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The Smoothing Potential of Depreciation for Local Authorities

Robyn Pilcher
Curtin University of Technology

Abstract

The purpose of this paper is to consider the question: Does depreciation allocation provide a vehicle for local councils to smooth, maximise or minimise reported operating result? In 1968 Copeland claimed there were five properties an accounting practice must possess before it may be used as a manipulative device. These criteria have been considered with respect to depreciation expense reported by local government councils. Results confirmed the existence of unexplained 'anomalies' which significantly impacted on a council's operating result and subsequent performance measures used for decision-making. These, in turn, satisfied Copeland's five manipulative characteristics.

This research provides the first (known), longitudinal empirical analysis related to the charging of depreciation to transport infrastructure by local authorities. It also adds to the 'manipulation' literature by considering its applicability in a public sector context. Future research will apply a statistical activity cost theory framework or similar instrument to ratify the findings reported here.

Introduction

Since the notion of depreciation was introduced as a means of allocating the cost of an asset over its useful life, account preparers have allegedly used it to manipulate financial results for external reporting purposes. According to Hillier and McCrae (1998: 75), 'ample evidence exists that managers attempt to use "artificial" choices concerning alternative accounting procedures for classification, valuation and allocation of transactions to smooth reported period income or earnings series'. The traditional view of earnings arguably found its most comprehensive expression in the work of Thomas (1969, 1974), especially in relation to problems concerning the interpretation and meaningfulness of allocations such as depreciation. Thomas concluded that such allocations were arbitrary in terms of direct economic meaning (in Hillier & McCrae, 1998: 79).

As a result of world-wide public sector reforms, accrual accounting was introduced for Australian local council reporting in 1993 by way of Australian Accounting Standard (AAS) 27, *Financial Reporting by Local Government*. In line with this standard, councils were required to value their infrastructure assets and report a subsequent depreciation expense

in their profit and loss statement. In the past, Sterling (1979: 68) contended that unless the objective of depreciation changed from one of reporting conventional allocations to that of measuring some kind of reality, depreciation would be reduced to an empty abstraction. Thomas (1977: 186) claimed that no amounts calculated as periodic depreciation could be verified because, infinitely, many other amounts were just as plausible. Unfortunately (or perhaps fortunately, depending upon the situation), nor could the amount be refuted since it was just as plausible as any alternative. In the context of local government reporting, are these merely 'excuses' which simply provide the means for management to use depreciation as a manipulation tool? This study contends that transport infrastructure depreciation practices have the potential to be manipulated to suit a council's current purpose. It provides the first known empirical analysis related to the transport infrastructure depreciation allocation practices of local authorities in NSW.

This paper begins by providing a brief overview of the literature relevant to this study. Then, empirical results by way of archival data, content and statistical analysis are expounded. Finally, these results are then used in the context of Copeland's five attributes to determine whether depreciation expense is, potentially, a smoothing vehicle for local authorities.

Theoretical Framework and Supporting Literature

Many writers have considered manipulation in the private sector with this public sector study drawing on Copeland's 1968 work to aid in providing an answer to the research question: Does depreciation allocation provide a vehicle for local councils to smooth, maximise or minimise reported operating result? This section provides a brief overview of some of this and other relevant literature. Although this is only a ripple in a large pool of similar literature, it forms the basis for this research.

According to Xiong (2006: 214), earnings management is likely to occur when management have incentives to mislead their financial statement users by exercising discretion over accounting choices in financial reporting. It has been contended (e.g., Revsine, 1991) that many of the financial decisions which are made in both the private and public sectors use accounting 'surrogates' or 'abstractions' rather than directly observed events. Manipulating the surrogates provides decision-makers with a means for influencing peoples' perceptions of managerial performance (Revsine, 1991: 16). Revsine also claimed that financial reporting rules are often arbitrary, complicated and misleading, providing opportunity for manipulation of financial figures so as to selectively misrepresent economic reality when deemed necessary by management (1991: 16). In Australia, accounting has assumed a greater role in local government in the last 13 years or so as a means of ensuring compliance as well as being used to monitor local councils.[1] Hence, it is expected that more motivation exists to misrepresent financial results now than in previous years. Revsine (1991) suggested that to avoid misrepresentation, accounting standards (for the public sector) should be tightened. If anything, 13 years on, local government standards are becoming obsolete as private sector standards dominate. This claim is supported by the fact that the three governmental accounting standards currently in force in Australia (AAS 27, AAS 29 and AAS 31) will be phased out by 2008.

In the private sector, it is thought that managers have a preference for these 'loose' standards which provide latitude in income determination (Revsine, 1991). This, in turn, can lead to the miscalculation of profits. What is being suggested here is that although it is contended that depreciation is being used to smooth the bottom line, reasons for this are aligned more with Alchian's (1950) 'survival of the fittest' premise. In other words, councils need to satisfy influential stakeholders, such as the State Government and related legislative bodies, in order to survive the pressures created by structural reform, budgeting constraints and increased costs.

'Manipulation' is *prima facie* an emotive word. Here, recourse is made to Copeland (1968: 110) who defined manipulation as an ability to increase or decrease reported net income at will. Chambers (1966: 455) calculated that it was possible to measure a given firm's income as any one of 30,000,000 figures, all determined according to generally accepted accounting principles. According to Moore (1973: 100), one significant aspect of such manipulations is highly variable: the underlying motivations may be the desire to smooth, maximise or minimise reported income, or some other reason. In the past, writers have expressed considerable concern at the impairment of the usefulness of accounting reports by lack of objectivity (Wright, 1965). In more recent literature, reference has been made to the concept of 'earnings management'. Initially this seemed to be viewed quite positively but more recently, following the 'accounting irregularities and restatements' post the dotcom and Enron/WorldCom crashes and Australia's HIH crash for example, earnings management is now viewed more pejoratively.

Smoothing, as one way of managing numbers, can be divided into 'real' and 'artificial' dimensions (Barnea *et al.*, 1976). It is the second concept that is considered here. The 'artificial' dimension includes discretionary choices of a wide range of accounting practices and rules concerning classification, valuation and allocation of transactions (Barnea *et al.*, 1976). Depreciation was identified as a potential artificial vehicle for smoothing by Hepworth (1953). Then in 1968, Copeland provided five characteristics he claimed the 'perfect smoothing device must possess' (p. 102):

A. *Once used, it must not commit the firm to any particular future action;*

B. *It must be based upon the exercise of professional judgement and be considered within the domain of 'generally accepted accounting principles';*

C. *It must lead to material shifts relative to year-to-year differences in income;*

D. *It must not require a 'real' transaction with second parties, but only a reclassification of internal account balances;*

E. *It must be used, singularly or in conjunction with other practices, over consecutive periods of time.*

These are considered in the context of local government depreciation reporting - an artificial vehicle for smoothing. For the purpose of the current research, the definition of smoothing needs to be accordingly adjusted. Hence, smoothing here refers to: the manipulation of depreciation allocations to influence the operating result (as opposed to 'earnings') and subsequent financial key performance indicators (FKPIs), both of which are used to assess the financial health of NSW local councils.

There is a myriad of literature examining the manipulation of depreciation in years past. For example, in the 19th century Edwards (1989: 116) claimed that managers of railway companies were faced with conflicting objectives and the desire to report a profit figure sufficient to cover dividends deemed adequate by shareholders led to profit smoothing on a large scale. Pitts (1998: 38) also contended that reported company profits were often determined with planned dividends in mind, leaving depreciation as the balancing variable. The coal industry also experienced problems with reporting depreciation. An example of variability in practice within a company was found in *Shelton Iron Steel and Coal Co. Ltd* (as reported in Edwards, 1989: 122). In those times an unregulated environment existed in which management was free to select the accounting method which best supported its chosen strategies. For example, if the aim was to finance activity from internal sources, then the capital accounting procedure which produced the lowest total for reported profit (that is, the immediate write-off of capital expenditure against revenue) would likely be favoured. If management instead decided to emphasise external financing, the objective became reporting profits and declaring dividends to foster a favourable response among the investing public.

The accounting treatment of capital expenditure within local authorities gave rise to most intense public debate beginning in the late 19th century (Coombs & Edwards, 1992: 182). According to Edwards (1989), 19th century published financial statements were littered with examples of 'error and bias' (p. 110). In 1903, it was revealed that only 55/319 (17%) of boroughs charged depreciation. Even then, this figure could not be relied upon as practices were inconsistent and dependant upon profit levels. It would appear that in the 20th and 21st centuries, very little has changed. Similar findings are discussed in this study as between 1998/99 and 2002/03 up to 84 percent of councils failed to record a cost or depreciation expense for some component of transport infrastructure. Those that did record depreciation often used variable and inconsistent practices – a practice which, it is argued here, continues today.

Whatever the reason or excuse – and there are many – depreciation has conveniently provided a tool with which managers are able to influence their financial statements. This very brief review of literature provides a backdrop for the subsequent discussion regarding the use of depreciation charges by NSW local councils.

Method

Archival research and content analysis by way of a longitudinal study of all NSW councils (170) over a period of five years was combined with systematic statistical analysis, multiple-case studies and interviews. This research draws upon two of these – content and statistical analysis.

Each year, local councils submit their annual reports to the Department of Local Government (DLG) as representative of the State Government. DLG staff then collate information using the electronic reports as well as supporting hard copy data. Both these data sources were obtained for analysis. Initially the annual reports, covering a five year period for the population of NSW local councils (170), were examined in order to identify whether they contained the required information regarding transport infrastructure cost

and depreciation. By using the population, validity problems associated with sampling were avoided. Guthrie *et al.* (2004) contended that content analysis could be used to analyse published information systematically, objectively and reliably. As one of the major forms of determining what has or has not been included in a company's annual report, it is based on manipulating the documents and on studying the text in a very detailed and analytical way (Krippendorf, 1980). As discussed below, in order to determine the accuracy of transport infrastructure depreciation allocation, figures were 'manipulated', compared and analysed.

Content analysis aided in the formation of tentative conclusions prior to undertaking the more detailed statistical analysis. Transport infrastructure – roads, bridges and footpaths – was selected as it represents, on average, 70 percent of NSW local council infrastructure assets and 54 percent of depreciable assets (IPWEA Asset Management Conference, July 2002). In 2003, for example, local councils were responsible for over 60,000 kilometres of sealed road (surface) at a value of around AUS$17 billion. The contestable amount estimated to bring roads to a satisfactory condition was AUS$3.461 billion. Hence, it is a significant cost for local authorities.

Councils may select from a myriad of measurement bases when valuing their transport infrastructure and this in itself provides opportunity for financial misrepresentation. However, it is the allocation of depreciation and the selection of useful lives that are the focus of concern for this paper. External reporting requirements include the publication of comparative figures based on financial statements and ratios that include reference to depreciation of transport infrastructure. It was conjectured (and confirmed by preliminary interview evidence) that the use of comparative reports by legislative and political bodies influenced the allocation of depreciation:

> ... *council results were being misused by Ministers* [for political purposes] ... *Reality is how you value assets and depreciation does impact upon council's financial position ... Depreciation expense is a financial figure used to 'balance the books' ... there was a push* [by state government] *for some of the financial indicators to justify amalgamation ... their* [state government] *approach was not transparent ... Ultimately, valuation will be a financial principle, not an engineering on e...* (Director of Corporate Services, Council C154).

Results

Chambers (1994: 77) stated that '... as long as a fallacious and irrelevant accounting survived, the course of business affairs would remain beyond reasoning and reasonable analysis'. For exposition here, the choices available when deciding upon which depreciation method to use as an allocation base, including the use of a hypothetical useful life, are, in today's society, 'reality'. For example, all NSW local councils use straight-line depreciation (LGAAM, 1999). Though there may be problems with this method – myriad choices for cost, residual and useful life – it is accepted by the relevant stakeholders as 'reality'. Hence, given that the method is legitimate, the bottom line can, potentially, be concealed by differential valuation rules, optional rules, or by managerial

discretion (Chambers, 1994). The hypothesis and randomness tests corroborate this assertion.

A simple hypothesis test was developed to determine whether differences between the recorded result (R) and a theoretical one (T) were different from zero. The theoretical result was founded on core information provided by each of the councils in their annual reports (for example, cost of the asset divided by remaining useful life to provide a notional depreciation expense). Sealed road surface and unsealed roads constitute up to 70 percent of transport infrastructure and were selected as the two focal analytical components for this study. The null hypothesis was based on the mean difference being equal to zero: H_o: $\mu_o = 0$; H_a: $\mu_a \neq 0$.

$$\Delta = T - R$$

H_1: That mean Δ in useful lives for sealed road surface equals zero.

H_2: That mean Δ in useful lives for unsealed road surface equals zero.

H_3: That mean Δ in depreciation expense for sealed road surface equals zero.

H_4: That mean Δ in depreciation expense for unsealed road surface equals zero.

A paired samples t-test was used to compare the means of the recorded and theoretical result.[2] For all the hypotheses, H_a applied and all mean differences were significant to 0.05. The next step was to determine which councils could be categorised as lying in the critical zone. For this exercise, the critical zone was defined as $\mu \pm X$ (where $X = 0.84(STD)$) whereby the probability that councils would fall outside the area between the μ and X was calculated. Adjusting this slightly for ease of exposition, it was decided to use 80 percent - that is, only those councils falling in the top or bottom 10 percent were captured. This allowed for anomalies, such as those described below. For ease, councils were then classified as 'bad' (falling in the area beyond X and including those missing data) or 'good' (falling in the area between the mean and X). To ensure as normal a distribution as possible, outliers were removed.[3] Councils missing data, but not falling within the critical range, are discussed separately. Table 1 provides details of the classification results.

Table 1: Classification of Councils in Relation to Normal Distribution

Test	1999/00		2000/01		2001/02		2002/03	
H_a	Good	Bad	Good	Bad	Good	Bad	Good	Bad
H1	125	45	122	48	120	50	117	53
H2	122	18	85	55	92	48	104	36
H3	128	42	132	38	132	38	128	42
H4	94	46	116	24	113	27	118	22

Source: Original table.

A test of randomness over four years was used to determine whether councils were recording differences systematically or randomly. The hypothesis tested was that the difference between (T-R) for each individual council over a period of four years was random with the outcomes being +1 (positive large differences, T-R) or -1 (negative large differences, T-R). All councils classified as 'bad' were included. Then, after conducting the runs, those councils that only recorded a difference in one year were eliminated from further analysis. The reason for this was that the council in question may have (a) carried out major works in the middle of the year impacting on depreciation; (b) revalued part of their transport infrastructure class; (c) some other unknown anomaly may have occurred. A very small or very large number of runs in a sequence would indicate non-randomness. As the maximum number of runs which could occur in this exercise was three, this test was used to establish firstly whether any runs existed and secondly whether or not they were systematic. Therefore, if only one run existed and it occurred in two or more years, for the purposes of this study, this council would be said to have been over- or under-recording useful lives or depreciation systematically. If more than one run existed, this council would be said to be allocating non-systematically.[4]

Table 2: Results of Runs Test for Random Differences

Category	**B**	**E**	**B_1**	**1 run: Systematic* (No. of councils)**	**1 run: Non-systematic* (No. of councils)**	**≥ 2 runs ** (No. of councils)**
Sealed road surface useful lives	108	52	56	31	9	14 (sig.=1.000) 2 (sig.=0.724)
Unsealed road useful lives	83	33	50	30	6	13 (sig.=1.000) 1 (sig.=0.724)
Sealed road depreciation	89	48	41	20	3	18 (sig.=1.000)
Unsealed road Depreciation	64	33	31	19	4	8 (sig.=1.000)

Source: Original table. Note: * Under or over-recording in at least 2 years; ** Significance in brackets. Where:
B = Max number of councils initially categorised as 'bad' over four years.
E = Councils eliminated that only showed a significant difference in one year.
B_1 = New total of councils categorised as 'bad'.

The results in Table 2 imply that any difference between the theoretical figure and the recorded figure for each of the four categories is non-random. Therefore, it is contended that councils were systematically under- or over-recording both transport infrastructure useful lives and depreciation expense between 1999/00 and 2002/03. This, in turn, implies that depreciation may have been deliberately manipulated rather than 'accidentally' miscalculated.

Content analysis of the annual reports and supporting notes determined that several councils were also missing essential financial data from their annual reports. For example,

52 percent of councils were missing 296 figures related to sealed roads from their annual reports between 1999/00 – 2002/03. A runs test concluded that 38 percent of councils were systematic in their exclusion of significant figures. With respect to unsealed roads 84 percent of councils were found to have a total of 463 figures missing. The results of the runs test showed that 49 percent of these were systematically failing to record a figure for unsealed roads.

Implications for Performance

To determine the impact of the above results on the profit and loss statement, the operating result was recalculated based on the net depreciation difference (T-R) for all councils. For demonstration purposes, all other figures in the profit and loss statement were assumed to be correct. The net basis was chosen to off-set any inter-component errors, thus providing a look at transport infrastructure as a whole.[5] Over the four years 1999/00-2002/03, net depreciation differences ranged from $8,710,000 to $40,668,000, with up to 100 percent of councils revealing an anomaly. For exposition consider two councils - C34 and C33. In 2002/03 Council C34 recorded a surplus of $286,000 which, when theoretical depreciation was used, changed to a deficit of $11,752,913. This was largely due to the council only recording a depreciation expense of $4,000 when, in theory, it should have recorded $1,472,394.[6] The expense recorded implied that C34 was using a useful life rate of 0.008 percent (or around 12,000 years) instead of the rate it stated it was using – three percent (or 33.33 years). Sealed road surface usually has, with regular maintenance, a useful life of around 12 years before needing major reconstruction (Ingenium, 2002). In 2002, Council C33 recorded a depreciation expense of $2,323,000 on a cost of $87,389,000. However, in 2003, depreciation had dropped by 99 percent to only $16,000 whereas cost only declined by 0.6 percent. The impact theoretical depreciation had on the operating result in 2003 was to increase the deficit of $108,000 to $7,699,365.

Overall results showed that by 2002/03 if theoretical depreciation expense had been used, 113 of the 170 councils would have recorded a smaller surplus; a larger deficit or would have had their result reversed from a surplus to a deficit. Hence, potentially, the motive exists for councils to 'manipulate' depreciation expense to suit their needs at the time.

Finally, one of the key performance indicators which incorporates depreciation expense is mentioned briefly here to demonstrate the impact of anomalous depreciation figures on FKPIs used for decision-making purposes by the DLG. The ratio, 'dissection of expenses from ordinary activities' (also known as the Expenditure Ratio), is calculated:

$$\frac{\text{Type of annual expense (employee, materials \& contracts, borrowing, depreciation, other)}}{\text{Total ordinary expenditure}}$$

This FKPI is used for comparing the spending patterns of councils (DLG, 2002: 78). With respect to depreciation, it is the recognition of the cost of holding an asset that has a limited life. The use by the DLG of this ratio is *prima facie* indication of its perceived importance - *why* is never stated by the DLG. However, one wonders why this ratio would be considered as necessary with respect to depreciation when councils are not required to fund this expense. Also, by comparing the councils, analysis and argument here has shown

it is contestable whether one can infer that those councils reporting a lower ratio are better or worse than their colleagues. Then, when considering the theoretical figure, a different story emerges and councils in fact may need to allocate 'more' (more of *what* is unclear) to depreciation. However, this would then impact on their bottom line – a situation, arguably, to be avoided from the councillors' perspective if councils are to evade political retribution.[7] Results determined that up to 97 percent of ratios were incorrect due to the miscalculation, or exclusion, of depreciation expense by local councils.

Manipulated Allocation?

This section draws upon the above results to determine the 'smoothing' potential of local council transport infrastructure depreciation practices using Copeland's five criteria.

A. *Once used it must not commit the firm to any particular future action.*

NSW councils are not required to fund depreciation – hence, for those councils systematically under- or over-recording depreciation expense (up to 61%), no future financial action is necessary. For those councils missing figures (up to 84%) there are no immediate consequences affecting future action (other than, of course, the misrepresentation of their financial position and the possible impact on asset management practices – outcomes, not actions). Finally, as the method(s) used cannot be supported, then any other method can be justified.

B. *It must be based on the exercise of professional judgement and be considered within the domain of 'generally accepted accounting principles'.*

According to Copeland (1968), the auditor must accept the judgement that the underlying circumstances necessitate the allocation of the expense as needed. In other words, a smoothing device should not force management to disclose the fact of the manipulation and must not cause the auditor to qualify his opinion. Upon examination of all audit reports over a period of five years, it was determined that for those councils detailed above, reports were unqualified. Hence, it would seem that the auditors trusted the judgement of the accounting professionals preparing the financial statements.[8]

C. *It must lead to material shifts relative to year-to-year differences in income.*

For the period studied, it was clear that councils consistently under- or over-recorded depreciation expense for transport infrastructure. If one considers the population as a whole, then the trend over the four years was for councils to under-record depreciation expense. Consider Council C56. In 1999/00 C56 allocated a useful life of 80 years to sealed road surface and reported a depreciation expense of around $5,000,000. In 2000/01 and 2001/02 useful lives were changed to a rate ranging from one percent (or 100 years) to 20 percent (or five years). This averaged out to be 11 percent. However, C56 only used the one percent rate for its reporting to the State Minister. This ensured that, after capital grants, a surplus figure appeared on the profit and loss statement - a 'legal' way to manipulate depreciation to suit management's requirements at the time.

D. *It must not require a 'real' transaction with second parties, but only a reclassification of internal account balances.*

'A smoothing device ought to involve only accounting interpretation of an event, not the event itself' (Copeland, 1968: 104). Depreciation, as a book value, is an interpretation of the wear and tear associated with the use of transport infrastructure. It does not require a 'real' transaction and hence satisfies this criterion.

E. *It must be used over consecutive periods.*

The results discussed above, whereby up to 84 percent of councils were systematically recording an anomalous number or missing a significant figure (depreciation, useful life or cost of the asset), was determined to be occurring over at least the four years analysed. By using a longitudinal study and the full population this result is verifiable and replicable.

Conclusions, Limitations and Future Research

In the private sector, the process of choosing financial accounting and reporting principles has traditionally been one of selecting among various, acceptable, alternatives. Therefore, the operating result and financial position are somewhat at the discretion of which accounting principles are chosen (Fern *et al.*, 1994). Copeland (1968) claimed there was evidence that managers use a variety of vehicles to smooth reported earnings streams because they see advantages in doing so. This is said to be implicitly undesirable since it will typically 'bias' a reported earnings number and distort perceptions of the firm's economic performance and prospects (Chambers, 1966). However, it has been advocated as an appropriate management objective (Beidleman, 1973; Gordon, 1964).

This paper applies a traditionally private sector concept to the reporting practices of local authorities. In this environment it may be, as Chambers (1966) claimed, 'undesirable' to use depreciation as a smoothing device; however, undesirable to whom? In 2003/04, around 20 councils in NSW were either sacked or merged with their neighbours. If, potentially, smoothing the operating result avoided this outcome, then this could be considered 'desirable' to affected stakeholders. It is conjectured, however, that the most significant impact is on asset management practices; hence ratepayers and future generations are at risk. Unfortunately, as these stakeholders perceive financial results as 'reality' they may not notice the possible connection between the two (Whittred & Zimmer, 1990; Chambers, 1994). Concern has been expressed regarding the ability of councils to be able to replace infrastructure in the future (Walker *et al.*, 2000, 2004). In 2000, the DLG determined that more key performance indicators and financial schedules – containing reference to depreciation – must be released (NOLG, 2002). This, in turn, provided more ways to compare councils. Hence, a potential political reason exists to smooth income and related ratios. What is of concern is that neither the DLG (through any public medium) nor auditors (by way of qualification) appear to be aware of the results discussed above. A topic for future research.

The guidelines provided to local councils regarding valuation and depreciation are at best ambiguous and, at worst, misleading. For example, Australian Accounting Standards

Board (AASB) 116 *Property plant and equipment* (equivalent to IAS 16) allows organisations to determine depreciation method and useful life "... selection of depreciation method and estimation of useful lives are matters of judgement ..." (para. 75). As a result, additivity problems exist due to the use of different cost bases within a class of assets. Subjectivity with regard to useful life allocation is pervasive and inconsistency of practices with respect to capitalisation and depreciation are evident from the results reported here. Finally, an obvious disregard for compliance by many councils, as demonstrated by the omission of substantial figures from financial statements, means that local council transport infrastructure reporting practices are indefensible.

Statistical analysis confirms that current NSW local council transport infrastructure depreciation practices meet all of Copeland's (1968) income smoothing characteristics. However, these results are not conclusive and further research needs to be conducted. Although each of the criterion is satisfied, other explanations may be just as plausible – for example, Thomas' 'incorrigibility' proposition. Results also supported the premise that depreciation methods currently used by NSW local councils cannot be defended *per se*. For those councils failing systematically to record a depreciation expense, no defence is forthcoming and hence some type of 'manipulation', such as smoothing, is posited as one likely explanation. On the other hand, those councils under- or over-recording depreciation expense may defend their method on the grounds that, although, it allows smoothing to occur, it is an 'appropriate management objective' (Hillier & McRae, 1998: 75).

There are other limitations identified which will be addressed as part of future research. For example, only four years of data were analysed which may result in less than robust randomness results. Nevertheless, it cannot be denied that systematic anomalous or missing figures were found to be occurring in local council reporting. Future research will consider applying a statistical activity cost theory (SACT) framework (such as that used by Hillier & McRae, 1998) or similar instrument to ratify these findings. As well, the impact alleged depreciation allocation manipulation may have on asset management decisions will be investigated further. Finally, possible motivations for manipulation will be explored in more detail.

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Notes

[1] This is partially as a result of the introduction of accrual accounting in 1993.

[2] A 'paired samples t-test' is defined as a procedure that compares the means of two variables for a single group. It computes the differences between values of the two variables for each case and tests whether the average differs from 0 (SPSS, 2004, Version 11.5 for Windows). One advantage of the t-test over the z-score is that variances do not have to be equal.

[3] Outliers removed using SPSS *explore statistic*.

[4] However, by only using four years of data, randomness was not significant.

[5] In other words, using the net basis captures errors such as possible confusion between reporting of road 'surface' and 'structure'.

[6] Theoretical depreciation based on cost/remaining useful life = notional depreciation.

[7] By way of amalgamations, for example.

[8] In NSW external auditors are usually from the local accounting firm.