Cost efficiency under negotiated performance-based contracts and benchmarking – Are there gains through competitive tendering in the absence of an incumbent public monopolist?

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TITLE: **Cost efficiency under negotiated performance-based contracts and benchmarking – Are there gains through competitive tendering in the absence of an incumbent public monopolist?**

ABSTRACT: This paper uses data obtained from numerous sources in Australia to assess the extent to which negotiated performance-based contracts with actionable benchmarking can achieve as good as, or better, improvement in cost efficiency compared to competitive tendering when incumbents are not public operators. Stakeholders who promote the position that Government should choose to test the market for value for money through tendering, especially where incumbent operators demonstrate benchmarked cost efficiency, given the primary responsibility to the taxpayer, appear on the evidence in this paper to be inappropriately claiming noticeable benefits to society.

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1. Introduction

There is a new wind blowing in metropolitan Australia linked to a suite of bus contracting actions focussed on competitive tendering (CT), in preference to negotiated performance-based contracts (NPBCs). These actions appear to be driven by new governments and new advisers. Comments in the media in a number of countries, most recently Australia, South Africa and New Zealand, that CT carte blanche is the way to go for areawide contracts, have also gained momentum with claims of gains achievable by transferring private operators from negotiated contracts, with or without benchmarking, to competitive tendering[1]. The recent action in Sydney to put private operators out to CT[2], while allowing public operators to be exempt, raises questions about the virtue of such a strategy in general, and a selective one in particular, in the light of the many years of experience throughout the world that suggests that noticeable cost efficiency gains to the funder will only occur when a public monopoly is put out to tender, and evidence that this cost efficiency improvement is a once off windfall gain, even if it is up to 30 percent. Subsequent rounds of competitive tendering, relative to a starting point of an incumbent public operator, especially from round three onwards (see Wallis *et al.* 2010) have been shown to deliver little if any cost efficiency gains to the funders, and have placed service quality at risk.[3] Indeed, if the costs of disruption and tendering are taken into account, these can often exceed the benefits. Cities that have adopted the tendering process, such as Adelaide, have experienced greater discrepancies in service delivery and public dissatisfaction. The "Adelaide model" saw early success with tendering, but in 2012 a new entrant in round three has resulted in dramatic increase in costs, well above their projected tender bid price[4].

The Adelaide experience is often used to guide procurement policy in favour of CT; however the recent evidence is somewhat worrying. In a paper by Wallis *et al.* (2010, 89-98), they state:

"A key attribute of competitive tendering for the periodic selection of operators of subsidised public transport services is to secure the provision of specified services at efficient cost levels. This has proved particularly effective where services were previously provided by an inefficient

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[1] Australia in many ways is different from Europe (with some exceptions) where in the European setting the private operators which exist tend to be new, and have come from privatisation (even though they may have evolved from private operators earlier in the last century being brought into public ownership). This is in contrast to (at least) the Sydney private operators who, in the main, have been long established.

[2] This does not apply to all Sydney private metropolitan operators. Operators who in their 2005 contracts committed to provide access to assets, including buses and depots, at the end of the contract term, as part of an argument to 'reduce the burden on taxpayers', were given the option to renegotiate their contracts, rather than being competitively tendered (if the government so wished) like other Sydney metropolitan bus contracts. Only two of the 15 contract regions, operated by Veolia Transdev (renamed Transdev on July 1, 2013), committed to this arrangement, and on January 16, 2013 Veolia Transdev issued a press release announcing the renewal through negotiation of their two contracts for a further seven years, with a number of service enhancements. This raises some interesting questions about the rationale and strength of a commitment to competitive tendering and what can be achieved through NPBCs. It also begs the question as to whether this option to go to NPBC is a once off and will not be available in the next round of renewal in 2020.

[3] UK experience with the refranchising of the West Coast Mainline, lost in 2012 by Virgin Rail and now subject to legal proceedings, confirms the point about repeated tendering. The same point may well apply in other modal situations such as the way terminal operators are involved in ports. I thank Michael Bell for this suggestion. See also http://www.fiveaa.com.au/audio_on-the-buses_105548.

[4] In addition, the Auditor-General identified gaps and weaknesses in the State Government's management of Adelaide's controversial public bus contracts. In response, the government has revealed that all performance benchmarks for bus operators were only finally put in place in July 2012 - a year after the new contracts were awarded. The Auditor-General noted that "The audit found the department has not implemented a process to ensure information provided by bus contractors is valid, complete and accurate."

monopoly operator. The arguments for the adoption of competitive tendering in preference to negotiation with the incumbent operator may be less clear-cut in other cases."
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"The conclusions drawn from the assessment against relevant SA Government objectives are that the [negotiated contract] NC strategy is clearly preferred against the group of 'quality' criteria, and also on balance preferred against the group of 'supplier market and cost' criteria. These conclusions are essentially supported by the assessment against international differentiating factors, which concludes that the current Adelaide situation has a number of features which indicate that an NC strategy is likely to be more appropriate in this case. These two assessments together lead to the conclusion that, given the Adelaide situation at the time of the assessment, there was a strong case for adopting an NC-based strategy (with CT as the fallback) rather than CT as the primary strategy." (page 96)

In 2012, the NSW Government proceeded with competitive tendering for the first time, rejecting NPBCs, although only for metropolitan private operators in nine contract regions (exempting the public operator and two private contract regions as explained in footnote 2). The new contracts are region-based gross cost contracts with service specifications detailed, with the possibility of some patronage incentive payments and penalties for poor performance.

The outcome of the first tranche of four contract regions in Sydney was announced on November 7, 2012, and the 2nd tranche on 28 August 2013. Seven (7) of the eight contracts remain with incumbents (although with variation in contract boundaries and membership of bid team), and one with a new operator entering the Sydney market (who currently operates under a CT procurement management contract in Adelaide and Perth). The annual savings were announced as $18m per annum in tranche 1 and $45m for both tranches (approximately 4.5 percent of pre-tender cost outlays)[5], which translates in tranche 1 into approximately 50c/in-service km[6], higher than predicted by analysts, and which amounts to close to a 10 percent reduction in the cost per km[7]. If we exclude the savings due to a transfer of part of the public operator's services to one private operator, this saving is closer to an average of 20c/km. or 3.8 percent. These new contracts allow the winner to sit down and discuss ways of delivering additional service above levels bid for, but at payments based on the winning price (in terms of $/km, $/hr, $/peak bus). Benchmarking, introduced in the previous contracting regime is likely to continue, although the key performance indicators appear to have been modified to a list of operational criteria unrelated to financial performance, in order to ensure that operators deliver as per the contract. Charter services and revenue, previously linked to the previous contracts, is now delinked in terms of revenue sharing with the government, and patronage risk is now removed from the operator.

Although in Sydney the Government has invested time and effort over the last five years in developing and testing a world class benchmarking framework, in the spirit of complete cooperation amongst all stakeholders, and which had achieved the necessary buy in and was

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[5] One operator who lost his contract (and others since have confirmed his position) said: "Yet I note in the Minister's media release that savings were achieved by this process, the majority of which no doubt came from the over-costed State Government Transitway T80 service now included in one of the Regions and previously operated by the State Transit Authority. How can the Government presume no savings could have been achieved if they negotiated with the existing operators, if the Government failed to consult with said existing businesses prior to, during or after the Tender?" (Australian Bus and Coach (ABCA) magazine, 9 November 2012), The T80 service was at least 50-75 percent more expensive per km than private operator services.

[6] Using evidence the author has, and not data being used by the Tendering Authority.

[7] There is a caveat linked to the T80 service being transferred from the public operator to a private operator under the redefined contact obligations. This figure is based on a comparison with the current situation where benchmarking has not been introduced such that incumbent operators were not delivering on what could have been significant cost efficiency gains had the government implemented its ready-to-roll benchmarking program. This benchmarking program, developed by the author, is used herein as a basis of normalising data when undertaking a scientifically rigorous comparison of CT and NPBC. I calculate that $10.5m of the $18m is a saving related to the Transit way being transferred to a private operator and the balance is savings from incumbent operators, most of which I argue is from one operator who lost their joint contract in one of the regions who had a large amount of excess time and excess dead running.

ready to implemented, ensuring that the cost efficiency gains through revised targets could be achieved under this scheme, it was not implemented prior to the introduction of CT[8].

Had the NSW Government proceeded with benchmarked NPBCs, this could have led to an outcome that would have provided all the right incentives to deliver continuous improvement through a trusting partnership (with arms length commercial obligations)[9] at least as good as, and potentially better than, the recently announced outcomes of CT (see the evidence later in the paper). Foregoing the opportunity to implement benchmarking reform under a NPBC meant losing the opportunity to demonstrate (at least as a counterfactual) how cost efficiency gains could have been achieved without placing service levels at risk, and without the relatively higher administrative costs of the tendering process[10]. The announcement of an $18m savings in the first tranche[11], even if not linked to a specific transfer of a service from public to a private operator (see footnotes 9 and 11) may be illusory when benchmarked against achievable outcomes under NPBCs[12]. It is this 'level playing field' comparison that needs to be undertaken, and which is the basis of this paper.

The main focus of this paper begins with a position that an efficient NPBC with strong incumbents who are subject to compliant benchmarking and regular monitoring, is able to deliver at prices as efficient as those achievable via CT. Furthermore, CT increases the risk in diminishing trust between purchaser and provider, and will substantially reduce the prospects of a partnership at the tactical level, which has been so important in States, such as Victoria, in driving patronage increases[13] and in adding flexibility to service delivery arrangements. A CT generally requires more rigidity in contractual requirements than a NPBC during the course of the contract period, which reduces the government's opportunities for change to improve services as conditions change.[14] If, however, a trusting partnership with a long period (at least 10 years) CT contract were in place, then one might expect some convergence between CT and NPBC.

This paper uses data obtained from numerous sources throughout Australia to assess the extent to which a NPBC with actionable benchmarking, can achieve as good as, or better, improvement in cost efficiency without incurring the additional costs of administering a CT process, as well as removing the risk of service loss attributable to repeated rounds of CT when incumbents are not public operators[15]. Crucially, we need a framework within which the counterfactual evidence is on a level playing field, so that it is possible to make sensible

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[8] It has, however, been used to inform the CT assessment process.

[9] BusNSW Executive Director considers the new contracts as representing a shift to greater government control though a comprehensive penalty-based performance regime: "With regard to the estimated $18m savings, if you take out of this amount the cost of the tendering process and the savings from the government-run Transitway in Region 3, it is difficult to fathom how the balance remaining could have not been achieved by negotiation," (ABCA Magazine, 9 November 2012)

[10] Although the January 2013 signing of two NPBC renewal contracts for Veolia-Transdev may in due offer important counterfactual evidence.

[11] BusNSW, with the advice from Pitcher Partners, estimated that the maximum cost savings was likely to be less than $18m per annum for all tranches. If we exclude the transfer of public operator services to the successful private operator, under CT, our calculations suggest a total savings relative to current non-benchmarked NPBCs of about 5.9 percent.

[12] There is also a widespread view that the transactions cost of tendering are far greater than under NPBC, but this is currently not substantiated.

[13] Patronage growth based on delivering service enhancements agreed between government and industry has resulted in a service elasticity of 1.14.

[14] This comment is based on the often excessive compliance obligations set out *ex ante* in contrast to an *ex post* approach given the inevitable incompleteness of contracts. With greater detail *ex ante* we observe great ambiguity in the understanding of both parties (see Hensher 2013).

[15] Recently competitively tendered services in Australia that were previously renewed through negotiation listed a number of service improvements offered by the operators. These could have been achieved through benchmarking and negotiation, and it is surprising that they have surfaced under CT as if it were the only way for this to happen.

statements about the comparative cost efficiency of service suppliers operating under the same conditions. As far as we are aware, this has never been undertaken, due simply to the lack of data that will permit the level playing field comparisons. Restricting the evidence to one country, but having evidence from both CT and (non-benchmarked) NPBC regimes that have been in place for some time (and a benchmarked regime that has yet to be implemented under NPBC), provides a unique setting within which to undertake a meaningful comparative assessment.

The paper is organised as follows. We begin with an overview of NPBCs and CT, followed by an assessment of the current cost efficiency of metropolitan bus contracts in Australia under (non-benchmarked) NPBC and CT, taking into account different circumstances (such as management contracts in Adelaide and Perth) and contracts that require operators to provide all assets under a set of financing rules. The emphasis is on gross and net cost efficiency, the latter normalising for key features of the operating environment that are not, in the main, under the control of the operator, with all contract costs included that relate to payments to the operator and the cost to government. That is, we use actual contract cost payments made in 2010-2011 (for example, using what government contributes as annualised capital costs (vehicles, depots) and not what operators use for their own tax purposes). Any items funded by the government (for example, buses in Adelaide) are added in for valid contrasts. We describe the methods used to normalise the data so that we can obtain net cost efficiency measures, and finally establish the likely outcome under CT and benchmarked NPBC. We describe the data anonymously in order to preserve necessary confidentiality.

2. A brief overview of negotiated performance-based contracts and competitive tendering

T he broad objective(s) of government is to provide a good quality, integrated and continually improving transit service for a fair price, with reasonable return to operators that gives value for money under a regime of continuity and community obligation (update based on Hensher and Stanley 2008)

Australian bus contracts have been pioneering in the development of negotiated performance-based contracts founded on trusting partnerships, whereby contracts are re-negotiated with existing operators, subject to meeting certain conditions. Melbourne and Sydney until late 2012 are examples of this approach[16]. Wallis *et al.* (2009) reviewed the Adelaide experience with three rounds of tendering and concluded that there is little to gain in terms of cost efficiency and quality enhancement by going to a fourth round of tendering. They argue that a move to NPBCs not only can reduce transactions costs (associated with tendering) but also offers the opportunity to work closely with efficient incumbents to grow trust and build patronage where possible (mindful of the realities of the market for public transport services). It also reduces the uncertainty associated with renewal through tendering, where a very efficient incumbent operator can still lose the right to provide services. Under tendering, there is a real and observed risk of incumbents tending to not commit to longer term investment in the industry (both physical and human resources), especially where contract continuity is uncertain, even when all the boxes are ticked on performance. Tendering also has a negative impact on building and maintaining a trusting partnership (in addition to high transactions (including transitional) costs every time re-tendering is put in place).

In very general terms, negotiation is the process through which parties perceive one or more incompatibilities between them, and work to find a mutually acceptable solution[17]. In contrast to

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[16] Melbourne started in about 2002 with a focus at the tactical or system planning level.

[17] We would suggest that, where a body of expertise exists in an Association that operators belong to, that with permission from the operators, there is much to be gained by at least including such an Association where elements of negotiation are generic in scope. This has the supplementary benefit of accessing the expertise of consultants, and saving costs which ultimately are met by government

competitive tendering, which is framed to *determine* the value of a product or service, negotiation is designed to *create* the value of the product or service.

Provisions to guard against regulatory capture are critical in a negotiated performance-based contractual process. Australian experience suggests that, under NPBCs, transparency and accountability can be achieved if the following four conditions are in place (Hensher and Stanley 2008):

1. Performance benchmarking to ensure that operator performance is efficient and effective. This benchmarking needs to be subjected to independent verification. Key performance indicators (KPIs) and the threat of competition (through tendering)[18], in the event of inadequate performance, assists the maintenance of competitive pressure and efficient performance.

2. An open book approach to costs, achieved through an independent auditor. Operators whose costs appear to be high through this analysis must justify their numbers or face a cut in remuneration[19]. Those whose costs appear low have the opportunity to argue for an increase.

3. The appointment of a probity auditor to oversee the negotiation process.

4. Public disclosure of the contract.

Australian experience across jurisdictions that implement competitive tender, and those that negotiate, suggests that there is a tendency for cost convergence. A number of operators who provide service under each regime have noted this trend.

In the negotiated outcome, the importance of benchmarking in order to deliver continuity of service and value for money needs to be reinforced. Benchmarking is designed to monitor and ensure efficiency and effectiveness through the life of a contract, and not just at the point of contract completion. Incentives built into a negotiated contract conditioned on market-linked benchmarks and the ultimate sanction of tendering if non-compliant, enable the incumbent operator to at least prove their worth initially and then, provided the regulator does their job, to deliver true value for money at minimum transaction cost, even after allowing for the on-going regulatory costs that should be common to all regimes, be they CT or NPBC.

There is a growing body of theoretical and empirical evidence to support the promotion of awarding mechanisms with formal and informal devices, aimed at economic efficiency and effectiveness through the life of the contract that is, *ex ante* and *ex post* coordination. Building on growing arguments to support NPBCs instead of CT, Bajari *et al.* (2002) (and Bajari and Tadelis 2001) suggest that CT performs poorly when 'projects' are complex and contractual design is incomplete. Area-wide metropolitan bus contracts tend to fit this circumstance. This literature argues that competitive tendering can stifle communication between buyers (that is, the regulator) and sellers (that is, the service provider), preventing the buyer from utilising the contractor's expertise when designing the project (which could be a network in the public transport setting). Authors such as Yvrande-Billon (2007), drawing on the French experience, promote the case for greater emphasis on establishing a credible regulatory scheme that is able to govern the procurement of public services *ex post,* arguing that focusing on introducing market mechanisms *via* competitive tendering per se, *ex ante,* does not guarantee better value for money. Implicit in her arguments is the need to develop trusting partnerships and

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[18] In a very real sense, negotiation and competitive tendering might be seen not as alternatives but as complements in a sequence (Ivanova-Stenzel and Kroger 2005), where the competitive tendering stage is only necessary where certain conditions are not satisfied within the negotiation stage and during the agreed service delivery period. This is consistent with the promotion in Hensher (2007) of negotiated PBCs, with competitive tendering invoked when a service provider fails to deliver under the agreed contract with reasonable notice (see also Stanley and van de Velde 2009).

[19] Under competitive tendering, it is less likely that operators see any obligations to reveal their cost structures, since government has awarded them a contract based on the offered price under competition. Thus the benchmarking and open book auditing under NPBCs provides a much better way to obtain *detailed data* on operator performance that can be used to benchmark in a very meaningful way, controlling for differences that are not under the control of the operator.

(incomplete) commercial contracts with unambiguous incentive and penalty structures throughout the life of a contract, with market mechanisms such as competitive tendering always present as a way forward when operators fail to comply under reasonable notice.

This focus may well enable a greater emphasis on achieving social objectives in contrast to commercial objectives. Some might say the tendering "paranoia" may have taken governments away from the real objectives of social obligation and maximising net social benefit per dollar of subsidy, as recognised by Preston (2007), to a disproportionate and over-zealous focus on cost containment and reduction. We would argue that the key issue is not 'applying the wrong kind of competitive tender to the wrong market' (Preston 2007), but the inappropriateness of any form of competitive tender where the transaction costs are so high as to nullify any financial gains from the tendering process at the expense of the relative neglect of broader social obligations, which place as much emphasis on benefits as on costs. The exception is typically a *first round* tender when moving from an historically entrenched publicly provided public transport service. The latter usually delivers huge windfall financial gains in the range 20-30 percent (Hensher and Wallis 2005, Wallis and Hensher 2007).

3. Approach to establishing benchmarked cost efficiency

Text In developing comparative measures of operator performance, it is essential to distinguish between those influences that are under the control of the operator, those that are under the control of government (or the regulator), and those that are essentially determined by other (for example, market) forces. Separating out the sources of control is a grey area, and so any decision must be based on a 'reasonable amount of influence'.

Adjusting gross cost efficiency by controlling for (or normalising on) those influences not under the control of the operator is a main focus of this paper, including presenting the evidence for a single financial year, enabling a level-playing field comparison of CT and benchmarked NPBC. Each operator will face contextual effects over which they have no control (for example congestion which affects speed), which is adjusted by applying a formula such as:

$$\frac{\$}{\text{bus km}} = f\left\{\begin{pmatrix} \text{average peak speed, spread of service hours,} \\ \text{vehicle utilisation, peak vehicle requirements} \end{pmatrix} \text{ plus effects under operator control}\right\} \text{x Annual CPI}_{adj}$$

This formula is a way of recognising, and allowing for, differences in costs that vary by the hour and the peak bus requirement, that are the basis of payment models based on \$/bus km plus \$/bus hour plus \$/peak bus (Hensher *et al.* 2012).

We have, in previous studies, including those undertaken for Transport for NSW, since 2005, and subsequently for Translink in Queensland, identified a number of operating environment features that are reasonably not under the control of the operator. These are speed (based on average timetabled speed), spread of service hours, and bus utilisation. The point of these adjustments is to focus on the 'offer' where efficiency of service provision is under the control of the operator, and to normalise the offers for factors outside the operators' control (see Hensher in press 2014). These three operating elements are typically context-specific influences, and have been found to be the key drivers[20] of the differences between operators in gross cost per service kilometre and, to some extent, patronage.

Each of the factors identified above is directly impacted by the operator's network plan, which is often under the control of the regulatory authority (certainly under route contracts, but also in

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[20] Although the cost of delivering services is influenced by many factors, we believe these three key influences impact in a non-marginal way, and cannot be materially adjusted by the operator. That is, they are the result of the external environment, be it geographical, socio-economic, or institutional.

most area-wide contracts). Statistical analysis in Australia, for example, has shown that average peak speed is a major influence on differences in gross cost per bus kilometre efficiency across contract areas within a given geographical location. The UK practice, prior to economic deregulation, calculated payments for network subsidies on the basis of $/km plus $/hour plus $/peak bus[21], confirming that these adjustments have long been regarded as sensible adjustments for key cost drivers. This is justified in more detail as follows:

Average speed. Slower average peak speed, due to traffic congestion and/or an inefficient on-board fare payment system for instance, will typically increase driving time and operating costs[22].

Spread of operating hours. A higher ratio of timetabled operating hours during periods when penalty rates of labour pay apply (for example, weekends and possibly very early in the morning on weekdays (for example, before 7 am)), will typically increase operating costs.[23] Non-timetabled school services should be included (if they are part of a contract).

Average bus utilisation. A higher number of annual service kilometres per peak bus, because of higher timetabled route frequencies, will typically lower unit costs through diluting fixed costs.[24] Although only a small proportion of cost might be considered to be actually fixed (for example, bus registration and third party insurance), other overhead costs will increase with activity (even if not in direct proportion), especially where there is a significant increase in kilometres. This suggests bus utilisation on route buses is less likely to be under the operator's control.

The formula given above for cost per kilometre needs to be calibrated on existing operator data in order to obtain estimates of unknown parameters that define the role of context-specific influences. This will enable the model subsequently to be used to adjust for influences that are not under the control of the operator, essentially by replacing operator-specific levels of speed, spread of service hours, bus utilization, and peak vehicle requirements in the model with a median or best practice level that is used to contrast each operator's gross cost per km with a benchmark reference level of performance. In the current paper we have data for four metropolitan areas in Australia and apply the same method to the pooled data.

4. A comparative assessment of NPBC and CT in Australia

Data obtained from four jurisdictions in Australia have been pooled to assess the role that CT vs. NPBC plays in the determination of both a gross and net cost efficiency measure of overall contracted services. A series of econometric models of the regression model form have been estimated, accounting for whether a contract was awarded through CT or NPBC, which are designed to identify the role of average peak speed, spread of service hours and bus utilisation (See Table 1, Model 1), to obtain normalised estimates of net cost efficiency. For contacts awarded under NPBC, we then identify the current gross and net cost efficiency and apply a sliding scale, over a five year contract period, given the calculated benchmark cost efficiency (mean and median), to identify the most likely performance level required under a renewed NPBC. This is compared to known CT outcomes.

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[21] We thank Chris Nash for reminding us of this practice.

[22] It could be argued that slower speeds can also be the result of poor timetabling practices, which are under the control of the operator. However we believe the impact of slower speeds imposed by external factors in the operating environment will dominate here.

[23] A greater spread of operating hours, along with increased midday off-peak services, can allow the operator to build more straight, rather than broken, shifts. This could lower wage costs per hour given wage agreements.

[24] We acknowledge that average vehicle utilisation could vary substantially over a contract period, especially in situations where for example government introduces extra buses into the network, but then restricting kilometres to those buses. For example, the 300 growth bus strategy in Sydney in 2009 targeted kilometres at the peak, and kilometres attached to the growth buses was often half the km/ bus of the existing fleet.

The overall goodness of fit of the gross cost model, as an adjusted R^2, is 0.84 (the unadjusted fit is 0.99), indicating that 84 percent of the variance in gross cost per km across all contract regions can be explained by the three normalisation criteria and contract-region specific dummy variables. We note, however, that the proportion of

service vehicle hours as defined is not statistically significant, due in large measure to the relatively high partial correlation with average speed (-0.461) and bus utilisation (0.433), compared to a 0.091 correlation with gross cost per kilometre.[25] Model 2 in table 1 is included to establish the potential influence of the procurement model (CT vs. NPBC) after controlling for the two statistically significant contextual influences that are not under the control of the operator. The t-value of -0.64 indicates that the procurement model does not have a statistically significant influence on gross cost per kilometre; that is, the CT vs. NPBC dummy variable is not statistically significant from zero, which reinforces the view that NPBC has as much merit as CT.

Table 1: Regression model results (with region-specific constants suppressed) dependent variable = gross cost per km

Model 1

Explanatory variables	Parameter estimate	t-value
Overall constant	18.365	11.5
Contract-region specific dummy variables(1,0)	Not available for confidentiality reasons	
Average speed (km per hour)	-0.2793	-4.24
In-service kilometres per bus	-0.000126	-1.98
Proportion of service vehicle hours on weekends and after 7pm weekdays	1.6548	0.89
Adjusted R2	0.841	

Model 2

Explanatory variables	Parameter estimate	t-value
Overall constant	8.2563	14.2
CT (1) vs. NPBC (0)dummy variable	-0.1754	-0.64
Average speed (km per hour)	-0.0889	-3.93
In-service kilometres per bus	-.000028	-4.17
Adjusted R2	0.561	

The data comprises 33 NPBCs, all of which are currently not benchmarked by the regulator, in order to achieve cost efficiencies, and seven CT contracts. We have excluded all current public operators who have not to date been subject to CT[26]. The CT contracts are management contracts, and the CT data has been adjusted to include (with support from the government agencies) additional cost items (such as some of the buses and depot support) so that it is the same set of costs incurred by the NPBC private operators. All data relates to the 2011 financial year.

The mean gross cost per km of the NPBC's without benchmarking is \$4.56/km, and the mean under CT is \$4.77/km. (Table 2 and Figure 1). The median values are \$4.69 for NPBC and \$4.49 for CT. These estimates are not strictly comparable because we have not taken into account the factors that are jurisdiction specific and not under the control of the contracted operator. When we allow for these effects through normalisation, we find that although the normalised mean cost per kilometre is higher under NPBC than under CT, the median, which is a much more reliable indicator if there exist deviations from a normal distribution for all contracts, is lower under NPBC (\$4.78/km) than under CT (\$4.95/km)[27]. What we have

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25 We also considered the potential role of fleet size, but found that its inclusion with the explanatory variables in Table 1 made it statistically insignificant. The partial correlation between fleet size and average speed in particular (-0.422) appears to be the source of this statistical insignificance given that average speed is a higher correlate with the dependent variable.

26 This exclusion is designed to avoid the outlier effect associated with significantly higher gross costs per kilometre typically, on average, 100 percent greater than the private operators (before normalisation).

27 The overall variability of the cost data increases, after controlling for differences in cost factors deemed to be outside operator control. Specifically, the standard deviation of gross and net cost per km respectively are 0.78 and 1.39; the range is 2.99 for gross cost per km and 5.97 for net cost per km; and the minimum and maximum values are 3.08/6.07 for gross cost per km and 2.42/8.39 for net cost per km. It is possible that the upper or lower (maximum, minimum) estimates could be closer to the net

identified is a case for not assuming that competitive tendering will ensure greater cost efficiency than (pre-benchmarked) NPBCs.

The reason for concentrating on the median is that it is more robust for skewed distributions. In our data, the (absolute value) skewness statistics for gross and net cost per km are respectively -0.12 and 1.04. Two times the standard error of skewness is 0.775, given the number of contracts. What this suggests is that the absolute value of skewness is less than 0.775, and we would conclude that the gross cost per km distribution is mildly negative but not statistically significant from a normal distribution. By contrast, however, the net cost per km distribution is significantly (and positively) skewed, making the use of the mean an inappropriate indicator of performance. Since the comparison of cost efficiency must be in terms of net cost, the robust and sensible comparator for CT vs. NPBC is the median cost per km. (in bold in Table 2). The normalised values suggest that NPBC's, even before benchmarked targets are implemented through the negotiation process,[28] offers a three percentage points gain in cost efficiency[29].

Table 2: Aggregate mean and median cost efficiency under the two procurement plans

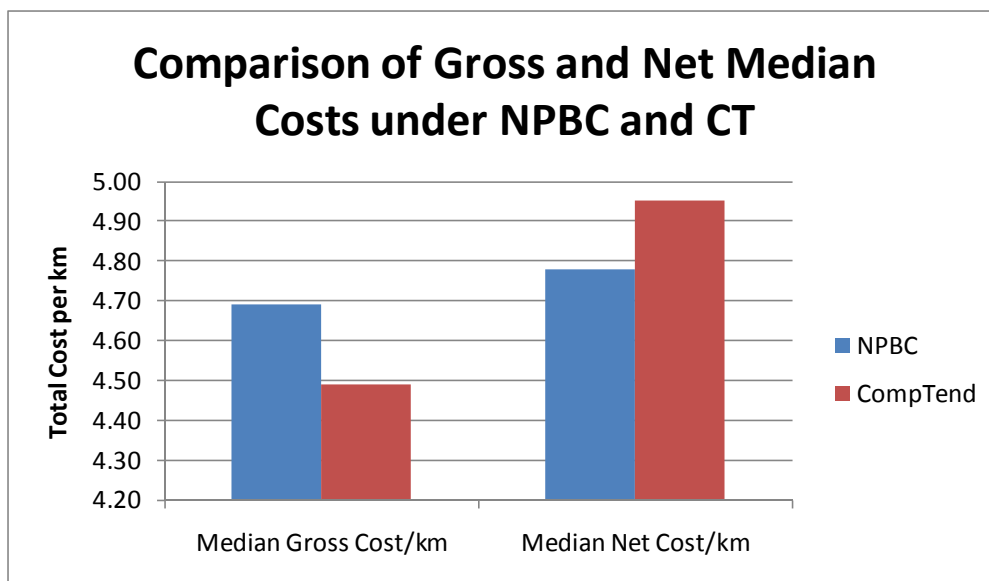| Procurement	Gross Cost (GC)	Net Cost (NC)	GC-NC
Mean NPBC	4.56	4.89	-0.33
Mean CT	4.77	4.74	-0.03
Median NPBC	4.69	4.78	-0.65
Median CT	4.49	4.95	-0.28
Mean –All private operators	4.60	4.87	-0.52
Median –All private operators	4.59	4.94	-0.52

Figure 1: Aggregate median cost efficiency under the two procurement plans

Taking a closer look at the full distribution as shown in Figure 2, ranked by normalised net cost efficiency, the estimates of gross and net cost efficiency for each operator indicate that an outcome which favours CT is far from definitive. There are four operators under NPBC that

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mean than the gross mean, but it is not guaranteed. Specifically, a number of contract regions display strongly advantageous average speeds and bus utilisation, and given their gross cost, it can happen through normalisation that their net cost per cost increases significantly, in large part due to the fact that their gross cost per km, while it maybe be relatively low, is still cost inefficient compared to other operators who do not have the strong relative advantage in respect of average speed and bus utilisation. Consequently, one can arrive at a net cost that is well above the highest gross cost per km in the sample in order to correct for the base gross cost inefficiency.

28 As well as accounting for the relatively higher administration costs of tendering, compared to negotiation.

29 Prior to the closing date for the first tranche of Sydney tenders, rumours abounded that a 10 percent savings in costs to government under CT was expected.

outperform the best CT outcome, another three before one CT, and then another 10 NPBC contracts before two CT contracts appear.
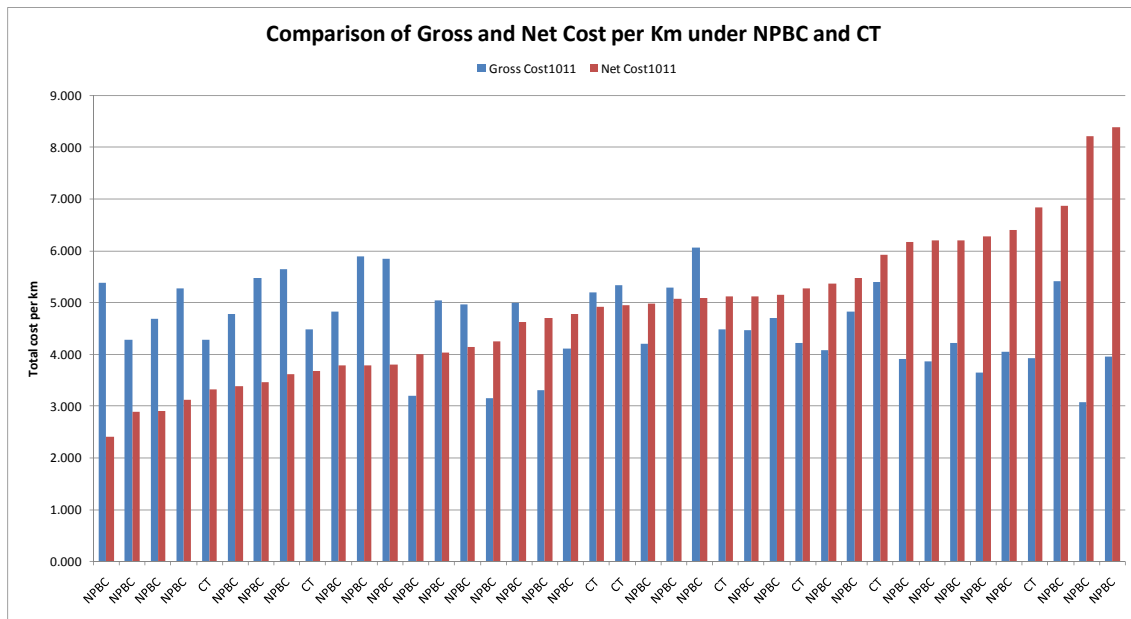

Figure 2: Comparison of CT and NPBC cost efficiency for operators in the Australian metropolitan bus market, sorted by net cost efficiency, 2011

The mean and median estimates for NPBC reported in Table 2 and Figures 1 and 2, whilst normalised for jurisdiction and factors outside the operator's control, are not adjusted for any sliding scale improvements that might be agreed as benchmark targets introduced during the negotiation process. As an example, given an initial year contract price in excess of the median NPBC net price of $4.78, a reasonable sliding scale would see operators who have not achieved the agreed normalised median target level of cost efficiency, adjusted for inflation, be required to improve by a determined percent over a five year period.

For example, if we considered an operator under a current contract with a net cost of say $5.20/km in 2011, which over five years is increased to $6.03 in 2016 (assuming inflation of three per cent per annum), then the expectation (to avoid competitive tendering) would be an improvement of 42 cents/km. over the five years (averaging 8.4/km per annum) in order to return to the benchmark net cost efficient median level of $4.78 (before inflation, or $5.54 after inflation of 3 percent per annum in year five). This outcome offers a preferred net cost efficiency outcome compared to the CT median price of $4.95 (a 3.6 percent gain), which can then be converted back to a gross cost estimate (i.e., a median of $4.69/km in $2011 or a mean of $4.56 before inflation adjustments) for government budgetary purposes. However, given that this adjustment will result in a revised overall benchmark indicator (being based on the median of the improved outcomes), the mean gross cost of $4.56 is expected to move, over a five year contract period, to a gross cost annual average closer to $4.35/km. If the winner under CT had a bid price greater than $4.35/km (in $2011 before inflation)[30], *in this example*, we would predict that a benchmarked NPBC would have achieved a better value for money outcome than CT.

The evidence and discussion in the previous paragraph is based on using normalised speeds applicable to all four metropolitan areas in our data. Clearly, to assess the case for a specific contract region in a specific metropolitan area requires further adjustments. A final analysis of interest is to take a single geographical jurisdiction (i.e., an existing contract region) and assume that all bidders, incumbent to the same metropolitan area, and new entrants from other CT jurisdictions in Australia, would offer a price based on the existing contract region average

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[30] This would be a gross cost /km in each of the following five years (2012-2016), after inflation (assumed to be 3 percent per annum), respectively of $4.48, $4.61, $4.75, $4.90, and $5.04.

speed, average bus utilisation and average spread of service hours, as well as other conditions that exist that are under the control of the incumbent operator. The findings for the net cost per km. are presented in Figure 3. The particular winner in this (real) example would not be the current region incumbent, who was ranked sixth on net cost efficiency. The regulator could then exercise their roles and rights to require the actual region incumbent to comply with the most cost efficient outcome, or be subject to CT. Interestingly, all new entrants currently have competitively tendered contracts in other metropolitan areas, and not one of them would have (or should have) won on cost efficiency. This analysis would need to be undertaken for each and every contract region. The winning bid on net cost/km would be expressed as a gross cost/km., which in this application is a maximum[31] mean gross cost/km. of $4.56[32].
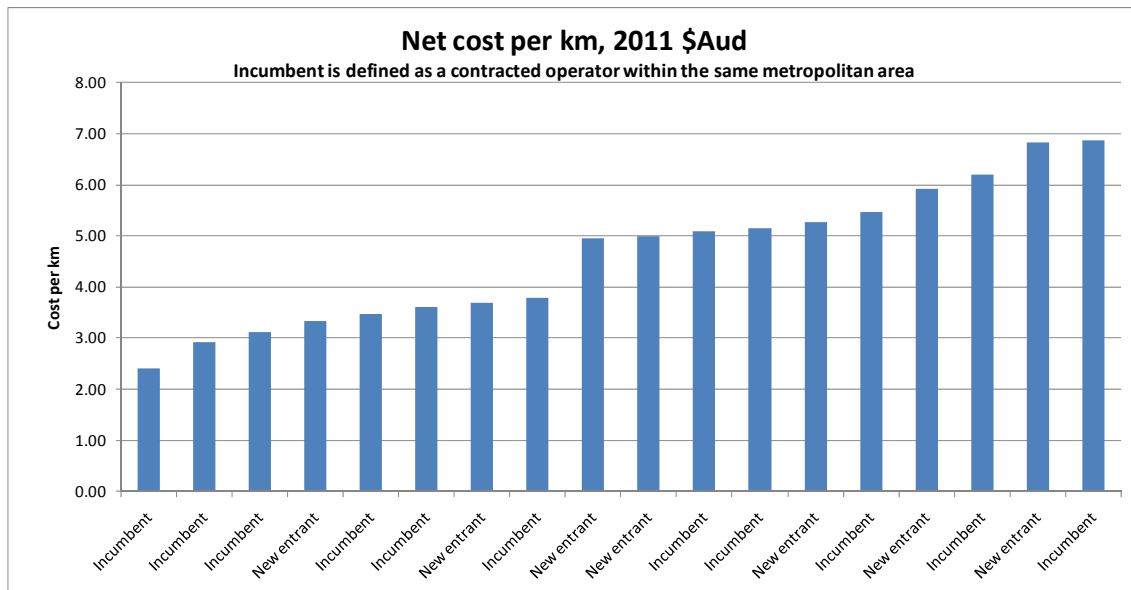

Figure 3: Comparison of net cost efficiency of incumbents and new entrants, sorted by cost per km, 2011 for one contract region

5. Conclusions

Using data to link CT prices of successful bids to NPBC outcomes, the evidence suggests that the gains from CT are generally illusory or overstated (outside of the situation of an incumbent public operator). It appears from the evidence presented in this paper, in the Australian setting, that testing the market for value for money through competitive tendering, in situations where incumbent contract holders are from the private sector, is not consistent with the well held view that such a procurement plan is looking after the interests of society, compared to benchmarked actioned NPBC33.

Although the evidence is drawn from Australia in the context of four of the major metropolitan areas, we believe that it sends a strong message about the presumption that competitive tendering is naturally the way forward. While noting that many governments suggest that CT

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[31] We specifically say 'maximum' because we might reasonably assume that the winning bid would recognise improved cost efficiency associated with influences that the operator *has control over*, and that they would be more cost efficient than the existing operator.

[32] This result, under benchmarked NPBC, is a 12.3 percent reduction in the current gross cost per km. for the contract region in this example, which is lower than the CT outcome. This contract region has not been subject to CT to date, and we would want the CT price to be a noticeable improvement over $4.60/km to be a value for money outcome.

[33] A referee asked the question: 'Is the choice of regime really random, as is implicitly assumed here?' If one interpretation of the finding is that it does not matter whether one goes for CT or benchmarked NPBC, given the small margin of difference in cost/km, then this is an important result, even if on balance one might argue that NPBCs with actionable benchmarking win out. The big message, however, is that value for the taxpayer's dollar under CT is far from assumed; this paper questions this proposition with real evidence.

ensures transparency, our experience with the practice of CT does not ensure such a claim is necessarily valid, for often the details of tender review and assessment are rarely published, and claims of cost savings have been known to be fabricated. Whilst we cannot claim that the processes and outcomes associated with NPBCs with benchmarking will be published, we suggest, given the evidence herein, that if an incumbent has built up a strong trusting partnership with the regulator (with arms length commercial and legal obligations), and is subject to stringent benchmarked obligation, then the outcome is likely to deliver (in the long run) better value for money to society.

Whichever procurement model is adopted, however, some specific underlying conditions are assumed in the comparisons presented. In particular, we assume a mature market of competent private operators who are available to both tender if required, or to purchase through acquisition an incumbent if the opportunity arises. We also assume that the regulator has the skills to ensure that all alternative procurement processes can be undertaken efficiently, and that suitable monitoring of performance is in place as a credible threat to non-compliance under the terms of a contract.

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