# Using Performance Measures

# To Drive Change

# Within The Public Sector

# The NSW Experience

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## NSW Treasury

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## 1. Introduction and Overview

This paper discusses the role of performance measurement in driving change within the public sector.

There are many examples of performance measurement contributing to reform. For example, the electricity supply industry. Taking up the story in the mid 1980s, State monopoly generating companies were thought to be imposing an unnecessary cost burden on Australian industry. Total factor productivity studies and international benchmarking of reserve plant margins provided firm evidence supporting this view. That evidence intensified the pressure to consider removing the State monopolies and splitting the large incumbent generating companies into smaller, competing firms. A study of scale effects in electricity generation showed that Pacific Power, in New South Wales, could be split into two or three firms without introducing scale inefficiencies. This information was used to guide the reforms that followed.

As well as providing information for restructuring industries, performance measurement can be used to drive change to the structures within organisations. This paper will focus on this less dramatic use of performance measures - encouraging government agencies (government businesses and Budget Sector agencies) to improve their performance.

Section 2 outlines the objectives of reform of government agencies to illustrate the need for reliable measures of performance. Section 3 outlines the role that performance measurement plays in guiding policy development. Section 4 describes how performance measurement is used in the financial management of agencies and outlines some applications to NSW government agencies. Section 5 provides some general conclusions.

## 2. Reform of Government Agencies

Government agencies provide vital infrastructure services such as rail and electricity, and core human services such as health and education. Expenditure on these services is approximately 20 per cent of GDP. Improvements in the performance of government agencies will have a significant impact on economic growth and community welfare.

Governments are interested in improving the performance of these agencies because of:

- The importance of these services;
- The burden on the community of funding these services (through taxes and charges); and
- General public concern over the financial management of the public sector.

Major reform of the NSW public sector commenced in the late 1980s and is built on five core principles:

- Setting clear and consistent objectives and standards;
- Giving managers increased operational responsibility and autonomy;
- Holding agencies to account by objective performance evaluation;
- Giving managers and their agencies the incentive to perform better; and

- Removing privileges or handicaps to put government agencies on a comparable footing to their private sector counterparts.

It took time to properly come to grips with the fifth of the principles, competitive neutrality. In the meantime, application of the first four principles produced some fairly substantial gains. But this was not enough to maintain ongoing and sustained change. Evidence of this is provided by the waterfront container handling sector beginning to lose ground in the move to best practice after making some promising early gains (BIE 1995). To maintain and extend productivity growth in government businesses, structural reforms are needed.

The principle of competitive neutrality was given impetus with the adoption of National Competition Policy by the Council of Australian Governments in 1995. This policy provides both a framework for the reform of government business and consistent directions for the microeconomic reform efforts of individual States and Territories. It provides for the separation of regulatory and operating functions; the separation of natural monopoly and potentially competitive activities; and the break up of potentially competitive activities into independent business units to promote competition. The Industry Commission estimates that reforms associated with National Competition Policy will provide major economic benefits for Australia, increasing real GDP by 5.5 per cent per annum and creating a net gain of 30 000 jobs (Industry Commission 1995).

The NSW Government has introduced a financial framework for its government businesses, which was reflected in the principles of competition policy. The framework is designed to remove any net competitive advantages conferred by government ownership and make government businesses operate in a commercial manner analogous to private enterprises with similar risk.

The financial framework requires government businesses to focus on commercial activities, and industry regulation is overseen by either Commonwealth or State regulatory bodies. To encourage competitive behaviour, the potentially contestable activities of government businesses are being separated from non-competitive activities and divided into several businesses.

For example, the NSW Government separated the non-competitive natural monopolies undertaking distribution and high-voltage electricity transmission from the competitive electricity generation and retail supply sectors of the electricity supply industry. There has been a restructuring of the generators and retailers and they will be operating in markets that will be progressively opened to competition from both intra-State and interstate competition.

State Governments are now beginning to apply competition principles to Budget Sector service providers. The NSW Government is introducing contractual budgeting for the Budget Sector. Under contractual budgeting an agreement to purchase services is entered between the Government and agency. Additionally, private companies are already free to bid to provide some government services, and are doing so in areas like information technology, cleaning, building maintenance, transport, staff and property management.

This brief overview of the public sector reform process provides the context in which measures of performance are being applied. The role of performance measures is briefly described in the next section.

## 3. Performance Measurement and Policy Development

In a well functioning market, price changes provide signals about the quality of and demand for goods and services. The outputs of government agencies are typically traded in markets where prices are not free to adjust or may not exist and an alternative to prices is needed to indicate performance improvements and guide decisions.

Measures of performance provide:

- A catalyst for policy ideas;
- Information to facilitate accountability;
- A means of identifying areas for review;
- A means of monitoring policy implementation and success;
- Information on the potential productivity improvements of an agency;
- A means for analysing the interrelationship between agencies and between programs, to allow governments to coordinate policy across agencies, for example - the interrelationships between policing, courts and correctional services;
- Information to promote yardstick competition in government agencies which face little direct competition in input or output markets;
- A powerful internal management tool for agencies - they provide managers with an idea of how efficient they are, explain reasons for poor performance and can identify appropriate 'leading performers'; and
- Assistance for the resource allocation/budgeting process by providing a means of allocating funding between competing needs based on performance and need, rather than historic precedent.

**Box 1. Key Performance Measurement Concepts**

| | |
|---|---|
| **Productivity** | the ratio of all outputs to all inputs |
| **Partial productivity** | a ratio of outputs to inputs which does not include all inputs and outputs, for example, output per employee |
| **Efficiency** | how well an organisation uses its resources to produce outputs relative to best practice at a point of time |
| **Technical efficiency** | refers to the conversion of physical inputs such as employees and machines into outputs relative to best practice. Technical efficiency is affected by managerial practices and the scale or size of operations. |
| **Allocative efficiency** | refers to whether, given input prices, inputs are chosen to minimise the cost of production |
| **Dynamic efficiency** | refers to the timeliness of changes to technology and products in response to changes in consumer tastes and productive opportunities |
| **Economic or cost efficiency** | refers to whether an organisation is technically, allocatively and dynamically efficient |
| **Effectiveness** | how well the outputs of a government agency achieve the objectives expected by the Government, for example are the activities of hospitals having an effect on the general health of the community |

Improvements in the productivity performance of government agencies is necessary for substantial increases in community welfare. Improved productivity comes about through structural change:

> '*Increasing wealth will only come if an economic system is able to carry out a complex process of structural change, in which the proportions of sectoral output, of consumption and, most important of all, of employment, in different sectors, are continually changing. The process of moving labour, ie people, from job to job, of moving labour and capital from sector to sector and even from region to region, far from being exceptional events, appear as the very normal pattern of growth of wealth through technical progress.'*

The purpose of productivity measurement is to guide structural changes.

Several government exercises are developing consistent indicators for the performance of government agencies (Steering Committee on National Performance Monitoring of Government Trading Enterprises 1996; Steering Committee for the Review of Commonwealth/State Service Provision 1995 and NSW Treasury's *The Performance of NSW Government Businesses)*. These exercises provide useful information to compare the performance of agencies with similar agencies in New South Wales, Australia and overseas.

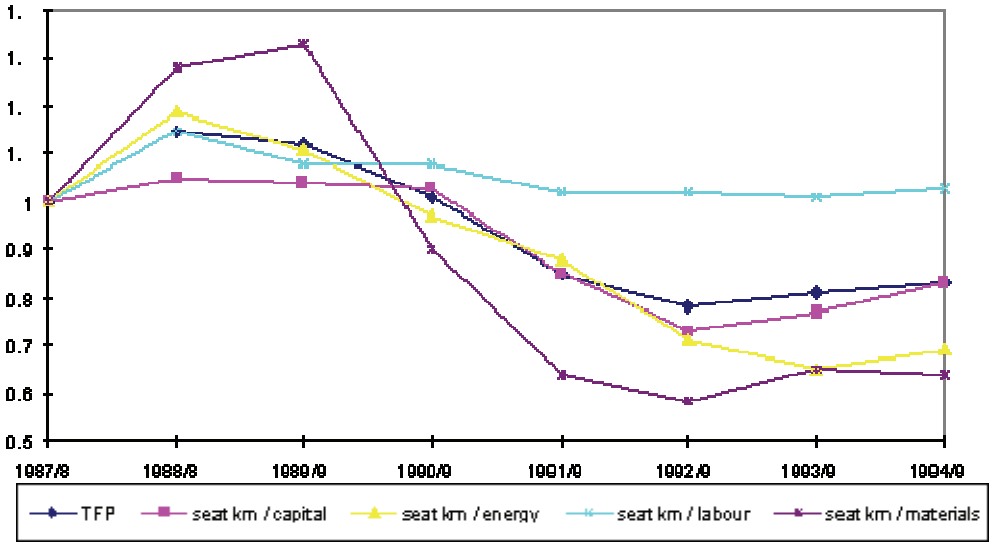
The publications provide some technical and economic efficiency measures. However, the main indicators of efficiency are usually unit cost per unit of service or partial productivity measures, such as service per employee.

Partial indicators can vary for reasons other than inefficiency; for example, government agencies may deliver services in different environments, have a different mix of clients or use different input mixes. For example, focussing on partial measures such as output per employee can be misleading because it only tells part of the story - how labour is moving with production. It says nothing about capital. Consider the example of Sydney Ferries in Box 2.

**Box 2. Total Factor Productivity (TFP): An application to Sydney Ferries**

Focusing on partial measures of performance can give a misleading impression of the performance of government businesses. Figure 1 presents various partial performance indices and the TFP index (which uses seat kilometres as the output) for Sydney Ferries. The labour productivity index indicates an increase in productivity of 0.4 per cent over 1987-88 to 1994-95. However, the TFP index indicates negative growth of 2.6 per cent over the period. The negative growth is explained by declines in the partial factor productivity of capital, energy and materials.

**Figure 1 Partial Factor and TFP Indices for Sydney Ferries 1987-88 to 1994-95**




As a consequence of the shortcomings of partial indicators, governments are turning to more comprehensive techniques such as Data Envelopment Analysis (DEA), Total Factor Productivity (TFP) and Shareholder Value Added (SVA). The techniques combine information on the major services (outputs) and inputs of government agencies to provide better measures of performance. The key features of these techniques are outlined in the Box 3.

**Box 3. Basic features of TFP, SVA and DEA**

| | **Measures** | **Features** |
|---|---|---|
| **TFP** | Productivity - ratio of outputs (weighted by revenue shares) to inputs (weighted by cost shares) | • Index number technique<br>• Handles multiple inputs and outputs<br>• Requires prices of inputs and outputs |
| **SVA** | Economic profit - operating profit after tax and a charge for debt and equity (also known as Economic Value Added - EVA) | • Financial analysis tool<br>• Separates a firm's operations from its financing<br>• Deducts the opportunity cost of capital (debt and equity) from operating profit<br>• Uses a cash flow format where possible |
| **DEA** | Technical efficiency - identifies best practice within the sample and measures efficiency relative to best practice units | • Linear programming technique<br>• Handles multiple inputs and outputs<br>• Does not need prices (particularly useful for Budget Sector agencies which do not trade in markets) |

The NSW Treasury is increasingly using these techniques to monitor the performance of major agencies. It is encouraging agencies to use the techniques to identify reasons for poor performance that would otherwise go unnoticed, such as management practices, scale of operations or government regulation.

Treasury will use SVA analysis to help set financial targets for the major government businesses in 1997-98, and is investigating the use of TFP to assist in separating the financial performance of government businesses into productivity and price components. DEA will be used to help specify service targets for the major government service providers in 1998-99. These techniques will allow Treasury to monitor the progress of the financial and structural reforms to government agencies.

# 4. Performance Measurement And Monitoring

## 4.1. Government Businesses

Treasury annually negotiates financial targets and other performance benchmarks with government businesses to help ensure the Government receives a commercial return on its investments. The performance indicators are incorporated in a Statement of Financial Performance (SFP) - an agreement between Treasury and the majority of government businesses on the expectations of its financial performance.

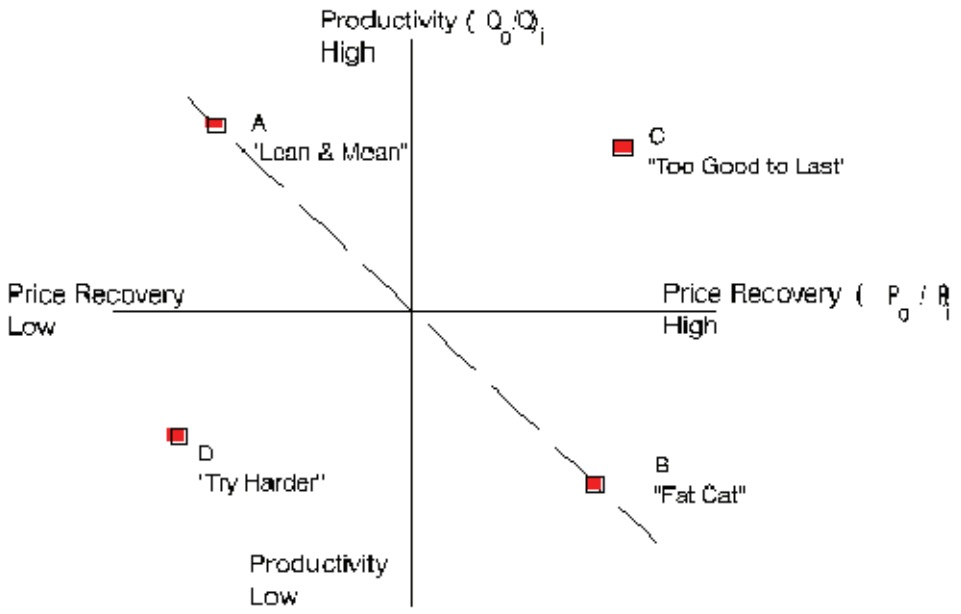
Treasury regularly monitors the financial performance of government businesses by focusing on the capital structures, rates of return and dividends. However, such accounting-based measures have a number of deficiencies and have led Treasury to introduce a broader measure of financial performance. As noted above, Shareholder Value Added (SVA) is the net operating profit of a business after tax less a risk-adjusted charge for the debt and equity capital employed. By focusing on this particular measure, a government business is encouraged to maximise its value to the shareholders - in this case the NSW taxpayer.

A government business's profitability is determined by its productivity (ie the amount of inputs required to produce its output) and the level of price recovery (ie the relationship between output and input prices). Accordingly, changes in SVA or economic profit may not move with productivity improvements. A business could improve its profit by expanding the wedge between input and output prices while productivity declines. Conversely, a business's profit may be low despite improvements in productivity because output prices are low. For example, Orion Energy (an electricity distributor) had a 2.3 per cent increase in profitability over the period 1987-88 to 1994-95. This is the result of a 9.8 per cent increase in productivity and a 7.5 per cent decline in price recovery (NSW Treasury 1996a).

Under National Competition Policy government businesses will face increased competition, and profitability from monopoly pricing may no longer be sustainable. Profitability will need to increasingly come from productivity improvements, and information on productivity and efficiency will be of strategic importance.

Information on both productivity and price recovery is vital for determining reforms within a government business. The chart below shows four very different positions for a government business, with corresponding differences in the appropriate reform path.

**Box 4. Profitability and Productivity**




To complement SVA analysis, Treasury has developed a 'financial' TFP model to determine the relative contribution of productivity improvements and price recovery to a government business's profit. For more information on SVA see Stewart (1994) and NSW Treasury (1996a).

TFP studies (both standard and 'financial') provide information to help set financial targets for government businesses and allow Treasury to monitor the structural reforms to their activities. Additionally, the studies will form an input to the determination of maximum prices for monopoly services.

In NSW to date, TFP models have been developed for government businesses operating in the electricity supply and transport sectors. Results are shown in Box 5. The growth in Pacific Power's productivity was driven mainly by more efficient use of the enterprise's labour and capital resources. Productivity growth for the former four metropolitan distributors - Sydney, Prospect, Orion and Illawarra - was underpinned mainly by better utilisation of labour resources. Box 6 outlines the TFP model for the distributors and considers Sydney electricity in more detail.

Productivity results in the transport sector have been mixed. Sydney Buses, Newcastle buses and Freight Rail recorded impressive growth in total productivity. However, Sydney Ferries (see Box 2), and CityRail both experienced poor productivity performances. Box 7 describes the CityRail study in more detail.

**Box 5. Total Factor Productivity Growth**

| | Annual Average Change % | Total Change % |
|---|---|---|
| **Electricity:** | | |
| Pacific Power * | 5.4 | 36.8 |
| Sydney Electricity | 7.4 | 64.7 |
| Prospect Electricity | 4.7 | 37.9 |
| Illawarra Electricity | 2.5 | 19.1 |
| Orion Energy | 4.5 | 36.2 |
| **Transport:** | | |
| Sydney Buses ^ | 5.5 | 45.2 |
| Sydney Ferries ^ | -2.6 | -16.9 |
| Newcastle Buses ^ | 5.4 | 44.1 |
| Freight Rail # | 8.3 | 61.3 |
| City Rail ~ | -1.5 | -7.2 |

* 1987-88 to 1993-94. Includes both generation and transmission functions.

^ 1987-88 to 1993-94.

# 1988-89 to 1994-95.

~ 1989-90 to 1994-95

**Box 6. TFP Studies Of The Former Metropolitan Distributors**

A set of standard TFP models were developed to measure the productivity performance of the four former metropolitan electricity distributors - Sydney, Prospect, Orion and Illawarra. The main features of the model are:

**Output**

- Electricity sold (GWh)

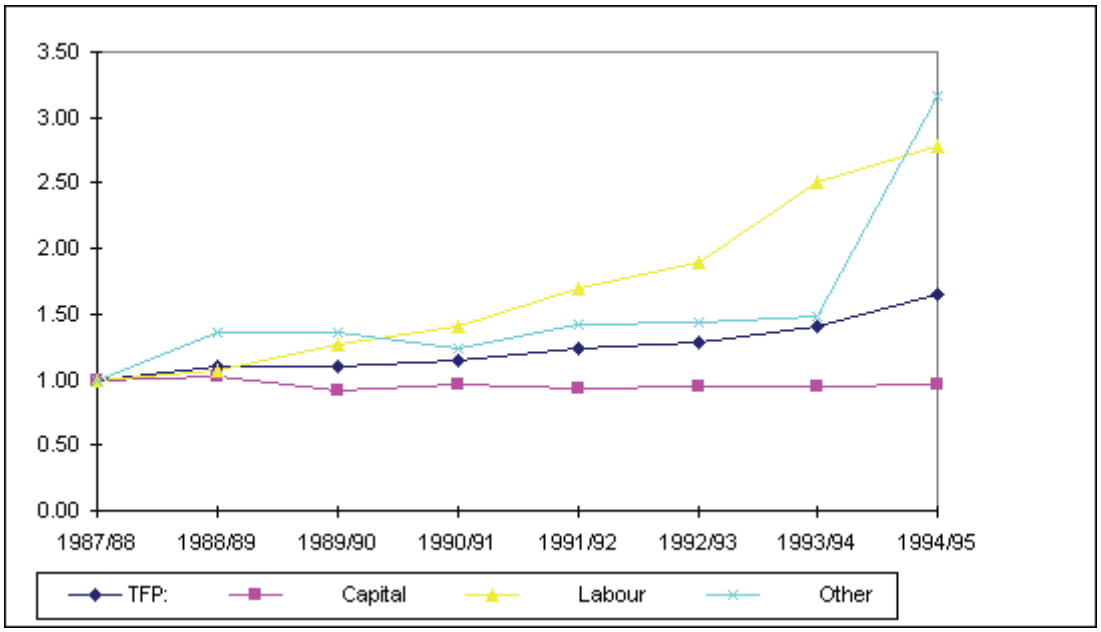
**Inputs**

- Labour (average full time equivalent employees)
- Capital (real capital stock)
- Other (real residual operating expenditure)

To create a single index of inputs, labour, capital and other inputs are weighted by their share of total costs. The productivity index was calculated by dividing the output, electricity sold, by the input index.

Figure 2 presents partial factor and total factor productivity results for Sydney Electricity. Sydney Electricity recorded growth in total factor productivity of 65% from 1987-88 to 1994-95. This reflects dramatic increases in the partial factor productivity of labour and other inputs.

**Figure 2 Partial Factor and TFP Indices for Sydney Electricity 1987-88 to 1994-95**



**Box 7. TFP Study of CityRail**

The NSW rail sector was restructured in 1996 to establish an open access regime. This model TFP model is for the 'old' CityRail which included of 'below rail' infrastructure (eg, track and signalling). The main features of the model are:

**Output**

- Seat kilometres - the total number of seats available over the rail network
- Passenger kilometres - the approximate distance travelled by passengers

**Inputs**

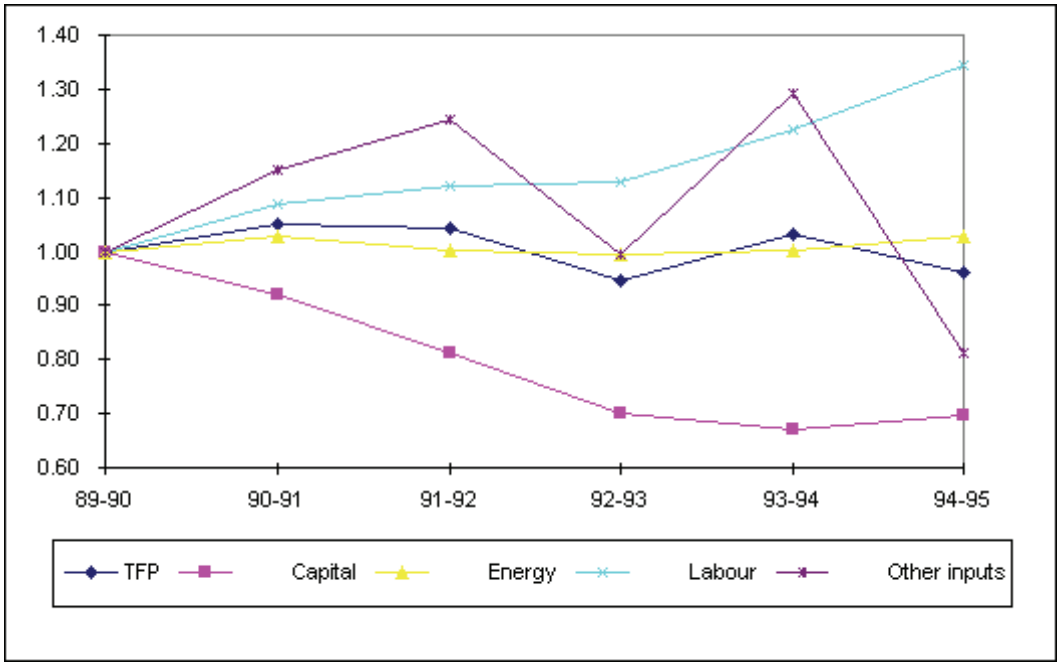
- Labour (average full time equivalent employees)
- Capital (real capital stock)
- Energy (gigajoules consumed)
- Other (real residual operating expenditure)

Two alternative output measures were used. Seat kilometres is a measure of supply, and passenger kilometres is a measure of demand.

To create a single index of inputs, labour, capital, energy and other inputs are weighted by their share of total costs. The productivity index is calculated by dividing each output by the input index.

Figure 3 presents CityRail's productivity performance. From 1989-90 to 1994-95, CityRail's TFP declined by 4%. The partial productivity of labour increase by 34 per cent, while the partial productivity of capital fell by 30 per cent. Other inputs productivity was volatile.

**Figure 3 Partial Factor and TFP Indices for CityRail 1989-90 to 1994-95 (seat km output)**




In partnership with government businesses, Treasury intends to continue TFP measurement for the restructured metropolitan energy corporations and CityRail and to construct new models for the NSW water corporations and CountryLink. (back to contents)

### 4.2. Budget Sector Agencies

Reforms to the financial management of the NSW Budget Sector over recent years include the introduction of forward estimates, global budgeting, accrual accounting and publication of output and outcome measures in the Budget Papers. The task now is to strengthen the linkages between these various reforms.

An approach to resource allocation, which is designed to achieve better quality services for the consumer and greater accountability to the taxpayer, is being developed in New South Wales under the umbrella of *contractual (or performance) budgeting*. It involves:

- Developing a better understanding of the services or outputs, for example court cases and people immunised, produced by Government agencies and of the results or outcomes, for example crime rates and mortality rates;
- Linking resource allocation decisions at both the whole-of-government and individual portfolio levels with identified Government policy and priority outcomes; and
- Ensuring greater efficiency in the delivery of outputs by encouraging agencies to use benchmarking and other related techniques.

The term *contractual* is designed to indicate that agencies will become more accountable for delivering the outputs and achieving the outcomes for which they have been funded. This follows the model already used when private businesses provide services for the government.

The implementation of contractual budgeting in New South Wales involves several overlapping stages:

- The development and publication of output and outcome measures;
- The implementation of Statements of Financial Performance (SFP), similar to those used for government businesses; and
- More explicit separation of the Government's purchaser and provider roles and the implementation of service competition policy.

The first two stages of this process are well underway. For more information on the financial reforms in New South Wales see Carrington et al (1996).

It is worth emphasising that improving the performance of government service relies on both efficiency and effectiveness and SFPs will list both outputs and outcomes. A government service provider may increase its efficiency by sacrificing the effectiveness of its service. For example, an 'efficient' school may have enrolled students in a course beyond the optimal class size and reduced the quality of teaching. By contrast, an 'inefficient' school may have lower class sizes to provide more thorough teaching. Therefore, it is important to develop effectiveness indicators for government service providers, for example, are students acquiring relevant knowledge and skills? Viewed together, effectiveness and efficiency indicators provide a better understanding of the performance of government service providers.

Box 8 lists some examples of output and outcome measures reported in SFPs for NSW Budget Sector agencies. It is worth noting that the measures used are limited by the reliable data available. For example, over time a measure for hospital readmissions may be developed.

**Box 8. Output and Outcome Measures used for NSW Budget Sector Agencies**

| **Outputs** | **Outcomes** | |
|---|---|---|
| **Health** | children immunised<br>patients admitted to hospitals | incidence of specific diseases<br>mortality rates<br>percentage of smokers (adults)<br>average waiting time for overnight elective surgery |
| **Police** | Arrests<br>investigations<br>random breath tests | assault victims<br>property thefts<br>collisions (speed and alcohol) |
| **Corrective Services** | numbers in custody<br>inmate employment positions | escapes<br>re-offenders<br>deaths in custody |

The NSW Treasury is beginning to use DEA to assist in the financial management of Budget Sector agencies. The results of DEA studies will contribute to the information used in the monitoring process.

DEA provides a comprehensive picture of technical efficiency, by constructing a total production function and adjusting for the influence of environmental factors, such as population density. The technique can handle multiple inputs and outputs and does not require price information. It is a linear programming technique that identifies the best

performers at a point in time by their ability to produce the greatest level of outputs with a given set of inputs or to produce given outputs with the least inputs. Other service providers receive an efficiency score that is determined by their performance relative to the best performers.

The technique can determine whether the main source of technical inefficiency is the managerial capabilities of the service provider or the scale of operations, that is whether a unit is too large or too small. Further, DEA can incorporate environmental variables that influence the efficiency of a service provider but are beyond its control, for example the education or wealth of clients. The method to calculate technical efficiency and its components is presented in Lovell (1993). The Steering Committee for the Review of Commonwealth / State Service Provision will be releasing an information paper on DEA later this year.

However, as with any other technique, a DEA study will only be as good as its data. If major inputs or outputs are omitted from the model, the results may be meaningless. Additionally, DEA is a non-stochastic technique and is particularly sensitive to data outliers, random events and errors in the data. Errors in the data may be a problem in some of the studies presented below and the results should be considered with these limitations in mind. Many of the agencies are establishing better information systems to improve the data for future studies.

Performance measurement techniques such as DEA can assist with the implementation of SFPs:

- By helping specify the outputs of agencies;
- Identifying sources of inefficiency, such as management practices, the scale of operations, government regulations or social program policies; and
- Providing central agencies with an indication of the scope of possible managerial and scale efficiency improvements.

The NSW Treasury has undertaken DEA studies of NSW police patrols, minimum security correction centres (prisons), motor registry offices and technical and further education (TAFE) colleges. Summaries of these studies are presented in the boxes below. Studies have commenced to determine the technical efficiency of local courts, fire brigades and hospitals in New South Wales and Treasury is examining further opportunities to use the technique. DEA is best suited to agencies which have a number of separate units that provide similar services.

To undertake these studies Treasury requires the cooperation of the agency. The agency has detailed knowledge of the services it provides. This knowledge is required to determine the scope of the study. The basic requirements for a DEA study are input and output data for individual service units, for example hospitals.

The agency contributes further by examining the results of the study. It can assess whether sensible comparisons between service units are being made and may be able to explain the reasons for inefficiency. This may lead to further refinements to the study to include different combinations of inputs and outputs, better measures for inputs and outputs, correcting errors in the data or considering the influence of environmental variables. Early models need to be interpreted with the understanding that the models may not adequately describe the production process.

The modelling process is iterative and accordingly, assistance and liaison will be ongoing. Such cooperation is also vital for the successful adoption of DEA as an internal management tool.

The results of the DEA studies of NSW agencies shows that differences in the performance of individual police patrols, prisons, TAFE colleges and motor registries exist. Some of these differences may be due to errors in the data, inputs, outputs or environmental variables we have not adequately captured in the model.

In most cases the studies have identified managerial inefficiencies which the agencies are now investigating. The agencies have found DEA a useful addition to their suite of management tools.

The studies to date have found that managerial efficiency is more significant in explaining differences in performance than scale. This is pleasing, because it indicates that technical efficiency can be improved without dramatic structural changes. However, DEA only provides comparisons with existing performance, efficiency may be further improved through substantial restructures for which the technique provides little advice.

Before presenting the results of the NSW studies, it should be noted that DEA efficiency scores are derived relative to best practice within the sample. The average efficiency scores reflect the technical efficiency of the units in the sample and cannot be compared to efficiency scores in other studies. The studies provide no information on the relative efficiency of the samples or how NSW government service providers compare with Australian or world-best practice. The Steering Committee for the Review of Commonwealth / State Service Provision is encouraging the establishment of national DEA models so that more extensive comparisons can be made.

**Box 9. DEA Study of NSW Minimum Security Correctional Centres (Prisons)**

The units investigated in a DEA study should face the same production technology. Higher security centres are not included in the same study as minimum security correctional centres because the technology and resources used to manage inmates are very different.

The study considers eleven minimum security correctional centres. This data set is too small to generate sensible DEA results if only one year's data is used. This problem is overcome by using panel data for 1990-91 to 1994-95. This is appropriate because the NSW Department of Corrective Services advises that there was minimal change in managing inmates over the period.

The model distinguishes between different types of inmates, and includes personal development programmes provided to inmates. Inmate receptions is used to capture the turnover of inmates which is resource intensive and unevenly distributed over the centres.

The DEA model for NSW minimum security correctional centres includes:

**Outputs**

- Confinement of inmates eligible for conditional leave of absence (number)
- Confinement of other inmates (number)
- Inmate receptions (number)
- Personal and support services for inmates (number of hours in personal development programmes)

**Inputs**

- Capital (number of beds)
- Labour (full time equivalent)
- Raw materials (real expenditure less wages and salaries)

The study found on average the correctional centres could produce the same measured outputs with 4 per cent less inputs if they operate at current scale and use their inputs efficiently.

**Box 10 DEA Study of NSW TAFE Colleges**

The DEA model for NSW TAFE Colleges for 1994 includes:

**Outputs**

- Resource intensive services (student hours)
- Less resource intensive services (student hours)

**Inputs**

- Teachers (salaries)
- Support staff (non-teacher salaries)
- Materials (recurrent non-labour expenses)
- Capital (floor space)

TAFE Colleges also provide consultancy services. We were unable to quantify this output for this model. The TAFE Commission is developing a method to convert consultancy services into student hours for inclusion into future models. The measure for capital, floor space, does not capture other parts of a college's capital stock such as computers or industrial machinery.

The study found on average the colleges were 19 per cent below their potential outputs given their inputs and current scale of operations.

The average efficiency of country colleges is significantly lower than the average efficiency of metropolitan colleges. This result is hardly surprising, colleges in sparsely populated areas are likely to produce less education services compared to metropolitan colleges with similar inputs.

Care is required interpreting these results because of the weakness of some data, especially the information on floor space and the exclusion of an input for consultancy services. Despite reservations over the quality of some data, the TAFE Commission considers that the results are sensible and fairly robust.

**Box 11. DEA Study of Motor Registry Offices**

The DEA model for NSW motor registry offices for 1994-95 includes:

**Outputs**

- Number of transactions weighted by the average time taken for each type of transaction
- Quality of service (reciprocal of waiting time)

**Inputs**

- Labour (total hours)
- Raw materials (expenditure on licences, plates, postage and stationery)
- Capital (expenditure on computers)

The measure for capital proved problematic. The Roads and Traffic Authority has incomplete information on the assets of individual motor registries. It suggested the number of computer terminals is a good proxy for the capital used in a registry. Information on the number of terminals was collected for 1995-96 and will be used in future studies. For the 1994-95 study the value of computers installed in each registry in 1991 the year when the bulk of computers were installed was used.

The study found on average the NSW motor registries could produce the same measured outputs with 15 per cent less inputs if they operate at current scale and use their inputs efficiently

Some registries enter data for transactions processed in areas without computers. Further work is proceeding to address a possible weaknesses in way in which these activities are included in the DEA model.

**Box 12 DEA Study of NSW Police Patrols**

The DEA model for NSW police patrols for 1994-95 includes:

**Outputs**

- Number of arrests
- Number of responses to car accidents
- Number of responses to incidents (number of offences)
- Number of summons served
- Kilometres travelled by police cars (proxy for problem solving and crime prevention)

**Inputs**

- Number of police officers
- Number of civilian staff
- Capital (number of police cars)

A major output of policing is crimes prevented which is difficult to measure. Kilometres travelled by police cars is used as a proxy to capture proactive policing. This variable captures some aspects of proactive policing such as the visible police car reassuring the public and deterring and preventing crime. However, it ignores the proactive policing done on foot by metropolitan patrols. Information on alternative proactive policing activities such as information collected by beat police or stationary random breath tests was not available.

The study found on average the patrols could produce the same measured outputs with 13.5 per cent less inputs if they operate at current scale and use their inputs efficiently. We are uncertain how the quality of police work influences the measured law enforcement outputs of a police patrol. It is conceivable that a patrol identified as efficient by DEA, because it has a high number of crime related activities relative to its inputs, is a patrol which is ineffective in crime prevention. Further work is required to improve the measure for proactive policing.

## 5. Conclusions

Performance measures can be used to drive the large structural changes such as the reform of the electricity supply industry. Performance measurement is also being used to drive less radical changes such as ongoing improvement in the performance of agencies by providing information to internal managers and the 'corporate finance arm of head office' - Treasury.

Over time NSW Treasury plans to integrate the information provided by such techniques into the financial management process. Such information may be used in negotiations between Treasury and the agency to assist in improving performance and achieving objectives. At the moment this process is still being developed.

Treasury plans to extend the use of DEA and TFP to more government agencies, and to press for appropriate follow up action by agency managers based on DEA study results. (

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