

# Investing in Transport Infrastructure: Institutional Design and Efficiency

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# Themes

- **New ways of providing Gateway and Corridor infrastructure**
- **Identifying the problems with them and some (imperfect) solutions**
- **Illustrate with Australian Experience**
- **Importance of government objectives and commitment to good performance**



# Outline

- **New institutional forms**
- **Investment under private ownership subject to incentive regulation**
- **Public Private Partnerships (PPPs)**
- **New trends in investment evaluation**
- **Conclusions**

# New Institutions

# New Institutional Forms

- **Concerned with provision of transport infrastructure- the building blocks of gateways and corridors**
- **Two models of provision:**
  - (1) Public enterprise (or government department)**
  - (2) Private with cost based regulation**
- **Countries like Australia relied heavily on (1)**
- **Two new models:**
  - (1) Privatisation with incentive regulation**
  - (2) PPPs**
- **Shall evaluate the alternatives from an efficiency perspective**

# Objectives for Gateway Infrastructure

- **Getting infrastructure quantity and quality right**
- **Too little: Costly; gateways do not perform well**
- **Congestion, delays, unmet demand**
- **Too much: Costly; gateways do not perform well**
- **Prices too high, underutilised capacity, excessive quality and gold plating**



# Competition

- **Will promote economic efficiency**
- **With transport infrastructure, some limited scope**
- **Competition in port facilities; perhaps airports; road- rail competition**
- **Not much scope with natural monopoly facilities, such as rail track; most airports; ports; terminals**
- **Hence the reliance on the private/regulate model**

# Investment under Incentive Regulation



# Regulation and Investment

- **The link recognised since 1962 (Averch and Johnson model)**
- **Rate of return regulation leads to excessive investment**
- **Profitable to supply too much capacity, gold plating etc**
- **Regulation operates on a cost plus base- higher costs passed on to customers**
- **A key reason for the shift to incentive regulation since the 1980s**



# Incentive Regulation

- **Seeks to promote efficiency, especially productive efficiency**
- **Core aspect is to set allowable prices without direct reference to the firm's own costs**
- **Thus firm can profit if it reduces costs**
- **Price paths are set for a period- say 3 to 5 years**
- **Common form is CPI-X regulation (real prices fall by X per annum)**
- **Used extensively in the UK, Australia and elsewhere**
- **Initially, not much attention given to the implications for investment**

# Investment Incentives

- **Generally, incentives point to under investment with incentive regulation**
- **Lower investment → lower costs**
- **Under provision of quality enhancing investments, though not cost reducing investments**
- **Question about investment needed to increase capacity**
- **If  $P > LRMC$ , investment is profitable**
- **But  $P < LRMC$  in many cases( e.g. Increasing costs of expansion, land purchases, reclamation)**
- **Also  $P$  as set may reflect historical asset values/ costs, and be below replacement levels**



# Commitment Problem

- **Regulator can commit for 3-5years**
- **But investment may last for 50 years**
- **Can firm be sure that prices over project lifetime will be sufficient to cover costs of the investment?**



# Addressing the Problem

- **Investment behaviour is sensitive to regulatory parameters**
- **Governments and regulators do recognise the problem**
- **Can seek to set  $P$  at such a level that efficient investment does take place**
- **Forecast investment needed to handle demand; apply a weighted cost of capital, and set  $P$  so as to cover estimated costs over the long run**
- **Can allow also for quality enhancing investments**



# Comments

- **Process is moving back towards rate of return regulation (cost based)**
- **Price still set for several years in advance**
- **Can have mechanisms to change price caps for necessary new investment during the price period (Australian airports prior to 2002)**
- **E.g. Allow price increases if worthwhile investments are made to improve quality**
- **Problems greater when there is vertical integration (e.g. rail track and trains), and regulator needs to ensure competitive neutrality between facility owner and its competitors**



# Regulatory Discretion

- **Regulator is the key decisionmaker when it comes to investment**
- **Makes an assessment (CBA?) and then sets parameters**
- **How good is the regulator's information?**
- **Probably not as good as the firm's**
- **This hybrid regulation can degenerate into cost plus regulation, and can lead to excessive investment**



# Alternative Approaches

- **Can try to be less prescriptive**
- **Set investment incentives- link prices allowed to output achieved**
- **Extra output may only be feasible if capacity is increased- an indirect investment incentive**
- **Reward quality and encourage investment in quality**
- **Regulator still needs to know a lot to set parameters at the right level**

# Regulator's Objectives

- **Do all regulators seek only the public interest?**
- **Outcome under regulation depends on what regulators are seeking to achieve**
- **Many regulators are under strong pressure to ensure that prices are very close to costs (and large profits are not earned)**
- **This pushes them towards cost plus regulation**

# Regulatory Gaming 1

- **These regulatory arrangements are favourable to gaming**
- **Consider an opportunistic regulator- seeks to keep prices down to court popularity in the short term**
- **A firm may invest in sunk assets, but the regulator ratchets prices down close to operating costs**
- **Firm is then unwilling to invest further**
- **Often alleged to be a problem**



# Regulatory Gaming 2

- **Firm knows that the regulator is under pressure to ensure adequate investment**
- **Regulator willing to allow the firm a price which adequately rewards investment**
- **Firm then refuses to invest unless it is allowed a higher price**
- **Regulator relents, but then firm does not invest as much as promised**
- **Capacity crisis- regulator under even more pressure to increase prices**

# Investment Conditionality

- **Regulator can make higher prices conditional on delivery of investment**
- **A partial solution sometimes tried**
- **E.g. In UK, with regulation of airports**
- **This makes the regulatory process very detailed, and very cost based**
- **Will not work well unless the regulator is well informed**



# Light Handed Regulation

- **This may be desirable for its own sake, but it too has problems with investment**
- **No direct regulation- review after X years, with sanction(re regulation?) if performance is not satisfactory**
- **But how does the reviewer assess the investment which has taken place?**
- **Will the reviewer accept price rises which have been made to cover the costs of investments which were actually made?**
- **If so, this is becoming very cost based.**
- **Still possible to get excessive investment under light handed regulation**

# Negotiations

- **Negotiations between provider and customers over investment**
- **Smaller investments- can work well**
- **Negotiations taking place with a background of regulation**
- **Facility owner still has the bargaining strength- can increase prices to fund investment even if customers do not want it**
- **Difficult to resolve disputes between large customers over major investments (do customers want to expand capacity to let competitors in?)**
- **Negotiations help, but don't solve the core investment problem**



# Regulation in Perspective

- **Regulatory parameters set determine what investment takes place**
- **Incentive regulation, in principle the best solution**
- **In its simplest form, it will lead to under investment**
- **Investment incentives can be built in, but the regulator has much discretion over investment**
- **Regulatory gaming distorts investment patterns**



# The PPP Option



# Public Private Partnerships

- **Increasingly popular form of infrastructure provision**
- **For building or operating facilities**
- **Amount to private involvement in a broader public network**
- **E.g. private roads in the public network**
- **Many examples in the UK, Australia and elsewhere**



# Examples

- **Renewal of the London Underground**
- **North South rail link in Australia**
- **Sydney, Brisbane airport rail links**
- **Urban toll roads**
- **Redevelopment of rail passenger terminal in Melbourne**

# Advantages

- **Private management of risks**
- **More efficient project management**
- **Gains from competitive tendering**
- **More efficient operation**
- **Gains from relying on specialisation**



# Disadvantages

- **Higher costs of risk bearing**
- **Higher transactions costs and costs of litigation**
- **Higher finance costs**
- **Restrictions imposed on competitors to facilitate cost recovery**

# Cost of Finance

- **Government can borrow more cheaply than private firms**
- **This is because government is (nearly) riskless**
- **But the project still involves risks- these are costly, but the government bears them**
- **This, at least part of the lower cost of government debt is illusory**
- **However, some equity finance is likely to be used by the private firms**
- **And the equity premium cannot be fully explained by the higher costs of risks**
- **Thus private finance still a bit more expensive than government finance (and we do not know exactly why)**



# Achieving Cost Recovery

- **Private firms require cost recovery if they are to invest**
- **But several projects cannot cover costs**
- **E.g. toll roads in the midst of a network of free roads**
- **Subsidies and cross subsidies may be used**
- **Alternatively, government may restrict competitors, to increase revenues of the project**
- **E.g. close roads which compete with the toll road**
- **Remove the Sydney airport bus to stop it competing with the rail link**
- **Governments may commit to not undertaking investments in future which may compete with the project**
- **All up, an inefficient way of achieving cost recovery**



# Budgetary Advantages?

- **PPPs often sold on the basis that they relieve pressure on the government budget**
- **But governments can borrow at least as cheaply as private forms**
- **No merit in restricting government borrowing if the project is done by PPP (same micro and macro impacts as under government financing)**
- **A meaningless, self imposed constraint – window dressing**
- **Does not limit a government's ability to undertake poor projects- these can be achieved through PPPs**



# Australian Experience

- **A mixed record- several problems:**
- **Project forecasts too optimistic (true for all types of projects though)**
- **Disputes and expensive litigation**
- **Restrictions to competing facilities often very disruptive**
- **Poor governance/ low transparency**
- **Poor projects facilitated**
- **Risks too often end up with the government**



# Who Bears the Risks?

- **Often the government!**
- **Theory is that private developers bear/manage the risks**
- **Reality is that sometimes contracts specify that the government bears the risks**
- **Also, contracts may specify that the private developer bears the risks, but they may end up with the government**
- **Firms can hold up governments- latter cannot afford the political costs of half finished projects**
- **NSW Transport minister- “this project will not cost the taxpayers a cent”**
- **He was right- it cost them nearly \$1bn**

# Poor Design Of Contracts

- **Accidental or intentional?**
- **Can be inadequate forecasting, inadequate allowance for risks**
- **But governments are often keen to get poor projects up and running- and cut corners on design**
- **Governments sometimes want to have it both ways- make profits from an uneconomic project**
- **Sydney Cross City tunnel was a disaster waiting to happen**



# Assessment of PPPs

- **Must remember that the alternatives (government provision) are not without problems too**
- **Problems are often papered over with cash- no one hears about them**
- **Can address several of the problems of PPPs with better design**
- **Helps to have explicit guidelines for them (as in the State of Victoria)**

# New Trends in Investment Evaluation



# Project Evaluation

- **Ultimately, gateway and corridor projects have to be evaluated, and good projects chosen**
- **Cost benefit analysis has been the preferred technique of evaluation**
- **Now, alternative, inappropriate techniques are being used**
- **Invariably show MUCH larger benefits- these are popular with proponents**

# Evaluation Process

- **Traditionally, a CBA by the government**
- **Regulators have a major role- may use a form of CBA (or they might simply accept what the firm says)**
- **Governments must choose projects to be undertaken by PPP**
- **Advantages and problems with CBA have been thoroughly canvassed**



# Impact Studies

- **Impact studies often used as a substitute for CBA**
- **Use input output model, determine multipliers, and estimate impacts on GDP or employment**
- **These are claimed to be the “benefits” of the project**
- **Invariably, much higher than the costs**



# Problems with Input Output Models

- **Inputs come freely from somewhere (not specified)**
- **No opportunity cost**
- **No allowance for negative impacts on other parts of the economy as resources are bid away from them**
- **Gross impacts on output are claimed to be benefits- but this does not make any allowance for the costs of creating the additional output**

# Computable General Equilibrium Models

- **Computable general equilibrium (CGE) models sometimes being used in the infrastructure assessment process**
- **CGE models are rigorous ways of estimating impacts (on GDP, Employment etc)- best practice method**
- **Do reflect the costs of inputs**
- **Embody labour, foreign exchange markets, government budgets**
- **Can estimate where inputs come from, and what they cost**
- **Can incorporate a welfare module**

# Qualifications

- **Changes in GDP do not measure gain in welfare (unless inputs are fixed)**
- **Need to cost additional inputs used (e.g. from unemployed labour)**
- **Need to handle consumers surplus when there are indivisibilities**
- **Need to handle externalities which are not incorporated in model**
- **Results depend critically on key assumptions- e.g. labour market assumptions**
- **Cannot use version with big impacts on economic activity if labour market is very tight**



# Role of CGE in Investment Evaluation

- **Can capture the general equilibrium aspects**
- **Relevant if there are distortions in other parts of the economy**
- **E.g. Excess labour in some parts of the economy; heavy taxation of some inputs such as fuel**
- **Relevant for the shadow pricing problem**
- **Can be used to estimate the effects on economic activity, and for estimating what these are worth**
- **But like all techniques, CGE models can be misused (be cautious about big benefits in economies with tight labour markets)**
- **Consider as a complement for, not a substitute for, CBA**
- **Links between CGE and CBA an important area for further research**



# The Investment Evaluation Problem

- A growing, now severe, problem in investment evaluation
- CBAs often not done for major investments- reliance is made on impact studies which report very large “national economic benefits”
- Gross overestimation of benefits make all projects look very good- how to choose amongst them?
- Politicians can choose their pet projects and claim that they have been evaluated
- Well intentioned decisionmakers do not have much to go on
- The application of Gresham's Law to project evaluation?
- What next- astrology?



# Conclusions

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- **Concerned to set up institutional arrangements to promote efficient performance of gateways and corridors**
- **In particular, to get provision of infrastructure right**
- **Inherently a difficult problem (complex motivations, asymmetric information)**
- **No simple answers- all institutional structures have their drawbacks**
- **But some are better than others**
- **It is *possible* to design incentive regulation and PPPs which work quite well**



# Conclusions

- **Actual examples fall short of the *ideal*;**
- **But more importantly, fall short of the *possible***
- **Better design of institutions, and more rigorous assessment of investment, quite feasible**
- **But do decisionmakers wish to make the most of what is available?**

**Thank You!**

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