

ACCOUNTING FOR INFRASTRUCTURE SERVICE DELIVERY BY GOVERNMENT: GENERATIONAL ISSUES

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INTRODUCTION

Inter-generational Accounting – Disclosure and Measurement Issues

There is increasing concern that deficit-based government accounting largely ignores the distributional and interperiod or inter-generational equity issues that are an integral part of a government's fiscal policy and accountability (Ablett, 1996). Deficit-based government accounting systems give very little information about how a government's (or government entity's) current expenditure, taxation or borrowing program will impact upon users in future periods, or, over longer time spans, on future generations of users and taxpayers. The financial reports of government, departments and other reporting entities disclose little about whether the current generation is bearing its fair share of the funding burden for large expenditure areas such as infrastructure services, medical insurance and superannuation provision; or whether the burden is being unfairly shifted onto future generations (Kotlikoff, 1992; and Auerbach et al., 1994).

Consequently, there is growing pressure on governments in Canada, the United States (US), the United Kingdom (UK) and Australasia to improve the disclosure about inter-generational inequities and the build up of undisclosed deficits in funding which are not currently revealed by governmental reporting (Kotlikoff, 1992; Haveman, 1994; and Ablett, 1996). The pressure for disclosure on the distribution of funding burdens and obligations is producing a response. In Australia, public sector superannuation funds are now required to make a triennial report in their financial statements of the unfunded employer benefit obligations. These occur when the superannuation contributions of government, as employer, become due but are not actually paid into the fund. This effectively shifts the burden of

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payment onto future generations who must fund the actual pension payouts to employees when they retire, since there is no fund of past employer contributions to draw on (Klumpes and McCrae, 1999).

The United States government's response has gone further. It now incorporates partial generational accounts as an integral part of general purpose external statements (GASB, 1997; U.S. Office of Management and Budget, 1993; Ablett, 1996; and GASB, 1994 and 1996). The GASB has also issued several statements which require an inter-generational accounting perspective on specific issues in governmental accounting, such as final pronouncements on treatment of capital assets (GASB, 1987), risk pooling (GASB, 1996) and pension fund plans (GASB, 1994) and the recently issued proposal to change the way state and local governments report on their finances from 2000 onwards (GASB, 1997). This proposal requires apportionment of funding and cost information about government activities over extended time horizons.

Preserving Interperiod Neutrality – A Fundamental Accounting Measurement Issue

The provision of financial disclosure about the distribution of funding and payment burdens for infra-structure assets across successive generations (cohorts) pre-supposes a generationally neutral system of accounting measurement which will not legitimate any particular pattern of distribution. At the very least, accounting measurements of infrastructure costs and associated service provision costs should possess the attribute of distributional fairness and should not, of themselves, bias the inter-generational allocation of cost or funding burdens (Auerbach et al., 1994).

In countries where government accounting is now based on commercial accounting concepts and principles, the question becomes – can government accounting measure the costs of infrastructure service provision in a generationally unbiased way using commercial accounting concepts and principles?

The issue is of the utmost significance for government accounting. Pallot (1990b), Musgrave (1985) and Stanton and Stanton (1998) all emphasise that this fairness attribute includes concepts of distributive justice between persons over time, or inter-generational equity. According to this attribute, government accounting measurement and disclosure should not, of itself, bias or shift the burden of funding over time, or legitimate a particular pattern of funding distribution. At the very least, the accounting concepts underlying the calculation and disclosure of infrastructure and public service obligations should not introduce inter-generational bias.

Private sector accounting concepts, principles and rules now form the required basis of public sector accounting in several countries, including Australia. But several authors claim that blanket requirements for strict adherence to this framework in the public sector arena may be incompatible

with recent calls for increased disclosure on accountability issues such as generational equity. This is the issue we wish to investigate in relation to accounting under private sector concepts for public, infrastructure assets. In particular, we examine whether *inter-generational fairness* and *neutrality* in measurement can be preserved using private sector accounting concepts of property ownership, capital maintenance, and depreciation accounting and the associated 'stock' perspective of asset accounting.

The analysis proceeds as follows. We now review the conceptual context of this generational accounting conflict, motivate the significance of generational accountability reporting for infrastructure asset provision and identify three conceptual difficulties as exemplars of inter-generational bias in measurement. The third section reviews the argument for inter-generational accountability and identifies the associated requirements for unbiased measurement. The fourth section is a detailed discussion of the three sources of measurement bias which may arise from enforced application of private sector proprietary and valuation concepts to infrastructure asset accounting; *viz.* (i) proprietary concepts of asset ownership, (ii) inappropriate accountability models and (iii) present value concepts of asset valuation. The fifth section analyses the inter-generational measurement bias potential of depreciation practices. The sixth section suggests a funds flow perspective as an inter-generational accounting alternative to the 'stock' perspective inherent in private sector accountability and asset valuation models. The final section presents our conclusions and re-emphasises the need for increased flexibility in the required application of accounting standards to particular asset categories such as infrastructure accounting in the context of inter-generational accounting.

THE CONCEPTUAL PROBLEM

Superficially there appears to be no inter-generational measurement conflict in the application of private sector concepts to public sector infrastructure assets. Private sector accounting standards emphasize a requirement for fairness and neutrality as necessary attributes of accounting measurement. In Australia, private sector accrual accounting is now the mandated basis of government accounting. Following trends in Britain and New Zealand, the Australian Accounting Standards AAS27, AAS29 and AAS31 apply private sector accounting concepts, principles and standards to the measurement and disclosure of public sector assets for government departments and local government (Australian Accounting Research Foundation (AARF), 1994a, 1994b and 1996; and Pallot, 1997).¹

Underlying these standards is a requirement for fairness and neutrality in measurement and disclosure. Accounting standard setting bodies in the UK, USA and Australasia, all promote 'fairness' as a basic attribute for accounting measurement and disclosure. The attribute of 'fairness' identifies neutrality or

lack of bias as an essential attribute in accounting measurement (AARF, SAC3, 1990). The Australian Statement of Accounting Concepts (SAC 3, s 21) recognises that:

General purpose financial reporting should, if it is to be reliable, be free from bias (that is, be neutral). It should not be designed to lead users to conclusions that serve particular needs, desires or preconceptions of the preparers (AARF, 1990, SAC 3, s 21).

Whether these attributes are actually preserved in commercial accounting is a matter of continuing debate. But there is now a substantive literature which argues that attempts to force government accounting to conform with commercial notions of capital accounting, wealth maximisation and maintenance of capital stock results in measurement that is neither reliable, fair or neutral. Thus, preservation of inter-generational neutrality in government accounting may not be possible using private sector accounting concepts.

These concepts support a 'stock' based view of the determination of an entity's wealth which appeals to notions of capital maintenance based on required asset valuations. But, this approach may not be appropriate to an assessment of the flow of benefits and costs which accrue to successive generations of taxpayers who compulsorily incur obligations to finance the construction and maintenance of these common property networks in order to participate in the benefits of their provision. As we shall show, commercial accounting concepts of asset valuation, depreciation charging and cost representation result in miscalculation and bias when estimating full costs of funding and service delivery.²

The problem is fundamentally a conceptual one. Mayston (1992, p. 235) suggests that, in government accounting, '(p)rolonged practical problems may themselves be the result of a failure of a system to make good sense in conceptual terms.' Private sector accounting measurement procedures appeal to concepts of capital, capital ownership and depreciation accounting that, in the public sector, lead to generationally biased measurement on three counts. First, these measurement procedures focus on capital valuation issues rather than funding issues. Second, the proprietary, private property concept of assets that provides the conceptual foundation for the commercial accounting paradigm is inappropriate for many infrastructure and other public sector facilities. Third, the transference of private sector standards to government accounting has led to an overwhelming preoccupation with a short term, narrow commercial view of accountability that ignores longer term, distributional issues.

A Focus on Generational Aspects of Infrastructure Service Provision

This paper examines the generational neutrality measurement issue in the specific area of accounting for infrastructure assets and community service

provision by government. This context is selected for several reasons. The size and impact of infrastructure service provision is a significant area of government accounting by any standards. These programs span all levels of government and involve the expenditure of billions of public dollars over successive generations of contributors. The sheer size of the funding requirements, the social impacts and the political significance associated with infrastructure projects, is sufficient to ensure that inter-generational funding and tax burden issues are a fundamental issue for financial disclosure.

Second, fiscal stress creates increased pressure on public sector managers (and politicians) to balance budgets by transferring part of the burden for funding infrastructure and service provision onto future generations. The temptation for political or managerial manipulation to produce the required financial outcomes in commercial terms is, arguably, almost irresistible. Such pressures ensure ample motivation for managers and politicians to use accounting choices as a means of hiding poor performance in service delivery through generational bias and unsanctioned wealth transfers, while also not wishing to disclose the build up of retained funds against future contingencies by overcharging for utilities.

Third, infrastructure service provision focuses attention on at least three contentious issues in the debate about the appropriateness of private sector accounting concepts to government accounting (Pallot, 1997). These issues refer to the recognition, valuation and depreciation of public sector assets, and the application of the capital maintenance principle to full cost recovery.

Purpose and Scope

A growing and substantive literature argues that forcing government accounting to conform to private sector concepts and measurement principles only leads to bias in accounting measurement as well as a concentration on short term, narrow micro-economic concepts of performance at the expense of longer term distributional accountabilities. Our analysis of generational neutrality identifies three major conceptual difficulties that arise from forcing government accounting to follow private sector accounting concepts and principles. These are:

- (i) a focus on inappropriate asset valuation and amortisation rather than value for money and funding obligations,
- (ii) the attempt to force common property assets held in trust by government into an entity based, private property concept of ownership associated with private sector accounting, and
- (iii) the inappropriate application of depreciation in calculating full costs of operation.

We suggest that the 'stock' based perspective of full cost estimation for infrastructure service provision and operation implied by commercial

accounting concepts does not preserve fairness or neutrality. This 'stock' view calculates performance measures through the charging of systematic depreciation calculated on the periodically estimated 'deprival value' of assets as a means of 'maintaining' the stock of capital. It emphasises balance sheet valuation issues and thus reverses the traditional articulation between periodic performance disclosure as a primary objective and the balance sheet as a subsidiary list of unexpired balances (Nobes, 1984).

In order to illustrate the conceptual considerations under issue, we argue that generational neutrality in government accounting may be better preserved by a *stabilised flow of obligations* approach than by reference to periodic depreciation charges based on replacement cost asset valuations.

GOVERNMENTAL ACCOUNTABILITY FOR INTER-GENERATIONAL EQUITY

The Role of Government Accounting

The preservation of generational neutrality in accounting measurement and disclosure is particularly crucial in government accounting since it contributes to the resolution of distributional conflicts. The fundamental role of accounting in resolving social conflicts about the apportionment of the costs and benefits of economic activity has long been recognised (Pallot, 1990b; and Lehman and Tinker, 1987). Indeed, Pallot (1990b) suggests that resolution of the agency problem is a fundamental motivation for government accounting.

But within this mediation process, government accounting, itself, can be used as a powerful political and managerial tool for legitimating the particular distributive patterns it presents (Paterson, 1988; Guthrie and Humphrey, 1996; and Kaidonis, 1997). Moreover, management manipulation of discretionary accounting choices can significantly alter the incidence of infrastructure funding burdens – shifting the burden of funding the costs of service provision and operation from current to future generations or vice versa. Lewis (1995) points to the inherent potential of depreciation to average costs over estimation periods of 'useful life' and its use as a device for 'smoothing' costs to both mask poor performance and to decrease deviation from 'average' periodic service delivery or profit taking (for a review of this literature, see Hillier and McCrae, 1997).

More generally, unsanctioned inter-generational transfer may occur in at least two ways; either through *real* processes such as running down infrastructures, underfunding discretionary liabilities and shifting actual infrastructure purchases or upgrades between periods, or by *artificial* means through discretionary accounting choice. Examples of the latter include – income and cost smoothing, double counting costs through depreciation charges, manipulating the definition of capitalised costs and revaluation of

assets under deprivation value concepts, the build up of reserves for future technological upgrades, and the use of cost plus pricing principles to overcharge (see, for instance, Hillier and McCrae, 1997; Ablett, 1996; Lewis, 1995; Rutherford, 1992; and Lapsley, 1992).

The point at issue is not whether alternative systems allow more or less potential for manipulation, all accounting measurement systems can be manipulated. The need is to develop accounting measurement that will allow disclosure of any such inter-generational inequities caused by real factors or artificial manipulation – an inter-generational accountability mechanism. This requires underlying accounting measurement concepts that will not, of themselves, distort or bias measurement. Given the powerful social impact of accounting, the public require assurance that governmental accounting and disclosure does not contravene the ‘fairness in disclosure’ requirements in relation to inter-generational distribution of funding and tax burdens. But, at present, no such assurance is possible, either for whole of government financial reporting or government entity reporting, despite the recognition by previous accounting theorists of the fundamental importance of these issues.³

Accounting Concepts and Distributional Accountability

We argue that inter-generational equity is a substantive issue in arguably the primary focus of government accounting – establishing governmental accountability. Indeed, several authors argue that accountability, rather than decision usefulness, is central to the government accounting paradigm (Aiken and McCrae, 1996; and Mayston, 1993). Pallot (1992) points out that even the Government Accounting Standards Board upholds the centrality of ‘accountability’ to the development of their conceptual framework:

Accountability is the cornerstone of all financial reporting in government ... Governmental accountability is based on the belief that the citizenry has ‘a right to know’ ... Financial reporting plays a major role in fulfilling government’s duty to be publicly accountable in a democratic society (GASB, 1987, p. 27).

Given the developments in the US and UK, there is plenty of support for the proposition that interperiod equity in the distribution of financial and pricing burdens is an integral part of this multi-layered financial accountability matrix serviced by government accounting and financial disclosure through general purpose financial statements (Glynn and Murphy, 1996; and Grey and Jenkins, 1993).⁴ In generational terms, accountability requires disclosure in financial reports which will enable society to form judgements on at least four issues:

- (i) The actual obligations to be borne by successive generations of society’s members who will enjoy those service benefits. These funding obligations for service provision may be either through general or dedicated taxation, rate charges, or actual prices charged to service users.

- (ii) The full cost of service provision to successive generations of consumers.
- (iii) Any inter-generational subsidies or imposts through sanctioned inter-generational transfer of obligations.
- (iv) Any 'hidden', or covert, inter-generational transfers. Examples of these 'hidden' transfers include implicit future deficits created by failure to maintain service potential or, conversely, an implicit future surplus created by charging current generations for technological upgrades which future generations will enjoy.

The construction of financial reports to service these purposes requires accounting measurement of costs, service performance and capacity maintenance that minimises interperiod bias and averaging as much as possible.

Clearly, present deficit/surplus type reports do not fulfil these functions (Kotlikoff, 1992). But even given this limitation, and the improvements wrought by the introduction of full accrual accounting, it is doubtful whether these requirements can be satisfied under government accounting concepts or principles based on notions of periodic capital maintenance of private property. Under proprietary theory, measurement is orientated towards the preservation of a continuous growth of wealth whose benefits exclude public participation. This orientation has little relevance to the ethical accountability aspects in government accounting such as disclosure of whether present generations of consumers are being penalised for past shortcomings in infrastructure growth and funding.

Under democratic traditions, executive government is often portrayed as the steward or trustee of the public interest. Since this role is ongoing over time, there is a view that governments should not advantage any one generation of community service users or resource providers at the expense of other generations (Sumner, 1987; and Auerbach et al., 1994). Under this perspective, any inequitable distribution pattern or unsanctioned inter-generational transfers of benefits or funding obligations should be disclosed to Parliament through financial reports (Kotlikoff, 1992). This disclosure gives Parliament the opportunity to reflect society's approbation or approval. While it is not the job of accounting to determine how the burden of financing capital investment should be shared among society's members over time, accounting should reveal how the burden is actually shared and to measure that distribution in a neutral manner so that it can be compared with the projected time profile (Mayston, 1992).

Criticising private sector, commercially orientated concepts of asset ownership, capital maintenance as inappropriate for establishing inter-generational accountability requires alternative suggestions. Improving the distributional neutrality of accounting measurement requires accounting concepts and principles that accord with the principles of government stewardship accountability, communal property rights and

distributive justice (Pallot, 1990b; Lehman and Tinker, 1987; and Kaidonis, 1997). But defining what constitutes an equitable distribution of the costs and benefits of infrastructure service provision may be a matter for social consensus, with all the difficulties of public choice economics which that implies. However, several precepts to guide ethical government action can be distilled from the substantial literature on property rights and distributive justice (see, for instance, Reich, 1964; Rescher, 1966; Reeve, 1986; and Macpherson, 1978).

1. A duty to make the asset available and accessible to the public.
Under philosophical notions of common property, access to community services should be equally available to all community members. This unique attribute further distinguishes community assets from that of ordinary fixed assets. Under entity theory notions of ownership, the benefits of the latter are solely the prerogative of the owner. The general public (especially free loaders) are excluded from benefits participation.
2. No generation should reduce the stock of non-substitutable resources.
3. No one generation should be required to fund construction of assets and also provide for its replacement (Reid, 1983).
4. A sufficient legacy between generations is the passing on of fully paid, well maintained assets.
5. Inter-generational subsidies or imposts require society's continued ratification.

The point here is that accountability for distributive justice emphasises the need for government accounting concepts and principles to accord with the accepted societal principles defining distributive justice. This congruency applies particularly to inter-period and inter-generational issues. For instance, a double counting of costs results where a periodic depreciation allocation is added to repair and maintenance costs already charged on infrastructure network. If rates or prices are then set to recover full costs, present consumers are paying more than they should. The accounting concepts and resulting accounting measurement techniques contravene the ethics of distributive justice. Consumers are effectively paying a tax to the government.

PRIVATE SECTOR STANDARDS AND DISTRIBUTIONAL NEUTRALITY

In Australia and the UK, government accounting often pays scant attention to identifying attributes of financial disclosure relevant to particular levels of accountability that typify the public sector (Glynn and Murphy, 1996). This credibility gap may facilitate the use of commercial accounting principles to either hide unsanctioned distortions of the burden of funding infrastructure services, or to legitimate inequitable distributions of those burdens when

judged on consensus ethics of distributive justice. We now examine three private sector accounting concepts which can create particular problems with respect to reporting on infrastructure service provision – agency issues, asset ownership, economic valuation of assets, and the nature of infrastructure assets.

Principal-Agent Relationships

The principal-agent paradigm underlying commercially orientated accounting principles usually treats the shareholder as principal and, ultimately, the owner of the means of production. Under a strict transference of this model to the public sector context, the government tends to be treated (and sees itself) as the principal and owner of infrastructure resources, while the public utility or department manager/director is treated as the executive agent. The public utility manager, as agent, is assumed to report to executive government as the principal and provider of resources for operation of the entity or department.

But as Aharoni (1981) points out, this view of the accountability process is not only fundamentally wrong constitutionally under Westminster but pernicious in its implications for the development of related accountability concepts and principles. Private sector accounting standards emphasise capital maintenance from the perspective of the commercial entity itself. Under this entity theory, shareholders and creditors are principals who, in accounting terms, are essentially external to the reporting entity which ‘owns’ the assets and liabilities as a separate legal entity (Holder, 1980).

But a traditional notion underlying public sector accounting is that all property resides in society, not in executive government. A basic principle in government is the preservation of democratic control over funds compulsorily acquired by executive governments, Weber and Wildavsky (1986). This notion of democratic control conflicts with assumptions about the centrality of the operating entity under commercial accounting (Pallot, 1990a).

The government and its operational entities do not ‘own’ the funds allocated to them or the assets they generate. Their role is more like trustees of the public estate who hold ongoing accountability to successive generations (cohorts) of resource providers and service consumers.

A classic example is that of accounting for infra-structure assets. Strict application of private sector models of ownership and capital maintenance to infra-structure assets may imply that the public utility manager, as agent, reports to executive government (shareholder) as the principal provider of resources for operation of the entity or department (1990). Such a view tends to narrow the wider dimensions of public sector accountability (trusteeship), excluding such distributive dimensions as inter-generational equity in funding, costing and pricing (Glynn and Murphy, 1996; and Humphrey et al., 1993).

This interpretation does not imply that generational accounting is incompatible with full accrual accounting. Indeed, it was the inability of deficit/surplus type cash flow accounting to provide information about generational issues that first raised the issue as a fundamental short-coming of government financial reporting (Kotlikoff, 1992; and Auerbach et al., 1994). Rather, private sector accrual accounting remains as a reference point but it obviously does not provide ready solutions for all the financial accountability reporting problems which government has to face and solve.

Common Property and the Nature of Infrastructure Assets

As mentioned above, a fundamental tenet of Westminster systems of government is that the government owns nothing. It is not the principal to whom the managing agent reports nor the ultimate provider of operational resources. The ultimate principal is the society which elects the parliament and the executive government. The government is a steward for public resources which are provided by and owned by the collective members of that society. It is the government which ultimately bears accountability to society for its policy and for the actions of its agents and for its use of the collectively provided resources which society provides through taxation obligations and loan financing.

A notion of common property, as opposed to entity based notions of private property, is a pre-condition for the analysis of inter-generational issues such as equitable distribution of burdens and depletion of natural resources (Pallot, 1997; Kiss, 1985; and Joyner, 1986). Private property theory is inadequate for the task (Barry, 1977).

In terms of accounting disclosure there is a potential conflict between philosophical and accounting notions of the entity ownership of assets under proprietary theory on the one hand and the common property rights to infrastructure assets under Westminster traditions on the other. Attempts to apply proprietary theory concepts to infrastructure assets only creates confusion and conflict when the focus is on measuring equitable rights and obligations.

Asset Valuation as Present Value of Future Service Potential

Notions of 'asset' valuation underlying private sector accounting in the private sector are based on economic concepts of future service provision and the present value of expected future cash flows received from such future service provision. Canning (1929) reflects this viewpoint when he maintains that an asset is not an asset unless it has the potential for future service provision. The notion of assets as service potential or rights to future service benefits is widespread in the accounting literature (Henderson and Peirson, 1983; and Pallot, 1990a).

But these valuation principles tend to ignore the funding side of the inter-generational burden sharing equation in relation to the full costs of service provision. Concepts of future service potential say little about the relative funding burden to be borne by each generation in providing this service potential. The distinction is vital in inter-generational terms, since the funding of future service benefits and upgrades should appropriately be borne by the generations or cohorts that enjoy those service benefits, not by present generations.

Similarly, future generations should not have to carry extra funding burdens that are shifted onto them either by non-payment or the running down of infrastructures to avoid budget deficits. Because infrastructure assets incorporate the potential for future service provision they need to be kept efficient and renewed as necessary, so they are passed on to future generations of users in a comparable form to their inheritance.

Fundamentally, infrastructure assets represent obligations which society chooses to impose upon itself as the means of providing present and future services which members of that society see as desirable or necessary. Since this service capacity also implies future service potential, the burden sharing of full costs of provision should be equitably spread across generations of users. Inter-generational accounting should help to disclose whether or not this equity is preserved over time.

The 'valuation' approach which dominates private sector accounting emphasises concepts of asset ownership and calculation of net worth of an entity after allowance for capital consumption through depreciation charges. But misplaced transference of these concepts to the public sector can seriously compromise the ability of governmental accounting measurement and reporting to provide information required for the assessment by society of the government's discharge of its distributional and generational accountability obligations. The calculation of an entity's 'net worth' under notions of replacement asset valuation provides little information about the (current value adjusted) funding obligations borne by successive generations of service recipients and resource providers to provide, maintain and expand the service infrastructure.

Since accrual accounting based on private sector models cannot address all public sector accountability information requirements, flexibility of accounting treatment is needed for such issues as providing information on inter-generational equity. For example, in countries which prohibit or severely restrict, infrastructure asset sales, separation of such assets in the balance sheet would facilitate determination of entity worth by separation into two components:

- (a) the net worth of infrastructure assets less costs of finance, and
- (b) the net worth of other assets determined by a comparison of remaining assets and liabilities.

GENERATIONAL BIAS OF MEASUREMENTS USING DEPRECIATION BASED ON REPLACEMENT ASSET VALUATION

In Australia, *AAS29* and current proposals for asset valuation through 'value to the owner' principles would subject any infrastructure 'asset stock' figure to periodic revaluation by reference to the lower of (i) current replacement prices from factor markets or (ii) present value of the future cash flows expected from the asset. In the majority of cases, this rule devolves to revaluing assets to reflect the current cost of investing in similar assets (Johnstone and Gaffikin, 1996). Depreciation charges are then based on recorded current costs.

Under Australian accounting standards the periodic expensing of this depreciation charge is then taken to reflect the 'true' costs involved in currently providing relevant community services for that period. The essence of this concept is that obligations (rates and taxes) based on current costs will, in some sense, reflect the diminution in future service potential used up during current operations. Charging depreciation to successive periods of use will thus ensure that periodic costs contain a charge to maintain capital intact (Edwards and Bell, 1961).

But as Pallot (1990b) points out, depreciation has its origins as a distributive matter, not as a cost allocation tool:

... to prevent dividends from being distributed at the expense of creditors or being distributed to the extent that the firm went into bankruptcy. The notion of deterioration was brought in later so as to give depreciation some legitimacy as a business expense. What depreciation is really doing is ensuring that funds equal to the depreciation of the asset are not distributed and are retained in the business to maintain its asset strength i.e. capital maintenance (p. 208).

The argument for charging depreciation based on replacement valuations for long lived infrastructure service assets is problematic. The means of such service provision are almost never replaced as such. These assets are more appropriately seen as being held *in perpetuity*. Long lived assets which must be adequately maintained and repaired, with sections occasionally replaced to preserve operation at desired standards of delivery. Under these circumstances, depreciation reduces to almost zero. In reality, the cost of 'maintaining operational capability' will be reflected in the actual costs incurred for maintenance, repair and replacement. Charging periodic depreciation expense results in double counting the costs of 'maintaining capital intact' since these costs are already included in charges for maintenance, repairs and replacement. Reid (1983, p. 197) puts it this way:

In the case of long-lived assets, questions of intergenerational equity may arise if rates, taxes or user charges are based on costs including depreciation, repayment of loans and maintenance of the full capacity of assets. It may be unfair to ask one generation to donate for the construction of assets and also to provide for its replacement through payments equal to depreciation.

Pallot (1990a, p. 83) also argues that it is unfair to ask any one group of users to:

... recoup the cost of constructing assets through loan repayments, to maintain the assets in sound physical condition and also to provide for the acquisition of future assets through payments equal to depreciation.

The calculation of service costs based on notions of valuation of infrastructure 'assets' biases cost estimation between periods. Historical cost valuations for such resources may be so dated as to be irrelevant. Replacement cost valuations are impractical since markets are non-existent for most infrastructure networks or assets are irreplaceable. Indeed deriving any monetary valuation for this type of resource class may be an irrelevant exercise for distributive considerations (Ijiri, 1967). As Mayston (1992) points out, measurement of funding obligations and the disclosure of capital financing information has little to do with measures of depreciation which are aimed at a completely different set of questions.

The inequitable impact of measuring costs under private sector concepts becomes particularly apparent under user to pay policies. The usual intention under such charging regimes is that the user should bear the full costs of service provision. But under private sector principles, full cost calculations can result in double counting as shown above. Thus management can charge successive generations of users more than their fair share of costs. These charges then contain an element of tax paid by consumers to government

The real problem is that, under current government accounting requirements in several countries (particularly the UK, Australia and NZ), these taxes become institutionalised by required accounting measurement principles. Mayston (1992) points out that the National Health Service (1991) capital accounting proposals included a capital charge of depreciation plus interest that had to be met in cash out of a hospital's revenues (NHSME, 1991). Such practices result in the undisclosed retention of funds within the entity. Management and politicians can then use these funds for unsanctioned, private interest purposes. The principle applies whether the method of funding is by taxes, rates or prices. Direct user-charges based on the full cost measurement of infra-structure service provision merely shifts the funding obligation from compulsory funding via taxation to specific users either under individual charges or rate charges.

If allowed to do so, management may be unable to resist the temptation to use discretionary accounting choice to build up unsanctioned reserves or 'funding slack' through overcharging. This practice results in inter-generational inequity. Either one generation is unfairly advantaged at the expense of later generations or, if the process is ongoing, successive generations bear more than the full costs to management's political benefit. The result is distortion of inter-generational equity through depreciation. Pallot (1990b, p. 209) observes that:

Insofar as principles of intergenerational equity have been developed, it would appear that the provision of well maintained assets fully paid for provides a sufficient legacy for the future. While no generation should reduce the stock of non-substitutable resources, it would seem unfair for the present generation to also finance the needs of the future generation, who are in many ways better off.

The issue for financial reporting under distributional accountability is that such biases or over-charging should be specifically disclosed to society. A parallel example from the private sector might be the failure of an investment company to disclose the practice of retaining investment income from one generation of investors to act as a buffer against poor performance in future years (smoothing returns on investment). The practice may or may not be ethical. The real issue is its disclosure. But here the similarity ends. Shareholders in the investment company at least have the option of withdrawing their funds. Community individuals may have no choice in the matter, either because the service is essential as in the case of gas, electricity and telephone services or because charges are levied by a general impost on all ratepayers as for water, sewerage or roads.

The introduction of bias through discretionary accounting choice detracts from the ability of financial reports to disclose the full costs and obligations of infrastructure provision and operation over successive periods. The matching which is relevant here is between the full costs of service provision which may be attributable to successive generations and the actual contributions or obligations incurred by each generation of resource providers and users who benefit from those assets.

AN ALTERNATIVE APPROACH TO PERIODIC FULL COST MEASUREMENT

The failure of private sector accounting measurement principles to maintain the quality of financial disclosure consistent with the fundamental dimensions of public sector accountability motivates a search for accounting measurement concepts that are more appropriate to accountability disclosure in the public sector (Aiken and Capitano, 1995; Parker and Guthrie, 1993; and Broadbent and Guthrie, 1992). We suggest that accrual accounting systems 'which measure operating results and net worth in line with commercial profit-and-loss statements and balance-sheet practices' (Parker and Guthrie, 1993, p. 70) are unlikely to have the attribute of generational neutrality in measurement. A change in accounting perspective is perhaps necessary. The *flow of funds* approach illustrates one alternative conceptual focus to the *stock based* measurement approach of commercial accounting. The approach is an extension of suggestions for a renewals accounting approach to the preservation and maintenance of infrastructure (Currie, 1987; and Pallot, 1990a), and is perhaps more consistent with the attributes of the class of public property assets that includes infrastructure service projects.

The fundamental accounting transaction in the *flow* approach is the provision of funds by successive generations through incurred obligations. At a conceptual level, this perspective suggests that successive generations don't buy assets – rather, they incur obligations which need to be discharged at a fair rate of interest. In this sense infrastructure assets are close to Mautz's (1981) concept of community assets as liabilities since they result in cash outflows, not inflows. From an 'incurred obligations' perspective, the emphasis turns away from the purchase of assets onto the flow of liabilities necessarily incurred to provide the service benefits. The funding obligations incurred by any one generation of service beneficiaries should be sufficient to ensure that the means of the service generation are passed on to the next generation in a well maintained, fully paid up state and to recover the costs of operations. The focus of accounting measurement and disclosure is to indicate whether the actual funding burden borne by the public body over time matches this requirement.

A *flow of obligations* approach aggregates capital costs, operational costs, debt servicing costs, maintenance and loan costs at their source (debt incurrence) and then amortises them over periods of greatest use.

These can then be compared with the actual funding obligations imposed on the public body. These through debt incurrence events include:

- (i) annual appropriations out of a government's tax revenue,
- (ii) annual indirect taxes and levies (e.g. rates),
- (iii) other compulsory direct charges (prices),
- (iv) longer term loan or capital raising.

We separate full cost calculation of service provision from the commercial concept of capital 'assets' for two reasons. First, it is impossible to divorce the 'assets' concept from private sector accounting principles of entity ownership and determination of 'net worth' through capital maintenance. Second, current concepts of asset valuation emphasise notions of the current value of future expected cash flows. Whereas the focus for generational accounting issues is upon the costs and obligations incurred and charged in relation to current service provision or in relation to immediate future service provision. Thus, a more appropriate measurement perspective is to focus upon the obligations necessarily incurred by each generation of consumers to fund the full costs of current service provisions.

A focus on the flow of funding obligations obviates any need to refer to subjective asset valuations when providing accounting measurements for the purposes of disclosure at the level of interperiod or inter-generational equity. Of course, whether the incurred obligations are sufficient for full cost coverage from any one cohort of users is a matter for disclosure.

The problem for a generational apportionment of required obligations for funding service provision may be put as follows. An infrastructure is usually built up over many years using capital loans carrying interest rates which,

under the time value of money and market forces, are designed to provide a pre-determined level and balance of benefits to the users. The benefits of such infrastructure service provision are best seen as long lived projects (in effect, perpetuities) intended to provide a pre-determined balance of benefits between citizens and among different generations of consumers. The loans are then to be paid off by revenue contributions by generations of consumers over the periods of greatest use. At present there are few examples of the provision of essential services which do not have a history of continuing operation – with associated continuing historical obligations and rights of consumers and other parties which are progressively modified as further loans are required to provide for service extension or technological upgrades.

In such situations, the potential for generational bias may be reduced where full cost measurement preserves the connection between the actual obligations incurred and calculation of the actual costs borne for service provision, extensions, technological upgrading and maintenance and repairs. In order to calculate the equitable portion of full cost falling to any one generation it is not necessary to appeal to any concept of ‘asset value’ at all. Such calculations are more appropriately treated as a function of loans and other obligations actually incurred in the provision, maintenance, extension and upgrade of project networks (Mayston, 1992).

This approach has the benefit of using a flow or matching concept of service provision rather than a ‘stock’ or ‘valuation’ concept. The essential point of reference in calculation of full costs to be recouped from the generations existing over the period of greatest use is the successive loan obligations and other funding obligations actually incurred in provision and ongoing operation of service delivery. Accounting for generational issues in infrastructure services focuses attention on the funding obligations imposed upon successive generations of tax, rate or price payers, not on a notion of ‘owned infrastructure assets’. The shift in focus from a ‘capital stock’ concept to a stabilised ‘funding flow’ concept in accounting measurement alters the target of purchasing power adjustments from the asset to the funding obligations.

Financial measurement of service costs attributable to successive generations refers fundamentally to the equitable division of incurred obligations, rather than to any notion of ‘capital stock’. Thus, preservation of comparability between the ‘real’ burdens borne by successive generations may require adjustment to the historical debt or liability figures attaching to historical obligations as expressed in monetary terms. If ‘purchasing power’ of funds is to be maintained to preserve comparability of the ‘real’ burdens imposed upon successive generations to cover the cost of service provision, then appropriate adjustment needs to be made to the monetary measurement of successive obligations. Choice of the most appropriate basis of adjustment is a matter for resolution based on a criteria of maximum preservation of generational neutrality in measurement.

We maintain that any adjustment procedure to convert financial measures into 'real' measures of funding is more realistic under a flow based concept of obligations than under a stock based concept of asset valuation. An obligations focus includes in full cost calculations the cost of the liabilities or debts assumed by society to provide the services through taxation or loans. Since interest rates can vary substantially between successive periods, adjustments also need to be made to convert the monetary cost of obligations to real liabilities that allow comparison over time in compatible units of measurement. Unlike the asset valuation approach, our concept of 'obligations flows' includes the costs of borrowing within the liabilities to be adjusted for variations in purchasing power of funds provided.

ACCOUNTING GENERATIONAL EQUITY: TECHNICAL MEASUREMENT ISSUES

The requirement for distributional fairness as an attribute of public sector accounting systems poses several challenges in relation to choice among alternative measurement systems and disclosure standards. We identify some of the important issues in relation to measuring the full costs of community service provision.

Are Infrastructure Assets to be Treated as Sunk Costs?

Most community services are well established in Australia. The general situation facing most governments (Federal, State and Local) is the operation, maintenance, extension and improvement of existing networks. Asset purchases that established the fundamental infra-structure, although developed over time, are often so historic as to be irrelevant in terms of current costing. The same comments apply to historical obligations.

A common reaction to this situation is to treat the basic infra-structure as a sunk cost and concentrate on charging present and future generations for the costs associated with operation, maintenance, extension and upgrade. The Chartered Institute of Public Finance and Accountancy (CIPFA, 1991) proposals suggest that all existing infrastructure assets with more than 20 years expected useful life be accounted for at amortised historic cost (i.e. sunk cost), while those acquired after the start of the new capital accounting program be recorded at unamortised historic cost.

A contrary viewpoint is that infrastructure assets require continual development and funding. Consequently, it is impossible to determine the cut-off point for 'sunk costs' or for incurred obligations in relation to those costs. Mayston (1992, p. 245) points out that the CIPFA's proposals:

... fails to provide an accurate measure of the real capital resource input that has gone into providing the services of the local authority.

In arguing for an indexing of historic cost by a real interest charge to reflect the cost of capital tied up in these assets, he goes on to argue that treatment of an infrastructure facility as a sunk cost:

... is itself no justification for ignoring measures of the real resources that have been invested in them.

How to Allocate Funding for Technical Upgrades and Extensions to the Network After Allowance for Repairs and Maintenance?

The principles of equity establish that generations of users are only liable for those costs associated with the benefits they receive. They should not have to bear costs associated with the introduction of improved technology or extensions when they do not benefit from these improvements or extensions. Such costs should be apportioned across generations which do benefit from these improvements. The problem here is one of identifying such costs, separating them from operation and maintenance, and then apportioning them to the appropriate generations.

Double Counting Costs where Depreciation is Charged for 'Capital Maintenance' in Addition to Maintenance and Operation of Networks

Depreciation is claimed to be a means of retaining funds within the entity to reflect the service potential of underlying assets used up in current provision of service. But long lived infrastructure or community assets are essentially perpetuities which are never sold in their entirety and then replaced; except, of course, when privatised – but such an event hardly comes within the parameters of normal operations. Where such assets have extremely long useful lives there is a case for depreciation charges to go to zero (Mayston, 1992). At the most, technical upgrades and obsolescence implies replacement of portions of the asset network, often funded by specific loan funding or levy.

Where operational costs already include full maintenance charges, imposing depreciation charges represent double counting of service costs which may result in considerable overcharging. Where such provisions are made, especially with shorter-lived assets that are not perpetuities, or may be sold, such overcharging can seriously bias the distribution of funding obligations or charges between present and future generations.

The Nature of Costs Included in 'Asset Valuations'

Current private sector accounting practice carries a narrow interpretation of the costs to be included in 'asset valuations'. Even within the private sector literature there is considerable debate on this issue. This results in considerable bias in relation to community assets.

DISCUSSION AND EXTENSION

Two propositions underlie our discussion of infrastructure asset accounting in relation to generational issues. First, generational accounting measurements should contain the attributes of *fairness* and *neutrality* in a generational sense. They should not bias the inter-generational allocation of cost or funding burdens. Second, the forced application of inappropriate commercial accounting concepts of asset valuation, depreciation and capital maintenance may introduce significant generational measurement bias. We illustrated these arguments in relation to three conceptual issues and proposed an alternative 'flow of obligations' approach which does not require reference to valuations of community service resources or arbitrary cost allocations under depreciation.

Despite increased pressure for disclosure of inter-generational imbalances, a lack of theory development still characterises accounting measurement for interperiod and generational issues despite the fundamental nature of distributional accountability to democratic government (Haveman, 1994; and Ablett, 1996). Urgent discussion is needed about how to articulate the fundamental measurement principles of government accounting with concepts of distributional fairness and distributional accountability that are based on principles of communitarian values rather than individualistic ownership.

There is increasing pressure for unbiased disclosure on interperiod and inter-generational financial implications of government policy. Unfortunately, private sector accounting principles, as presently applied, do not preserve generational neutrality in accounting. Requiring strict, literal adherence to the concepts underlying private sector measurement frameworks may just widen the credibility gap between theory and practice in government accounting and continue the loss of relevance of many general purpose financial statements produced by government and its reporting entities to the practical accountability decisions now facing users (Glynn and Murphy, 1996).

Generational accounting may require an additional accounting algebra to compliment existing full accrual accounting frameworks (Kotlikoff, 1992). We have suggested one alternative conceptual approach to measurement. This alternative is far from complete and is arguably open to as much managerial and political manipulation as the current conventional approach. But it does illustrate the need for government accountants to think laterally and flexibly in terms of their own conceptual frameworks when responding to calls for financial measurement systems orientated to inter-generational equity in the sharing of funding and cost recovery burdens attached to government policies and activities. Flexibility is needed to ensure development and application of fundamental measurement concepts that possess the required attributes for the production of inter-generational accountability information in relation to infrastructure assets.

The task for accountants is to improve the distributional neutrality of accounting measurement. Merely pointing to generalised notions of accounting measurement attributes supposedly inherent in private sector standards will not bridge the gap; nor will appeals to concepts of private property rights, capital maintenance and accountability. Private sector accounting is based on an economic resources and accrual accounting perspective which focuses on technical issues of performance in a narrow commercial outcome sense. It is interesting to note that economists, not accountants, introduced generational accounting into the government financial reporting arena.

NOTES

- 1 See Rutherford (1992) and an International Federation of Accountants study (IFA, 1991) for useful summaries of national approaches to public sector reporting.
- 2 Australia has given government accounting less room to maneuver in terms of the selective application of asset valuations in the measurement of the costs of providing and operating infrastructure assets. *AAS29* requires the valuation of all assets held by government departments and agencies to be included in general purpose, in contrast to the US situation which has different reporting requirements for different public sector asset classes (Stanton and Stanton, 1998).
- 3 As early as 1953, Littleton (1953) maintained that costs should properly fall upon successive cohorts of users and resource providers in terms of reciprocity for efforts and accomplishments unless varied by government under Parliamentary sanction.
- 4 Glynn and Murphy (1996) argue that these accountabilities are failing under the new public management reforms and the imposition of private sector accounting principles.
- 5 Indeed, the rhetoric used in privatisation debates tends to adopt this view-point. The government legislates to 'sell' ownership shares of infra-structure assets to the public which the society already owns, an action which crystallizes for one generation the aggregate asset values contributed by previous generations of tax-payers and users.

REFERENCES

- AARF (1990), *SAC3: Qualitative Characteristics of Financial Information* (Public Sector Accounting Standards Board, Australian Accounting Research Foundation, Melbourne).
- (1994a), *AAS29: Financial Reporting by Government Departments* (Public Sector Accounting Standards Board, Australian Accounting Research Foundation, Melbourne).
- (1994b), *AAS27: Financial Reporting by Local Governments* (Public Sector Accounting Standards Board, Australian Accounting Research Foundation, Melbourne).
- (1996), *AAS31: Financial Reporting by Governments* (Public Sector Accounting Standards Board, Australian Accounting Research Foundation, Melbourne).
- Ablett, J. (1996). 'Intergenerational Accounting and Saving in Australia', *The Economic Record*, 72/ 218 (September), pp. 236–45.
- Aharoni, Y. (1981), 'Managerial Discretion,' in R. Vernon and Y. Aharoni (eds.), *State Owned Enterprise in the Western Economies* (London, Croom Helm).
- Aiken, M. and M. McCrae (1996), 'The Commercialisation of Government's Departmental Accounting (AAS29): Quasi Rents and Public Welfare', *Abacus*, Vol. 32, No. 2, pp. 196–213.
- and A. Capitano (1995), 'Accrual Accounting Valuations and Accountability in Government: A Potentially Pernicious Union', *Australian Journal of Public Administration*, Vol. 54, No. 4, pp. 564–75.
- Auerbach, A. J., J. Gokhale and L. Kotlikoff (1994), 'Generational Accounting: A Meaningful Way to Evaluate Fiscal Policy', *Journal of Economic Perspectives*, Vol. 8, No. 1 (Winter), pp. 73–94.
- Barry, B. (1977), 'Justice Between Generations', in P. Hacker and J. Raz (eds.), *Law, Morality and*

- Society* (Oxford, Clarendon Press).
- Broadbent, J. and J. Guthrie (1992), 'Change in the Public Sector: A Review of Recent Alternative Accounting Research', *Accounting, Auditing and Accountability Journal*, Vol. 5, No. 2, pp. 3–31.
- Canning, J.B. (1929), *The Economics of Accountancy* (New York, Ronald Press).
- Chartered Institute of Public Finance and Accountancy (1991), *Capital Accounting by Local Authorities: Statement of Principles* (CIPFA).
- Currie, B. (1987), 'Accounting for Infrastructure Assets', *Public Finance and Accountancy*, Vol. 8, pp. 7–10.
- Edwards, E. and E. P. Bell (1961), *The Theory and Measurement of Business Income* (Berkeley, University of California Press).
- Glynn, J. and M. Murphy (1996), 'Public Management: Failing Accountabilities and Failing Performance Review', *International Journal of Public Sector Management*, Vol. 9, No. 5, pp. 125–37.
- Government Accounting Standards Board (1987), 'Accounting and Financial Reporting for Capital Assets of Government Entities', *Discussion Memorandum* (Stamford, Connecticut, GASB).
- (1994). 'Accounting for Pension Funds by State and Local Governmental Employers, GE29 (Norwalk, Ct., GASB, February).
- (1996). 'Application of Certain Pension Disclosure Requirements for Employers Pending Implementation of GASB Statement 27, Technical Bulletin, GTB901 (Norwalk, Ct., GASB, August).
- (1997), 'Basic Financial Statements – and Management's Discussion and Analysis – for State and Local Governments' (Norwalk, Ct., GASB, February).
- Gray, A. and B. Jenkins (1993), 'Codes of Accountability in the New Public Sector', *Accounting, Auditing and Accountability Journal*, Vol. 6, No. 3, pp. 52–67.
- Guthrie, J. and C. Humphrey (1996), 'Trends and Contradictions in Public Sector Financial Management Developments in Australia and Britain,' *Research in Governmental and Nonprofit Accounting*, Vol. 9.
- Haveman, R. (1994), 'Should Generational Accounts Replace Budgets and Deficits?' *Journal of Economic Perspectives* Vol. 8, No. 2, pp. 95–111.
- Henderson, S. and G. Peirson (1983), *Financial Accounting Theory: Its Nature and Development* (Melbourne, Longman Cheshire).
- Hillier, J. and M. McCrae (1997), 'The Income Smoothing Potential of Systematic Depreciation', *Abacus* (August).
- Holder, W. (1980), *A Study of Selected Concepts for Government Financial Accounting and Reporting* (Chicago, National Council on Governmental Accounting).
- Humphrey, C., P. Miller and W. Scapens (1993), 'Accountability and Accountable Management in the UK Public Sector', *Accounting, Auditing and Accountability Journal*, Vol. 6, No. 3, pp. 123–45.
- Ijiri, Y. (1967), *The Foundations of Accounting Measurement* (Englewood Cliffs, New Jersey, Prentice Hall).
- International Federation of Accountants (1991), Public Sector Committee Study No. 1, *Financial Reporting by National Governments* (New York, IFA).
- Johnstone, D. and M. Gaffikin (1996), 'Review of the Asset Valuation Guidelines of the Steering Committee on National Performance Monitoring of GTEs', *Australian Accounting Review*, Issue 11, Vol. 6, No. 1 (March), pp. 50–65.
- Joyner, C. (1986), 'Legal Implications of the Concept of the Common Heritage of Mankind', *International and Comparative Law Quarterly*, Vol. 35, No. 1, pp. 190–99.
- Kaidonis, M. (1997), 'Organizational Change and the Participation of Accounting Information Systems: A Critical Reflexive, Ethnography of the South Australian Housing Trust', Unpublished PhD Thesis (Department of Accounting, University of Wollongong).
- Kiss, A. (1985). 'The Common Heritage of Mankind: Utopia or Reality?' *International Journal*, Vol. 40, No. 3, pp. 185–211.
- Klumpes, P.J.H. and M. McCrae (1999), 'Evaluating the Financial Performance of Pension Funds: An Individual Investor's Perspective', *Journal of Business Finance & Accounting*, Vol. 26, Nos. 3&4 (April/May), pp. 261–81.
- Kotlikoff, L. (1992). *General Accounting – Knowing Who Pays, and When, for What We Spend* (New York, The Free Press).

- Lapsley, I. (1992), 'User Needs and Financial Reporting: A Comparative Study of Local Authorities and the National Health Service, *Financial Accountability & Management*, Vol. 8, No. 4, pp. 281–92.
- Lehman, C. and A. Tinker (1987), 'The Real Cultural Significance of Accounts', *Accounting Organisations and Society*, Vol. 12, No. 5, pp. 503–22.
- Lewis, N.R. (1995), 'AAS29: A Critique', in *Readings in Accounting Developments in the Public Sector* (Public Sector Accounting Centre of Excellence, Melbourne, Australian Society of Certified Practising Accountants), pp. 16–25.
- Littleton, A.C. (1953), *Structure of Accounting Theory* (Illinois, American Accounting Association).
- Macpherson, C.B. (1978), *Property: Mainstream and Critical Positions* (Toronto, University of Toronto Press).
- Mautz, R.K. (1981), 'Financial Reporting: Should Government Emulate Business?' *Journal of Accountancy* (August), pp. 53–60.
- Mayston, D. (1993), 'Principals, Agents and the Economics of Accountability in the New Public Sector', *Accounting, Auditing and Accountability*, Vol. 6, No. 3, pp. 68–96.
- (1992), 'Capital Accounting, User Needs and the Foundations of a Conceptual Framework for Public Sector Financial Reporting', *Financial Accountability & Management*, Vol. 8, No. 4, pp. 227–47.
- Musgrave, R. (1985), 'Public Finance and Distributive Justice', in D. Greenaway and G. K. Shaw, *Public Choice, Public Finance and Public Policy* (Oxford, Basil Blackwell).
- NHS Management Executive (1991), *Manual for Accounts, Chapter 3: Accounting Standards* (National Health Service Management Executive, London).
- Nobes, C. (1984), *Depreciation Problems in the Context of Historic Cost Accounting* (University of Strathclyde).
- Pallot, J. (1990a), 'The Nature of Public Assets: A Response to Mautz', *Accounting Horizons* (June), pp. 79–85.
- (1990b), 'Community Assets in Public Sector Accounting: Conceptual Framework and Definition', PhD Thesis (Department of Accounting, Victoria University of Wellington).
- (1992), 'Elements of a Theoretical Framework for Public Sector Accounting', *Accounting, Auditing and Accountability Journal*, Vol. 5, No. 1, pp. 38–59.
- (1997), 'Infrastructure Accounting for Local Authorities: Technical Management and Political Context', *Journal of Accounting and Public Policy*, Vol. 16, No. 1, pp. 225–42.
- Parker, L. and J. Guthrie (1993), 'The Australian Public Sector in the 1990s: New Accountability Regimes in Motion', *Journal of International Auditing and Taxation*, Vol. 2, No. 1, pp. 59–81.
- Paterson, J. (1988), 'A Managerialist Strikes Back', in J. Guthrie, L. Parker and D. Shand (eds.), *The Public Sector: Contemporary Readings in Accounting & Auditing* (Sydney, Harcourt, Brace, Jovanovich).
- Perrin, J. R. (1984), 'Accounting for Public Sector Assets', in A. Hopwood and C. Tomkins (eds.), *Issues in Public Sector Accounting* (Oxford, Philip Allan Publishers).
- Pratt, D. (1988), 'Capital Maintenance Adjustment Under the Financial (Real) Capital Concept', *Abacus*, Vol. 24, No. 2 (September), pp. 170–78.
- Reeve, A. (1986), *Property* (UK, Macmillan Education).
- Reich, C.A. (1964), 'The New Property', *Yale Law Journal*, Vol. 73, pp. 733–87.
- Reid, G.R. (1983), 'An Analysis of the Role of Depreciation Accounting in Relation to Management Financial Policies', PhD. Dissertation (Columbia, University of Missouri).
- Rescher, N. (1966), *Distributive Justice* (Indianapolis, Bobbs-Merrill).
- Rutherford, B.A. (1992), 'Developing a Conceptual Framework for Central Government Financial Reporting: Intermediate Users and Indirect Control', *Financial Accountability & Management*, Vol. 8, No. 4, pp. 265–80.
- Stanton, P. and J. Stanton (1998), 'The Questionable Economics of Governmental Accounting', *Auditing, Accounting and Accountability*, Vol. 11, No. 2, pp. 191–203.
- Sumner, L.W. (1987), *The Moral Foundation of Rights* (Oxford, Clarendon Press).
- US Office of Management and Budget (1993), *Budget of the United States Government; Fiscal Year 1993* (Washington, DC Government Printing Office).
- Weber, C. and A. Wildavsky (1986), *A History of Taxation and Expenditure in the Western World* (New York, Simon and Schuster).