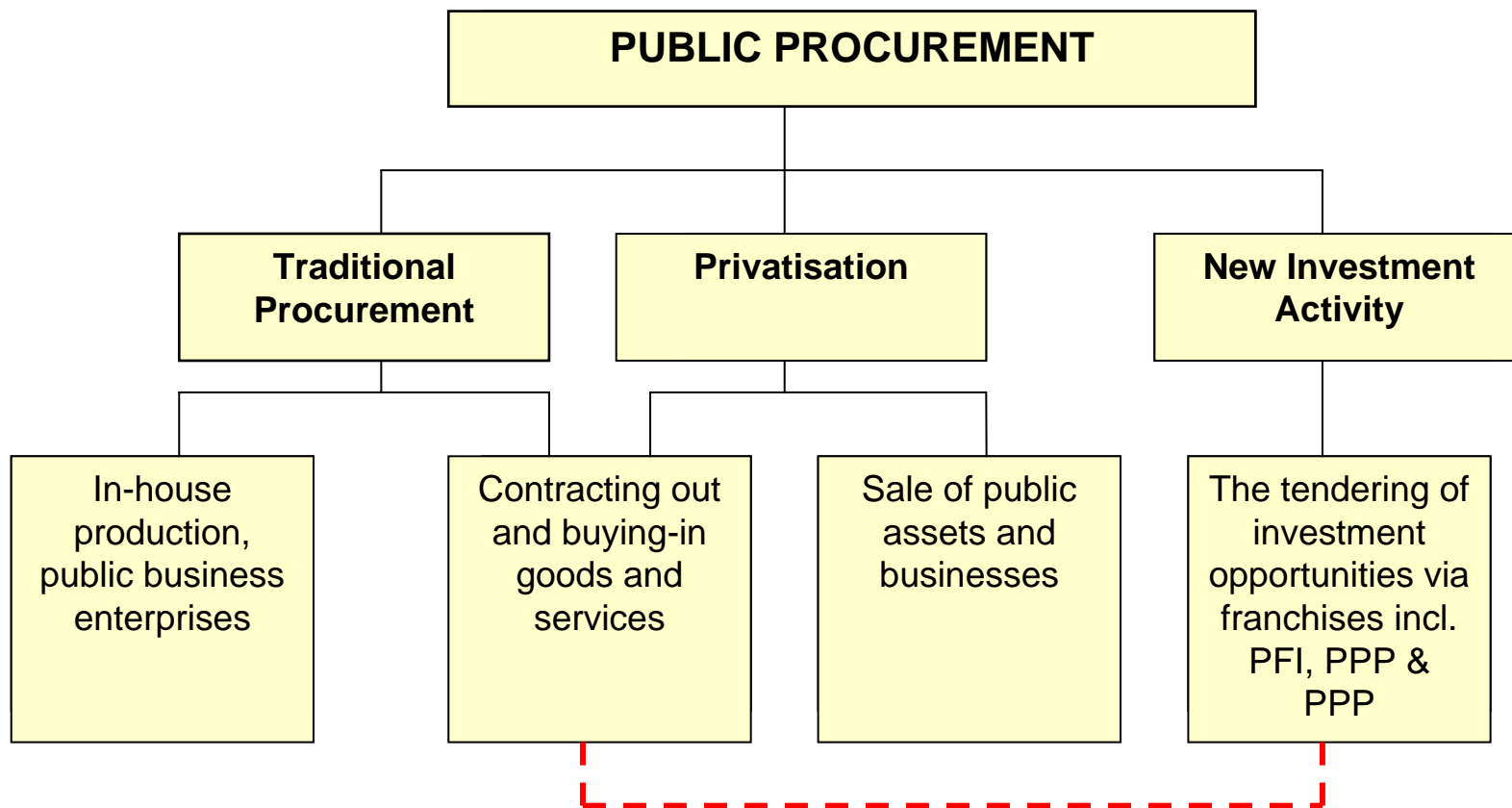
PPPs developed from early outsourcing models for public and quasi-public goods.

An evolutionary model:

- Outsourcing of assets
- Privatisation of the industry or service
- Build own operate (BOO) arrangements

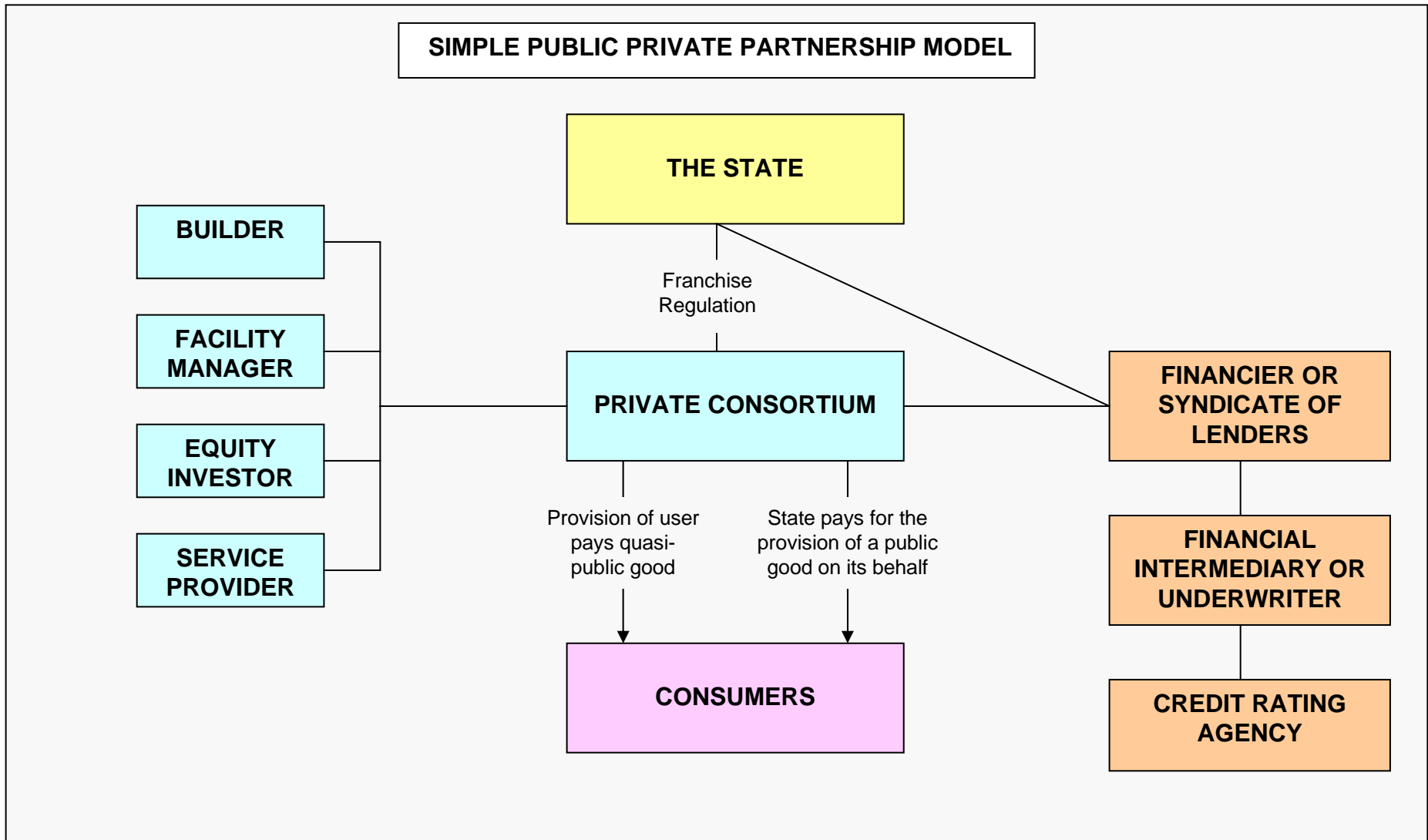
- Build Own Transfer (BOT) projects
- Build Own Operate Transfer (BOOT) & Design Build Finance Operate (DBFO)
- Licences & leases
- Franchises
- Public private partnerships
- Alliance contracts
- Joint ventures.

Where do PPPs sit in the procurement spectrum?



PPP configurations:

- State payment for service delivery
- Franchisee accepts market (revenue) risk under user-pays arrangements
- Shadow tolls – partial market (revenue) risk
- State supported projects – cash, revenue guarantees, “soft” debt, tenure or term.



PPPs require comprehensive policy frameworks:

- Victoria, ACT (Partnerships Victoria)
- New South Wales (Working with Government, Guidelines for Privately Financed Projects or PFPs)
- Queensland (Public Private Partnership program)

Exhibit: Tinsley & Sharpe 2005, Comparative Analysis of Australian PPP Policies in Public Infrastructure Bulletin, number 5.

Why do we use PPPs? What are the benefits?

- A substitute for public capital
- Fiscal sustainability
- The “deadweight” costs of public provision
- Improved procurement outcomes – better value for money (VfM)
- Public choice principles, political economy

- Opportunity cost
- Lifecycle costing and certainty
- Private sector advantage incl. incentivised performance, efficiency & productivity
- Traditional GBE and state procurement performance ...

Disadvantages of PPPs:

- Long-term projects, short-term political cycles, incomplete contracts
- Ex poste performance measurement
- Cost of capital – sovereign ratings may attract lower cost debt
- Transaction cost theory

- Essential services should remain under state control.
- Market imperfections
- Information asymmetry
- Transaction costs
- Agency theory
- The public interest

UK NAO 2003 Report on Prisons PFI.

What project characteristics are suitable for PPPs? Important characteristics:

- Economies of scale
- Capable of financing via market risk
- Complex projects
- Scope for innovation & technology

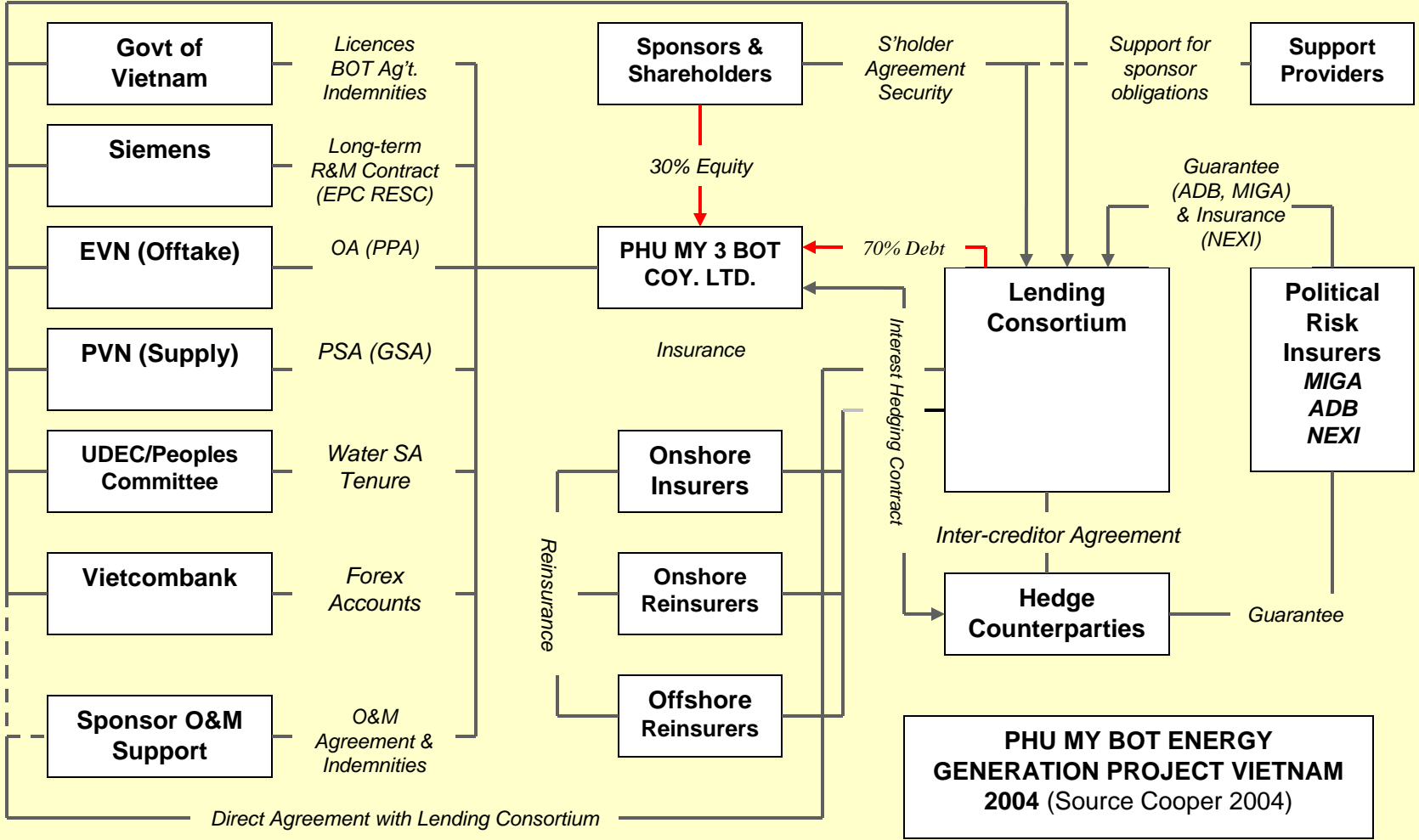
Key considerations:

- Core & non-core services
- Transaction size & bundling
- Effective risk transfer
- Political risk.

PPP Stakeholders

- Sponsor
- The state
- Financiers & agencies
- Facility manager or operator
- Construction company
- Corporate with an industry interest
- Other service providers ...

PPP TRANSACTIONAL STRUCTURE



2. Best Practice PPP Process

A successful PPP program requires three things:

1. Clear and detailed policy frameworks
2. State commitment – Treasury & the line agencies
3. An articulated process that is being continuously improved and modified in light of the lessons learnt.

Partnerships Victoria offers a “best practice” model.

DEVELOPING A PARTNERSHIPS VICTORIA PROJECT



- | | |
|--------------------------------|--|
| 1. Identify the Service Need | Output specification |
| 2. Appraise the Options | Procurement alternatives
Evaluate financial impacts |
| 3. Develop the Business Case | Risk identification
Cost benefit analysis
Commence the PSC |
| 4. Project Development | Commercial principles |
| 5. The Bidding Process | EOI, RfP, Evaluate bids |
| 6. Project Finalisation Review | VFM determination |
| 7. Final Negotiation | Contract, financial close |
| 8. Contract Management | Formalise contract
management, monitor
project delivery |

1. Identifying the service need

- Principles of public sector resource allocation
- Government policy agendas
- Line agency priorities & project ownership
- Skills required: personnel experienced in service contracts

- Central to identifying the service need is the *output* specification.

Early BOOT models featured comprehensive *input* specifications. Little scope for innovation. PPPs feature an output specification with a focus on the service to be delivered avoiding prescriptive solutions or defined inputs.

*Exhibit: UK Audit Commission 2003 Schools PFI;
NSW Auditor General's Report on the First
Schools PFP*

2. Option Appraisal

- Specialisation – agency capabilities
- Cost benefit analysis
- A preliminary PSC model – evaluate the financial impacts, risks & costs
- Network implications – access, pricing, state covenants to limit future competition
- Tenure – leases, licences and contractual arrangements
- PPP or traditional procurement ...

Alternative procurement methods available to the state:

- In-house delivery & management
- Management contracts, sale and lease-back
- Contract out, alliance contracting
- Franchising
- Hybrid forms of contracting
- Asset specification (DBFO models)
- Output specification (PFI, PPPs)

Key issues in early project identification:

- Community consultation
- Inter-agency liaison
- Provincial and central government control
- Project ownership – role of line agencies
- Financial & economic implications
- Public interest.

3. Business case development

- The role of line agencies, provincial & central governments
- Inter-agency consultation
- Develop the PSC – full project modelling & evaluation (*NSW Treasury Guidelines*)
- Inter-agency collaboration & devolution of project control & management
- Commence internal project approval & funding.

4. Project development

- Assemble the resources – steering committee, project director, probity auditor, procurement team
- Develop a project plan & program
- Develop the commercial principles
- Wider consultation.

The Public Sector Comparator (PSC)

A risk-weighted model of traditional procurement. The components:

- Competitive neutrality
- Project specific (unsystematic) risk
- The financial forecast & assumptions
- The discount rate & systematic risk

THE COST OF CAPITAL AND ROLE IN INFRASTRUCTURE FINANCE

COST OF CAPITAL

- Equity (CAPM)
- Debt (cap mkts + credit margin)
- WACC
- **Hurdle rates**
- A measure of risk
- **ACOC, ICOC**

DISCOUNT RATE

- Risk relativities & pricing
- NPV investment analysis & investment valuation
- **Asset valuation**

Systematic risk - the economy-wide risk that applies to all investments. Examples, high inflation, recession, interest rate or energy cost volatility.

Generic risk - the practice of “risk banding” or grouping of like investment risks. Example, PV, CCNCO risk categorisation.

Unsystematic risk - the specific risk that differentiates projects. Subjective and calculated for each project

MARKET RISK PREMIUM

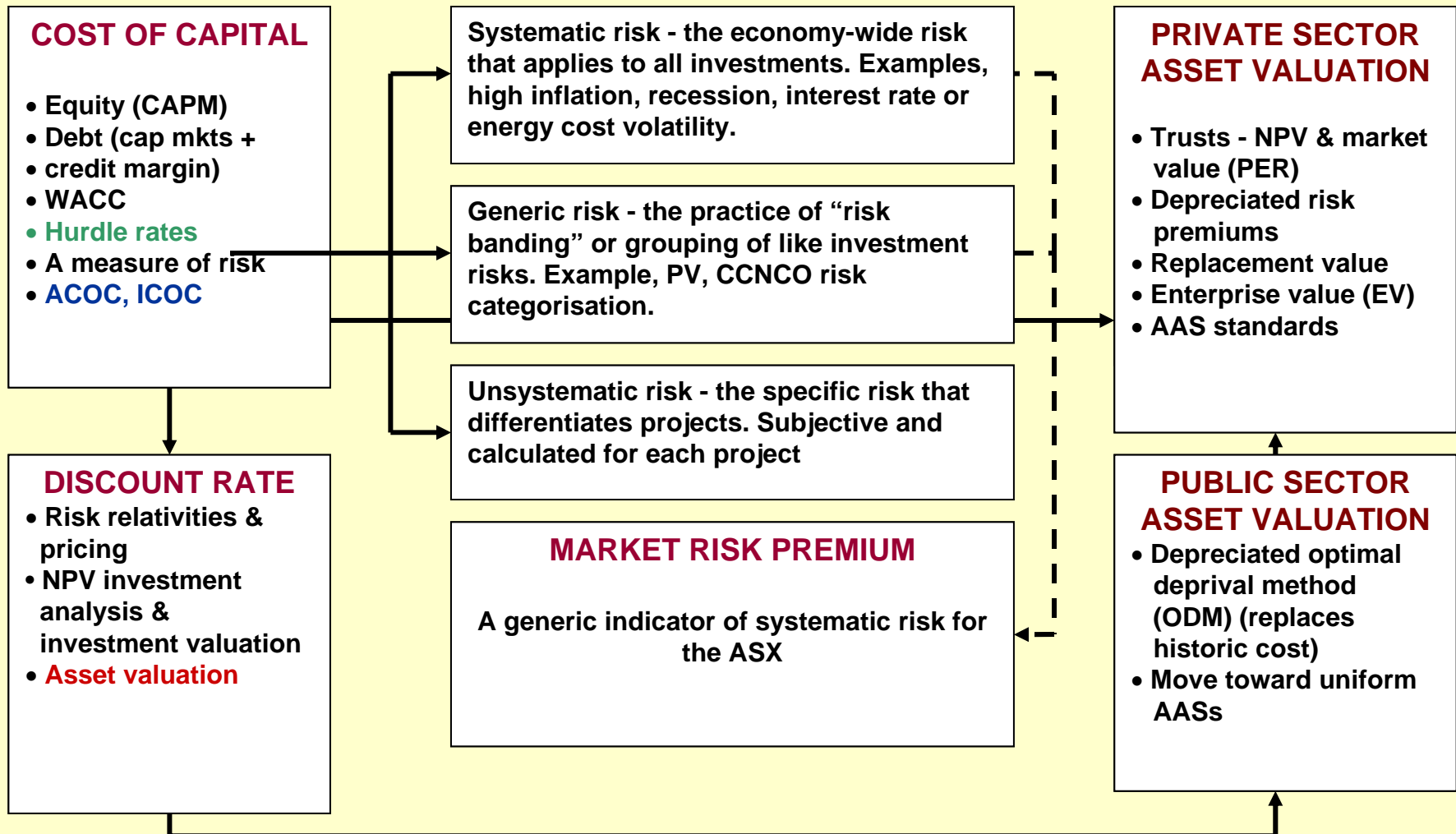
A generic indicator of systematic risk for the ASX

PRIVATE SECTOR ASSET VALUATION

- Trusts - NPV & market value (PER)
- Depreciated risk premiums
- Replacement value
- Enterprise value (EV)
- AAS standards

PUBLIC SECTOR ASSET VALUATION

- Depreciated optimal deprival method (ODM) (replaces historic cost)
- Move toward uniform AASs



5. The bid process (the EOI and RfP)

The priority is a competitive bid process –
market conditions is a major consideration

Competition theory – competition stimulates
innovation, new technology, efficiency at
the enterprise & microeconomic level,
lower prices (value for money).

Alternatives – a solus invitation to negotiate, an offer to incumbents, unsolicited bids, tender panels, auctions and invitations to lodge a bid.

Internal approval for an Expressions of Interest (EOI) – timing, content and scope, response times, deal flow and capacity constraints

Legal liability and due diligence (acceptance of manifestly low bids) *The Southern Cross Station PV Project.*

Key tasks:

- Develop a project brief
- Contract
- Seek approval to issue the project brief
- Conduct clarification sessions
- Evaluate responses & short-list
- Undertake the public interest tests.

Request for tender:

- Response time
- Conforming & non-conforming bids
- Timing & depth of bid market

*Case study: DOI Victoria 2005, The
refranchising of Victoria's public transport
system*

6. Bid evaluation (bid finalisation review)

- Confirm achievement of policy intent
 - Revision of the PSC following receipt of bids
 - Value for money - how are bids compared with the PSC?
 - The role of competitive tension
 - Selection of successful proponent
 - Approvals
-

7. Final negotiation

- Establish the negotiating team
- Set the negotiation framework
- Probity review
- Report to the Minister & Treasurer
- Execute contract
- Financial close
- Trade-offs (exchanging tenure for greater risk absorption & lifecycle maintenance obligations)

8. Contract management

- Formalise management responsibilities (agency responsibilities)
- Monitor project delivery & ex post performance monitoring
- Manage variations
- Agency capabilities & training
- The contract management manual; contract memory *Exhibit: UK NAO 2001-02 Managing the Relationship in PFI Projects*

- The role of incentives
- Disputes – arbitration & mediation, cure periods, step-in rights, penalties & fee abatement mechanisms
- Risk management – a proactive approach, risk cultures
- Political risk.

Reference: PV 2001, Practitioners Guide.

3. Project Evaluation

The proponents (line agency) develops the business case into a full *PSC*.

The techniques:

- Economic appraisal - cost benefit analysis
- Economic impact analysis
- CGE analysis
- The PPP procurement option
- Gateway procurement system.

Cost benefit analysis

CBA is the principal method for the formal analysis of the impact of project-specific investment. It quantifies in money terms, all the costs & benefits of an undertaking.

It is a tool for measuring the likely outcomes of public investment and comparing projects.

Economic impact analysis

Input-output (multiplier) analysis – suitable for regional economies. Measures direct & indirect employment & income inter-industry impacts. It does not take account of opportunity costs and is a poor guide to net economic benefits.

The analysis uses published industry multipliers (eg. US BEA RIMS II model) (*ABS Input-Output Tables*).

Computerised general equilibrium analysis
(CGE)

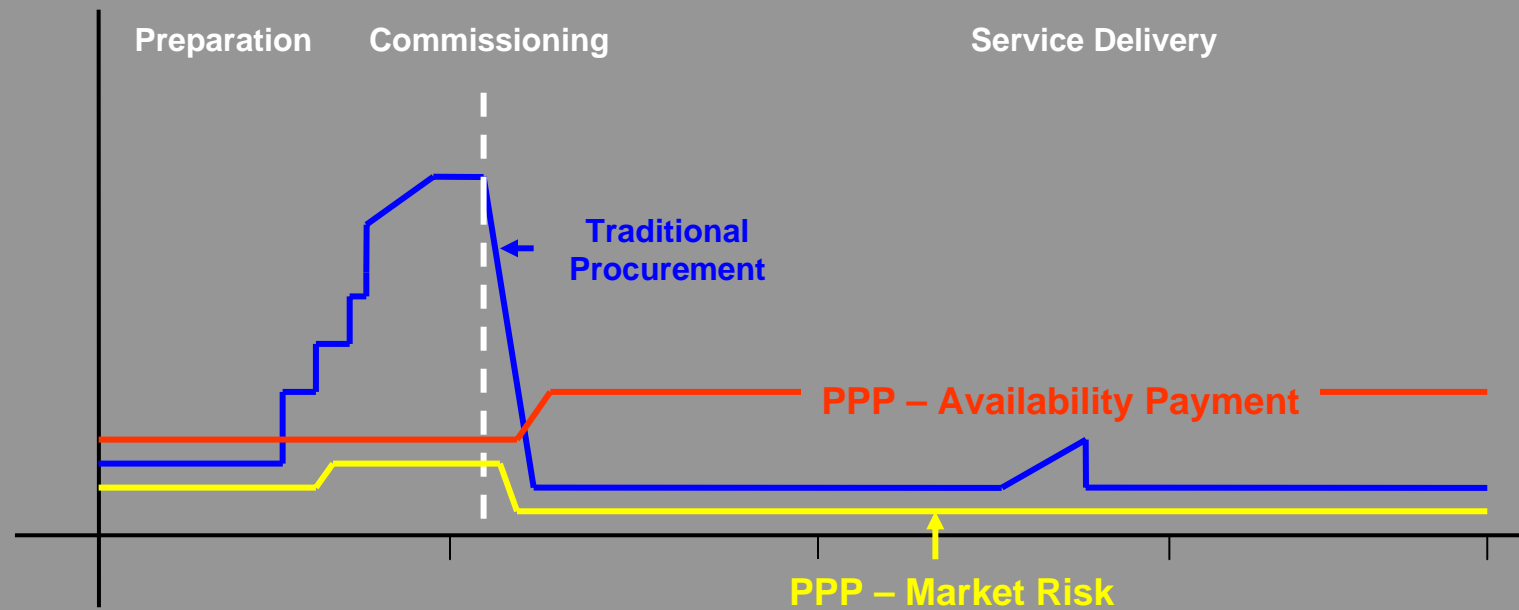
Computable general equilibrium (CGE or
Monash models) – a supply/demand
balance approach to interdependent
structural components of the economy.

The PPP Procurement Option

Based on the difference between the state incurring up-front capital expenditure on assets & services or converting these to a stream of availability payments over time.

The option of a market-risk PPP.

PPP & TRADITIONAL PROCUREMENT
Net Present Value of Payment Streams





The Gateway Procurement System

A procurement system developed in the UK and adopted in several international jurisdictions.

Employs the first 4 gateways in the PPP program for traditionally procured projects. Highly successful because it brings rigour to public procurement management (*UK NAO 2005, Improving public services through better construction 2005*)



TRADITIONAL PROCUREMENT PERFORMANCE United Kingdom 2002-2006

	Performance 1999	Review 2004	Objective 2006
Cost Overrun	73-75%	45%	30%
Late Delivery	66%	37%	27%

SOURCE

NAO 2005 Improving public services through better construction,
Report by the Comptroller and Auditor-General HC 364-1, NAO

4. PPPs in Capital Markets

The advantage of an active capital market:

- Rationality
- Independent pricing
- Efficiency.

A developed and effective capital market assumes institutional frameworks ...

Factors affecting capital market performance:

Institutional Frameworks

Confidence

Depth – insurance, derivatives, futures, debt & equity, hybrids

Foreign exchange – access, exchange rates

FDI rules (imported & exported capital)

Economic liberalisation (*The Economist* 2001, *Economic Liberalisation Index*) ...

INDEX
Developed Economies

USA	1.7
New Zealand	1.7
Australia	1.9
United Kingdom	1.9
Canada	2.0
Japan	2.2
Germany	2.2
Italy	2.3
Spain	2.4
France	2.5
Mexico	3.0

Developing Economies

Hong Kong	1.3
Singapore	1.5
Chile	2.0

Economic management and capital market performance:

- Sound macroeconomic management (fiscal and monetary policy)
- A neutral tax environment
- Effective regulation
- Minimal corruption
- Low inflation
- Recognition of property rights, rule of law
- Stability.

Benefits of Stock Exchange listing:

- Access to capital
- Liquidity
- Mark to market firm valuation
- Discipline.

Downside:

- Disclosure
- Bounded rationality (irrational market movements).



**ASSET CORRELATION MATRIX
ASX PROXY**

	CIR	F Beta	PER	DER	ROA	ROE	EBITDA	PP&E
CIR	0							
F Beta	-0.094	0						
PER	-0.012	-0.020	0					
DER	-0.331	-0.031	-0.135	0				
ROA	0.096	0.028	0.073	-0.149	0			
ROE	-0.057	0.121	-0.359	0.314	0.455	0		
EBITDA	0.256	-0.070	0.078	0.055	-0.061	-0.068	0	
PP&E	0.211	0.035	-0.121	0.022	0.187	0.279	0.094	0

Source Regan 2004

**ASSET CORRELATION MATRIX
INFRASTRUCTURE GROUP**

	CIR	F Beta	PER	DER	ROA	ROE	EBITDA	PP&E
CIR	0							
F Beta	-0.509	0						
PER	0.424	-0.519	0					
DER	-0.220	0.313	-0.342	0				
ROA	0.063	-0.539	0.068	-0.420	0			
ROE	0.626	-0.281	0.154	-0.489	0.106	0		
EBITDA	0.872	-0.693	0.557	-0.313	0.436	0.454	0	
PP&E	-0.340	-0.218	0.052	-0.213	0.177	-0.159	-0.283	0

SOURCE Regan 2004

**ASX INDUSTRY ACCUMULATION INDICES
CORRELATION MATRIX 1995-2001**

	Infra.	Direct Property	LPTs	Dev. & Contractors	Energy	Telecoms	ASX	Transport
Infra.								
Direct Property	-0.516							
LPTs	0.378	-0.479						
Dev & Cont.	0.510	-0.352	0.054					
Energy	0.305	-0.068	0.214	0.01				
Telecoms	-0.013	-0.048	-0.097	0.259	-0.276			
ASX	-0.139	0.038	0.031	0.360	-0.115	0.401		
Transport	0.331	-0.259	0.255	0.465	-0.183	0.044	0.376	

Bold indicates significance at 5% level

SOURCE Regan 2004



Asset class performance on listed markets

Infrastructure is unique because of its low correlation with other asset classes.

Correlation with sector indexes for listed property trusts and builders & contractors. A negative correlation with the ASX, direct property, utilities, energy & telecommunications sector indexes.

INFRASTRUCTURE ASX PERFORMANCE & LEADING ECONOMIC INDICATORS (CONTEMPORANEOUS)



	GDP	IBS2	IBS3	IBS4	Labour Part. Rate	U.S. GDP	CPI	Managed Funds
Infrastructure	-0.059	-0.535	-0.473	-0.353	-0.243	0.124	0.463	-0.261
Developers	-0.094	-0.268	-0.267	-0.198	-0.426	0.604	0.072	0.453
Dir Property	0.095	0.585	0.575	0.575	0.124	-0.367	0.101	-0.067
LPTs	-0.001	-0.575	-0.640	-0.498	0.071	-0.092	-0.298	-0.225
Energy	-0.500	-0.319	0.219	-0.091	-0.268	-0.282	0.043	-0.242
Transport	0.075	-0.449	-0.211	-0.107	-0.053	-0.222	0.141	0.068
ASX All Ords	0.152	0.219	0.194	0.142	-0.117	0.098	-0.213	0.534

NOTES

Bold value denotes significant at the 5% level

SOURCE

Regan 2004, ASX Stock Exchange Journal August 1994, Shares August 1995-2001



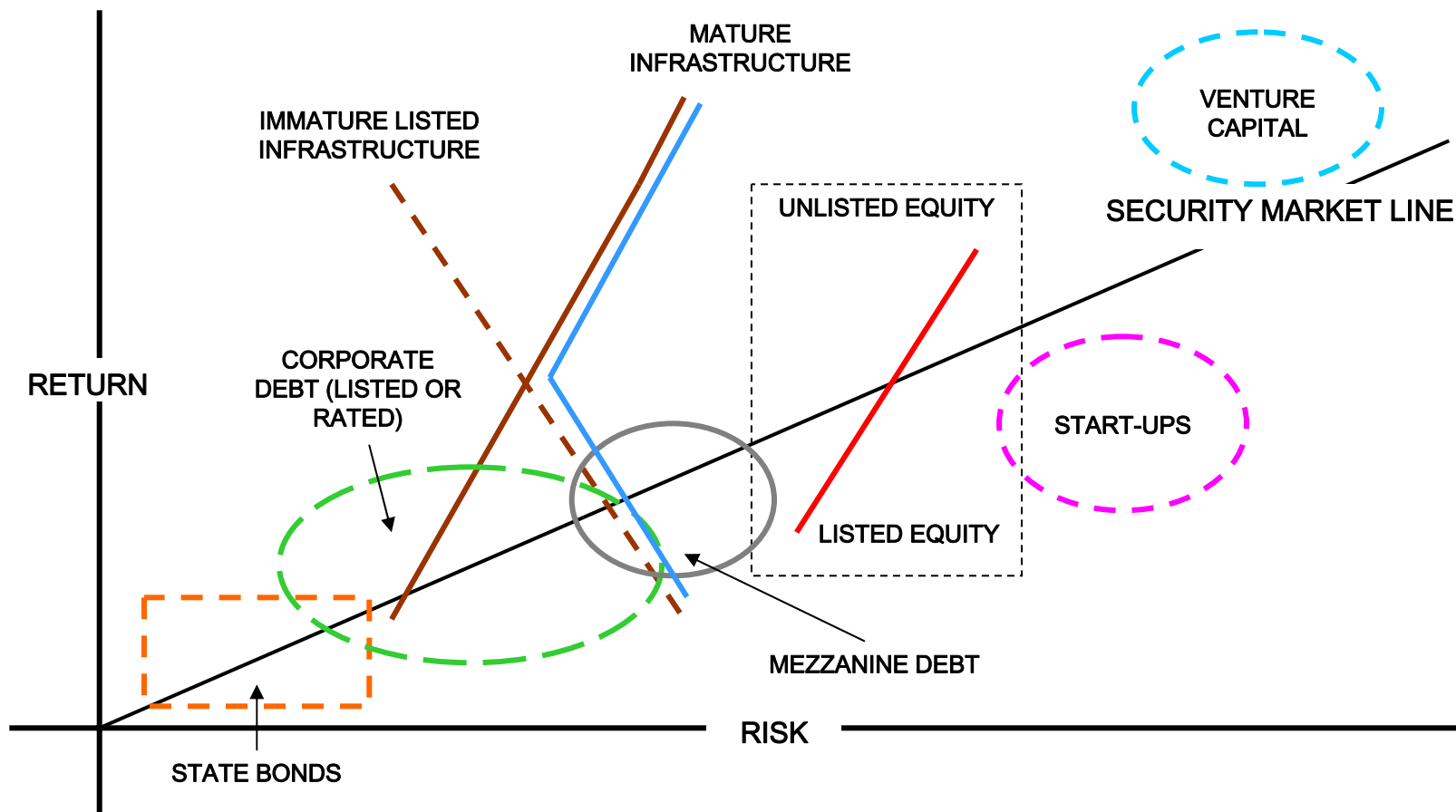
Infrastructure is correlated with short-term interest rates & indexed bonds.

Low return volatility.

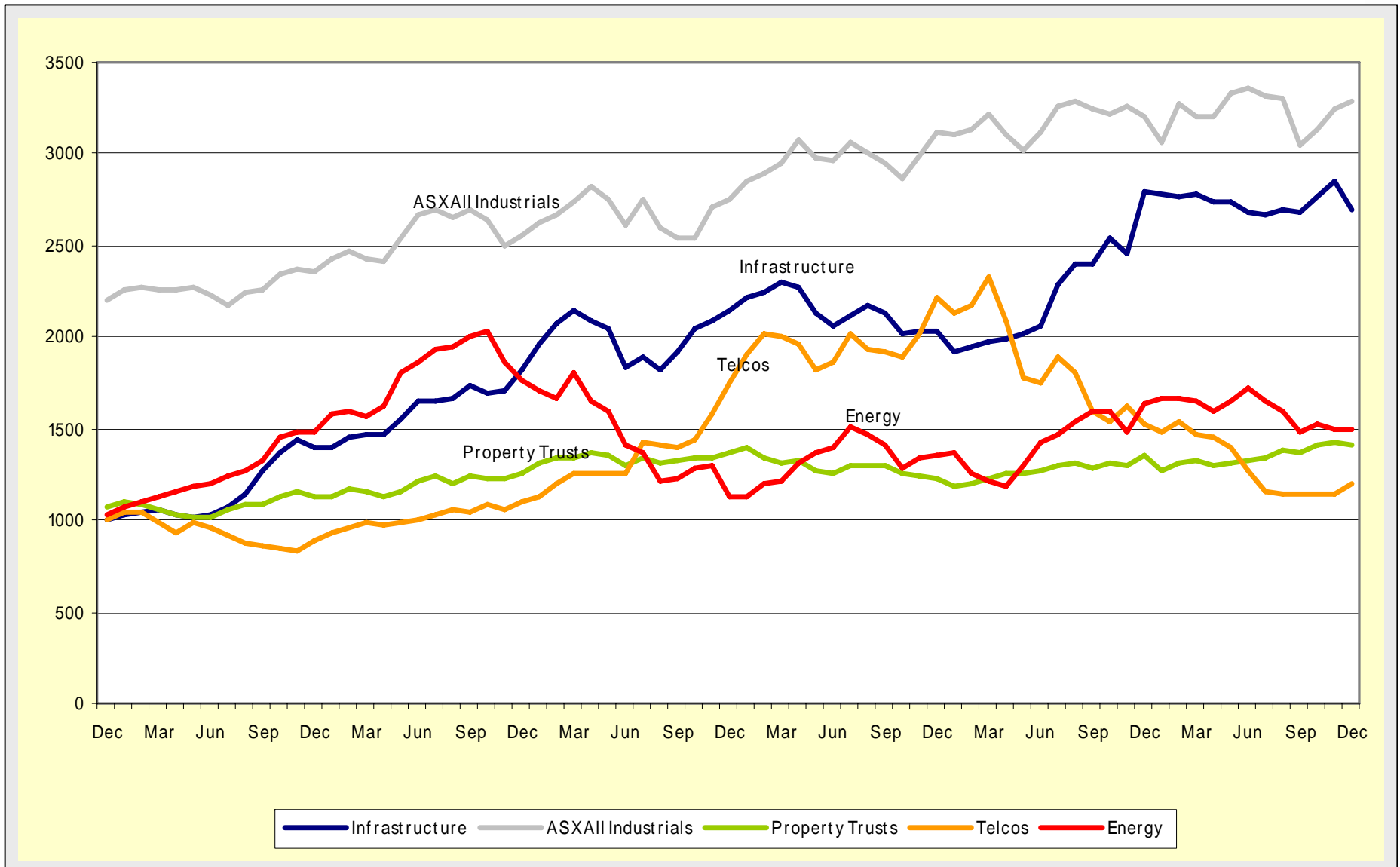
These qualities suggest that it is an excellent diversification tool for mixed-asset portfolios. The long-term investment characteristics provide a good reciprocal match for long-dated liabilities such as superannuation & life assurance policies.

CAPITAL MARKET ASSET PERFORMANCE

Australia 2005



I & U Sector Index - Market Performance



5. Value for money (VFM)

VFM is calculated by comparing a risk-weighted model of traditional procurement (PSC) with competitive private bids.

The PSC is constructed around three elements:

1. The time value of money
2. The most efficient method of providing the defined output
3. The costs + risks associated with the particular procurement (*PV Practitioners Guide 2001, pp. 61f.*)

Financial modelling using discounted cash flow (DCF) methods:

- Assumptions & forecasts
- Values – real or nominal
- Discount rate
- Asset residual value
- Embedded options.

The PSC builds on an agency business case that requires the following investigations & process:

- Project objective
- Scope of the services to be provided including externalities
- Project structure & preferred option
- Risk analysis
- Preliminary costs

- Authorisation and commitment
- Cost benefit analysis
- Market capability & appetite
- Performance measures & payment mechanisms
- Stakeholders – identify impacts
- Employment & local content

The PSC adds:

- A public interest test
- Site issues – networks, access, tenure
- Environmental & planning impacts
- Project timetable & resourcing

PV 2001, Practitioners Guide pp. 20-23.

3. The PSC works well with “vanilla” projects. However, it needs to be adapted to deal with complications such as:

- Non-conforming supplementary bids
- Lower consumer pricing
- Manifest PSC errors or omissions
- Unsolicited bids.

The PSC employs two tests:

A quantitative analysis using the public sector comparator (PSC), a risk-weighted model of traditional procurement (*PV 2001, 2003 Public Sector Comparator Technical Notes*)

A qualitative analysis using the public interest test (*PV 2001 Practitioners Guide; AGV 2005 Review of the ConnectEast PPP*)

First, the quantitative test ...



COMPONENTS OF THE PUBLIC SECTOR COMPARATOR
Source PV Practitioners Guide 2001, pp. 62-63

TRANSFERRED RISK	The value of those risks (from the state's perspective) that are likely to be allocated to private parties under the PPP approach
COMPETITIVE NEUTRALITY	Removes any advantage that accrues from public ownership (ie. tax exemption)
RAW PSC	Provides a base cost for public sector service delivery. The raw PSC excludes any valuation of risks to which the state remains exposed
RETAINED RISK	Value of risks retained by the state



Second, the qualitative (public interest) test

- Effectiveness – specification review
- Accountability & transparency – guidelines and policy (incl. Auditor General requirements)
- Affected individuals & communities – identify affected groups, consultation process, legal requirements

- Equity – can disadvantaged groups use and access the services?
- Public access – are there safeguards to ensure ongoing public access to essential services
- Consumer rights
- Security – community health & safety
- Privacy – adequate protection of user's privacy.

What creates VFM with PPP projects?

- Innovation & technology
- Efficiency (service delivery productivity)
- Incentivised management (*Fitzgerald Review 2004*)
- Risk transfer ...



FITZGERALD REVIEW 2004

Project	Size \$m a	Term Yrs. b	Evaluation
Victorian County Court	195	20	Asset exceeded utility and design criteria
Mobile Data Network	85	5	11% saving against risk-adjusted PSC
Berwick Hospital	115	25	9% saving against risk-adjusted PSC
Docklands Studios	n.a.	20	Entrepreneurial management, technology
Wodonga Wastewater	33	10	Superior technology & operational performance
Echunga Wastewater	51	25	Whole-life operational savings. Early completion
Enviro Altona	20	10	6% saving against risk-adjusted PSC
Spencer Street Station	309	30	Innovative design, improved visual amenity 5% saving against risk-adjusted PSC

NOTES

a NPV of public sector payments over service life

b Options may extend term. Spencer Street & County Court employ 99 year leases.

SOURCE

Fitzgerald 2004

Risk allocation

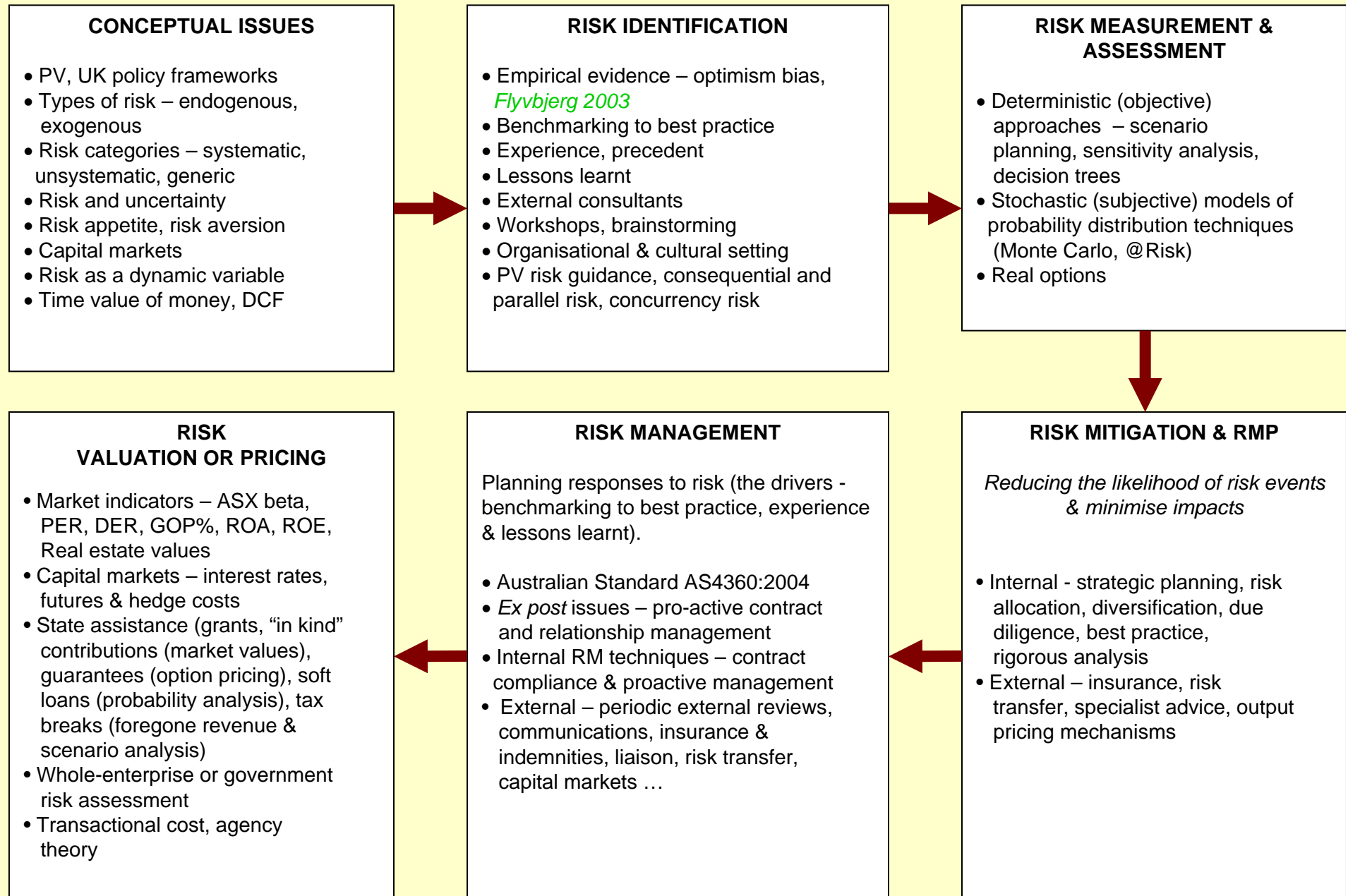
- General principle: risk should be carried by the party in the best position to manage it *at lowest cost*
- Risk allocation nominated in the EOI
- Risk take-back.

6. Risk identification & management

Risk – a key element in the value for money evaluation. There are a series of steps in the risk management process:

1. Identification
2. Measurement
3. Valuation or pricing
4. Management ...

THE RISK MANAGEMENT PROCESS FOR PUBLIC PRIVATE PARTNERSHIPS



Risk and Uncertainty

Risk – the likelihood of an adverse event.

Uncertainty – the fact or condition of not having knowledge about future, adverse events.

Knight (1921) and Keynes (1937) argued that risk and uncertainty were different things. Risk refers to situations where probabilities can be objectively determined. With uncertainty, this is not possible.



RISK AND UNCERTAINTY

RISK

Risk refers to situations where the decision-maker can assign mathematical probabilities to the likelihood of events. Example, the outcome of 100 throws of a dice (Knight 1921)

UNCERTAINTY

Uncertainty refers to situations where randomness cannot be expressed in terms of specific mathematical probabilities. Example, movement in future commodity prices (Keynes 1937)

UNCERTAINTY MERGES WITH RISK

A view that starts with incomplete knowledge of the prior distribution and proceeds with the formation of subjective probabilities updated with the accumulation of information over time over time (Bayes 1763).

Organisational risk appetite

All organisations have an attitude or policy in relation to risk. Government & conservative enterprises are risk averse. Some other enterprises that work daily with certain types of risk have an appetite to absorb & manage it. Other enterprises draw a half-way position – possibly, absorb the risk then outsource it.

Types of risk:

1. Systematic Risk

Risk that is incurred by everyone else in the economy – inflation, political upheaval, interest rates, bad weather, or the government's economic management.

In capital markets, systematic risk is measured using historical market returns and the beta value is an indicator of correlation.



SELECTED BETAS OF AUSTRALIAN INFRASTRUCTURE INDUSTRIES and COMPANIES, 2002

Energy Sector

Alinta Limited	0.22
Australian Energy	0.75
Australian Pipeline	0.18
EDL	0.83
EWC	0.22
Envestra	0.76

Weighted Average 0.49

Airports

BAA	0.49
JAT	0.75
Shanghai	0.61
Frankfurt	0.40
Auckland	0.14
Copenhagen	0.38

Weighted Average 0.51

Transport Sector

Adsteam	0.56
Auckland Airport	0.14
Aust Infra Fund	0.83
Chalmers	0.45
CTI	0.05
Heggies Bulkhaul	0.25
Hills Motorway	0.35
Huadu City	0.41
K & S Corporation	1.01
Macquarie Infra Group	0.23
Patrick Corp	1.24
P & O	0.82
Qantas	0.49
Toll Holdings	1.37
Transurban	0.28
Wridgeways	0.31

Weighted Average 0.58

SOURCE

PricewaterhouseCoopers 2003

2. Unsystematic Risk

Also called idiosyncratic or project risk & it describes specific risks attaching to projects on a case by case basis. Example, site conditions, environmental factors, topography of the land, existing buildings.

Difficult to compare projects because of major differences in local factors – complex or simple design, urban location, networks etc.

PPPs are different between industries, between projects in the same industry.



In finance (portfolio) theory, unsystematic risk is generally excluded because it can be eliminated by diversification.

A developer or investor engaged in a small number of large projects cannot diversify because of the major differences between projects, SAIV/SPV investment structures and the private (unlisted) status of firms.

3. Generic risk

The classification of risk using comparative techniques and objective standards:

- CIR, GOM, ROA, ROE, leverage
- ASX indicators – PER, security prices, betas
- ASX sector indices (energy, utilities etc.)
- Direct comparison with similar projects.



Partnerships Victoria uses a risk-weighted discount rate based on generic industry beta data ...



**RISK-ADJUSTED DISCOUNT RATES FOR
PARTNERSHIPS VICTORIA PROJECTS**



Risk Band	Project Sector & Example Projects	Asset Beta	Real Risk Premium	Real Discount Rate %
Very low	Accommodation and related services Aged care Public housing Hospital facilities Correctional facilities	0.3	1.8	5.5
Low	Water, transport, energy Wastewater treatment Water infrastructure Hospital car parking Hospital energy plant Non-toll roads	0.5	3.0	6.5
Medium	Telecommunications, media and technology Entertainment Telecommunications, IT Knowledge economy	0.9	5.4	9.0

NOTE

Risk premium assumes a market premium of 6%. The real risk premium is calculated as market risk premium x asset beta.

SOURCE

Partnerships Victoria published discount rate schedule January 2005

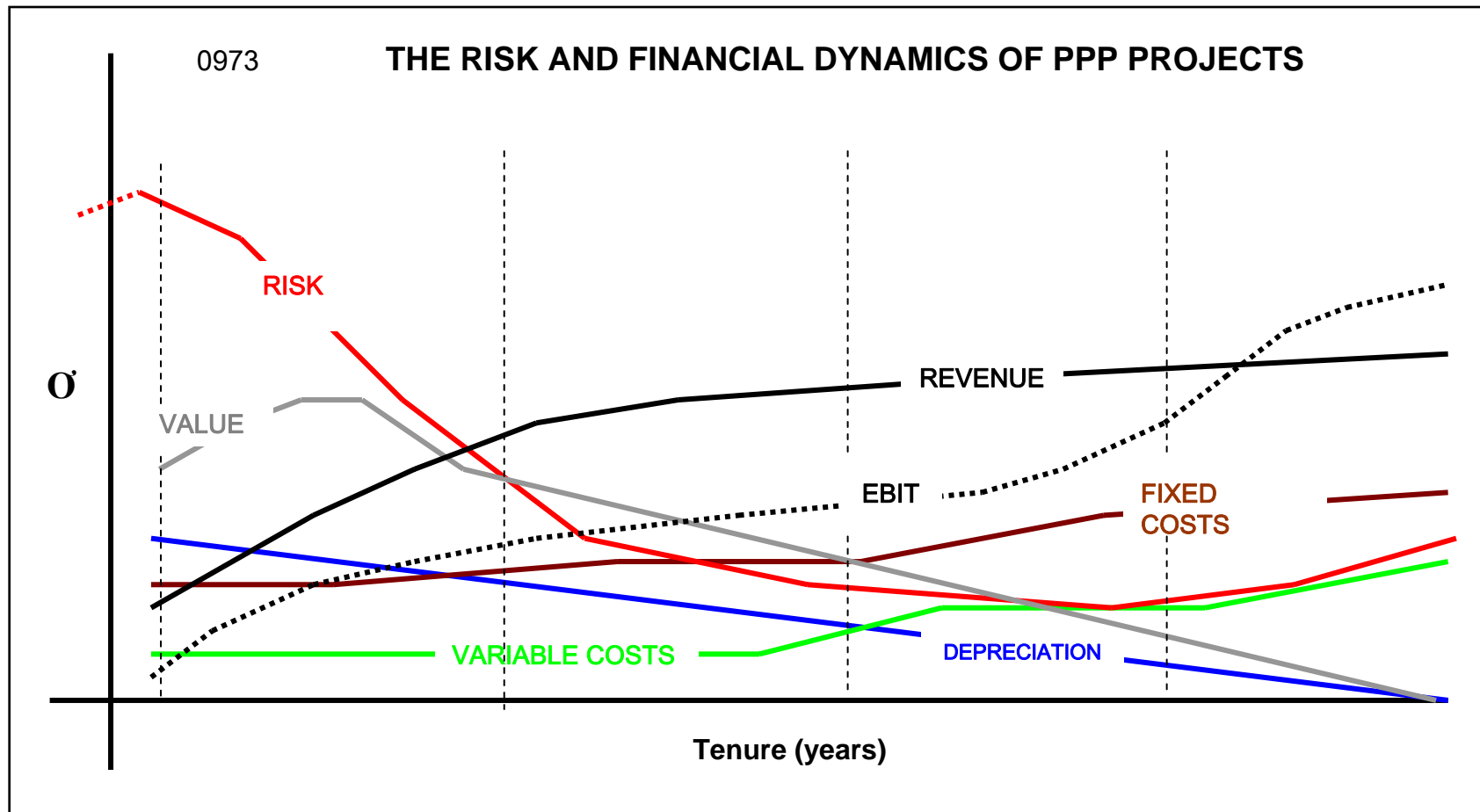
The Dimensions of Risk

Risk as a dynamic variable

Risk is not homogenous – it is different for each of the parties to a long-term project such as a PPP.

Risk affects stakeholders at different times during the life of the project ...

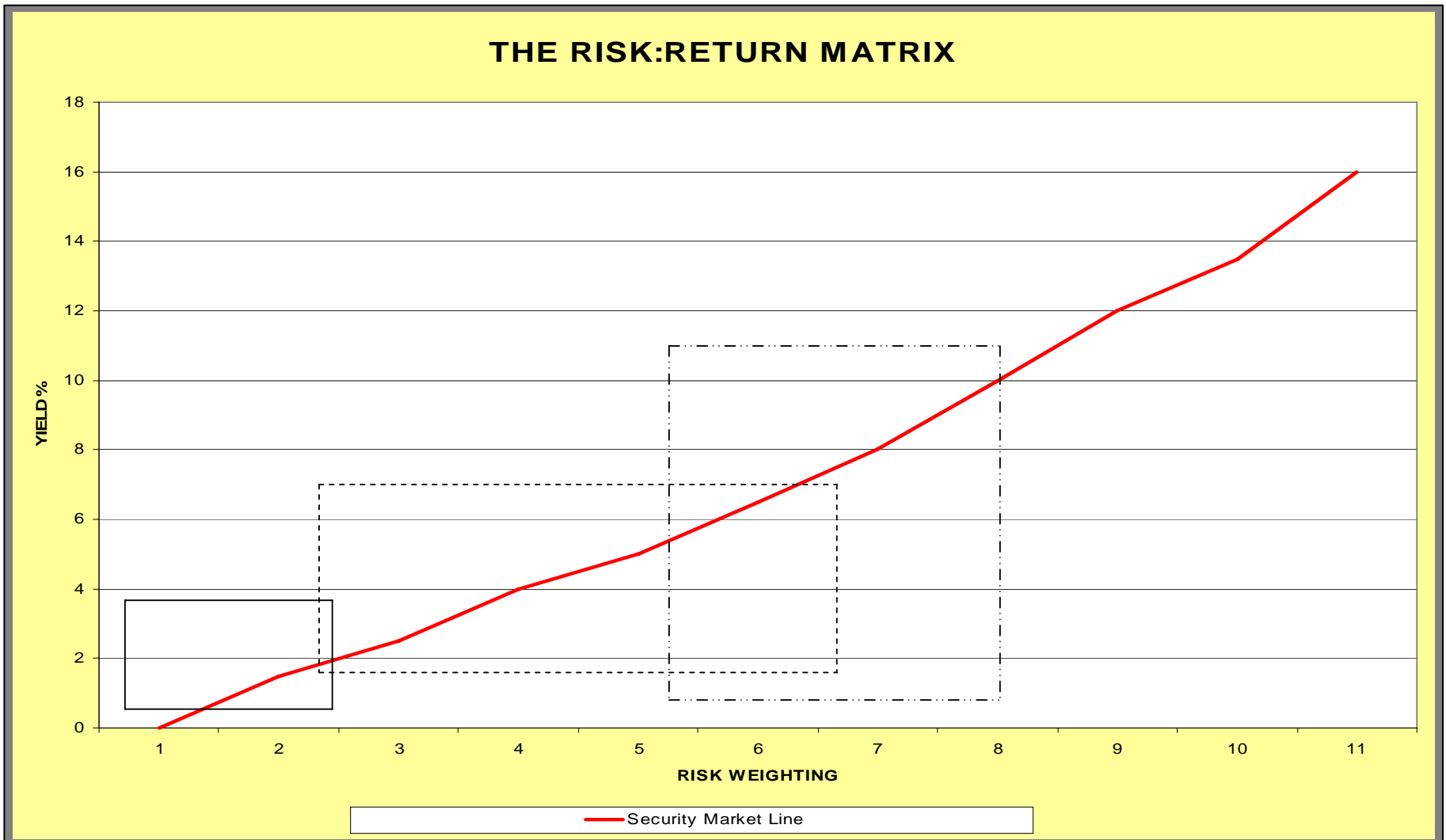




Risk is priced as a premium to the return offered without the risk

Risk is assessed objectively and priced subjectively on a case by case basis. It then forms part of the investor's cost of capital & hurdle rate ...

Risk is correlated with return ...



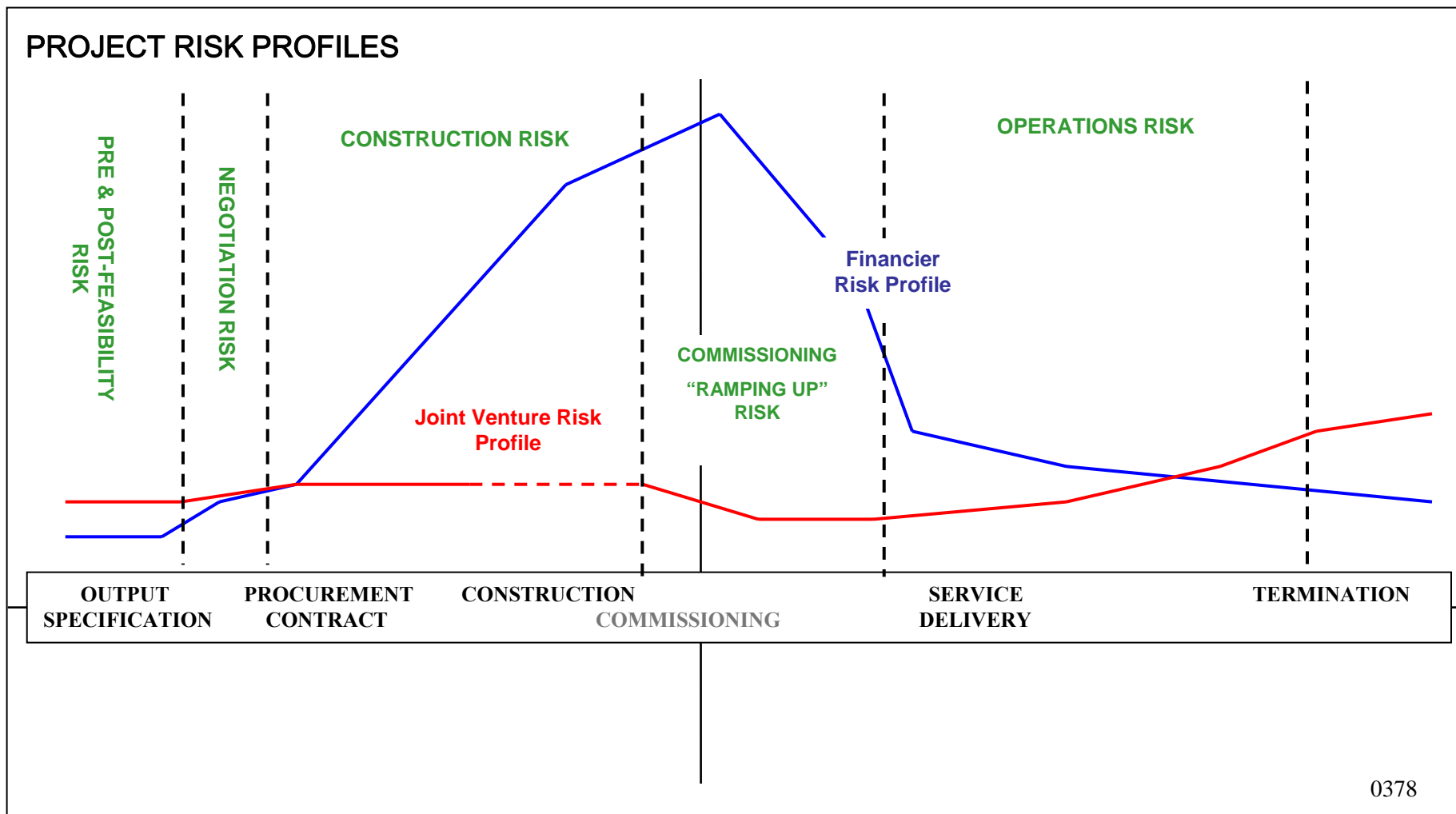
The economic aspects of risk:

Large and complex contracts may be incomplete – information and payoffs are unobservable and future events are unverifiable at the time of contract

(Rahman & Kumaraswamy 2005, p. 365)

Example, output specification cannot be fully specified (embedded options) *(Hart and Moore 1999)*.

RISK IS A DYNAMIC VARIABLE OPERATING WITHIN CLEARLY DEFINED STAGES ...



PPPs feature a high level of *information asymmetry* ...

Information possessed by one side of the market only which creates an advantage or value.
Example, insider trading.

This view of information has also been incorporated into models of industrial organisation and the valuation of public goods.

Is infrastructure investment risky? It is frequently argued that large projects cannot be accurately measured on a cost-benefit basis and governments need to act in the public interest and assume the risk (*BTCE 1996*).

Arguably, the state's exposure to risk is indemnified by taxpayers.

The capacity of public agencies to plan large projects (*NAO Light Rail 2003-04*)

Megaprojects can only succeed with delusion. Flyjvberg argues that large projects are inherently risky and most don't stack up financially when commissioned (*Flyjvberg 2003, p. 46; Davis 2005, p. 19*).

Optimism bias

Cost overruns with megaprojects (av. 75%)

Over-optimistic demand forecasts (av. 45%)

Feasibility error – the rule rather than the exception (*Flyvbjerg et al 2003, p. 43-48*)

Maintenance costs, user benefits

Construction (*Mott McDonald 2002, NAO 2003*)* and IT (*Engle 2005*).

* Note criticism of methodology in Unison 2005.

Reasons for demand prediction failures:

- Sophisticated multivariate modelling techniques available – assumptions are the problem
- Poor data
- Changes in (direct and indirect) demand factors as a result of factors that cannot be explicitly modelled (*Flyvbjerg 2003, pp. 28-30*)
- Management attention span

“ ... the traffic estimates used in decision making for rail infrastructure development are highly, systematically and significantly misleading ... decision makers are well advised to take with a grain of salt any traffic forecast that does not explicitly take into account the risk of being very wrong. For (some projects) ... a grain of salt may not be enough” *(Flyvbjerg 2003, p. 31).*

Other contributing factors:

- Changes in exogenous factors – social and political change, the economy, energy prices (*NAO London Underground 2004*)
- Failure of complimentary policies (*NAO Light Rail 2003-04; Monarto project in Sth. Australia 1977*)
- Promoter forecasting bias (*Flyvbjerg 2003, pp. 28-31*).
- Consultants are not independent ...

1. Risks within the control of the manager (endogenous risk)
 - Relationships with stakeholders
 - Directors
 - Shareholders
 - Creditors
 - Joint venturers
 - The public
 - Contractors, sub-contractors (*Turner 1999, pp. 67, 257*)
 - Project management

Projects need champions

Collective belief: project failure stems from a fervent and widespread belief among managers in the inevitability of their projects ultimate success (*Royer 2005*).

2. Risks beyond control of the manager (exogenous risk) may be predictable or unpredictable:

- Political
- Financial (refinancing, capital markets)
- Force majeure (unexpected events)
- The economy (systematic risk)
- Business cycles

- Natural phenomena
- Project specific
- Due diligence
- Skilled staff
- Judgement (timing and assessment of market signals).

How are we dealing with this?

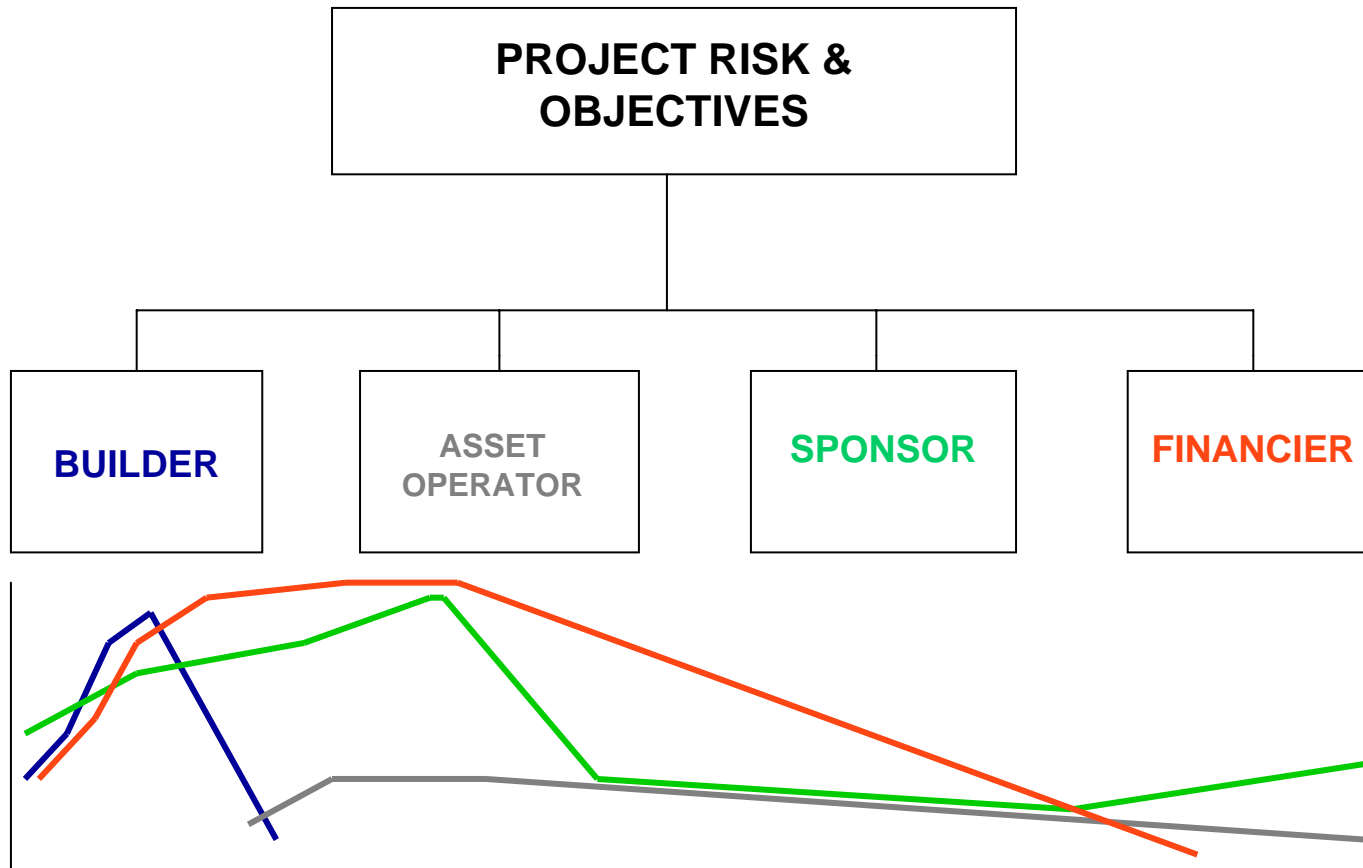
- Lessons learnt (*NAO 2004, Improving Public Transport in England through Light Rail*)
- Wide consultation (retain industry experts)
- Benefit from the experience of consultants (*Cf. Flyjvberg et al 2001*)
- Joint venture with experienced contractors

Specific PPP Project Risks

*(PV Risk Allocation Guidelines 2001,
Appendix A, pp. 178-191)*

1. Corporate risk - conceptual difficulty exists for consortium approaches to large projects:
 - Differences in risk appetite and capacity to absorb and manage risk in-house

- Different corporate approaches to risk management
- Tripartite agreements modify risk burden between the parties
- Highly differentiated enterprise risk profiles



2. Site risks
3. Design, construction & commissioning
4. Market risk
5. Technology
6. Financial risk

7. Operational risk
8. Network and interface risk
9. Industrial relations risk
10. Sovereign and political risk
11. Force majeure
12. Other risks - changes in asset or output specification, asset ownership risk.

7. Risk Pricing

The important role of risk pricing.

A relationship exists between risk and:

- Investment cost of capital (ICOC)
- Discount rates
- Betas
- Price earnings multiples
- Hurdle rates

Asset class characteristics:

- Capital intensity (CIR)
- High level of CSOs
- High sunk costs
- Elements of limited competition
- An essential service/externalities
- Output an input to other industries
- Stable (indexed) revenue stream

- Assets are site and use specific
- Output is regulated
- Distinctive demand characteristics
- Finite tenure, ownership interests
- Long-term investment horizon with well defined revenue “ramping up” stages ...

- A component of complex supply chains
- High levels of vertical integration
- Networked
- Low returns, low risk (low beta)
- Limited role of market economics
(Regan 2005, Infrastructure – The New Asset Class ϵ).

THE FINANCIAL ECONOMICS OF INFRASTRUCTURE ASSETS

Operational Characteristic

Financial Implications

Capital intensive

High plant & equipment content
Technology risk
Low variable costs
High EBITDA %
High levels of debt
Tax transparency, tax benefit transfer

Long-term

Wasting asset
Cash flow of high importance
Stable revenue stream
Importance of accurate forecasting
Lifecycle costing
Output pricing reference point
Input pricing reference point
Capital replacement risk

Operational Characteristic

Financial Implications

Revenue maturity

Low demand price elasticity
Revaluation, refinancing gains

Limited competition

Regulation of output pricing
Revenue stability
Low earnings volatility (beta)
Strong PER

Networked asset

SAIV structure
Access and pricing
Relationship management

Regulated

Limits to "blue sky" returns

Finite tenure

Wasting asset - limited options
Business valuation, exit strategies
Acquisitions - MAIV structure

Essential service

Political risk

State as counter-party

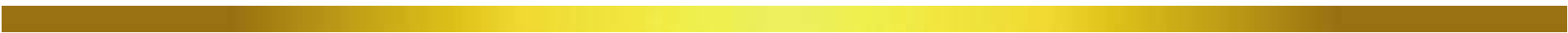
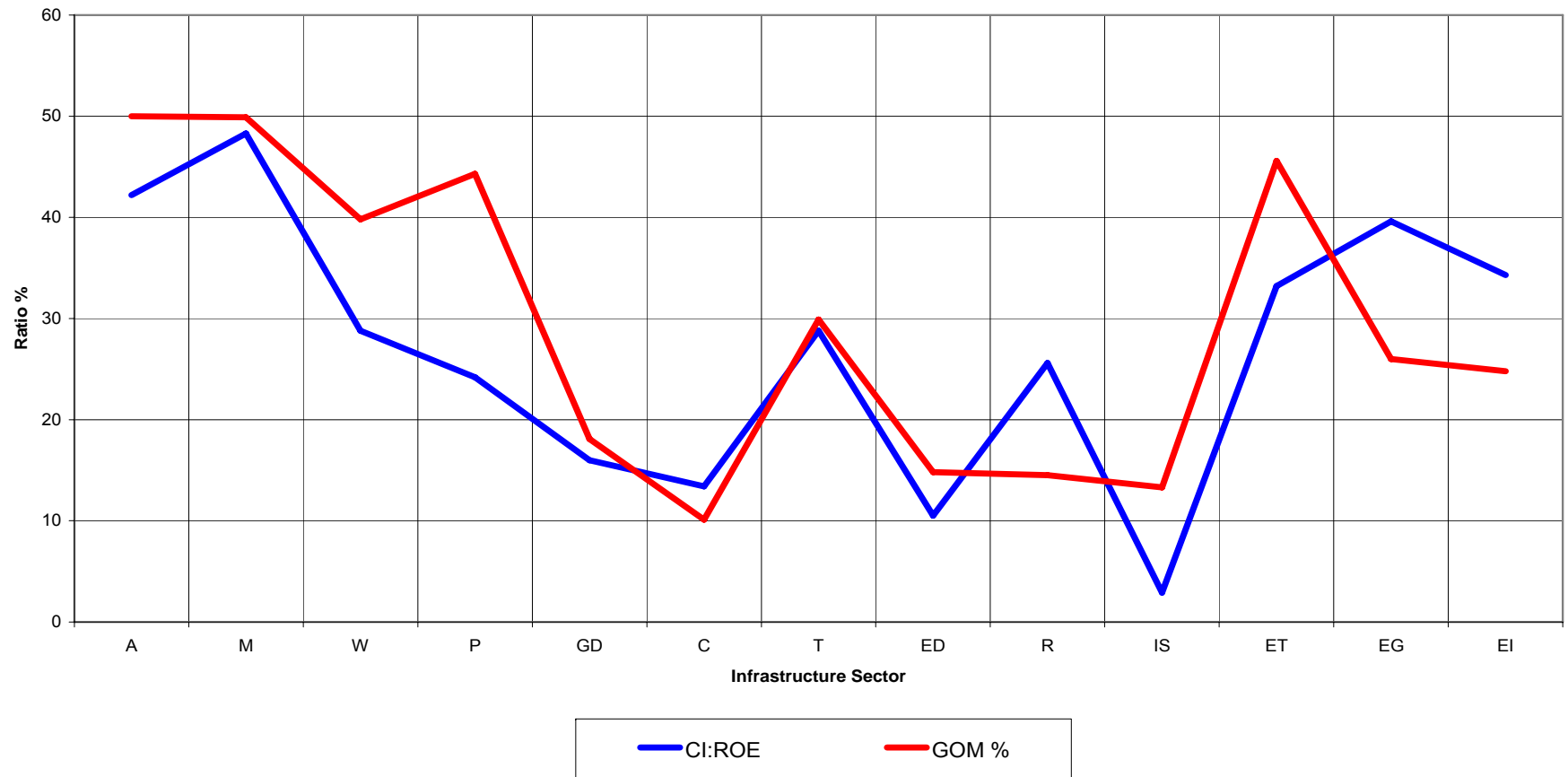
Securitisation options

Regan 2005

Valuing risk: evidence from capital markets

- Price earnings (PE) ratios
- Stock and sector beta
- Share prices
- The security market line
- Yield curve (term structure of interest rates)

CAPITAL INTENSITY & EBITDA % BY INFRASTRUCTURE SECTOR 2002



9. PPP Economics

- Transactional structures
- Liquidity, exit mechanisms
- Capitalisation
- PPP finance
- Asset revaluation
- Embedded options

Reference: Regan 2005, Infrastructure, The New Asset Class. Extract mregan@bond.edu.au.

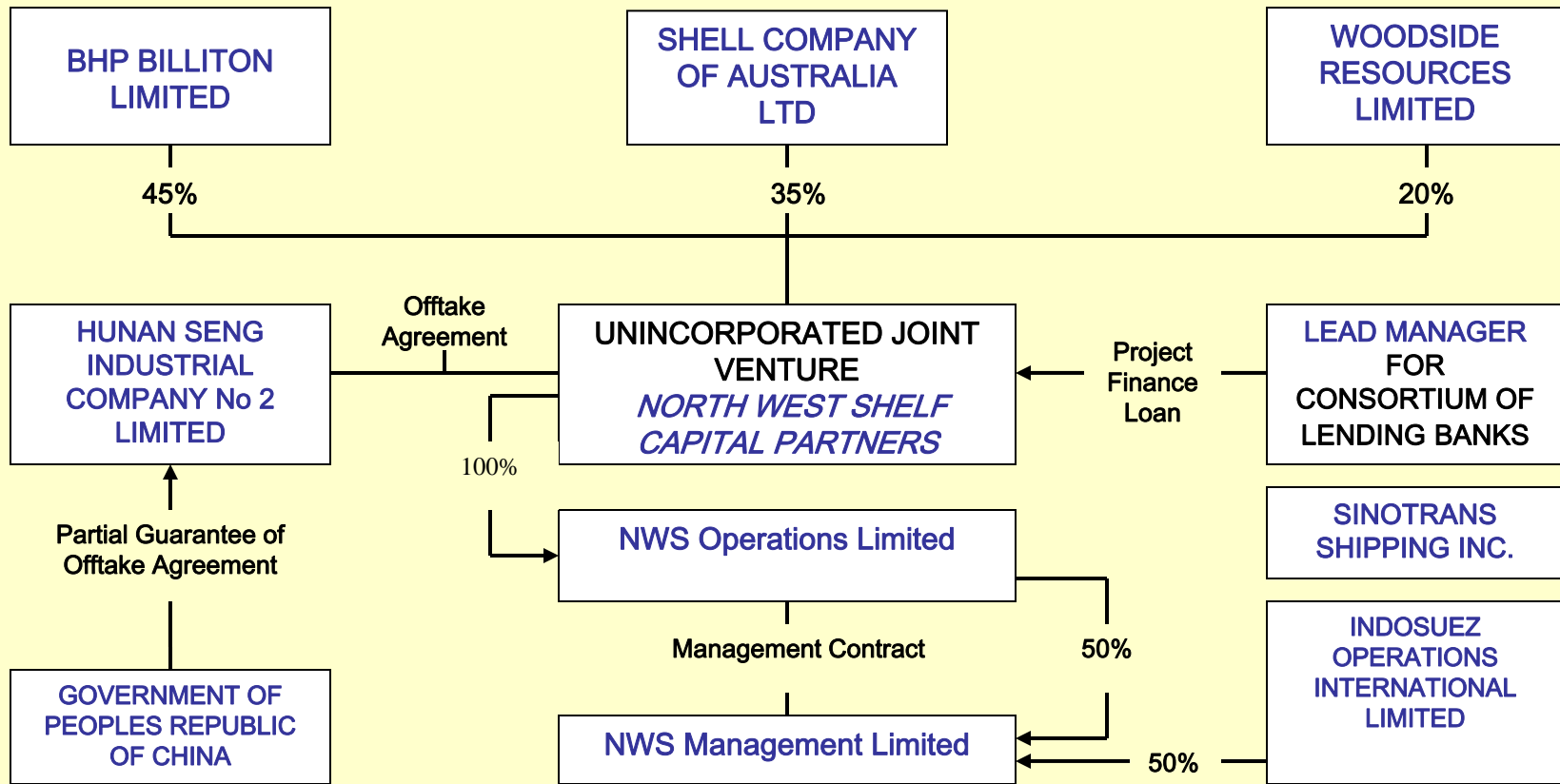


Main transactional structures:

Joint venture vehicle (SPV) unincorporated
joint venture offers tax benefit transfer

Assignment of operations & management to
wholly owned subsidiary provides limited
legal liability.

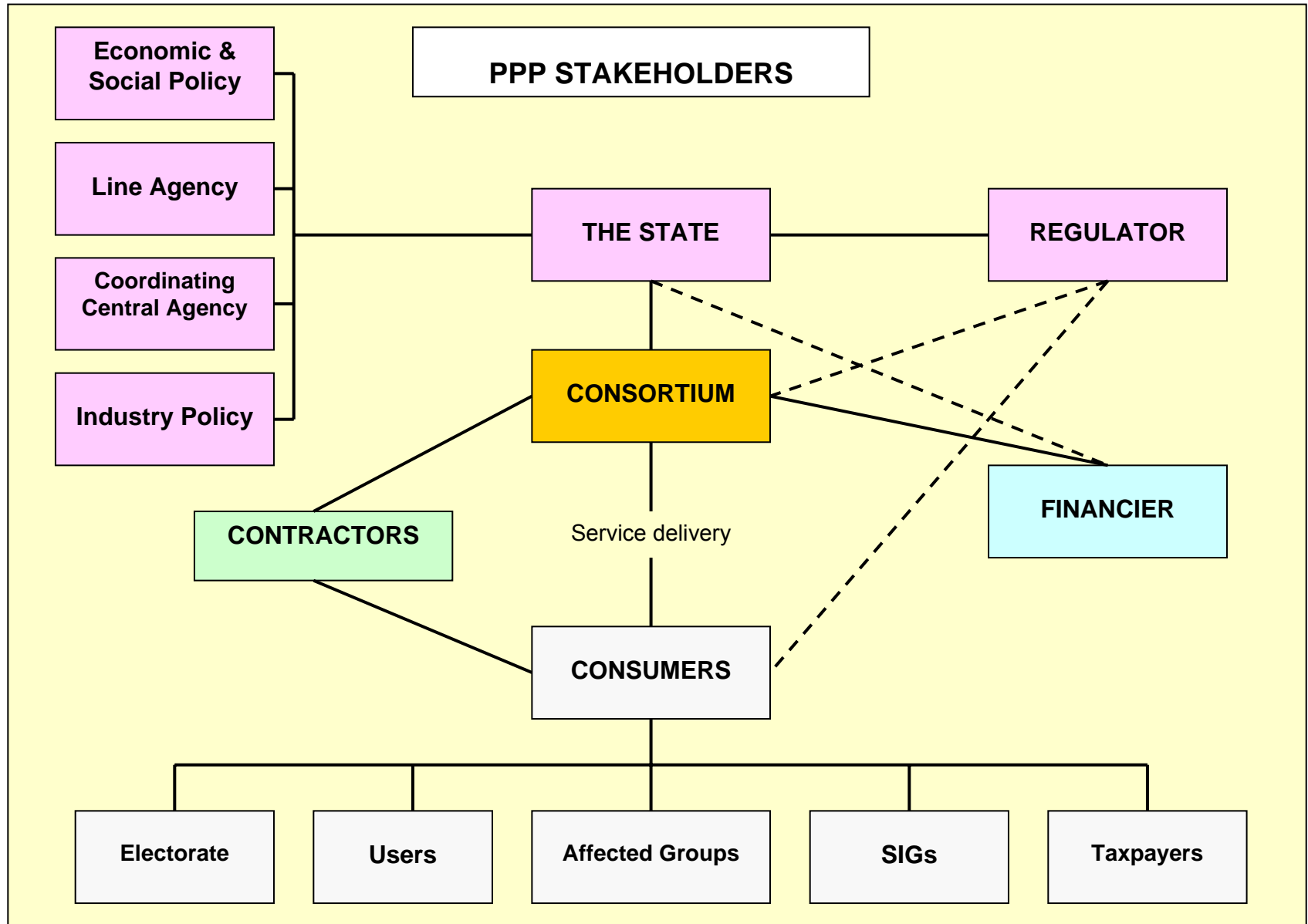
ORGANISATIONAL STRUCTURE FOR RESOURCES PROJECT FINANCE TRANSACTION



Major stakeholders:

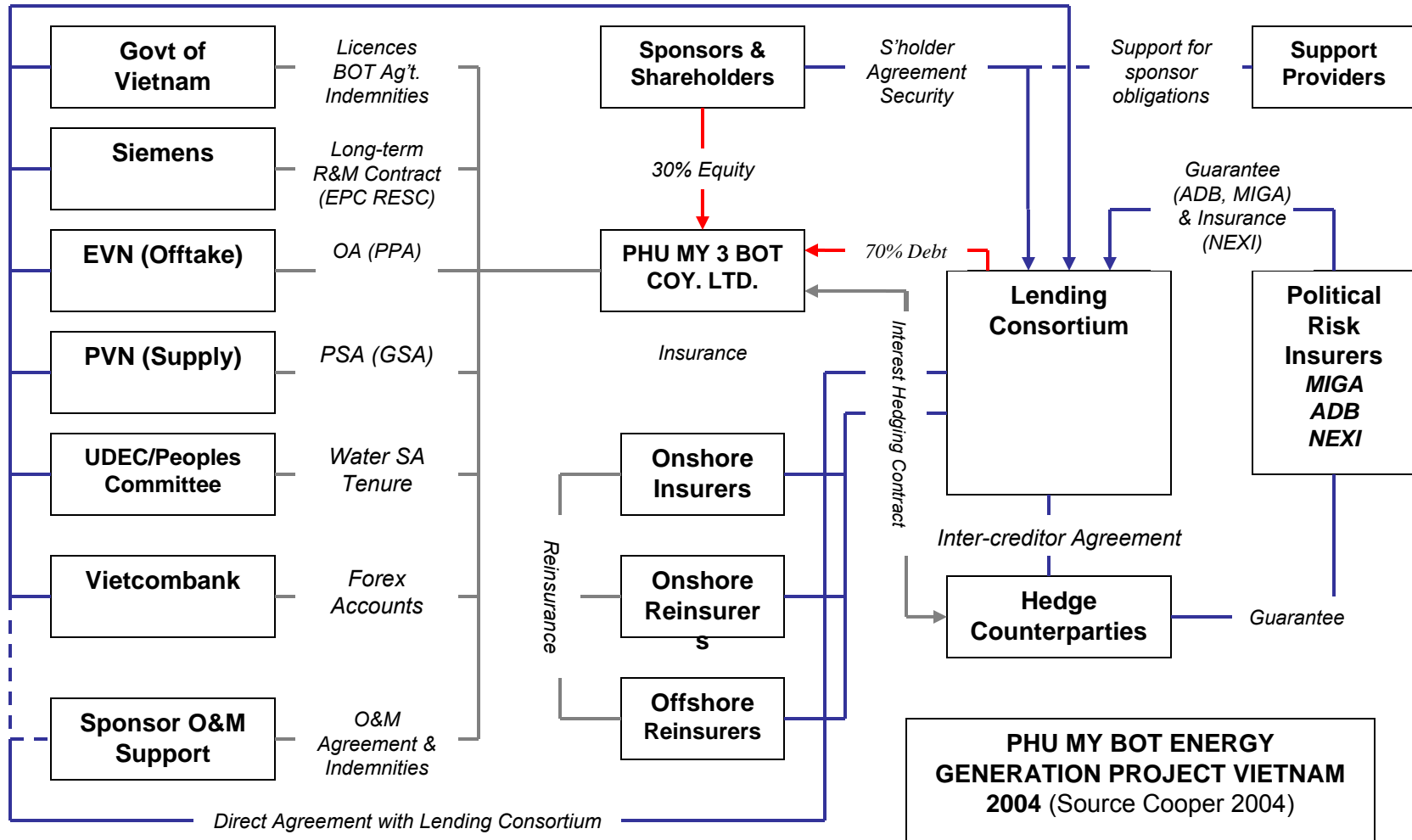
1. The state, state agencies, provincial governments & communities
 2. Sponsors (equity investors with a long-term strategic interest in operations)
 3. Consortium of financiers, security trustee, credit enhancer, rating agency
 4. Buyers (offtake agreement)
-

5. Suppliers (strategic inputs – fuel, transport, access, raw materials)
6. Network distributors (access & pricing)
7. Key contractors - facilities management, plant operations, technology providers
8. Independent or state regulatory authorities – licences, tenure, monitoring & the administration of institutional frameworks
9. Professional advisors.



Additional structuring considerations:

- Third party guarantors
- Risk transfer & mitigation
- Credit rating requirements
- Future IPO
- Tax effectiveness (*Cooper 2004*)
- Financier security arrangements ...



Potential complications:

- Separation of asset ownership & operations (*ConnectEast Prospectus 2004, p. 42; Notes Lecture 11*)
- Captive finance company (*Standard & Poors 2005 Lane Cove Tunnel Finance Company Pty Ltd; Notes Lecture 8*)
- Innovative financing approaches (*Crozer 2004; Notes Lecture 12*)
- Ranking security interests (*Brisbane Airport Corporation AR 2004*).

Embedded options

PPPs are incomplete contracts. A reason for this is embedded options – put or call option arrangements in respect of:

- Changes to the asset or service
- Forseeable events (tollways & new public roads)
Transurban Citylink – Calder Interchange Project
- Financial performance measures
- Franchise extension or renewal.

Finance

PPPs employ modified principles of project & corporate finance

- Project capitalisation – the types of capital, typical leverage
- Lender security
- Debt service coverage ratios, reserves
- The role of credit ratings – investment & non-investment grade projects

1. Capitalisation options:

- Short and medium-term corporate finance
- Public listing of the asset (IPO) using conventional & hybrid security structures
- IPO & stapled securities
- Project finance including annuity bonds ...

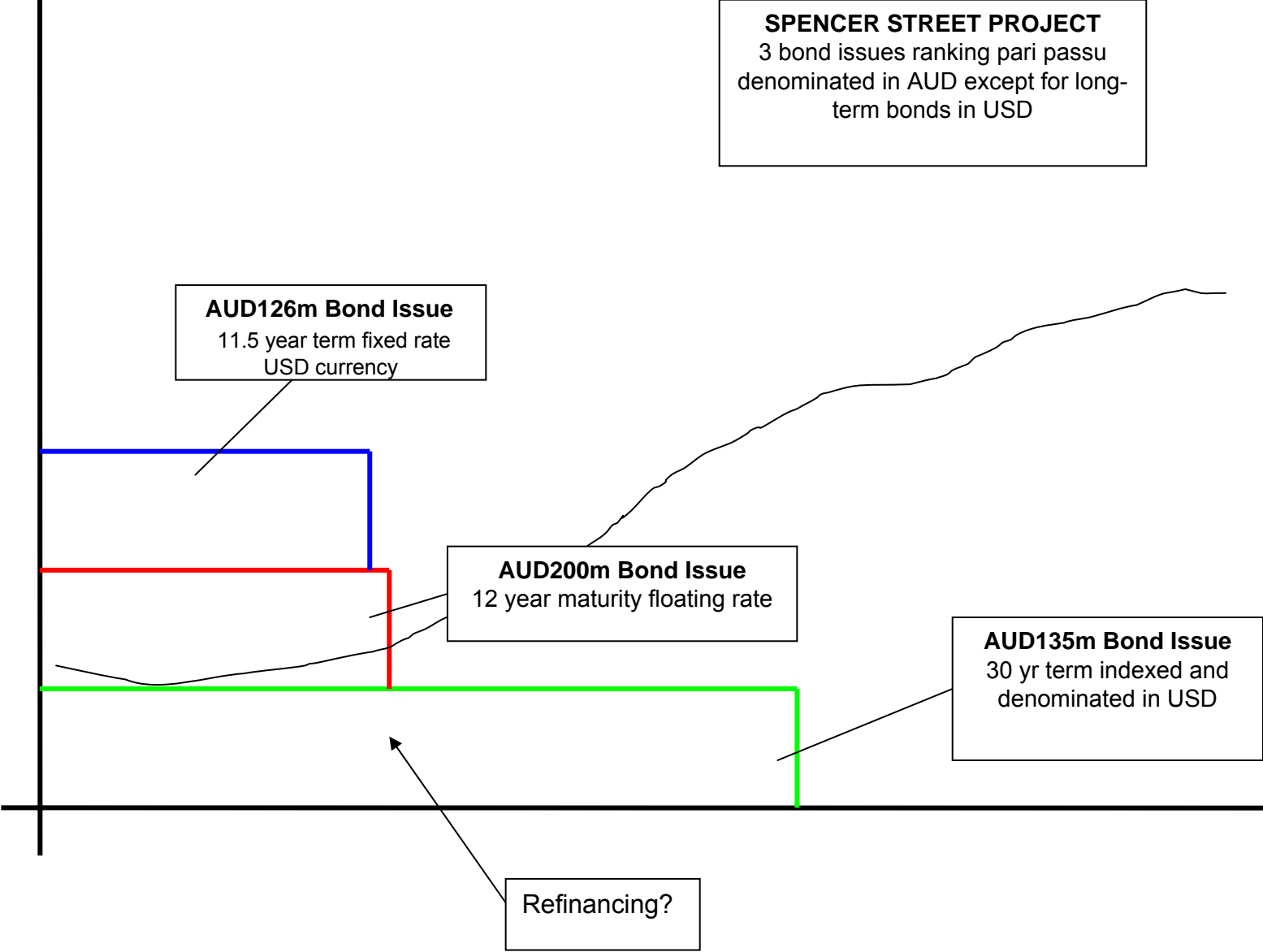


SPENCER STREET PROJECT
3 bond issues ranking pari passu
denominated in AUD except for long-
term bonds in USD

AUD126m Bond Issue
11.5 year term fixed rate
USD currency

AUD200m Bond Issue
12 year maturity floating rate

AUD135m Bond Issue
30 yr term indexed and
denominated in USD



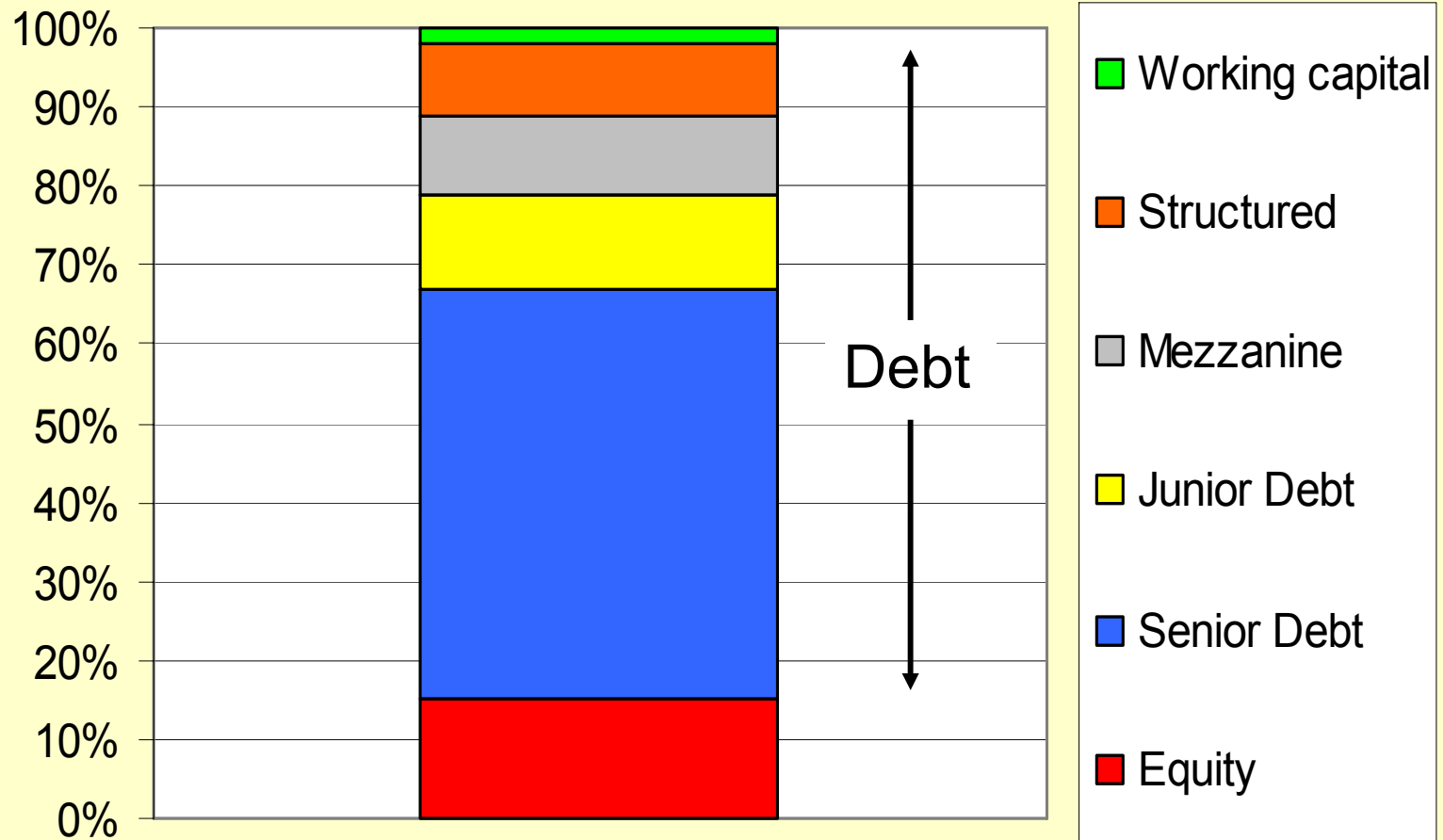
Refinancing?



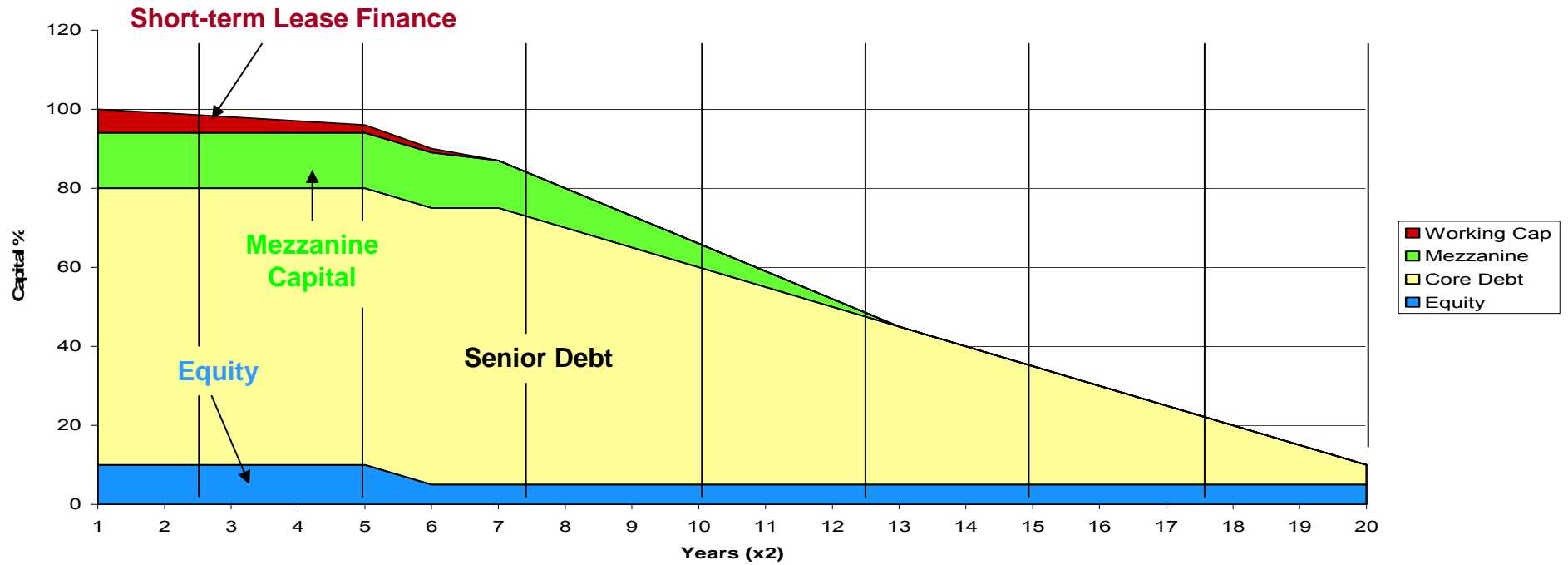
2. Capitalisation practice:

- PPPs are highly leveraged
- Senior & subordinated debt
- Annuity bonds or syndicated project finance
- Equity contribution 15-25%
- Leveraged & cross-border leases.

TYPICAL PROJECT FINANCE CAPITAL STRUCTURE



PPP CAPITALISATION



3. Financing terms

- Security – generally limited recourse
- Debt service coverage ratio range x1.25
- Role of institutional investors (fund managers, life companies) – passive, long-term and excellent match of liabilities & assets (asset class performance \ominus)
- Term – initially short-term to facilitate early revaluation, refinancing & asset sale ...



4. Credit Ratings

Credit ratings are “compliance certificates” issued by independent rating specialists. A credit rating to investment grade or above has two effects:

- It reduced the cost of debt
- It broadens the potential investors to include fund managers & institutions.

Credit ratings are an important risk management tool for the state & investors.



- Standard & Poor's
- Fitch Ratings
- Moody's Investor Services

Independent review of the risk of default under loan commitments.

Average underlying credit rating of BBB for PPP projects 1992-2004 suggesting <5% default rate. No defaults on rated projects under surveillance (*Standard & Poors 2004*).



LONG-TERM OBLIGATIONS CREDIT RATING SCALE

Moody's Standard & Poors

Aaa	AAA	Extremely strong credit capacity
Aa1-3	AA	Very strong credit capacity
A1-A3	A	Susceptible to adverse affects of changed circumstances
Baa1-3	BBB	Adequate protection perameters
Ba1-3	BB	Significant speculative characteristics - to the least degree
B1-3	B	Significant speculative characteristics
Caa-C	C	Significant speculative characteristics - to the greatest degree

CORPORATE BOND RATES June, 2005

%	Corporate Bonds			Spread Over Commonwealth Bonds		
	AAA	AA	A	AAA	AA	A
30 June						
2002	5.70	5.95	6.18	0.24	0.42	0.65
2003	4.93	4.83	5.05	0.38	0.35	0.61
2004	5.96	5.99	6.12	0.50	0.51	0.69
2005	5.60	5.67	5.81	0.48	0.56	0.69

SOURCE

Reserve Bank of Australia, Statistical Tables, F3 Capital Market Yields & Spreads, Non-Government Instruments

5. Other financial aspects:

- Indemnities & guarantees
- Financial intermediation
- Credit enhancement (or credit “wrapping”)
- Securitisation (e Session 14)
- Default rates (*References: Standard & Poor’s 2006; Erturk & Gillis 2004 (from mregan@bond.edu.au).*)

- Project finance default rates 1995-2004:
Investment Grade <0.1%
Speculative Grade 2.69%
Non-rated 4.7% (*Erturk & Gillis 2004*)
- No default on credit-rated PPP projects (*Standard & Poors 2004, 2005*). Immature capital market with extensive asset mobility.

6. Financial risk

- Interest rates
- Currency
- Debt service capacity
- Indexation of revenues & costs (matching)
- Concurrency risk ...

7. Investment Economics

Three perspectives on the holding term:

1. A development approach
2. An investment approach
3. Economic life of the asset.

Interventions:

1. Change in consortium composition
2. Underperforming investment
3. Sovereign risk.

7.1 A development approach

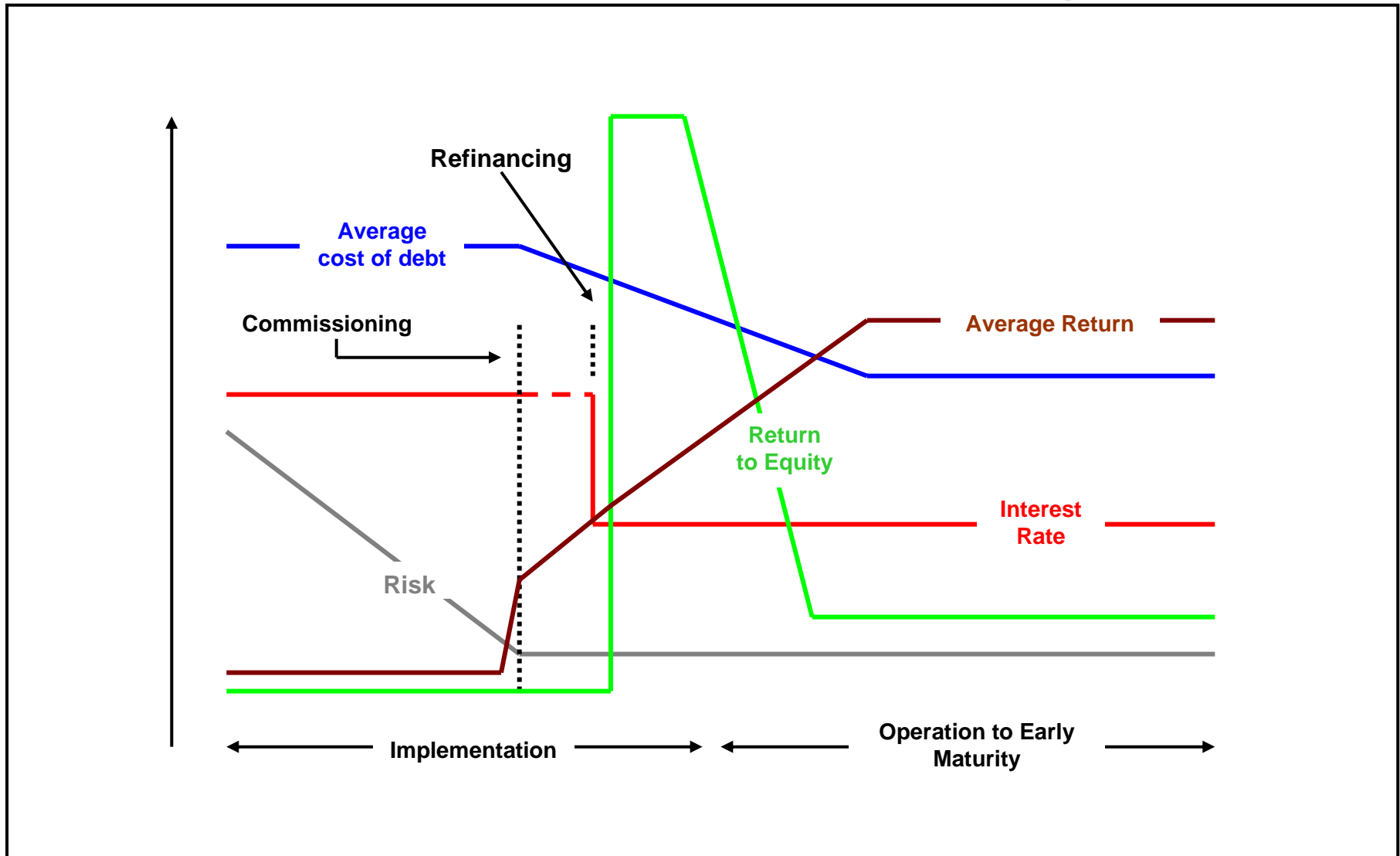
Manage early stage risk

Take advantage of capital growth first 5-7 years

Exit after finalising the value add process – asset revaluation and refinancing

Optimal tenure linked to asset valuation and investor appetite for sectoral risk

Maturity of debt facilities, credit rating issues.



7.2 A long-term investment approach

To fully amortise matching long-term liabilities or achieve robust long-term yield to maturity

Asset class characteristics critical – low return volatility, stable revenue growth, low cost structures

Tenure range generally 20-35 years.

7.3 An economic life approach

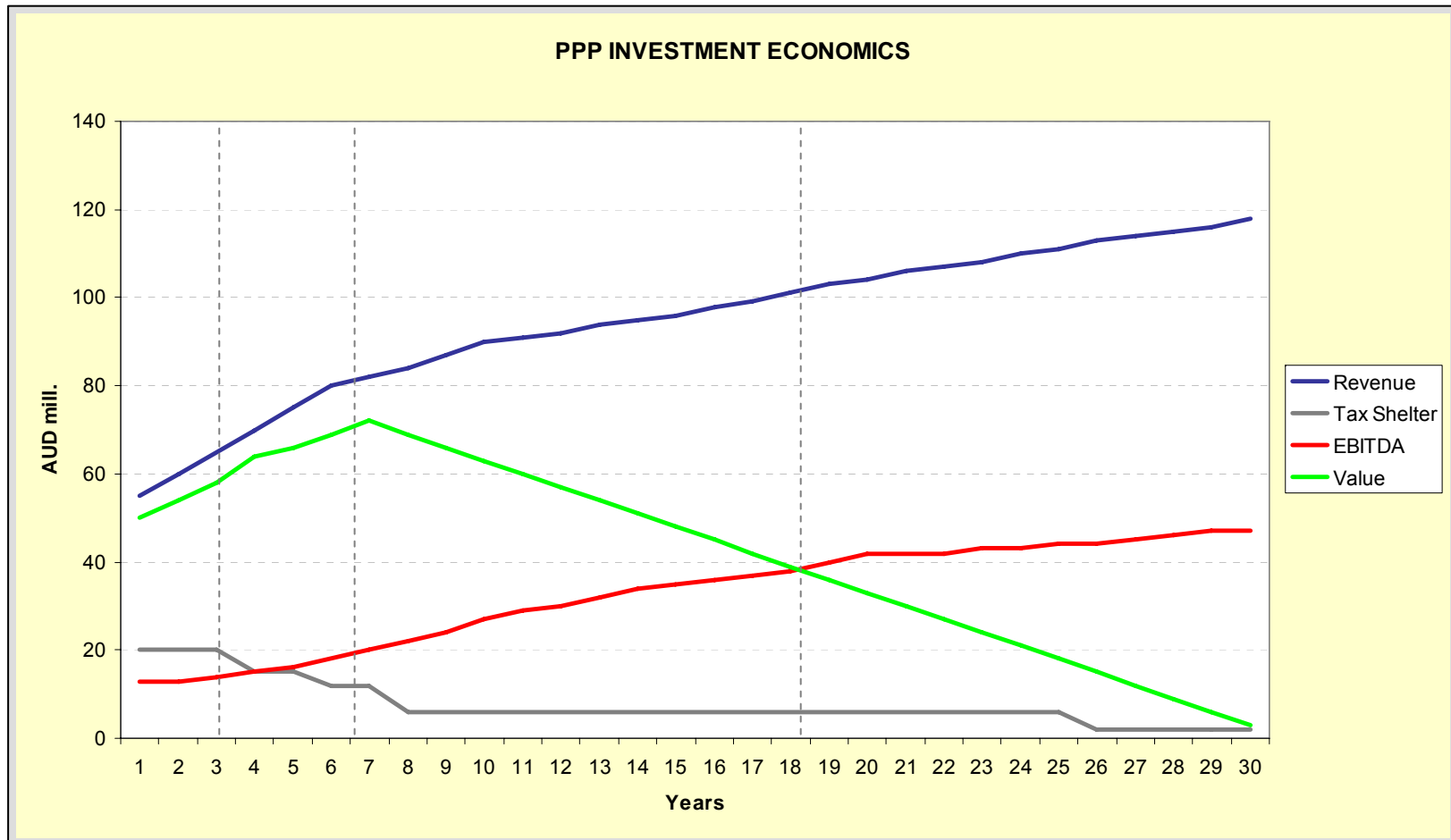
Consortium bids, PPPs, asset managers

Asset lifecycle economics – real
depreciation, lifecycle maintenance and
repairs

Surrender reinstatement obligations

Recognition of “wasting asset” principles

Role of tax depreciation and leverage
(enhances post-tax ROE).

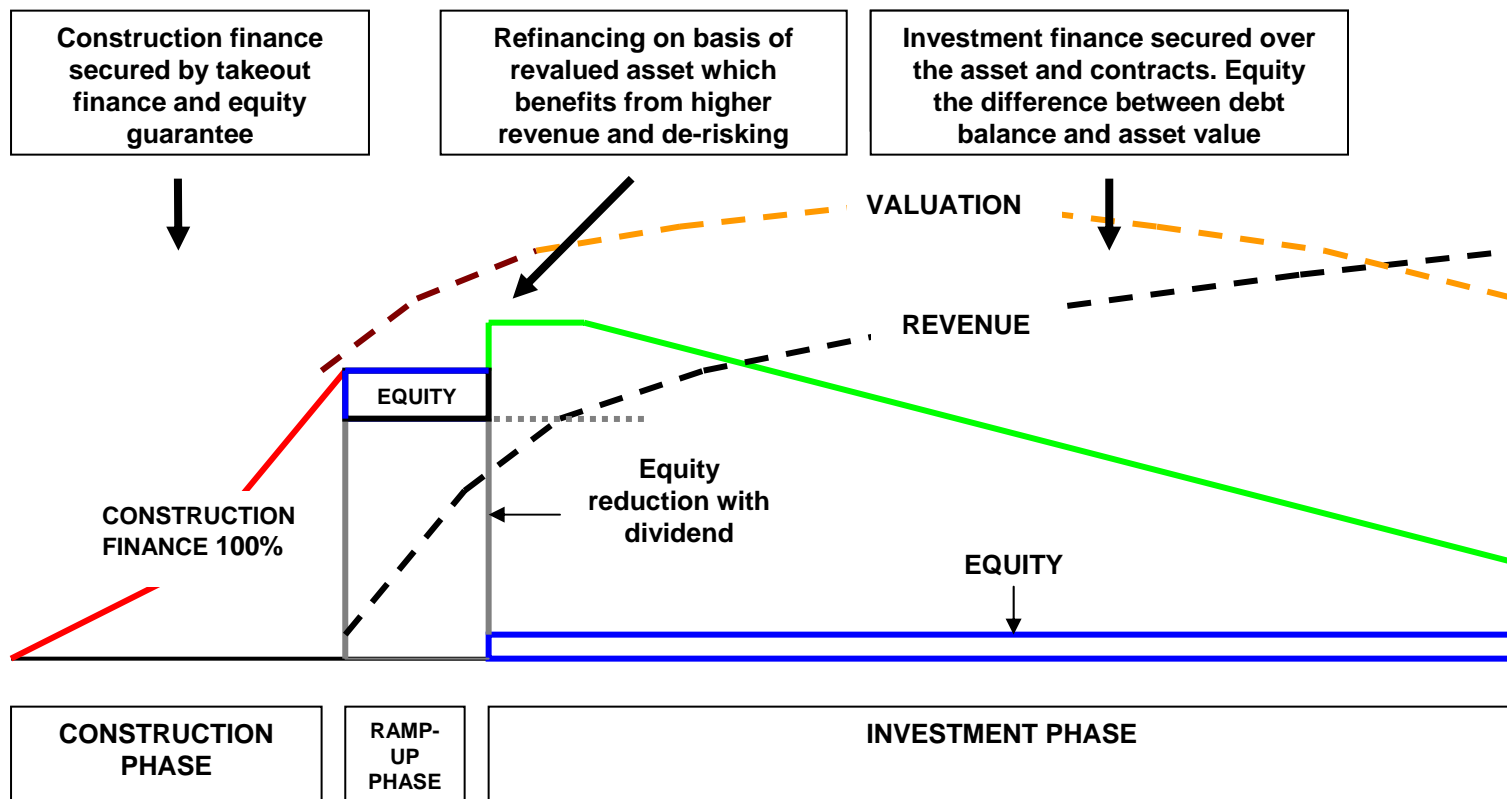


8. Revaluation & refinancing

The best exit opportunities exist during the first 25-30% of project life when asset value increases on an NPV basis whilst major risks have declined. There exists a mismatch between the project risk and return.

This creates the opportunity to revalue, refinance, increase debt & repatriate equity.

FINANCING OF INFRASTRUCTURE PROJECTS IN AUSTRALIA



Upside for the private investors:

- High return to equity
- Withdraw equity

Downside for the state

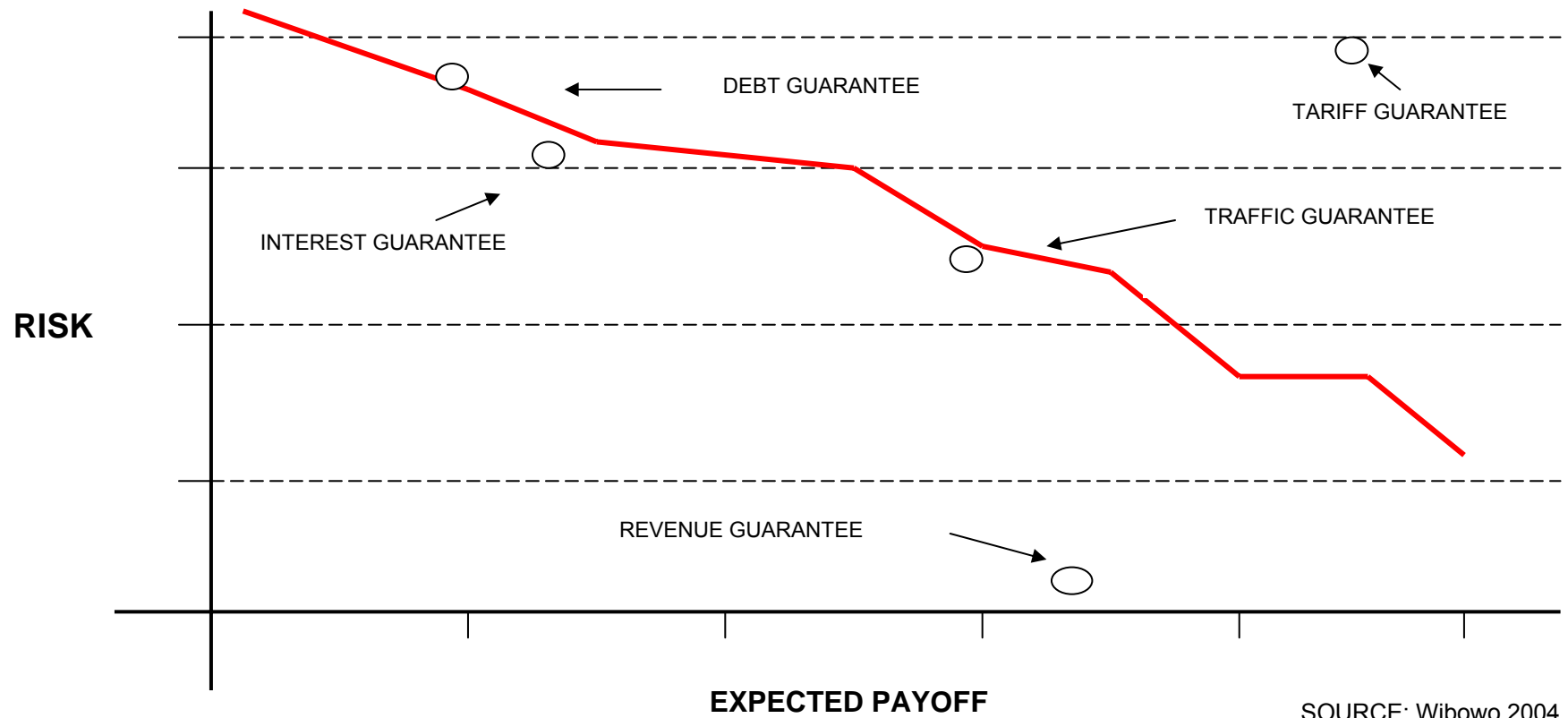
- More debt & higher leverage
- Reduced investor “hurt” or equity capital

This has led to minimum equity capitalisation requirements (*Wembley Stadium*).

9. PPP Issues

1. State support for PPP projects:
 - Output based subsidies
 - Grants and “in kind” contributions
 - Tax concessions
 - Soft loans
 - Guarantees – under state control
 - Guarantees – not under state control

STATE GUARANTEES: RISK AND RETURN



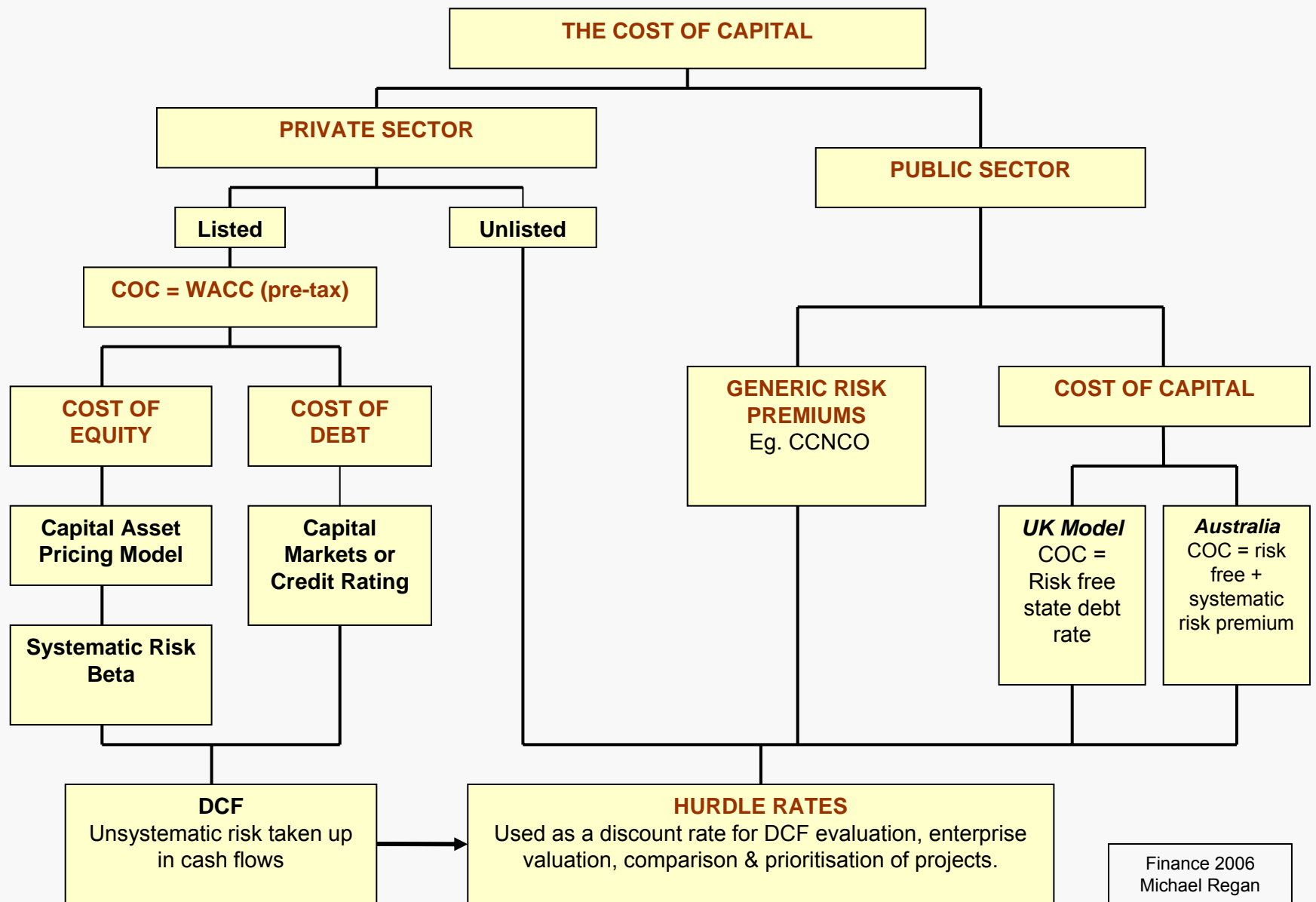
2. Discount rates

It is argued that the discount rate applied to state projects (including the PSC) should be costed at a government long-term bond rate (UK Treasury Green Book). Should public sector investment criteria include a risk premium?

No – *Quiggin 1996; UK Treasury Green Book*

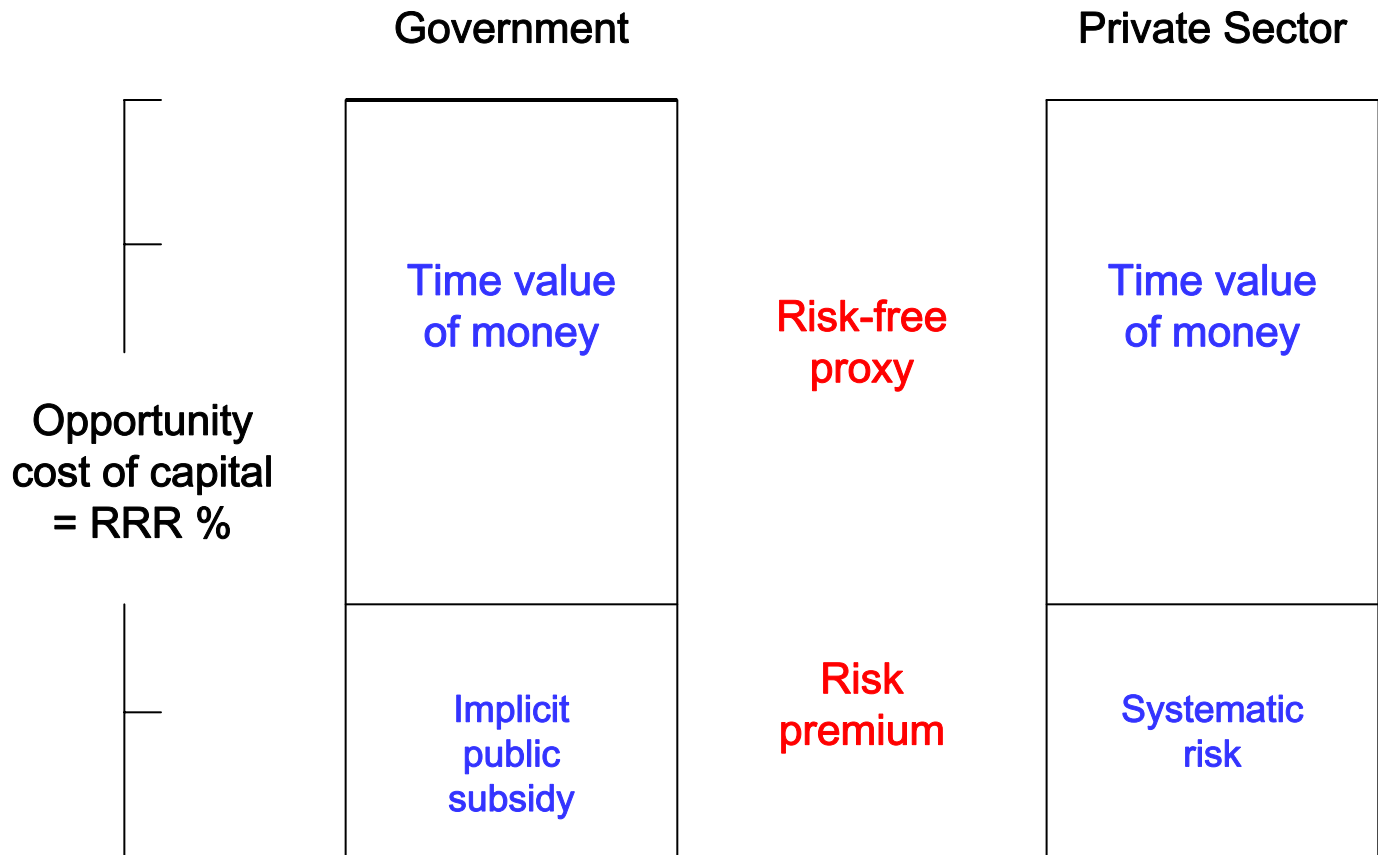
Yes – *PV Guidelines, Anderson, Finn & Peterson 1996; Grimsey & Lewis 2004; Grout 2003.*

Public sector discount rate = social time preference rate (STPR) which is a substitute for *market* rates of interest (*Bond & Brown 2003, pp. 221f*). It is the opportunity cost of public capital investment (plus a 20% cost premium) and is generally lower than commensurate market rates of interest. The proxy is the long-term bond rate.





COMPOSITION OF DISCOUNT RATE FOR PPP PROJECTS



Hurdle Rates in the Private Sector

Investment IRR benchmarks for projects with similar generic or industry risk profiles.

Available from some prospectus:

Macquarie Global Infra Trust (2001) 15% pre-tax

ITA 13.9% pre-tax (*ITA 1996, p. 54*)

Hills MG 17.5% pre-tax (*ITA 1996, p. 41*)

Infratil 15.4% post-tax (*Infratil 1998, p. 2*).

J P Morgan 2002, Derivation of Discount Rate, Western Mining Corporation Valuation.

INVESTMENT COST OF CAPITAL HURDLE & DISCOUNT RATES

Generic return	10.3%	The Commonwealth indexed bond at 4.7% + 0.3% margin + estimate of average annual inflation rate to 2015 (5.3%).
Systematic risk	3.8	Direct property + indexed bond beta of 0.6 + nominal pre-tax difference between the bond benchmark (10.3%) and the class return (15% divided by 1-t) of 17.65%.
Non-systematic risk	2.0	Credit margin applied by banks for construction finance i.e., credit risk).
Total	<div style="border-top: 1px solid black; display: inline-block; width: 50px;"></div> 16.1%	

SOURCE AMP Limited 1995

3. Industry differences

PPPs are used across a number of industry sectors. Industry differences include:

- Revenue profile
- Regulation
- Network access & costs
- Fixed & variable cost profiles
- Competition

STUDY OF THE INFRASTRUCTURE SECTOR
Australia, 2002



	Capital Intensity	Weighted Average ROR %	ROE %	GOM %
Airports	4.8	14.3	8.7	75.0
Motorways	17.9	7.6	2.7	49.9
Water	8.8	4.8	3.6	39.8
Ports	5.5	6.8	4.4	44.3
Gas Distrib.	1.3	13.7	12.3	18.1
Comms	0.6	12.1	22.4	10.1
Telcom	1.1	16.9	26.2	29.9
Urban Transport	1.2	-2.2	-115.0	2.0
Railways	3.2	3.9	8.0	14.5
Infra Services	0.2	2.5	7.9	13.0
Energy Trans	6.5	6.3	5.1	45.6
Energy Gen.	4.5	6.9	8.8	26.0
Energy (Integ.)	2.6	9.6	13.2	24.8
Energy Dist.	1.7	6.5	6.2	14.8

SOURCE Annual Reports 2002

- RETURN +

- Education
- Urban Transport
- Railways
- Regional airports

- Mature motorways
- Energy generation
- Capital city airports
- Ports
- Communications

- Water
- Health
- Immature motorways
- Entertainment facilities

- Energy distribution
- Specialised rail
- Energy transmission
- Water, gas pipelines

4. Refinancing and windfall gains

Do PPPs generate excessively high returns for private firms at the expense of government?

Evidence suggests that gains are short-term and are a consequence of:

- De-risking the project
- Revaluation and refinancing

- Achievement of short-term revenue & operational objectives
- Minimal compliance problems – abatement, penalties & service standards.

Refinancing is a result of changes to the risk pricing of the project. It generates abnormal returns to equity but increases debt ...

5. Change of ownership (investment liquidity)

- Short-term nature of corporate planning
- Constructors are not long-term investors
- Construction cost v lifecycle costing
- Institutional investors are the appropriate long-term investors for this asset class.

6. Lifecycle costing

Gives certainty to lifecycle repairs and maintenance. A specialist field requiring integration of the design, construction & asset management processes (*UK NAO Improving Public Services Through Better Construction 2005: The Cambridge University Western Campus, the Gates Information Technology Building Case Study, vol. 2*).

7. The characteristics of a successful PPP project

For the private sector:

- Achievement of hurdle rate objectives (ROR, ROE)
- Achievement of service standards
- A working relationship with the state.

Recent private market developments:

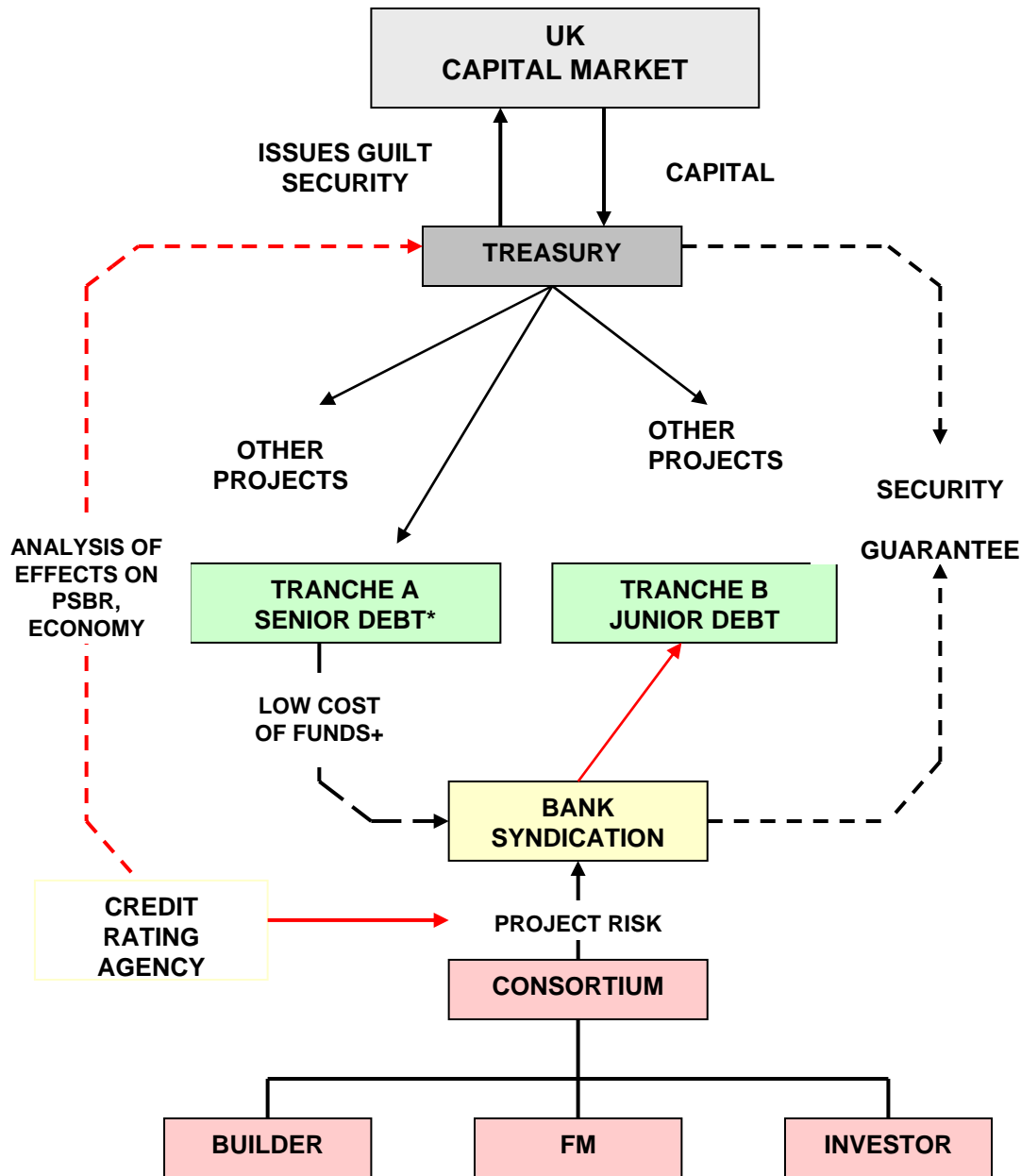
- High debt levels
- Strong *ex poste* operational management
- Reduction in equity exposure through revaluation & refinancing
- Innovation & technology (competitive advantage)
- Deal flow
- Sector specialisation.

8. The UK Credit Guarantee Model

A scheme introduced in the UK in 2004 that is designed to reduce borrowing costs for private PFI/PPP projects (*Standard & Poors 2004, 2005; HM Treasury 2004, CGF Technical Note 1*).

The scheme lowers project debt costs but preserves the performance incentives.

CREDIT GUARANTEE FINANCE MODEL



* Refinancing requires consent + 7-10% COF reduction

9. Securitisation

The conversion of a stream of future payments to a present lump sum. A contract with the state that promises payment for vanilla service delivery (such as an availability charge) supported by guarantees may be securitised to provide development capital ...

Securitisation offers a third option for infrastructure provision:

1. State provision on user-pays basis and securitises receivables
2. Private consortium provides service delivery guarantee and securitises state receipts
3. The intermediation of a state guarantee
(Archer & Guadagnuolo 2005: DEPFA securitisation in Ireland).

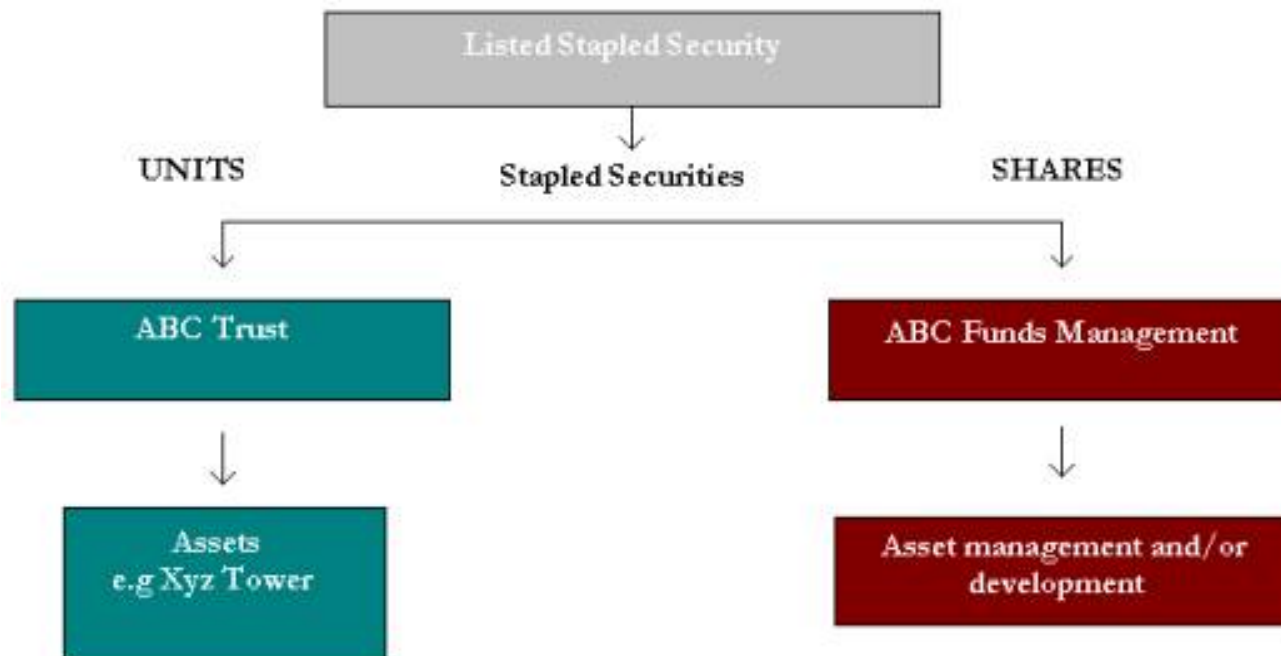
10. Stapled Securities

The infrastructure sector of the ASX pioneered the use of stapled securities.

The advantages include:

- The tax benefits of hybrid trust structures
- Blurring of the equity & debt distinction
- Segregation of asset ownership and asset management (general legal liability).

The trust holds the portfolio of assets while the related company carries out the fund or asset management and/or development activities.



11. Regulation - How are PPPs regulated?

- PPPs as an incomplete contract (*De Bettignies & Ross 2004*)
- Best practice regulatory standards – reasonableness v. the “big stick” approach to contract management. What is regulated?
- The importance of *ex poste* contractual performance criteria & benchmarks
- Default events – cure periods & abatement regimes.

The Lessons Learnt

- Clear policy framework & process
- Project selection – its not appropriate for all projects (non-core services)
- Business case development – a rigorous modelling of traditional procurement options
- The line agency and Treasury relationship
- Timing – study market signals suggesting potential limitations (business cycles, capacity constraints, bid market depth)

- A robust tender process
- Mitigation of bid costs
- Credit ratings apply discipline
- Transparency
- Contract management arrangements
- In-house capabilities.

OUTSTANDING ISSUES

1. Uniform transactional disclosure and transparency
2. PPPs have a poor public profile exacerbated by a critical media – the State and the financial community have an interest in addressing this
3. Lack of uniformity in PPP regimes
4. Bid costs
5. Capacity building in line agencies

7. Transparency & disclosure

In Australia & the United Kingdom, information is withheld on two grounds:

- commercial confidentiality agreements between parties, and
- State refusals under Freedom of Information legislation.

The Commonwealth Auditor-General has created FOI guidelines for line agencies.

8. Intergenerational inequity

Do PPPs create a fiscal burden for future generations? A contested theory (*Thompson 2003*).

- No increase in public debt (no upfront expenditure)
- No fiscal drag (taxation and public debt)
- Assets accrue to present & future generations
- No evidence of intergenerational inequity
- PPPs meet “user pays” criteria of fiscal sustainability (*Coombs & Dollery 2004*).

9. Depth of bid market
10. Deal flow
11. Unsolicited bid protocols
12. Uniform accounting and disclosure standards
13. Importance of leadership at the political and lead agency levels, agency ownership
14. PPPs are not increasing the capital available for infrastructure investment.

Open Forum