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Paying the price: The true cost of public provision of services

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Introduction

Private participation in infrastructure is increasingly important for the provision of infrastructure and utility services around the world.² While the reasons for involving the private sector may vary, one standard expectation is that the private sector will be more efficient than the public sector and so prices should be lower (or that better quality service will be delivered at the same price). Yet a common concern raised throughout the world, especially in some countries in Asia, is that private operation will lead to a more expensive service. This would disadvantage consumers and be politically and socially unacceptable.

Why is the concern about an increased price for service provision raised? A key reason is the fact that existing public services are often under-priced. This underpricing may occur for several reasons, including simple undercounting and policy decisions regarding mis-pricing of services. If the true cost of providing the public service was known, it is likely that consumers would see a fall in the price that they had to pay.

It should be realized that a mis-pricing of services sends signals about consumption and investment that can have a major impact on the economy. If a service is under-priced then consumers will consume more of the service than they would under true economic pricing (assuming that all demand can be met). This greater than economic consumption will lead to greater investment etc. which involves the economy over-investing scarce resources on an activity. Of course, there may be social and environmental reasons for wanting greater consumption – but this decision should be based on a starting point that involves knowing the true cost of the service.

This note reviews the costs that should be included when establishing the true cost of public provision of a service. It provides some examples of the way in which governments have addressed this issue and the way in which they then compare public and private provision.

Cost elements

The cost of providing a service can be broken into three elements:

- on-going operating and maintenance costs (labor, materials etc);
- a measure of the reduction in value in the infrastructure arising from the provision of the service (depreciation); and
- a return on the funds invested into the infrastructure to provide the service.

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² A review of trends in private participation is provided in *Private Infrastructure: A Review of Projects with Private Participation 1990-2000*, Viewpoint series, World Bank.

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Governments, on the whole, accept the need to include operating and maintenance expenditures in the price for a service, but that is only one of the three major cost elements. It is the other cost elements that are most often excluded when prices are established and so lead to a misleading comparison with the price that a private operator would charge.

Depreciation

When a service is provided using existing equipment the ability of the equipment to provide services in the future is affected. As such, it is often said that some of the equipment is being consumed in the provision of the service – depreciation is the measure of this consumption.

Determining how much of the productive capacity of the equipment has been consumed is difficult and, as such, it is normal to apply relatively simple approaches to determining the depreciation charge. For example, a train that is used for so many days a year and has some maintenance may have a productive life of 25 years. A simple rule would be that 4% of the value of the asset is consumed each year in providing the service (since 25 years at 4% a year will give 100%).

Why should depreciation be included in the cost of the service? For a company to be able to offer the same level of service year-on-year it needs to replace the assets that are being consumed. If that consumption (depreciation) is not recovered in the cost either the service being offered by the company will fall, or future consumers will have to pay even higher prices as large backlogs of replacement investment are undertaken to bring services back up to their earlier levels.

Return on capital

When the state owned enterprise or the government invests money into the assets of the public service provider a decision as to where funds should be used is being made. By choosing to invest into the public service provider either funds are either having:

- to be raised by the government (through taxation or by borrowing against future taxation); or
- earnings retained from operating the service are invested rather than being returned to the government as a return on previous investment.

As such, there is a clear opportunity cost to choosing to invest into the assets of the public service provider. How should this opportunity cost be reflected in the cost of providing the service?

Two options are often proposed:

- a rate reflecting the government's cost of borrowing should be used when determining the level of return that should be earned; or
- the rate that any company operating this type of service would have to pay to borrow should be used.

Many countries have used the former when they use any rate for state-owned enterprises. However, other countries, especially Australia and New Zealand, have moved towards rates that reflect the activity under consideration rather than the general government rate – Box 1 provides some detail on the approach favored in Australia. When thinking about the return that a specific activity should earn you should take into account the risk of that activity. A general government borrowing rate reflects a portfolio of activities and, as such is not appropriate when thinking about one activity.³

³ Although using a government rate is better than none! However, a portfolio rate implies that above average risk activities are cross-subsidized by below average ones.

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There are arguments that if the government rate was calculated ‘properly’ taking into account the implicit and explicit guarantees etc, the rate would be the same as that determined from the capital markets for a private operator. These arguments are outlined in *Risk, Taxpayers, and the Role of Government in Project Finance* by Michael Klein (World Bank Policy Research Working Paper no. 1688, December 1996). However, measuring the contingent liabilities associated with the guarantees is far from straight-forward. As such, a simpler way is to focus on calculating the equivalent private rate – the approach adopted by Australia and New Zealand.

Linked to the question regarding the rate of return is that of the value of the assets to which this rate should be applied. While there is a theoretically correct case of using the replacement cost of the assets (the value that it would cost an operator to replace the assets and provide the same level of service) very few governments enforce this valuation.⁴

Box 1: Establishing the return on capital for Government Trading Enterprises in Australia

When determining the appropriate return for a Government Trading Enterprise, the following rules should be followed:

- 1) Determine the company’s capital structure:
 - use market values of debt and equity; if these are unavailable, use book values;
 - preferably, total assets are valued on a current cost basis;
 - debt should include all capital that is required to be repaid regardless of whether it is explicitly bearing interest; and
 - equity is assumed to be equal to total assets less debt.
- 2) Determine the cost of equity:
 - use the prevailing risk-free rate as proxied by the Commonwealth Ten-year nominal bond rate;
 - use a market premium of seven per cent;
 - estimate the equity beta after undertaking a comprehensive risk analysis of the company’s operations; and
 - apply the Capital Asset Pricing Model.
- 3) Determine the cost of debt:
 - determine an appropriate split for materially different classes of debt (for example, long and short term);
 - observe the return required on different classes of debt;
 - make adjustments for the effects of government-related matters possibly using information taken from a debt rating of the company; and
 - weight the adjusted costs of the different debt classes to provide an average cost of debt.

Then, to establish the required rate of return the cost of equity and the cost of debt are combined using the relative proportions of debt and equity in the capital structure as the weights.

While there may be elements of this that are country specific (such as the value for the market premium), or elements that might differ from finance theory (using actual interest costs rather than forward looking ones) it does provide a nice example of how a government has tried to tackle the problem of setting a realistic target for state owned enterprises.

Source: Based on Box 3.5 in An Economic Framework for Assessing the Financial Performance of Government Trading Enterprises, 1996, Steering Committee on National Performance Monitoring of Government Trading Enterprises, Australia

⁴ For example, in the UK prices for public services reflected asset values that are significantly below the replacement cost of the assets. This is true under both private and public ownership since that under-pricing was reflected in the privatization sale price.

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Other options include:

- the historic book cost of the assets (the standard accounting valuation); and
- various ways in which the historic cost assets can be updated (through price indices etc).

What is important is that a starting value for the assets is established and then that all new investment is included into this asset value as it is undertaken.

Example of these calculations

Having considered the costs that should be included in the calculation, it is now worth considering two examples, one from Asia and one from Africa. The first, set out in Box 2 shows the under-pricing in the gas industry in an Asian country. The difference between the price charged and the actual cost runs to about US\$200m, a significant cost to be borne by the country (how this cost is borne is discussed later in this paper).

Box 2: The True Cost of Gas in an Asian Country

A recent report for a country in Asia considered a way of estimating the true cost of gas and what level of underpricing was occurring.

Long-run marginal cost

The approach is based on estimating the long-run marginal-cost (LRMC) of providing a service (this is a theoretical consideration of the assets used etc.)

User Group	Charge \$ per mcf	LRMC \$ per mcf	Underpricing
End-users	1.25 to 1.42	1.71	17-27%
Power Generation	1.05 to 1.16	1.55	20-30%

From this it can be seen that prices were at least 17% below what was necessary for a true cost reflective price.

Source: Government commissioned work, 2001

A second well-known example from Africa can be found with the price charged for water in Guinea. This case is well known since the government used an IDA credit to ease the movement from below cost tariffs to charging those that met all the costs of the water operator.

Paying for the short-fall

Box 3 raises another interesting issue. What happens if prices do not meet the full cost-recovery level? There are several possible situations that can arise. In some cases the government is able to make good the difference between the price charged and the full-cost level through taxation. An example of this can be found in some of the states in India where the government provides a direct subsidy payment to the operator (often a state owned enterprise). This subsidy covers the short-fall arising from charging cost reflective prices and is determined by the regulatory body.

What is the implication of using taxation to meet the short-fall? Consider the case when a country has only partial service provision (typical for all infrastructure services in Asia but especially important for electricity and water) yet raises taxation from the wider population (for example a sales tax is levied). Then, the wider population is paying the subsidy for the group of consumers that receive a service. This becomes even harder to reconcile when the fact that the connected population receiving the service is often the better-off urban middle-class.

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Box 3: Moving towards cost recovery for water in Guinea

In 1989 the Government of Guinea entered into a 10 year lease agreement with a consortium of French companies for piped water services in the capital Conakry and 10 other cities and towns. The lease was let on the basis of the operator receiving a payment equal to:

- operating expenses in both foreign exchange and local currency;
- depreciation on their investment; and
- a return on equity on their investment.

The level of this remuneration rate (set on a per cubic meter basis) was one of the two bidding criteria (the other being the cost for new connections to the system).

In 1989 the price charged per cubic meter of water was US\$0.12. A full cost recovery level, i.e. one that would meet the operator's remuneration and cover the cost of the existing assets etc. was forecast to be significantly above this and would continue to rise to a peak in 1995 at over US\$0.75 per cubic meter before falling back.

While the government wanted to see the price paid by consumers rise to cost recovery levels it wanted to see this phased in. As such, consumer prices increased steadily over the period with the difference between the true cost of service and the price paid by consumers being met by an IDA credit (the subsidy each year was phased to fall so that by 1996 there was no more subsidy).

This example shows the huge disparity that existed pre-reform and the phased way that the Government tackled the problem of wanting to move to sustainable prices.

Source: Easing Tariff Increases: Financing the transition to cost-covering water tariffs in Guinea, Brook and Locussol, in Contracting for Public Services: Output-based aid and its applications, 2001, edited by Brook and Smith.

Evidence on this distributional impact of subsidies is available from several sources. Initial information on the mis-direction of subsidies was provided in the 1994 World Development Report from the World Bank. Some recent work on this issue is summarized in box 4.

Borrowing from donors or the financial markets has the same impact as that of taxation – the interest payments and final repayments of capital will need to be met from taxation. The cost may be shared across more generations but the same basic situation arises – a larger population is subsidizing the service provision to the richer connected segment.

Another situation that arises is that governments do not try to make good the difference but rather allow the operator to take the difference as a loss. This may be enough to force the company to show an overall operational loss. Practical results of this often include:

- a lower tax payment by the operator (impacting on the finances of the government);
- a lack of needed maintenance, exacerbating the problem of poor service and slowing down expansion of service to new users; and
- slow payment (or even non-payment) to suppliers and staff. A common situation is that staff are owed salary and that suppliers may have to wait a very long-time for payment (and other state owned enterprises may never be paid).

This last situation can have a significant impact on a country. The lack of liquidity means that other companies are having to live off potentially expensive credit the cost of which they will never recoup from the service provider.

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Box 4: Examples of mis-directed subsidies

Three examples of the way in which non-poor households may benefit to a greater extent than the poor from ‘targeted’ subsidies are set out below.

Electricity subsidies to agricultural consumers in India

A key government policy in India has been the subsidization of electricity to agricultural consumers as a way of providing support to poor farmers. However, research in two states has shown that the way the subsidy is often paid – through charging farmers a flat tariff for each water pump they have – provides greatest support to farmers operating larger farms. Expenditure on electricity for large farmers represents 6% of gross farm income, it rises to 13% for small or marginal farmers.

Under-priced electricity services to households in Bangladesh

Bangladesh, like many countries, charges electricity prices to households that are cross-subsidized by other consumer groups and also subsidized by the government. This support mostly reaches the better-off owing to low connection rates – consider the following data from the 2000-2001 Household Income and Expenditure Survey:

Quintile income group	Connection rates (%)		
	Urban	Rural	Combined
1 (poorest)	46.4	2.9	11.7
5 (richest)	99.1	43.5	54.8

Increasing block tariffs in water concessions (Manila, Jakarta etc).

A common feature of water tariffs is an approach called increasing block tariff (IBT) whereby the tariff for the first household consumption bracket is below cost. This is rationalized on the basis of poor households only using a small amount of water. It is an approach that is used in the Manila and Jakarta water concessions. However, there is clear evidence that IBT:

- fails to allow for the fact that often poor households share a connection forcing them above the subsidized rate;
- in some cases, such as Jakarta, the first block is charged as a fixed fee for the whole block irrespective of how much water within that block is actually consumed; and
- the low block provides a disincentive for companies to connect poor households since they are uneconomic to serve.

Source: Power Subsidies: A reality check on subsidizing power for irrigation in India, Monari, 2002, Viewpoint no. 224, World Bank, Household Income and Expenditure Survey 2000-1, Government of Bangladesh, New Designs for Water and Sanitation Transactions: Making Private Sector Participation work for the Poor, Water and Sanitation Program and PPIAF, 2002

So, as can be seen, the solutions that are often employed to meet the issue of under-pricing create their own problems and can significant adverse effects on the economy or be regressive in terms of low-income households contribute to taxes that are subsidizing consumption by urban middle-class consumers.

Approaches adopted for comparisons

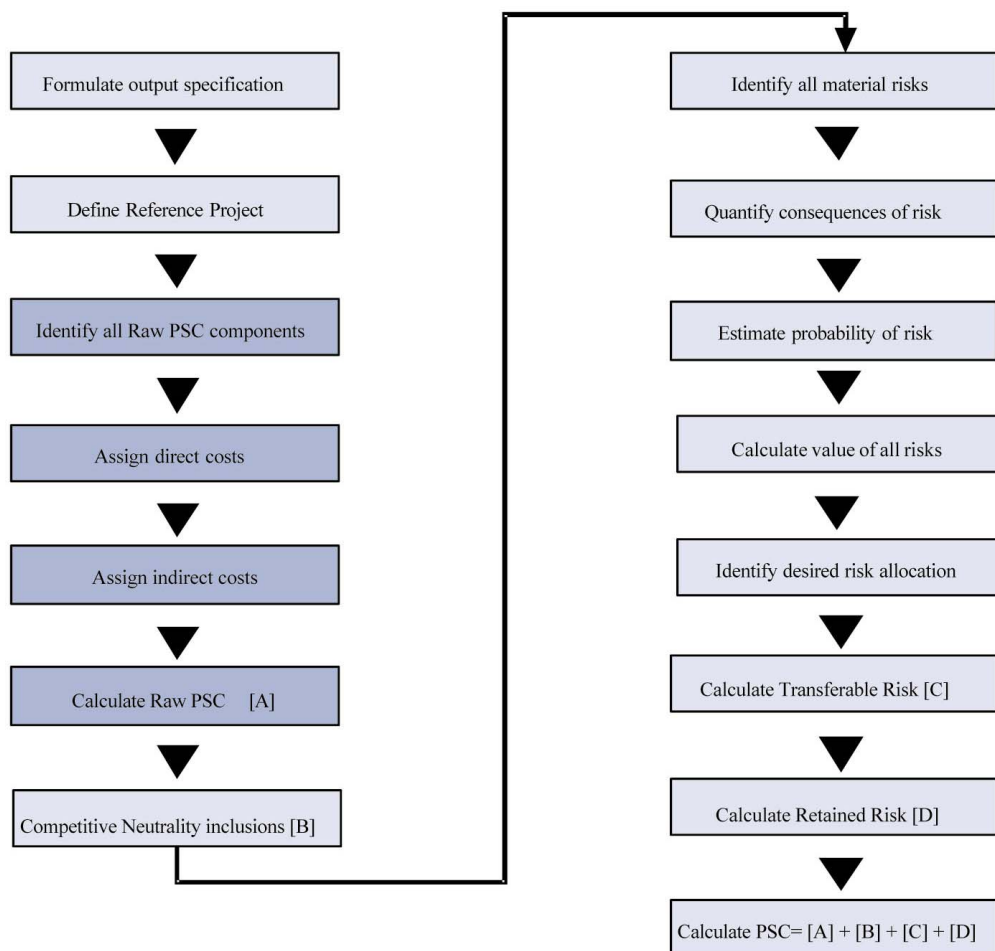
One of the outcomes of the move to greater use of the private sector for infrastructure service provision is a focus on making fair comparisons between the public and private sector – since the private sector should only be used when it is able to provide the same level of service at a lower cost. Work in the UK and Australia by the agencies responsible for public-private partnerships has produced a clearer approach to thinking about the public sector option.

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Figure 1 reproduces a simple flow-diagram used by Partnerships Victoria when they are thinking about the public sector option while determining if a private sector solution is appropriate.

What this approach shows are the key building blocks and as such is as useful when thinking about an existing service as a new one. For example, issues such as risk tie in to the level of return that has to be earned.

Figure 1: The Partnerships Victoria Public Service Comparator (PSC) model



There is, however, a further step that needs to be undertaken when comparing the probable cost of private service provision when compared to public service. That is, will the private operator be more efficient than the public operator? As mentioned in the introduction, while the rationale for private participation may differ between countries and sectors, in all cases you would expect the private operator to be more efficient than the public sector provider. The answer to this lies with the type of incentives that are created for the private operator and how they compare to the incentives for efficient operation under the public sector. It is fair to say that the private operator,

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if given appropriate incentives, is likely to prove more efficient than the public sector operator – even if the public service operator is working under the same incentive structure.⁵

Evidence on the relative efficiency of the private sector versus the public sector is growing. From those areas where reform has been underway for over a decade, especially Europe and Latin America, there is growing evidence of the greater efficiency of the private sector. Examples of this are provided in Alexander and Estache 2000.

Conclusions

When thinking about the true cost of public sector service provision it is vital that all the cost elements be considered – in far too many cases operating and maintenance costs (and maybe interest on external debt) is all that is collected through the tariff. This leads to significant underpricing (owing to the importance of returns on capital for these capital intensive industries) which can lead to poor service provision, lack of funds for investment (especially expansion of service provision) and a gradual deterioration in the productive capital of the operator.

It is important that when determining prices all cost elements are included. This will allow the operator to be viable and ensure appropriate consumption and investment decisions are taken. It will also facilitate a sensible comparison between the likely price for a private sector operator when compared to the public sector and help allow decisions to be taken on a like-for-like basis rather than the situation that exists at the moment.

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⁵ Some of the interesting outcomes from the reform process in the electricity sector in India is that creating ‘incentives’ for state owned enterprises is difficult and the outcome is far from certain.