

Public-Private Partnerships: When and How

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1. Motivation

- Organizational forms to provide infrastructure:
 - public/traditional
 - public-private partnerships (PPPs)
 - privatization
- Private firms in all cases — it's incentives that differ
- PPPs have grown in importance during the last two decades:
 - developing countries: 7-fold increase 2006-2008 vs. 1990-1992.
 - Europe: 6-fold (annual) increase 2005-2006 vs. 1990s
- Two decades of experience, time to take stock:
 - **when** is a PPP the best option?
 - **how** should PPP's be done?
 - book in progress

- **When** and **how** PPPs: infrastructure specific
- Will focus on highways in this presentation
 - book considers other types as well
 - developing countries: 20% (transport)
 - Continental Europe: 80% (transport), 56% (highways)
 - US: tenfold annual increase 2006-08 vs. 1996-2005

Highways



- Determine challenges of traditional provision of highways
- Use economic theory (and political economy considerations) to analyze whether PPPs can improve things
 - physical characteristics of specific infrastructure determine the organizational form (and therefore whether PPPs are best)
 - incorporate political economy considerations
- Confront the theoretical analysis with the evidence
- Answer **when** and **how**

Outline: PPPs — When and How

- 1 Motivation
- 2 **Basics**
- 3 Challenges (traditional provision)
- 4 Promises (of PPPs)
- 5 Experience
- 6 How it should be done

Physical Characteristics of Highways:

- Investments:
 - large, sunk upfront, long lived asset
 - usually a natural monopoly (interurban) or part of a network (urban)
- Operation:
 - excludable, rival (congestion an issue)
- Deterioration (and therefore maintenance):
 - depends on usage, highly nonlinear in axle weight
 - apparent long after it is optimal to restore the road

Physical Characteristics of Highways

- Quality of service is contractible
 - state of road determined by roughness, unevenness, texture, ...
 - can measure time needed to remove broken cars
- Demand:
 - very high uncertainty
 - mainly exogenous
- Why public intervention?
 - network planning
 - intensive use of public space and rights-of-way
 - monopoly requires toll regulation

Example: service contractible

- 10 page contract for 60 km road network of 6 roads for heavy trucks that transport forestry company production
- Contracted out to a concessionaire building and maintenance
- Contract specification:
 - building standards: width, thickness of asphalt cover, ...
 - every km of the road can be in one of three states:
 - damaged: asphalt cover damaged at most by 0.5% and not more than 30 sq meters of the km
 - collapsed: if more damage
 - optimal: if neither collapsed nor damaged
 - a road is collapsed if traffic is interrupted or if it has a collapsed km
 - service standard requirements:
 - damaged km repaired within 7 days or no monthly payment for km
 - collapsed road repaired to damaged within 24 hours or no monthly payment for **entire** road and forestry firm cashes warranties

Economic Determinants of PPP Contracts

- Private, but temporary ownership of assets
- Bundling of construction and operation
- Intertemporal risk sharing between private and public sector

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3. Challenges

Problems with public provision of highways:

- Poor choice of projects
 - Brazil, 1979–1984
 - built 6,000 kms of new roads ... while 8,000 kms of existing roads went from fair or good to bad quality
- Excessive cost of projects chosen
- Insufficient and untimely maintenance: too little, too late
 - **three** times the cost
 - lower quality of service on average

Why? No market for roads

- Current design of public works authority (PWA):
 - poor substitute for market **supply**
 - poor incentives to respond to users
 - easily captured by politicians and industry
- Financing via general taxes:
 - poor substitute for market **demand**

Solution strategy: Mimic a market

Under **public provision**:

- change institutional design of the PWA
- modify how roads are financed
- introduce competition for various tasks
- won't cover here

Under **public-private partnerships**:

- as a second best solution?
- need minimum quality of institutions

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4. Promises (of PPPs)

- Main idea: mimicking a market
- Competition **for** the field
- Filter white elephants when financed via tolls
- Easier to charge appropriate tolls: inflation, trucks
- Ownership and bundling?
- Relieve strained budgets?

“When high roads are made and supported by the commerce that is carried on by means of them, they can be made only where that commerce requires them. [...] A magnificent road cannot be made merely because it happens to lead to the country villa of the intendant of the province [...].”

- Ownership structure and bundling of investment - operations - maintenance:
 - incentives for appropriate **maintenance** (and innovation)
 - choose PPP (instead of privatization) because of planning issues
 - PPPs closer to **privatization** in this dimension
- PPPs relieve strained public budgets?:
 - mostly incorrect
 - upfront savings at the expense of foregone revenue (or larger subsidies) later on
 - PPPs closer to **public** provision in this dimension

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5. Experience

Typical contract:

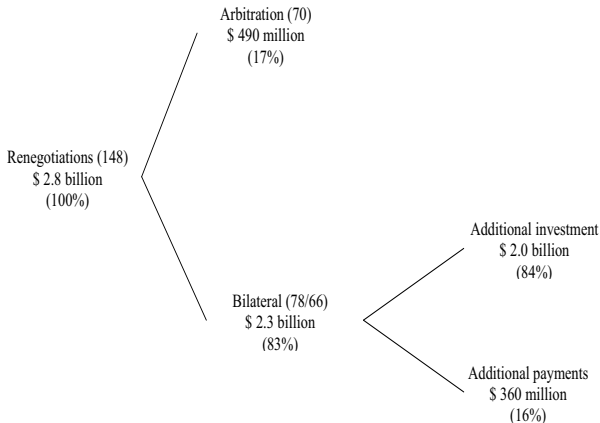
- Fixed term: 30 years
- Firm chosen via competitive auction
- Bidding variable: lowest toll, shortest concession term, highest annual payment to the government (cannon), lowest subsidy
- Minimum income guarantees
- Profit/revenue sharing in high demand scenarios
- Fiscal accounting: poor or totally absent
- One agency in charge of planning, adjudicating, monitoring and regulating the concession contracts

- Renegotiations: pervasive, often opportunistic
 - often during construction phase
 - additional works unrelated to original project: water collector
 - additional works paid by future administrations
- Guarantees: often unwarranted or too generous
- Both used to soften the government's budget constraint and anticipate spending
 - only under PPPs
 - "Cynics suspect that the government remains keen on PFI not because of the efficiencies it allegedly offers but because it allows ministers to perform a useful accounting trick." *The Economist*, July 2nd 2009.
- Poor risk allocation

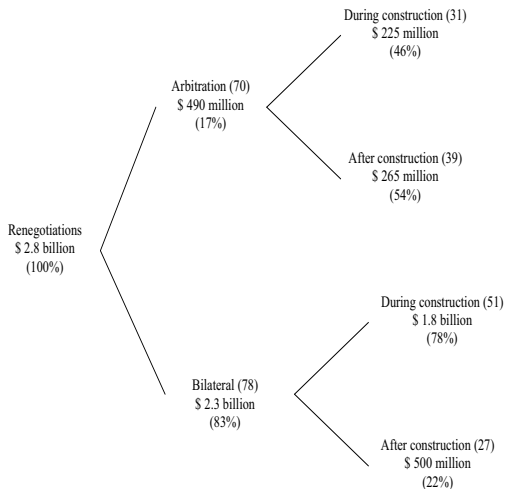
- Governments anticipate spending and indulge in pork barrel
- No competition for additional works; ex ante competition should eliminate gains from renegotiation, but:
 - adverse selection: renegotiations attract inefficient firms good at lobbying (work in progress)
 - moral hazard: PW authority is careless

- Guasch (2004)
- Guasch, Laffont and Straub
- New evidence from Chile:
 - 50 concessions (26 highways)
 - 147 significant renegotiations: once every 2.5 years
 - upfront investment: US\$8.4 billion
 - renegotiations: US\$2.8 billion
 - contracts and renegotiation addenda on the web

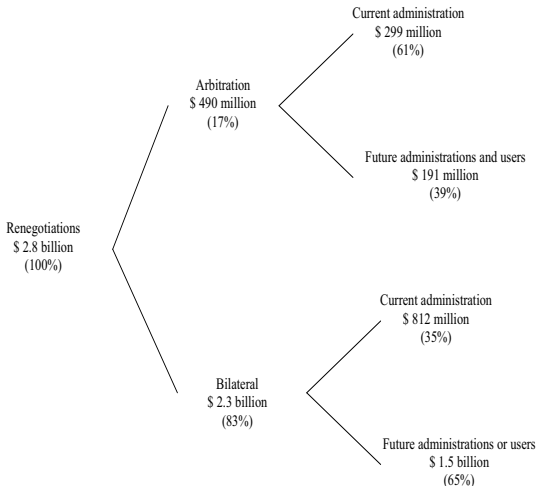
Renegotiations: how and what



Renegotiations: when



Renegotiations: who pays



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6. How it should be done

- 1 Improving governance
- 2 Improving contract design

- Additional works should be tendered
- Set service standards
- For each renegotiation, $\Delta PV = 0$:
 - filters “bad faith” renegotiations
 - avoids adverse selection problem
 - does not avoid anticipating spending
- Independent review:
 - Ex ante (planning of projects)
 - Ex post (renegotiations)

- Budgetary accounting:
 - including future liabilities in current budget not enough
 - include capital investment as well
 - dynamic budget \implies PPP = public provision
- Reforms of PPP legislation along these lines
- If doable, PPPs much better than public provision, answers **when**
- Next: **how**

Improving contract design

- Flexible term contracts:
 - reduce demand risk ... mostly beyond the firm's control
 - fewer guarantees and renegotiations
- PVR contract: firms bid on present value of toll revenue, contract lasts until winning bid collected
 - lowers demand for guarantees: sizeable reduction in risk premium
 - fair compensation easy to calculate
- Two-threshold auction extends PVR to projects that require substantial subsidies
- Flexible term contracts: routine in Portugal and Chile
- Political economy of flexible term contracts

Experience with Flexible Term Contracts



Experience with Flexible Term Contracts

UK, 1989: PVR contract, without the auction:

- Queen Elizabeth II Bridge at Dartford
- Beauty contest, chose best project
- Financed 100% via debt (BoA, Trafalgar, Prudential, Kleinwort-Benson)
- Concession ends when pay back debt and interest
- Cash flow: pay back debt and interest

Colombia, 1997: auction, without present value

Chile, 1998: first PVR auction

Chile, 2006: PVR auctions for all highway franchises

Experience with Flexible Term Contracts: Portugal

- Shadow toll concession program began in 1999
- Bill faced by transport authority by 2004-2007: EUR 650MM, equals total annual road budget
- Motivated move to concessions that do not involve public budget
- Litoral Centro: 98.4km highway from Marinha Grande to Mira
- Europe's first variable-term toll concession
- Concession period depends on when (and whether) net present value (NPV) of toll revenue reaches the EUR 784 MM mark:
 - attained before year 22: 22 years
 - attained between years 22 and 30: ends when attained
 - concession ends in year 30 if not attained by then
- Eurofinance project of the year
- Portugal using flexible term franchises for all highway concessions

- This presentation: highways
- Pitfalls with PPPs:
 - renegotiations and fiscal games
 - excessive risk borne by the firm
- If done (reasonably) well, PPPs are best:
 - filter white elephants
 - better maintenance
 - better risk allocation

- 1 “Least-Present-Value-of-Revenue Auctions and Highway Franchising”, *J. of Political Economy*, 2001.
- 2 “Privatizing Highways in Latin America: Fixing What Went Wrong,” *Economia*, 2003.
- 3 “The Basic Public Finance of Public-Private Partnerships,” mimeo, January 2008.
- 4 “On the Efficient Provision of Roads,” mimeo, April 2009.
- 5 “Soft Budgets and Renegotiations in Public-Private Partnerships,” mimeo, August 2009.
- 6 “Renegotiations and Corruption,” work in progress.
- 7 *Public-Private Partnerships: When and How*, book in progress.