Pricing Outputs: A Case Study in Law Enforcement

This paper discusses the advantages and limitations of economic evaluation as a measurement methodology within the Australian government’s outcome and output framework including preliminary benefit–cost analysis of Australian Federal Police investigations. The results suggest that the Australian Federal Police is returning over $5 to the community for every dollar invested in fraud and drug investigations. It is concluded that benefit–cost analysis is a useful tool for comparing the price of an output to the value of an outcome. The method has limitations. Not all outcomes will admit of easy assessment and the information may be difficult to collect. However, the use of surrogate measures and extrapolation of results may overcome most of these limitations.

There has been considerable recent interest in the issue of public sector accountability and economic reform (Argy 2001; Kluvers 2001; Mulgan 2000). Among the reforms introduced by the Australian government has been the requirement for all Commonwealth agencies to report on the basis of an outcome and output framework. Each year agencies define their outcomes and outputs through their portfolio budget statements and report the results in their annual reports. This paper discusses the advantages and limitations of using economic evaluation as a measurement methodology within the Australian government’s outcome and output framework. The feasibility of such an approach is demonstrated by the reporting of the results of a preliminary benefit–cost analysis of Australian Federal Police (AFP) functions.

Detailed guide notes on the purpose and structure of the Australian government’s outcome/output framework have been provided by the Department of Finance and Administration (2001). Key points from that document are summarised below together with comment on their relevance to performance management within the AFP as background to the analysis and discussion that follows.

In short, through the outcomes and outputs framework, the government seeks to achieve its goals (i.e. outcomes) through outputs provided by agencies. These outputs can take the form of administered items or goods and services which are delivered by the agencies against specific performance benchmarks or targets (performance indicators). The AFP has no administered items and does not produce goods. The AFP’s outputs relate to the provision of various law enforcement services in order to assist the government to achieve its policing objectives nationally and internationally. The AFP also provides a community policing service to the Australian Capital Territory. As this service is funded and delivered according to an agreement with the ACT government, it is not further discussed in this article. The AFP’s Commonwealth government outcome is the investigation and prevention of crime against the Commonwealth of Australia and protection of Commonwealth interests in Australia and overseas (Attorney-General’s Department 2001). The price of this outcome for 2001–02 is estimated at $312.8 million. The AFP contributes to this outcome through the provision of three outputs:
• **Investigation Services** ($229.2m) — the AFP provides a flexible, reactive investigative capacity across a large range of national interests. It enforces a range of federal laws including protecting the integrity of national economic and social institutions.

• **Protection Services** ($30.0m) — the objectives of this output are to ensure that individuals and interests identified as at risk by the Commonwealth are kept safe and their dignity preserved.

• **International Services** ($53.6m) — the objectives of this output include facilitating an effective response to international law enforcement efforts; providing a contribution to Australia’s international peace-keeping/monitoring commitments; and providing community policing services to Australia’s External Territories.

(Attorney-General’s Department 2001)

The Department of Finance and Administration (2001) recommends that the framework should be used both as a means of corporate governance and to improve public accountability through the transparent reporting of organisational performance. One of the signal features of the framework, according to the department, is that it provides an enhanced capacity to manage complexity. Complexity arises from internal and external sources. Internally, most agencies have a number of objectives. These objectives may overlap and it will be difficult to distinguish the impact of one program on society from that of another. Externally, there may be a wide range of factors outside of agency control that also impact on government objectives. For example, the minimisation of fraud against the Commonwealth will to some extent depend upon the efficacy of AFP investigations but is also based on the effectiveness of prevention and detection strategies within Commonwealth agencies as well as a multitude of environmental factors related to the socioeconomic state of society. The department notes that while no framework will account for all the complexities of public sector administration, the outcome and output framework allows a reasonably straightforward and flexible approach to the management of complex responsibilities.

The relationship of AFP outputs to its outcome and the composition of the outputs themselves both reflect the complexity evident in the outcome and output framework of many agencies. Output 1, Investigation Services, includes investigations of illicit drug trafficking, people smuggling, organised crime, serious fraud against the Commonwealth, money laundering and the interception of assets involved in or derived from these activities. The impact of these crimes upon society is various. The social impact of illicit drug abuse is well documented and massive. In Australia each year there are over 1,000 deaths due to overdose, approximately 25,000 years of potential life lost and 14,000 hospital admissions (Intergovernmental Committee on Drugs 2001) as well as associated loss of productivity and drug-related property crime. Fraud against the Commonwealth impacts directly on Commonwealth revenue and expenditure and diverts funds from those in need to those not in need. Fraud is a drain on the government’s ability to carry out its program and restricts the government’s ability to reduce the overall level of taxation. Fraud has been estimated at approximately $3 billion annually (Walker 1997). Similarly, money laundering results in loss of revenue for the Commonwealth as well as providing a vital link for drug traffickers and other organised crime to benefit from the profits of their illegal activities. Worldwide the value of money laundering has been estimated to be equivalent to the output of an economy the size of Spain (Financial Action Task Force 1999).

Law enforcement has traditionally struggled in developing and using appropriate performance indicators. Criminal investigation is necessarily complex, usually lengthy and costly, adversarial and restricted in the types of evidence it can consider. Evidence can often only be obtained with the order of a court and people may choose not to cooperate. Criminal conviction also requires proving a set of facts beyond a reasonable doubt. Historically, police in Australia and around the world have concentrated on measuring what is done rather than how well it is done.

The AFP has recently moved from activity reporting to output-based measures that, through integration with the management decision-making process, will improve the quality of investigative process. Some of these performance measures, such as the proportion of cases proceeding to legal process, are applicable to all or most of the types of investigations undertaken. Others, such as drug seizures, are
relevant only to a specific type of investigation. The AFP is not the only agency (either in the public or private sector) which could potentially provide these services to government and the government can decide upon the quantum of outputs that it wishes to purchase from an agency as well as the price to be paid.

The pricing of services against service outcomes is a key feature of the outcome and output framework. In general, however, performance against outcomes achieved is not described or reported in economic terms. Benefits tend to be couched in terms of social impacts such as improved health, better transport systems or safer communities. Alternatively, the AFP has tended (like many other agencies) to report the cost of its inputs against selected performance measures for its outputs. Nevertheless, it is both desirable and possible in many instances to provide a more direct comparison between the costs of a program and an estimate in dollar terms of the benefits resulting from its implementation.

While considerable lip service is paid to the notion of economic evaluation in the public sector, actual studies are quite rare. A good example of a recent economic evaluation relates to the federal government’s Black Spot program. The then Department of Transport and Communications conducted a benefit–cost analysis of the Black Spot program (Bureau of Transport and Communications Economics, 1995) and estimated a return of $4 for every dollar invested in the program. Recently, the analysis has been repeated and returned a benefit cost ratio of 14.0 (Bureau of Transport Economics 2001). The increase in benefit–cost ratio from 4.0 to 14.0 may not necessarily reflect a significant increase in the effectiveness of the program but may be related to a change in the assumptions underlying the analysis. The recent analysis employed a willingness-to-pay methodology that resulted in much higher estimates of the costs associated with fatal and serious road crashes. While it is important to note the significance of underlying assumptions in determining the magnitude of benefit–cost ratios and the implications of this for the comparison of the results of individual studies, it is equally important to note that, on the basis of these results, the Black Spot program represents a good return on investment for government funds.

The AFP commissioned a similar internal analysis of the economic value of some of its investigation services. In the first instance, the analysis was limited to fraud and drug investigations which between them comprise over 70 percent of the services delivered under the output and are both good candidates for assessing resulting benefits. It should be stressed that the results are preliminary and it is intended to publish a fuller investigation at a later date. Their relevance at this point is that they help to illustrate more fully both the advantages and limitations of the application of this type of analysis within an outcome and output framework. In particular, they represent, on the one hand, a situation (fraud) where the benefits and costs are readily identifiable and quantifiable and, on the other hand, a situation (drugs) where the benefits are complex and difficult to quantify.

The case studies are preceded by a short explanation of the type of economic evaluation undertaken. A more extensive treatment of the topic may be found in the references given below.

Economic Evaluation

Benefit–cost analysis (BCA) is a direct method for assessing the economic value of programs in the private and public sectors. BCA is a systematic, quantitative method of assessing the time-phased costs and benefits of a program. Chisholm (2000) states that BCA can be used by the public sector for a number of purposes including:

- to determine the financial investments in a program;
- to provide direction in the selection and maintenance of programs;
- to determine the optimal benefits of a given budget.

The economic success of a program can be indicated by a number of BCA tools (Rolstadas 1995). Three of the most widely used are net present value (NPV), return on investment (ROI) and internal rate of return (IRR). NPV (described in more detail below) is considered the most reliable indicator of economic value (Bureau of Transport and Communications Economics 1995). Other measures, such as ROI and IRR, can be used to provide supplementary information (Brown and Jackson 1990). In the current
evaluation NPV and ROI were used, as they are relatively easy to calculate, the required data were available and they have greater interpretive value (Bureau of Transport and Communications Economics 1995).

**Net Present Value**

NPV yields the discounted net value of the program and thus shows the economic value of a program in absolute terms. The NPV is calculated by converting the program costs and benefits to their ‘present (year one) value’ taking into account the difference for each year by applying a discount (or interest) rate (Rolstadas 1995). NPV is represented mathematically by the following formula:

\[
\text{NPV} = \frac{B_1 - C_1 + \frac{B_2 - C_2}{1+i} + \frac{B_n - C_n}{(1+i)^n}}{(1+i)}
\]

where

- \(B_1\) = Benefits in year 1
- \(C_1\) = Costs in year 1
- \(B_2\) and \(B_n\) = Benefits in year 2 to year n
- \(C_2\) and \(C_n\) = Costs in year 2 to year n
- \(i\) = Annual interest rate
- \(n\) = Number of years of program life

If the NPV derived is positive, that is, if the present value of benefits is greater than the present value of costs, then the returns obtained from the program exceed the interest rate applied to it. In other words the program is economically efficient. If the NPV is negative, however, the program returns are less than the interest rate and are thus considered economically inefficient (Brown and Jackson 1990).

**Return on Investment**

ROI is the ratio of the total benefits from the program to the total investment. In contrast to NPV, an absolute measure, ROI shows the value of the program in relative terms (Rolstadas 1995). ROI is calculated using the following formula:

\[
\text{ROI} = \frac{\frac{B_1}{C_1} + \frac{B_2}{C_2} + \frac{B_n}{C_n}}{(1+i)^n}
\]

If the ROI is greater than 1 this implies a positive NPV and a beneficial economic value for the program in question. An ROI of at least 1 is desirable as this implies that the value of the program benefits is greater than the opportunities forgone from the resources diverted from other activities.

**Discount Rates**

The use of a discount (interest) rate is based on the premise of the time value of money; that is, what a dollar is worth 12 months ago is not the same as its value today. Effectively the discount rate is the ‘exchange rate’ between the value of the dollar 12 months ago and the dollar today (Department of Finance 1991).

**Case Study 1: Fraud Investigations**

**Benefits**

The AFP is responsible for the investigation of serious and complex fraud against the Commonwealth. Successful investigation of fraud cases can result in all or any of the following benefits to the Commonwealth government: (a) the recovery of amounts fraudulently received; (b) the avoidance of further loss by the Commonwealth from the continuation of a crime; and (c) the deterrence of like crimes in the community.

Fraud figures were extracted from the AFP’s database for fraud cases reaching legal process for the first time during 1999–2000 and 2000–01. Past losses recovered, future losses averted and deterrence value were not available directly from the database. However, the estimated value of the fraud was available and the relationship between this and the three types of benefits was derived by manually reviewing files relating to 100 cases randomly selected from a population of 327. The sample results were then applied to the known population using the following procedures.

(a) **Past Losses Recovered**

A fraud was considered to be recovered if the matter had been settled in court through a reparation order or fine, or was settled out of court by agreement. By examining the sample of 100 cases, a recovery rate was calculated as follows:

\[
\text{Recovery rate} = \frac{\text{Value of fraud recovered}}{\text{Value of fraud}}
\]

The recovery rate (20 percent) can then be applied to the total value of fraud over 1999–2000 and 2000–01 to obtain an estimate of fraud recovered, using the following formula:
Past losses recovered = Value of fraud x Recovery rate

For the two years reported in the current analysis, the estimated amount of past losses recovered was $58 million.

(b) Future Losses Averted

AFP investigations tend to address frauds in progress. For the purpose of the study, it was assumed that the current value of the fraud was a good indicator of potential future losses if the fraud had continued undetected. Further research is required to establish a more accurate figure. Certainly, experience suggests that frauds not addressed tend to continue for long periods and therefore the estimate used in this study is probably conservative. Furthermore, it is also probable that those prosecuted for known amounts of fraud are also responsible, at least in some cases, for amounts undetected. The result of prosecution may be to curtail all fraudulent activity by such individuals.

Nevertheless not all fraud investigations have successful outcomes. Again, the random sample of 100 fraud cases that reached legal process during 1999–2000 and 2000–01 was examined manually to determine the rate at which a successful outcome was achieved. A successful outcome included cases where there was a conviction, or there was an agreement made to repay the value of the fraud. The success rate can be described as:

\[
\text{Success rate} = \frac{\text{Fraud cases reaching legal process with a successful outcome}}{\text{All fraud cases reaching legal process}}
\]

The success rate (90 percent) can then be applied to the total value of fraud over 1999–2000 and 2000–01 to obtain an estimate of future losses averted, using the following form:

Future losses averted = Value of fraud x Success rate

For the two years reported in the current analysis there was an estimated $263 million in future losses averted.

(c) Deterrence Value

Deterrence value refers to the fact that the prosecution of criminal activity may deter others in the community from emulating this type of crime. The deterrence value associated with successful fraud investigations is particularly difficult to estimate, although it is suspected that, due to the large number of successful outcomes, the deterrence value is significant. Given the lack of reliable evidence on which to base an estimate, the value of the deterrence effect was set to zero in the current model.

Estimated Benefits

The total undiscounted benefits of fraud investigations were estimated using the following formula:

Benefits = Past losses recovered + Future losses averted + Deterrence value

The value of AFP fraud investigations, calculated on this basis, was $321 million over the two years reported.

Costs

The introduction of a time recording system into the AFP and the use of existing resource allocation information in the AFP’s financial system allowed the accurate costing of AFP activities including fraud investigations. It was estimated that the AFP spent $63 million on fraud investigations in 1999–2000 and 2000–01. This cost was composed of direct salary costs associated with investigations which are derived from hours worked recorded against specific investigations, direct costs associated with equipment and services utilised in investigations, and estimated costs of administrative and corporate overheads.

Results

Table 1 has details of estimated fraud values for past losses recovered, future losses averted, the total value of fraud investigations, inputs, estimated NPV and ROI.

The estimated NPV, for the $63 million invested by the AFP in fraud investigations over the two years since June 1999, was $258 million. The ROI for the same period was estimated at 5.1.

Case Study 2: Drug Investigations

Benefits

The benefits from fraud investigations are mainly financial and easy to quantify. The benefits associated with a reduction in the level of drug abuse are more complex and distinctly less easy to quantify. The main benefit to be derived from successful drug investigations is a
Table 1: Estimated Fraud Values, Inputs, NPV and ROI  
1999–2000 to 2000–01  

<table>
<thead>
<tr>
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<th>1999–2000 to 2000–01</th>
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<tbody>
<tr>
<td>Past losses recovered</td>
<td>$58,387,467</td>
</tr>
<tr>
<td>Future losses averted</td>
<td>$262,743,602</td>
</tr>
<tr>
<td>Deterrence</td>
<td>Not estimated</td>
</tr>
<tr>
<td>Total Fraud Benefit</td>
<td>$321,131,069</td>
</tr>
<tr>
<td>Inputs</td>
<td>$63,228,377</td>
</tr>
<tr>
<td>NPV</td>
<td>$257,902,692</td>
</tr>
<tr>
<td>ROI</td>
<td>5.1</td>
</tr>
</tbody>
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Reduction of supply of illicit drugs to the community and an associated reduction in the social, health and financial costs that society bears as a result of drug abuse. For the purpose of this study, the economic benefit associated with drug seizures is equivalent to the avoidance of harm that would have ensued had these drugs reached the community. Thus, the benefit of drug seizures was measured in terms of future cost to society avoided.

There have been a limited number of studies of the economic cost associated with drug abuse. Collins and Lapsley (1996) estimated the social cost of drug abuse in Australia for 1988 and 1992 but the study did not include the cost of drug-related property crime. Other studies suggest property crime is a significant contributor to the costs associated with drug abuse. The Commission of the European Communities (1990) estimated that property crime accounted for 85 percent of all costs associated with drug abuse. In the absence of a relevant, recent and direct measure of economic cost, it was decided to use an indirect measure.

It must be emphasised that there is no ready replacement measure for a properly conducted study of social cost. However, there is some evidence from the USA that the total street value of drugs seized may be a broad indicator of social costs associated with illicit drugs. The Office of National Drug Control Policy (2000) has estimated that US drug users spent US$86 billion (in 1998 US$) on drugs in 1991 or approximately US$72 billion in 1991 US$ values. The actual economic cost of drug abuse in the USA for the same year has been estimated at the slightly higher amount of US$76 billion (Parsons and Kamenca 1992). For the purpose of this preliminary study, street price of drugs seized has been used as a surrogate for the economic value of harm associated with drug use.

Information on drug seizures were retrieved from the AFP’s database for the years 1999–2000 and 2000–01. Individual state and territory estimates of street price for heroin, cocaine, amphetamines and cannabis were obtained from the Drug Trends Bulletin (Darke et al. 2000). To estimate the true street value of drugs seized, differences in the purity of drugs when they are imported into the country and when they are sold on the streets were also taken into account (Australian Bureau of Criminal Intelligence 2001).

The benefits associated with the seizure of drugs during 1999–2000 and 2000–01 were estimated at $1,189,269,210.

Costs

An estimated $231 million was invested in illicit drug law enforcement over the two years 1999–2000 to 2000–01.

Results

For the $231 million invested in drug investigations over the two years since June 1999, the estimated NPV was $959 million. The ROI for the same period was estimated at 5.2. Refer to Table 2.

Discussion

The results suggest that the AFP is returning over $5 to the Australian community for every dollar invested in its fraud and drug investigations. As noted, this is a preliminary figure and will be revised. It should also be noted that the estimates used in arriving at this figure were conservative and the final results may well
Table 2: Street Value of Drug Seizures, Inputs, NPV and ROI
1999–2000 to 2000–01

<table>
<thead>
<tr>
<th></th>
<th>1999–2000 to 2000–01</th>
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<tbody>
<tr>
<td>Heroin</td>
<td>$430,938,690</td>
</tr>
<tr>
<td>Cocaine</td>
<td>$579,265,920</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>$95,482,500</td>
</tr>
<tr>
<td>Cannabis</td>
<td>$83,582,100</td>
</tr>
<tr>
<td>Total Street Values</td>
<td>$1,189,269,210</td>
</tr>
<tr>
<td>Inputs</td>
<td>$230,490,435</td>
</tr>
<tr>
<td>NPV</td>
<td>$958,778,775</td>
</tr>
<tr>
<td>ROI</td>
<td>5.2</td>
</tr>
</tbody>
</table>

indicate a greater rate of return. Economic evaluation appears to offer a direct method for calculating the value of outcomes derived against the price of providing the output.

Nevertheless, there are a number of significant issues including the implications for government assessment of program value (including Output Pricing Reviews conducted by the Department of Finance and Administration) and the mechanism by which performance information is collected. These are discussed below.

Assessing Government Programs
The Department of Finance and Administration has identified improvements in efficiency and effectiveness as part of the rationale for introducing the government’s outcome and output framework. Contributing to these aims are Output Pricing Reviews (Department of Finance and Administration 2001), which allow agencies to evaluate the price of their outputs against other private and public sector agencies. The use of economic evaluation takes this process to another level. While price is important (comparing the price of an output to similar outputs elsewhere) it is arguably more important that agencies evaluate whether their output is returning effective outcomes on an economic basis. While the traditional Output Pricing Review measures efficiency, an economic evaluation can add direct measures of the effectiveness of outputs in achieving outcomes. This approach serves to further align public sector management practices with the private sector investment decision-making process.

For example, on the basis of Case Studies 1 and 2, the AFP has been highly effective in providing the government and the community with a good return on investment for funds invested in fraud and drug investigations.

Performance Information
Traditionally, performance information for reporting purposes under an outcome and output framework has been collected on an ongoing basis either through extraction from existing databases or manual collection.

Certainly with respect to costs, it is essential that agencies have in place financial systems that allow the detailed identification of expenditure by output and outcome on an ongoing basis. The existence of such a financial system within the AFP allowed the ready identification of direct and indirect costs at the level of individual investigations.

With respect to outcome benefits, it may be possible to make estimates directly from existing systems where the benefits are closely connected to the activity itself. The major benefits of fraud investigations tend to be functions of the value of the fraud investigated. Monies recovered, further losses averted and deterrence tend to be directly related to the investigation itself. The benefits can be measured directly in that they accrue to the government in terms of funds recovered or losses avoided.

This type of situation is probably rare. The impact of drug seizures is a better example of the type of outcome benefit more common in the public sector. The seizure of drugs represents a significant threat avoided and that threat encompasses health, social and productivity outcomes. Full economic studies of the impact of illicit drug abuse are expensive to carry out both in terms of time and funding. Case Study
2 provided a surrogate measure for full economic analysis. It was based on an observed relationship between the price of drugs at street level and economic estimates of harm associated with illicit drugs. This is not without limitations. Obviously, the amount of harm associated with a given mass of narcotics is unlikely to change whereas the street price will fluctuate with supply and demand. Nevertheless, it was argued on the basis of the evidence that street price is a conservative estimate of harm. As such, it sets a bottom line to the potential benefits associated with drug seizures.

The use of the surrogate measure is valuable because it is easily obtained and can be reported on an ongoing basis. Nevertheless, it is important that surrogate measures be recalibrated with more direct measures of expected benefits on a regular basis. The AFP intends to attempt such a calibration when the results of the forthcoming Collins and Lapsley analysis of the social cost of drugs in Australia are available. This study is a repetition and extension of the Collins and Lapsley (1996) analysis of the cost of drug abuse in Australia. In general, it should be possible to interpolate or extrapolate estimates of benefits for years where no direct measure is available on the basis of a surrogate measure calibrated against a more direct measure of outcomes. In short, the use of surrogate measures is recommended where the cost of a full economic evaluation is prohibitive.

In both Case Study 1 and Case Study 2, a handful of major investigations accounted for the majority of the observed benefits. This accords with the AFP’s targeting of its limited resources at a relatively small number of the most serious matters. This may imply that should the business decisions change as to the work undertaken then so too would the benefit–cost result. It may eventually be possible to identify a trend of diminishing returns and thus identify the optimum investment in law enforcement.

Another issue relating to the collection of data for benefit–cost analysis relates to the time period under study. The estimation of benefits is likely to be affected by the variability in the data itself. One way of addressing this issue is to extend the time period for data collection so as to allow reasonable representation of a broad range of cases. In the current analysis, a two-year period was used and more research is needed to identify the ‘ideal’ collection period for AFP investigations. On the evidence to date, it appears likely that a two or three year rolling period will be appropriate for AFP reporting.

Conclusion

On the basis of these results, it is suggested that economic evaluation is a relevant and indeed superior tool for comparing the price of an output to the value of an outcome. This approach is more closely aligned to the government’s expectation of increased public sector efficiency than the more traditional method of comparing the price of outputs. The method has limitations. Not all outcomes will admit of easy economic assessment and the information may be difficult to collect. However, the use of surrogate measures and methods for extrapolating or interpolating results may overcome most, if not all, of these limitations.

The AFP intends to extend and refine the economic evaluation of its functions and will continue to report these results as they become available.

Note

* The authors gratefully acknowledge the contribution of Dr Helen Lapsley of the University of New South Wales for her comments on an earlier draft of the case studies reported herein.

References


Parsons, C & A Kamenca 1992 *Economic Impact of Drug Abuse in America*, University of Southern California, Los Angeles.
