

**TAX PAYMENTS VERSUS THE AER'S ALLOWANCES FOR REGULATED
BUSINESSES**

Dr Martin Lally
Capital Financial Consultants Ltd

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EXECUTIVE SUMMARY

The ATO has recently advised the AER that over the 2012-2016 period there appears to have been a discrepancy between the actual tax payments to the ATO by the regulated energy networks and the AER's tax allowances for these businesses used in its price/revenue allowances. In particular, the aggregate actual payments by the state government owned entities have been consistently more than the AER's allowances, and the aggregate actual payments by the privately-owned businesses have been consistently and significantly less than the AER's allowances. The ATO has also identified what it considers to be the principal sources of the discrepancy for the privately-owned entities: the use of non-corporate ownership structures, gearing in excess of the AER's level, the carry forward of tax losses not reflected in the AER's assessments, and various aspects of the depreciation deductions claimed by the businesses (the use of DV depreciation, shorter economic lives than prescribed by the ATO, and the low-value pool mechanism). Accordingly, this report seeks to assess whether the AER's current regime for determining tax allowances should be altered, in support of the long-term interests of consumers. The principal conclusions are as follows.

Firstly, in respect of the privately-owned businesses, the alternatives to the current regime comprise setting the regulatory tax allowances in accordance with the actual taxes paid ("complete pass through"), reducing the regulatory tax allowance to match the actual taxes paid whenever the latter is less than the allowance under the current regime ("capping"), and identifying specific activities that have been taken by the businesses to reduce their tax payments, quantifying their impact, and reducing their tax allowances accordingly ("targeting"). Each of these approaches could be applied at the individual firm level or the sector-wide level, or some mix of the two.

Secondly, complete pass through is inferior to capping because it has two significant disadvantages and no countervailing advantages. The first of these would be higher prices for consumers than those consistent with the NPV = 0 principle, if tax payments exceeded the level allowed under the current regime, and this disadvantage would exist regardless of whether complete pass-through was applied at the individual firm or sector wide level. Such an outcome is not consistent with the long-term interests of consumers. The second disadvantage would apply if complete pass-through was applied at the individual firm level, and consists of encouraging firms to undertake actions that raise their corporate tax payments

but are not desirable. For example, with complete pass through, a business would have the perverse incentive to reduce and possibly eliminate all debt financing because the higher corporate tax payments from doing so would be fully offset by the higher regulatory allowance whilst the advantages to the firm from doing so (lower personal taxes for investors, no bankruptcy risk, etc) would be retained by the firm. Accordingly, complete pass-through should be dismissed.

Thirdly, capping is a blunt instrument, which implicitly and wrongly attributes all shortfalls between the taxes paid by businesses and those allowed by the regulator under the current regime to tax minimization behavior by firms. Accordingly, it suffers from numerous disadvantages, including the potential for overestimating the extent of tax minimization activities by regulated businesses, leading to tax allowances and hence revenue allowances that would be too low to satisfy the NPV = 0 principle, which is not consistent with the long-term interests of consumers. Some of these disadvantages of capping would arise if the capping approach were applied at the individual firm level whilst the others would arise regardless of whether the capping approach were applied at the individual firm or sector wide level.

Fourthly, targeting tax minimization activities (including the use of non-corporate ownership structures) would replicate the efforts of the ATO but with much less chance of success, be administratively complex, require the AER to monitor all ATO actions in this area (so that the AER could alter its tax allowances in response to the ATO nullifying any tax minimization activities by firms), and when applied to the use of trusts would require estimates of personal tax parameters that would be very difficult to obtain. These disadvantages apply regardless of whether this approach is adopted at the individual firm or sector-wide level. If applied at the individual firm level, tax minimization activities would additionally tend to be legitimized. If applied at the sector-wide level, the level of tax minimization activity is likely to increase as firms seek to ensure that their tax payments do not exceed their tax allowances. Accordingly, I recommend against the AER targeting tax minimization activities.

Fifthly, targeting the corporate tax savings that firms enjoy from gearing above the AER's level, by adjusting each firm's tax allowance to reflect its actual gearing level, will certainly discourage such activity by firms because the advantage to the firm in the form of lower

corporate taxes would be stripped from it whilst the disadvantages (higher personal taxes to its shareholders, higher bankruptcy risk, etc) would not be. However, the optimal leverage is firm-specific whilst the AER's level is a mere estimate of the average optimal level across the regulated sector. Thus, a firm might judge that its optimal leverage was above the level used by the AER. Consequently, such targeted adjustments by the AER would discourage potentially efficient behavior by firms; this is not desirable and is contrary to incentive regulation.

Sixthly, in respect of the carry-forward of tax losses not currently reflected in the AER's tax allowances, these would arise from unregulated activities or tax minimization activities associated with the regulated activities. The former is not relevant to a regulator and targeting of the latter by the AER would suffer from all of the disadvantages of targeting tax minimization activities that have been described above.

Seventhly, in respect of the use of Diminishing Value (DV) depreciation by businesses rather than the Straight Line (SL) method used by the AER, the former is superior in present value terms for any asset life and discount rate because it front-loads the depreciation and this always raises the present value. So, adoption of this approach by the AER would reduce the allowed revenues of businesses to the level consistent with the $NPV = 0$ principle, which is in the long-term interests of consumers. Furthermore, the effect is material, there are no adverse incentive effects on businesses from doing so, and it is as simple for the AER to use DV as it is to use SL. So, there is a clear case for the AER to use DV for all firms.

Eighthly, in respect of firms using shorter economic lives than prescribed by the ATO, some instances of shortening by firms are likely to constitute tax minimization, and therefore targeting of these by the AER would inherit all of the significant disadvantages of targeted adjustments for tax minimization activities discussed earlier. Furthermore, even if the shortening by firms were legitimate, there would be a significant administrative burden to the AER in replicating this, and the effect could be small. So, the merits of the AER changing its approach in this area are weak.

Ninthly, in respect of the low cost pool mechanism, use of this by firms could only materially affect their taxes if most of their assets (in dollar terms) cost less than \$3,000. It does not seem plausible that this is the case. So, subject to the AER verifying that most of the assets

of a regulated energy network business (in dollar terms) do not cost less than \$3,000, the use of the low-value pool mechanism would not generate any material reduction in the tax allowances of businesses, and therefore can be ignored by the AER.

Tenthly, in respect of uplifts to the tax book values of assets, which can occur but are not recognized in the AER's tax allowances, the effect of these uplifts on the taxes paid could be substantial. Adjustment to the AER's tax allowances for the firms receiving them so as to reflect such uplifts would reduce the allowed revenues of businesses to the level consistent with the $NPV = 0$ principle, which is in the long-term interests of consumers. This approach also appears to be free of any drawbacks. In particular, it would not target any tax minimization activities by businesses, it does not appear that it would discourage any efficient (or encourage any inefficient) behavior by firms, and the administrative effort in doing so (by requiring regulated businesses to inform the regulator of any such uplifts, followed by amendment of the regulatory tax allowance) would likely be small because such events are presumably rare. I therefore recommend that this be done. Furthermore, since these uplifts presumably arise from events that are at least partly beyond the control of a firm, they should be firm-specific.

Finally, in respect of the government-owned businesses, since their tax payments are in excess of those arising from the AER's model rather than less, there are no efficiencies to incorporate into the process of setting tax allowances. Furthermore, if the tax allowances for these businesses were raised to reflect the actual payments of these businesses, the businesses would face the perverse incentive to take actions that raised their tax payments, because they receive both the revenues and the taxes. In addition, their customers would be paying higher prices than necessary to satisfy the $NPV = 0$ principle, and this is not consistent with the long-term interests of consumers. So, apart from the recommendations above for the AER to switch to DV depreciation for all firms and to raise tax book values of particular firms if they are uplifted by the ATO, I do not recommend any change to the AER's current approach for these businesses.

1. Introduction

The ATO (2018a) has recently advised the AER that over the 2012-2016 period there appears to have been a discrepancy between the actual tax payments to the ATO by the regulated energy networks and the AER's tax assessments used in price or revenue capping these businesses. In particular, the aggregate actual payments by the state government owned entities seem to have been consistently more than the AER's allowances, and the aggregate actual payments by the privately-owned entities have been consistently and significantly less than the AER's allowances. These results are unsurprising, and reflect the incentives of owners; the owners of private-sector firms wish to minimize taxes because taxes are a cost to them, whilst the owners of the public-sector entities presumably wish to maximize taxes because those taxes flow to themselves. Furthermore, in respect of the privately-owned entities, the ATO (2018a) has also identified what it considers to be the principal sources of the discrepancy: the use of non-corporate ownership structures, gearing in excess of the AER's level, carry forward of tax losses, and various aspects of the depreciation deductions claimed by the businesses (the use of DV, shorter economic lives, and the low-value pool mechanism).

In response to these conclusions regarding the privately-owned businesses, the AER (2018) is seeking to assess whether its current approach is appropriate. Accordingly, this report for the AER seeks to assess whether the current regime should be altered, in support of the long-term interests of consumers. I commence with a description of the current tax regime, and relevant features of the privately-owned regulated businesses.

2. The Mechanics of the Regulatory Tax Allowance

Letting REV_R , $OPEX_R$, $TDEPR$, and INT_R denote the expected revenues, expected operating costs, expected tax depreciation, and expected interest, each in accordance with the regulatory model, the regulatory allowance for corporate tax before the effect of imputation credits is TAX_R as follows (AER, 2015, pp. 8-8 to 8-10):

$$TAX_R = .30[REV_R - OPEX_R - TDEPR - INT_R] \quad (1)$$

In addition, REV_R is the sum of the regulatory allowances for the cost of debt (INT_R), the cost of equity (CE_R), regulatory depreciation ($RDEP_R$), operating costs ($OPEX_R$), and tax (TAX_R) net of gamma (γ), as follows:

$$REV_R = INT_R + CE_R + RDEP_R + OPEX_R + TAX_R(1 - \gamma) \quad (2)$$

Substituting the last equation into its predecessor, and solving for TAX_R , yields

$$TAX_R = \frac{[CE_R + RDEP_R - TDEP_R](.30)}{1 - .30(1 - \gamma)} \quad (3)$$

This is the regulatory allowance for corporate tax, before the effect of imputation credits. By contrast, the actual tax payment TAX is 30% of the actual revenues REV net of actual operating costs $OPEX$, tax depreciation $TDEP$, interest INT , and other terms OTH as follows:

$$TAX = .30[REV - OPEX - TDEP - INT - OTH] \quad (4)$$

The results from (1) and (4) may differ, due to tax minimization activities (activities entered into for the sole or primary purpose of reducing tax payments, and therefore at risk of rejection by the ATO), reflected in OTH in equation (4), or at other points in the equations.

3. Significant Features of the Private-Sector Regulated Businesses

The DUET Group is a set of four securities that must be traded as a bundle (“stapled”), comprising a trust (DFT) and three corporate entities; these entities in turn own equity stakes in four companies (DUET Group, 2015, page 2), whose revenues in turn are almost entirely regulated (Duet Group, 2015, page 003). The trust makes loans to companies within the Group (DUET Group, 2015, pp. 37-38), which generate interest deductions and therefore reduce company profits. These profits instead appear as income to the trust, which does not pay tax and distributes its income to its beneficiaries, who are then taxed at the personal level. The overall tax effect of this arrangement is to convert corporate to personal income, and it is favourable to the owners of the stapled securities because every \$1 that is transferred from company profit to trust income faces only one layer of tax (personal) whilst the \$1 left as

company profit would give rise to both corporate tax and some personal tax (because some imputation credits generated by the payment of corporate tax are not distributed, and some of the distributed credits cannot be used by investors).

To illustrate this point, suppose a corporate has pre-tax profits of \$100m, on which company tax at 30% is paid, all of the post company tax income is distributed to shareholders (and hence all imputation credits are distributed), the utilization rate for the credits is 50% due to local investors comprising 50% of investors, and all investors are taxed at a personal rate of 35% (inclusive of any withholding taxes and assuming that such taxes do not affect the total personal taxes paid). So, local shareholders will face additional personal tax of \$2.5m and foreign shareholders will face personal tax of $\$35m(0.35) = \$12.25m$, totaling \$14.75m. By contrast, with a trust structure, there is no corporate tax and trust beneficiaries would face personal tax of 35% on \$100, which is \$35m. The results are shown below in Table 1. The income to investors net of all taxes is higher by \$9.75m under the trust structure, because the foreign shareholders in a corporate structure face two levels of taxation (corporate tax at 30% on their half of the pre-tax income and a further 35% on the dividends):

Table 1: Income From Corporate Versus Trust Structures

	Company	Trust
Pre-tax income	\$100m	\$100m
Company tax at 30%	\$30m	n/a
Income post company tax	\$70m	\$100m
Personal tax	\$14.75m	\$35m
Income after all taxes	\$55.25m	\$65m

If the investors in trusts are foreigners and foreigners are taxed at personal rates of less than 35%, the advantage of trusts over corporates would be magnified. For example, if foreigners face personal tax rates of only 15% (inclusive of any withholding tax), the “Income after all taxes” in Table 1 rises to \$62.25m for the corporate structure and \$85m for the trust structure, so the trust advantage is now \$22.75m, i.e., over twice that in the first scenario.

If these loans via the trust simply substituted for conventional loans to a corporate, the tax consequences of the trust loans would be the same as those of conventional loans to corporates: lower corporate tax and higher (but not as high) personal tax. However, since the trust loans are in substance equity, this trust arrangement would permit firms to increase the level of their notional debt because the increased debt would not expose the Group to heightened bankruptcy risk. Furthermore, one would expect this to be the case because the trust structure serves no other apparent purpose. This appears to be a tax minimization scheme. In the three most recent years, virtually no corporate tax has been paid by the Group (DUET Group, 2015, page 41; 2016, page 34), and at least part of the explanation for this is likely to be the trust loans.

AusNet Services now has a conventional corporate structure (AusNet Services, 2016, page 6). However, until 2016, it was a set of three stapled securities, comprising a trust and two companies (AusNet Services Transmission and AusNet Services Distribution) to whom the trust made loans (AusNet Services, 2015, page 22). This is the same scheme as the DUET Group. The first of these companies paid corporate tax (AusNet Services, 2015, page 62 and page 142).¹ As with DUET, this appears to have been a tax minimization scheme. Furthermore, in 2014 the ATO judged it to be unacceptable in that it disallowed the interest deductions arising from the interest payments on these ‘loans’, nullified past tax losses, and required additional tax payments (AusNet Services, 2015, page 75). AusNet’s abandonment of the trust arrangement in 2016 was presumably due to the ATO’s decision. There have also been other disputes with the ATO (AusNet Services, 2015, page 75; 2017, page 80).

Spark Infrastructure is a trust, which has issued stapled securities (one “unit” in the Trust plus one Loan Note issued by the Trust per stapled security) whose proceeds have been used to purchase (minority) equity stakes in a number of companies carrying out regulated activities (including Victoria Power Networks and SA Power Networks), and also to make loans to these companies. The existence of the loans is not apparent from Spark’s Financial Statements, because they are consolidated and the segment data lack sufficient detail to identify them, but the existence of the loans is apparent from the fact that the interest deductions received by Victoria Power Networks and SA Power Networks on at least some of

¹ AusNet Services (Transmission) is a subsidiary of AusNet Services (Distribution). A comparison of their Cash Flow Statements reveals that the company tax payments appearing in the consolidated accounts of AusNet Services (Distribution) Ltd matches those paid by AusNet Services (Transmission) Ltd, and therefore all such taxes paid by the Group are paid by AusNet Services (Transmission) Ltd.

these loans have been disallowed by the ATO (Spark Infrastructure, 2015, page 48; 2013, pp. 56-58). In the six most recent years, no corporate tax has been paid by the Group (Spark Infrastructure, 2017, page 81; 2015, page 38; 2013, page 41). At least part of the explanation for the absence of corporate tax is the interest on the trust loans, at least some of which has been rejected by the ATO (as noted above). There are also disputes with the ATO on other tax matters (Spark Infrastructure, 2017, page 93; 2015, page 48; 2013, pp. 56-58).

Australian Gas Networks (formerly Envestra) has a conventional corporate structure, without a trust. This differs from the cases of DUET, AusNet, and Spark. No tax has been paid by the Group in the six years up to and including 2014 (Australian Gas Networks, 2014, page 40; 2012, page 43; 2010, page 46).² Furthermore, no disputes with the ATO are recorded in the Financial Statements of the Group.

In summary, amongst the four principal groups of private-sector businesses regulated by the AER, only one (AusNet) has consistently paid tax in recent years.³ In addition, three use a trust structure (DUET, AusNet, and Spark), whose effect and presumed purpose is to generate interest deductions on loans that are in substance equity finance, so as to reduce corporate tax payments. Furthermore, in two of these cases (AusNet and Spark), the interest deductions have been partly or fully disallowed and other matters are also in dispute with the ATO.

4. Alternatives to the Current Regime: Privately-Owned Businesses

Since the situation facing the privately-owned businesses, and the motives of their owners, is quite different to that of the government-owned businesses, I consider each of them, starting with the former.

As noted in the Introduction, the aggregate actual tax payments by the privately-owned businesses have been consistently and significantly less than the AER's allowances. This suggests that the AER's approach to determining the tax allowance for regulated businesses, as shown in section 2, has been too generous to the regulated businesses. Furthermore, in

² Annual Reports could not be located since 2014, and the company's website has since then posted only "Annual Reviews", which lack the relevant information.

³ I exclude APA Group because its regulated revenues are much smaller than those of the four groups examined and represent less than 20% of the total revenues of the Group.

respect of the privately-owned businesses, the ATO (2018a) has identified what it considers to be the principal sources of the discrepancy: the use of non-corporate ownership structures, gearing in excess of the AER's level, carry forward of tax losses, and various aspects of the depreciation deductions claimed by the businesses (the use of Diminishing Value, shorter economic lives, and the low-value pool mechanism).

Aside from the current regime, there are three options open to the AER. The first would be to set the regulatory tax allowances in accordance with the actual taxes paid ("complete pass through"). The second would be to reduce the regulatory tax allowance to match the actual taxes paid whenever the latter is less than the allowance under the current regime ("capping"). This approach implicitly equates any shortfall between taxes paid and the regulatory tax allowance under the current regime with 'efficient' activity, and is an asymmetrical version of the previous approach. The third option would be to identify specific activities that have been taken by the businesses to reduce their tax payments, quantify their impact, and reduce the tax allowances accordingly ("targeting").

All three approaches could be applied at either the individual firm or sector-wide level. For example, in reducing the tax allowances in accordance with the specific activities that had been identified, the reduction in a firm's tax allowance could be based upon the identified activities of that firm or in accordance with the average level of identified activities across regulated businesses (or some mix of the two). So, there are nine possible approaches.

Across these nine possible alternatives to the current regime, there are numerous difficulties as follows. Complete pass through is inferior to capping because it has two significant disadvantages and no countervailing advantages. The first of these would be higher prices for consumers than those consistent with the $NPV = 0$ principle, if tax payments exceeded the level allowed under the current regime, and this disadvantage would exist regardless of whether complete pass-through was applied at the individual firm or sector wide level. Such an outcome is not consistent with the long-term interests of consumers. The second disadvantage would apply if complete pass-through was applied at the individual firm level, and consists of encouraging firms to undertake actions that raise their corporate tax payments but are not desirable. For example, with complete pass through, a business would have the perverse incentive to reduce and possibly eliminate all debt financing because the higher corporate tax payments from doing so would be fully offset by the higher regulatory tax

allowance whilst the advantages to the firm from doing so (lower personal taxes for investors, no bankruptcy risk, etc) would be retained by the firm.⁴ By contrast, with capping, the firm would not be compensated through the regulatory allowance for the higher corporate tax cost, and therefore would not face this perverse incentive to reduce and possibly eliminate all debt financing.

To illustrate this point, consider a firm with an operating income before taxes of \$100m, all of the income post company tax is distributed (and all imputation credits are distributed), the utilization rate for the credits is 50% due to local investors comprising 50% of investors, and all investors are taxed at a personal rate of 35% (inclusive of any withholding taxes). If no leverage is adopted, this income of \$100m would be taxed at the corporate tax rate of 30%, leaving \$70m, which would be distributed to shareholders (local and foreign) and attract additional personal tax of \$14.75m, leaving \$55.25m after all taxes. This is shown in the first column of Table 2.

Table 2: Income From Different Leverage Levels and Revenue Allowances

	No Debt	Debt	Debt (RA)
Pre-tax operating income	\$100m	\$100m	\$91.17m
Interest	n/a	\$50m	\$50m
Company tax at 30%	\$30m	\$15m	\$12.35m
Sholders Personal tax	\$14.75m	\$7.37m	\$6.15m
Debtholders Personal Tax	n/a	\$17.5m	\$17.5m
Income after all taxes	\$55.25m	\$60.12m	\$55.52m

If instead borrowing is undertaken on which the annual interest payments are \$50m, and the allowed revenues are unchanged, the income after all taxes rises to \$60.12m because the double taxation of foreign shareholders is mitigated by the interest payments on the debt. This is shown in the second column of Table 2. So, firms secure tax savings for their

⁴ The leverage decision involves a wide range of additional considerations, including the signaling value of debt in the presence of asymmetric information (Ross, 1977), the reduction of underinvestment problems springing from the use of equity finance (Myers and Majluf, 1984), the reduction of agency costs springing from the use of equity finance (Jensen and Meckling, 1976), and the disciplinary effects of debt (Jensen, 1986).

investors by borrowing, and this encourages firms to do so up to some level, despite the resulting bankruptcy risk. However, with complete pass-through, the reduced corporate tax induces a reduction in the allowed revenues. With no debt, the allowed revenues incorporate a tax allowance of \$15m (the \$30m corporate tax payment net of gamma at 0.5). With debt, corporate tax is lower and therefore the allowed revenues incorporate a tax allowance of \$6.17m (tax of \$12.35m net of gamma at 0.5), yielding pretax operating income of \$85m + \$12.35m(0.5) = \$91.17m.⁵ The results of this are shown in the last column of Table 2 (Debt with a revenue adjustment for the lower tax, denoted Debt (RA)). Income after all taxes is now only \$55.52m, compared to \$55.25m with no debt. So, with complete pass-through, firms would have an incentive to reduce and possibly remove all debt because income after all taxes would be barely affected but bankruptcy risk would be eliminated.

Turning now to capping, this is a blunt instrument, which implicitly (and wrongly) attributes all shortfalls between taxes paid and those allowed by the regulator under the current regime to tax minimization behavior by firms. The result is a number of adverse consequences, as follows.

Firstly, even if firms undertaking regulated activities do not *currently* have any other activities, the taxes currently paid by the firm may be less than the regulatory tax allowance under the current regime for a variety of reasons other than tax minimization activities. One of these is tax losses arising from *earlier* activities unrelated to the regulated business and these earlier activities may not even involve tax minimization. Another is inefficiency in the sense of having a higher asset level or operating costs than provided for in the regulatory model, which lowers the taxes paid by the firm but the overall effect of the inefficiency is unfavorable for the firm. Yet another is the adoption of a higher level of leverage than reflected in the regulatory model, and hence higher interest payments for a given asset level, which reduces company taxes. So, equating any shortfall between taxes paid and the regulatory tax allowance under the current regime with tax minimization activities would overestimate such activities. Accordingly the tax allowances and hence allowed revenues would be less than those required to satisfy the NPV = 0 principle, and hence inconsistent with the long-term interests of consumers.

⁵ Denoting the new tax allowance (before the gamma adjustment) as R , the taxable income would then be \$85m pre-tax and interest (as before) plus $.5R$ less interest of \$50m, and 30% of this would have to equal R . The solution to this equation is $R = \$12.35m$.

Secondly, even if firms undertaking regulated activities do not have any other activities, and do not have tax losses from earlier unregulated activities, reducing the tax allowance to match the actual taxes paid whenever the latter is below the allowance under the current regime would undermine desirable incentives and produce perverse incentives. For example, if a regulated firm judged that its optimal leverage was in excess of the leverage ratio embodied in the allowed revenues, it would be discouraged from adopting the higher leverage because the advantage to the firm in the form of lower corporate taxes would be stripped from it via reduced tax allowances whilst the disadvantages (higher personal taxes to its shareholders, higher bankruptcy risk, etc) would not be. This is inconsistent with incentive regulation.

Thirdly, if firms undertaking regulated activities were also involved in unregulated activities (which is the norm), this would induce further errors when attributing any shortfall between taxes paid and those allowed by the regulator under the current regime to tax minimization activities, and the errors could be in either direction. In particular, at least part of the explanation for this shortfall could lie in activities within the unregulated part of the business including tax minimization, depreciation deductions, the prevailing unprofitability of the business, or past tax losses arising from any of these things. So, equating the shortfall between taxes paid and the regulatory tax allowance under the current regime with tax minimization activities relating to the regulated activities would be likely to overestimate such activities. For example, consider Victoria Power Networks (VPN), comprising Citipower and Powercor, which is partly owned by Spark Infrastructure. The first three columns of Table 3 shows the regulatory revenues for each year from 2012 to 2015 and the tax component before deduction of gamma, drawn from the AER (2012a, Table 6; AER, 2012b, Table 6). The penultimate column shows the actual revenues over the same periods, drawn from Notes to the Financial Statements (Spark Infrastructure, 2015, page 51; 2013, page 60).⁶ Over this period, no taxes were paid by the group to which VPN belongs (Spark Infrastructure, 2015, page 38; 2013, page 41), which implies that VPN did not pay any taxes, and hence the entries in the last column of Table 3. In addition, there were ongoing tax disputes with the ATO involving disallowance of the interest deductions received by VPN on loans from Spark and other matters (Spark Infrastructure, 2015, page 48; 2013, page 57).

⁶ VPN was selected for analysis because its regulatory years and Spark's financial statements cover the same period (calendar year). The data is presented only back to 2011-12 because the revenues of VPN are not separately identified in Spark's Annual Report before that point. Subject to the omission just noted, the data covers a regulatory cycle, and therefore stops in 2015.

However, since VPN’s revenues are approximately twice its regulated revenues, as shown in Table 3, it is possible that at least part of the explanation for the absence of tax payments is activities within this unregulated part of the business, including tax minimization, depreciation deductions, the prevailing unprofitability of the business, or past tax losses arising from any of these things. So, equating the shortfall between taxes paid and the regulatory tax allowance with tax minimization activities relating to the regulated activities would be likely to overestimate such activities.

Table 3: Taxes and Revenues for VPN

Year	REV_R	TAX_R	REV	TAX
2012	691	41.4	1,287	0
2013	775	45.3	1,430	0
2014	827	48.3	1,437	0
2015	893	52.8	1,666	0
Average	797	47.0	1,455	0

In addition, equating any shortfall in taxes paid relative to regulatory tax allowances with tax minimization activities could also lead to underestimating tax minimization activities. For example, the first three columns of Table 4 shows the regulatory revenues of AusNet Services (Transmission) Ltd for each year from 2010-11 to 2014-15 and the tax component before deduction of gamma, drawn from the AER (2008, Table 8.3) and the AER (2014, page 43 and page 148). The penultimate column shows the actual revenues over the same periods, drawn from the Income Statement in the Annual Report.⁷ The final column shows the taxes paid to the ATO, deduced from the imputation credits distributed and the change in the Franking Account Balance (following Lally, 2015). So, the actual taxes paid by the firm not only exceed the regulatory allowance but do so by more than the revenues of the firm exceed the regulatory allowance by (73% versus 17% respectively). So, equating any shortfall in taxes paid relative to the regulatory tax allowances with tax minimization activities (with or without the correction for the relative revenues of the regulated and unregulated activities)

⁷ As with VPN, the regulatory years and period to which the financial statements apply match for this company. The analysis ceases in 2015 because AusNet shortly afterwards ceased using a trust structure, which was presumably established for tax minimization purposes.

would lead to the conclusion that there were no such tax minimization activities. However, as noted in section 3, up until 2015-16, the firm seems to have engaged in tax minimization activities involving loans from a trust within the Group to this company. So, equating any shortfall between taxes paid and the regulatory tax allowance with tax minimization activities would fail to detect the tax minimization activities that this company appears to have undertaken.

Table 4: Taxes and Revenues for AusNet Services (Transmission) Ltd

Year	REV_R	TAX_R	REV	TAX
2010-11	485	33.5	531	23.8
2011-12	512	33.8	586	77.5
2012-13	528	34.6	620	34.9
2013-14	541	32.2	649	41.7
2014-15	519	27.1	651	100.4
Average	517	32.2	607	55.7

Fourthly, given the problems just described, the presence of unregulated activities would require rules for allocating the taxes paid by a firm between its regulated and unregulated activities, and any choice of rules would inevitably give rise to errors and also provide incentives for firms to game the system. In respect of gaming, firms undertaking regulated activities would be incentivized to engage in (or park within the same firm) unregulated activities with higher taxes than the AER's allocation rule (whatever it is) would predict, because some part of the higher taxes would then be attributed to the regulated activities through the AER's allocation rule, thereby unjustifiably boosting the allowed revenues of the regulated business. For example, suppose the taxes are allocated in proportion to revenues, the revenues of the regulated activities are \$100m and those of unregulated activities in another firm within the Group are also \$100m. In addition, the taxes arising from the regulated activities are \$20m, matching the allowance under the current regulatory approach, and those arising from the unregulated activities are \$40m. So, parking these unregulated activities in the same firm as the regulated activities would produce revenues and taxes for this firm of \$200m and \$60m respectively, and \$30m would be allocated to the regulated activities using revenue weights. So, if the tax allowance for the regulated activities were

matched to the estimate for the actual taxes of that activity, the tax allowance for the regulated activities would (unjustifiably) rise from \$20m to \$30m.

In respect of errors, tax losses from earlier unregulated activities provide a good example of the problem. For example, suppose the taxes were allocated between a firm's regulated and unregulated activities in proportion to revenues, the revenues of the regulated activities were \$100m and those of unregulated activities in the same firm were also \$100m. In addition, suppose the taxes arising from the regulated activities were \$20m, matching the allowance under the current regulatory approach, those arising from the unregulated activities were also \$20m, but no taxes were paid due to past tax losses arising from unregulated activities. So, using revenue weights to allocate the actual tax payment of zero across the two types of activities, the estimate of the actual taxes for the regulated activities would be zero. Accordingly, setting the tax allowance for the regulated activities in accordance with this estimate would produce a tax allowance for the regulated business that was too low by \$20m. Allowed revenues would then be less than those required to satisfy the NPV = 0 principle, which would be inconsistent with the long-term interests of consumers.

Amongst these disadvantages of capping, those involving incentive problems are applicable if the capping approach is applied at the individual firm level whilst the others are applicable regardless of whether the capping approach is applied at the individual firm or sector wide level.

Turning now to targeting, which could be applied at the individual firm or sector-wide level, there are significant disadvantages to doing so when seeking to target tax minimization activities (activities entered into for the sole or primary purposes of reducing tax payments, and which therefore could be rejected by the ATO). Firstly, the AER would be replicating the ATO's efforts in this respect, but with presumably inferior expertise, and therefore it is not plausible that the AER could do a better job than the ATO. The use of trusts by the regulated businesses is a fairly obvious scheme (because the trusts are so apparent and so lacking in any legitimate rationale) but this is merely the tip of the iceberg. For example, Spark Infrastructure (2015, page 48) lists five such activities (in addition to the use of a trust) that are presumably tax minimization activities (because the ATO has challenged them), including deductions for motor vehicle running costs, asset replacement projects, and rebates paid to customers.

Secondly, the AER could not do any more than offset the effect of the tax minimization schemes through reductions in allowed revenues, which would have no deterrent effect and could only progressively narrow the opportunities open to firms. By contrast, the ATO can impose substantial penalties and this presumably strongly discourages such activity.

Thirdly, when part or all of the ultimate ownership of a regulated business is a trust that has raised equity capital and loaned it to the regulated business, thereby generating an interest tax deduction for the regulated business on capital that is essentially equity, the tax that has been reduced through the trust structure is not simply the reduction in corporate tax but the reduction in corporate tax net of the change in personal tax. Thus, if the goal were to neutralize the tax advantage of trusts, any reduction in the regulatory tax allowances to reflect such activity should net off the change in personal tax, and this would be complicated by the difficulties in estimating this change in personal tax.

To illustrate this, I return to the example portrayed earlier in Table 1 (and reproduced here as Table 5), in which the corporate tax rate was 30% and the personal rate was 35%. If the company was regulated, the pre-tax income of \$100m would comprise \$85m for costs other than tax plus a corporate tax allowance of \$15m (being corporate tax of \$30m multiplied by the gamma value of 0.5 to reflect full distribution of credits and a utilization rate of 50%). If the company switched to a trust structure, its pre-tax income would remain \$100m under the present regulatory regime, and therefore its investors would benefit by the \$9.75m advantage shown in Table 5.

Table 5: Income From Corporate Versus Trust Structures

	Company	Trust
Pre-tax income	\$100m	\$100m
Company tax at 30%	\$30m	n/a
Income post company tax	\$70m	\$100m
Personal tax	\$14.75m	\$35m
Income after all taxes	\$55.25m	\$65m

So, if a regulator sought to remove this advantage for the trust by altering the corporate tax allowance, that new allowance (R) would have to be chosen so that the new allowed revenues would yield income after all taxes of \$55.25m to match that for the corporate structure, i.e.,

$$(\$85m + R)(1 - 0.35) = \$55.25m \quad (5)$$

The solution is $R = 0$, i.e., no regulatory tax allowance. Furthermore, this result is invariant to the average personal tax rate used, so long as this rate applies equally to local shareholders, foreign shareholders, and trust beneficiaries. However, if foreigners face an average personal rate different from local investors (15% v 35% for example) and 90% of trust investors are foreigners (for example), the personal tax faced by shareholders will be the \$2.5m faced by local investors (as before) plus $\$35m(0.15) = \$5.25m$ for foreign shareholders, totaling \$7.75m, and the personal taxes faced by trust beneficiaries would now be $\$90m(0.15) + \$10(0.35) = \$17m$ (and hence an average personal tax rate of 17%). Substituting these changes into Table 5, the result is as shown in Table 6:

Table 6: Income From Corporate Versus Trust Structures

	Company	Trust
Pre-tax income	\$100m	\$100m
Company tax at 30%	\$30m	n/a
Income post company tax	\$70m	\$100m
Personal tax	\$7.75m	\$17m
Income after all taxes	\$62.25m	\$83m

Using equation (5) again, with these new parameters

$$(\$85m + R)(1 - 0.17) = \$62.25m \quad (6)$$

The solution is now $R = -\$10m$, i.e., not only would there be no tax allowance but revenues would have to be reduced further by \$10m, to \$75m. Alternative average personal tax rates would produce different values for R . So, if the corporate tax allowance granted by the regulator to trusts were altered from that granted to corporates so as to neutralize the tax

advantage that trusts have over corporates, the appropriate adjustment would depend upon personal tax rates. Clearly, it would be a very radical step for the AER to not simply remove the allowance for corporate tax granted to trust structures but to further reduce their revenue allowance so as to fully neutralize the tax advantage of the trust structure. If it were not done, a significant tax advantage might still exist for trust structures. If it were done, the AER would require estimates of personal tax rates. Since there is no reliable source of estimates for these personal tax rates, the AER would then face a significant implementation problem.

Fourthly, the AER would have to permanently monitor the ATO's decisions, and the responses by businesses, so that it could alter its tax allowances in response to the ATO nullifying any tax minimization activities by firms. For example, AusNet Services (2015, page 75) has recently suffered the overturning of some of its tax minimization activities, in the form of a Federal Court decision and an agreement with the ATO involving AusNet making additional tax payments, nullifying tax losses that had been carried forward, and desisting from seeking tax deductions on interest payments arising from certain intra-group loans. Apparently in response, AusNet (2016, page 6) terminated its trust structure. Spark Infrastructure (2015, page 48; 2013, pp. 56-58) has also recently suffered the overturning of some of its tax minimization activities, in the form of an agreement with the ATO to nullify tax deductions and tax losses on interest payments arising from certain intra-group loans. Since DUET engages in similar behavior but apparently without ATO objections (to date), one could reasonably suspect that DUET will at some future point attract similar attention from the ATO, and DUET has even recognized this possibility (DUET, 2011, para 2.17). Furthermore, the ATO (2018b) has recently announced a set of measures designed to restrict the use of stapled securities for tax minimization purposes.

Fifthly, if the adjustment to the tax allowance for each business for specific tax minimization activities were set at the average level of such activity amongst regulated businesses, businesses engaging in more than the average level of activity would retain some of the benefits of their activity and would therefore be encouraged to continue doing so whilst firms engaging in less than the average level of activity might be driven to increase that level in order to counter the loss in allowed revenues. The result would be an increase in the average level of such activity, and therefore in the size of the adjustment by the regulator, which might lead to even more such activity by firms. In the limit, all firms might seek to eliminate all of their tax liabilities through tax minimization activities. Furthermore, at this point, all

firms would be driven to continue acting in this way because any firm desisting from such activity would still receive allowed revenues based upon the average level of tax minimization activity, and therefore would be worse off from desisting from such activity. So, a regulatory adjustment set equal to the average level of such activity might eventually drive all firms to undertake actions designed to avoid all company taxes and to continue to do so even when the regulatory adjustment matched this. This is not socially desirable. Taxes would be stripped away from the government, to the benefit of only the customers of regulated businesses (in the form of lower prices).

To illustrate this point, suppose that there are two firms (A and B), each with regulatory tax allowances of \$50m per year, and engaging in tax minimization activities that reduces their tax payments to zero and \$40m respectively.⁸ Upon observing this, the regulator therefore reduces the tax allowance to \$20m per firm. Firm A continues as before but firm B might reduce its tax payments to \$20m (so that its tax payments did not exceed its tax allowance). If so, the industry average tax payment would then be \$10m, and therefore the regulator would reset the tax allowance at \$10m, to which firm B might respond with activities further reducing its payments to \$10m, which would reduce the average tax payment to \$5m, and so on. This sequence is shown in Table 7.

Table 7: The Tax Payment Race to the Bottom

	Allowance	Firm A Pymt	Firm B Pymt	Average Pymt
Stage 1	\$50m	0	\$40m	\$20m
Stage 2	\$20m	0	\$20m	\$10m
Stage 3	\$10m	0	\$10m	\$5m

Eventually, this ‘race to the bottom’ would lead firm B to reduce its tax payments to zero, and the regulatory tax allowance would then also be zero. So, the regulatory revenues of the firms would be reduced by \$100m in total (to the benefit of their customers) and tax payments would also be reduced by \$100m. Thus, the effect of the regulator setting the tax allowance in accordance with the average payment, and therefore in accordance with the

⁸ This difference between the firms in their tax payments reflects the fact that there is considerable variation across firms in their recourse to tax minimization activities.

average level of tax minimization activity, would be to drive even firm B (which does not initially engage in much such activity) to increase such activity in order to avoid paying more tax than their regulatory allowance.

Sixthly, if the adjustment to the tax allowance for each firm for specific tax minimization activities were set at the level of such activity by that firm, firms would presumably quickly desist from such activities because desisting would presumably be immediately followed by a matching increase in their regulatory tax allowance and hence their revenues, and they would then be spared the administrative costs of these schemes along with the risk of attention from the ATO. Prima facie, this is socially desirable. However, by treating tax minimization activities in the same way as activities by regulated business that reduces their operating costs, tax minimization activities would be legitimized and this is likely to raise the level of such activity elsewhere in the economy.

Seventhly, if the regulatory tax adjustment for tax minimization activity for each firm reflected some mix of the level of activity of the firm and the average level of activity of the regulated sector, the consequences would be the same as if the adjustment reflected only the average level of activity in the sector; all firms would be driven to undertake actions designed to avoid all company taxes and to continue to do so even when the regulatory adjustment matched this.

To illustrate this point, suppose as before that there are two firms (A and B), each with regulatory tax allowances of \$50m per year and engaging in tax minimization activities that reduces their tax payments to zero and \$40m respectively. In addition, the regulator sets the tax allowance for each firm midway between the amount paid by the firm and the industry average (currently \$20m). This implies regulatory tax allowances of \$10m for firm A and \$30m for firm B. Firm A continues as before but firm B would seek to reduce its tax payments to \$30m or less. Suppose it reduces them to \$30m. The industry average tax payment would then be \$15m, and therefore the regulator would set the allowance for firm B at \$22.5m, to which firm B would respond with activities reducing its tax payments to \$22.5m, which reduces the industry average tax payment to \$11.75m, and so on. As in the previous example, the end result of this 'race to the bottom' is that neither firm would pay any tax.

These points strongly suggest that complete pass-through is inferior to capping, and can therefore be disregarded, that capping has very serious disadvantages, and so too does the targeting of tax minimization activities by the AER. This leaves the possibility of targeting businesses gearing above the AER's level, the carry-forward of tax losses not reflected in the AER's tax allowances, and for various aspects of depreciation deductions. I therefore consider each of these possibilities.

In respect of targeting the corporate tax savings that a firm enjoys from gearing above the AER's level, by adjusting each firm's tax allowance to reflect its actual gearing level, this will certainly discourage such activity by firms because the advantage to the firm in the form of lower corporate taxes would be stripped from it whilst the disadvantages (higher personal taxes to its shareholders, higher bankruptcy risk, etc) would not be. However, the optimal leverage is firm-specific whilst the AER's level is a mere estimate of the average optimal level across the regulated sector. Thus, a firm might judge that its optimal leverage was above the level used by the AER. Consequently, such targeted adjustments by the AER would discourage potentially efficient behavior by firms; this is not desirable and is contrary to incentive regulation. By way of analogy, if a firm incurs more opex than allowed by the AER but less capex, and judges the trade-off to be favourable, the AER does not seek to undercut this judgement by the firm. So, I do not recommend that the AER targets corporate tax savings arising from firms adopting gearing levels above the AER's level.

In respect of targeting the carry-forward of tax losses not reflected in the AER's tax allowances, the ATO (2018a, page 2) notes that several private-sector firms had significant tax losses carried forwards that did not appear to be reflected in the AER's tax allowances. There are a range of possible explanations here. One is that the tax losses arose from unregulated activities, which do not warrant any change in the AER's approach, and reducing the tax allowances of regulated businesses would then reduce the allowed revenues of the business below that consistent with the $NPV = 0$ principle, contrary to the long-term interests of consumers. Another possible explanation for these carry-forward tax losses is that regulated businesses have engaged in tax minimization activities. However, as argued earlier, the targeting of tax minimization activities by the AER has such significant disadvantages that I strongly recommend against the AER doing so.

In respect of the use of Diminishing Value (DV) depreciation by businesses rather than the Straight Line (SL) method used by the AER, the former is superior in present value (PV) terms for any asset life and discount rate, because it front-loads the depreciation and this always raises the PV. So, adoption of this approach by the AER would reduce the allowed revenues to the level consistent with the NPV = 0 principle, which is in the long-term interests of consumers. Furthermore, there is no additional administrative effort for the AER, because it is as simple for the AER to use DV as it is to use SL. So, there is a clear case for the AER to use DV. To investigate the extent of the effect, consider an asset with an arbitrary cost of \$100m. For energy network businesses, the asset lives for lines etc are 40-50 years, and other assets would have lower lives (ATO, 2018c). So, on average, asset lives would be about 40 years. The ATO offers a choice of SL or DV, with the SL rate naturally being the inverse of the asset life and the DV rate being double this (ATO, 2018d). So, I commence with an asset with a life of 40 years subject to SL depreciation. I also assume opex initially at 2% of the asset cost and growing at 2% p.a. Using a discount rate of 6% (the WACC), the PV of the opex over the asset life of 40 years would be \$40m as follows:

$$\frac{\$2m(1.02)}{1.06} + \dots + \frac{\$2m(1.02)^{40}}{(1.06)^{40}} = \$40m$$

As shown in equation (2), the revenue allowance is the sum of the cost of debt, the cost of equity, regulatory depreciation, opex, and the regulatory tax allowance (net of gamma). The PV of the first three items is the asset cost, of \$100m. The PV of the opex allowance is \$40m, as shown above. Turning to the PV of the tax allowance, using equation (3) with gearing of 60%, a cost of equity of 7%, and the regulatory depreciation allowance (presumably at SL) equal to the regulatory allowance for tax depreciation (assumed to be SL at this point), the PV of the allowance for the cost of equity over the 40 year asset life would be \$26.7m as follows:⁹

$$\frac{\$100m(0.4)0.07}{1.07} + \dots + \frac{\$2.5m(0.4)0.07}{(1.07)^{40}} = \$26.7m$$

⁹ This analysis assumes that the regulatory depreciation contributing directly to the revenue allowance is the same as depreciation used for the tax allowance. However, even when both use SL, they will differ because the asset lives used will in general differ. This distinction is ignored in the interests of simplifying the example.

So, following equations (2) and (3), with gamma of 0.5, the PV of the tax allowance net of gamma would be \$4.7m as follows:

$$TAX_R(1 - \gamma) = \frac{\$26.7m(.3)(1 - .5)}{1 - .30(1 - .5)} = \$4.7m$$

So, the PV of the allowed revenues is \$100m + \$40m + \$4.7m = \$144.7m, of which the tax allowance of \$4.7m is a mere 3%.

These calculations assume that the regulator uses SL depreciation in setting the tax allowance. If the regulator switches to DV in setting the tax allowance (but continues to use SL for the regulatory depreciation contributing directly to the revenue allowance), and therefore uses a DV rate of 5%, the PV of the depreciation tax deductions (using a discount rate below the WACC, of say 5%, to reflect the low risk nature of the cash flows) would change from

$$\frac{\$2.5m}{1.05} + \dots + \frac{\$2.5m}{(1.05)^{40}} = \$42.9m$$

to

$$\frac{\$100m(0.05)}{1.05} + \frac{\$95m(0.05)}{(1.05)^2} + \dots + \frac{\$14.2m(0.05)}{(1.05)^{39}} + \frac{\$13.5m}{(1.05)^{40}} = \$50.9m \quad (7)$$

So, following equations (2) and (3), the PV of the tax allowance net of gamma would then be \$3.3m as follows:

$$TAX_R(1 - \gamma) = \frac{(\$26.7m - \$8.0m)(.3)(1 - .5)}{1 - .30(1 - .5)} = \$3.3m$$

So, the effect of the change in the depreciation method used by the regulator would be to reduce the PV of the tax allowance from \$4.7m to \$3.3m. This is a reduction of 30% in the tax allowance, and a reduction of 1% in the PV of the allowed revenue stream over the asset's life of \$144.7m (and hence a reduction of 1% in the price/revenue cap). This approach would apply to all firms.

Turning now to shortening the economic lives used for depreciation purposes, this is potentially as significant as a switch from SL to DV. For example, suppose the asset life for

depreciation purposes is shortened from 40 years in the above example to 30 years, and therefore the DV rate rises from 5% to 6.7% p.a. The PV of the depreciation deductions then rises from the \$50.9m shown in equation (7) to \$58.4m as follows:

$$\frac{\$100m(0.067)}{1.05} + \frac{\$95m(0.067)}{(1.05)^2} + \dots + \frac{\$14.5m(0.067)}{(1.05)^{29}} + \frac{\$13.5m}{(1.05)^{30}} = \$58.4m$$

This increase is 15%, and therefore almost as large as that obtained from the switch from SL to DV. So, the effect would be to reduce taxes by almost 30% and the price or revenue cap by 1%. However, this calculation is purely illustrative because the scope for such shortening is unclear. Furthermore, whilst there may be legitimate grounds for shortening in some cases, it is also very likely that some instances of shortening by firms constitute tax minimization, and therefore targeting of this by the AER would inherit all of the significant disadvantages of targeted adjustments for tax minimization activities discussed earlier. Furthermore, even if the shortening by firms were legitimate, there would be a significant administrative burden to the AER in replicating this, because data would have to be collected on the (potentially) large number of assets for which firms exercised this option, and the AER's tax allowances adjusted accordingly. Furthermore, upon doing so and recalculating the depreciation deductions, the PV effect could be much less than in the above example. So, the merits of the AER changing its approach in this area are much weaker than in switching from SL to DV.

Turning now to the low-value pool mechanism, this allows assets that have been depreciated for at least one year, using the DV method, and currently having a tax book value of less than \$1000, to be depreciated at 37.5% p.a. (ATO, 2018e). Such a depreciation rate would exceed the rate that would be available on any asset with an economic life of more than six years. To maximize the effect of this mechanism on a firm, all of a firm's assets would have to have costs of no more than \$1000 (so as to quickly reach the point at which the DV rate could be substantially raised) and to have long economic lives (so as to experience a large increase in the DV rate upon being added to the low-value pool). For example, suppose all assets of a firm cost \$1,000 and have economic lives of 40 years (the latter corresponding to the estimate for the average life of the assets of energy network businesses). If the low-value pool is not used, the firm will claim depreciation at 5% DV, and the PV of the deductions using a discount rate of 5% will be \$509 as follows:

$$\frac{\$1,000(0.05)}{1.05} + \frac{\$950(0.05)}{(1.05)^2} + \dots + \frac{\$142(0.05)}{(1.05)^{39}} + \frac{\$135}{(1.05)^{40}} = \$509$$

If the low-value pool option is exercised, it becomes available after one year, at which point the DV rate rises from 5% to 37.5% and the PV of the deductions rises by 66% to \$846, as follows:

$$\frac{\$1,000(0.05)}{1.05} + \frac{\$950(0.375)}{(1.05)^2} + \dots + \frac{\$0.00003(0.375)}{(1.05)^{39}} + \frac{\$0.00002}{(1.05)^{40}} = \$846$$

This 66% increment is very large. However, as the asset cost rises above \$1,000, this gain rapidly falls away to zero. For example, with assets costing \$3,000 each, the tax book value would not reach the \$1,000 threshold until the 23rd year, at which the switch to 37.5% occurs, and the PV of the deductions is then increased by only 6% from switching. With assets costing \$7,000 each, the tax book value would not reach the \$1,000 threshold until the last year in each asset's economic life, and therefore the switch to the higher DV rate would never occur. It does not seem plausible that even a substantial proportion of the assets of a regulated energy network business (in dollar terms) would cost less than \$3,000, and therefore the effect of this option for regulated energy network businesses is therefore presumably trivial. So, subject to the AER verifying that that most of the assets of a regulated energy network business (in dollar terms) do not cost less than \$3,000, this option should be ignored by the AER.

The final depreciation issue to consider is that of uplifts to the tax book value of the assets, which can occur but are not recognized in the AER's tax allowances. An example of this is the uplift of \$967m experienced by AusNet Services (2017, page 80). The pre-uplift book value is not recorded, but the accounting book value of the non-current assets was \$11.1b (AusNet Services, 2017, page 67) and the uplift represents 9% of this. Since the company was presumably using DV, its tax book value was likely to be less than the accounting book value (based on SL depreciation) and therefore the uplift presumably represented at least 9% of the contemporaneous tax book value. Using an arbitrary asset cost of \$100m, an uplift of this level half-way through the asset's life of 40 years would raise the PV of the depreciation deductions from \$50.9m shown in equation (7) above to \$51.6m as follows:

$$\frac{\$100m(0.05)}{1.05} + \dots + \frac{\$35.8m(1.09)(0.05)}{(1.05)^{21}} + \dots + \frac{\$15.5m(0.05)}{(1.05)^{39}} + \frac{\$14.7m}{(1.05)^{40}} = \$51.6m$$

This is an increment in the PV of the deductions of only 1.4%. However, a 50% uplift at the same point would raise the PV of the deductions by 8%, and a 50% uplift at the ten-year point would raise the PV by 19%. This later increase is comparable to the PV effect of switching from SL to DV, and therefore would also reduce taxes by about 30% (see above). So, the effect of these uplifts on the taxes paid could be substantial. Adjustment to the AER's tax allowances to reflect such uplifts would reduce the allowed revenues to the level consistent with the NPV = 0 principle, which is in the long-term interests of consumers. This approach also appears to be free of any drawbacks. In particular, it would not target any tax minimization activities by businesses, it does not appear that it would discourage any efficient (or encourage any inefficient) behavior by firms, it may be material, and the administrative effort in doing so (by requiring regulated businesses to inform the regulator of any such uplifts, followed by amendment of the regulatory tax allowance) would likely be small because such events are presumably rare. I therefore recommend that this be done. Furthermore, since these uplifts presumably arise from events that are at least partly beyond the control of a firm, they should be firm-specific.

In summary, in respect of privately-owned regulated businesses, I recommend that the AER switch to DV depreciation to determine the tax allowances, and also raise its tax book value for a business in line with any uplifts received by the business. Both steps would reduce allowed revenues to the level consistent with the NPV = 0 principle, which is in the long-term interests of consumers. They are or may be material, would also be straight-forward to undertake, and have no adverse incentive effects upon businesses. All other possible variations to the AER's current approach to determining the tax allowances are problematic. Complete pass-through is inferior to capping because it has two significant disadvantages whilst having no countervailing advantages. Capping is a blunt instrument, which implicitly treats *all* shortfalls between taxes paid and those allowed by the regulator to tax minimization behavior by firms, and therefore has significant disadvantages. Targeting tax minimization activities would replicate the efforts of the ATO with less chance of success, be administratively complex, require monitoring of all ATO actions in this area, and require estimates of tax parameters whenever trusts are used that would be very difficult to reliably obtain. Targeting the corporate tax savings that a firm enjoys from gearing above the AER's

level, by adjusting each firm's tax allowance to reflect its actual gearing level, will certainly discourage such activity by firms but it would be discouraging potentially efficient behavior by firms; this is not desirable and is contrary to incentive regulation. Targeting the carry-forward of tax losses not currently reflected in the AER's tax allowances will at best target tax minimization activity, and therefore suffer from all of the disadvantages of doing this that have been described above. Using shorter economic lives for assets than prescribed by the ATO, in line with such actions by firms, would be administratively highly burdensome, and would be to some extent targeting tax minimization activities with all of the disadvantages of doing so described above. Finally, subject to the AER verifying that most of the assets of a regulated energy network business (in dollar terms) do not cost less than \$3,000, the use of the low-value pool mechanism would not generate any material reduction in the tax allowances of businesses, and therefore can be ignored by the AER.

5. Alternatives to the Current Regime: Government-Owned Businesses

I turn now to consider government-owned businesses. Since their tax payments are in excess of those arising from the AER's allowances rather than less, there are no efficiencies to incorporate into the process of setting the allowances. These apparent inefficiencies on the part of the government-owned businesses are in principle no different to businesses incurring higher opex than the AER allows; in both cases, the owners of the business bear any consequences of their actions rather than its customers (and these consequences are zero here because the owners of these businesses also receive the tax payments).

Amongst the alternatives to the AER's current regime considered in the previous section, only complete pass-through would be relevant for these businesses in view of them paying in excess of the level arising from the AER's allowances. As noted in the previous section, such an approach would encourage firms to take actions that were not desirable but raised their corporate tax payments, because doing so would raise their allowed revenues. In respect of government-owned businesses, the perverse incentives would be even greater because the government-owned businesses receive both the revenues (as owners) and the taxes (under the National Tax Equivalent Regime). So, every additional \$1 paid in taxes would raise their revenues by \$1 and their tax receipts by the same, leaving them \$1 better off. So, the usual incentives to minimize the payment of taxes would be replaced by extreme incentives to overpay taxes. In addition, increasing the allowed revenues of a business simply because its

tax payments are above the level arising under the current regime would inflict higher prices on their customers than necessary to satisfy the $NPV = 0$ principle, and this is not consistent with the long-term interests of consumers. So, apart from the recommendations in the previous section for the AER to switch to DV depreciation and to raise tax book values if they are uplifted by the ATO, I do not recommend any change to the AER's current approach for these businesses.

6. Conclusions

My principal conclusions are as follows. Firstly, in respect of the privately-owned businesses, the alternatives to the current regime comprise setting the regulatory tax allowances in accordance with the actual taxes paid ("complete pass through"), reducing the regulatory tax allowance to match the actual taxes paid whenever the latter is less than the allowance under the current regime ("capping"), and identifying specific activities that have been taken by the businesses to reduce their tax payments, quantifying their impact, and reducing their tax allowances accordingly ("targeting"). Each of these approaches could be applied at the individual firm level or the sector-wide level, or some mix of the two.

Secondly, complete pass through is inferior to capping because it has two significant disadvantages and no countervailing advantages. The first of these would be higher prices for consumers than those consistent with the $NPV = 0$ principle, if tax payments exceeded the level allowed under the current regime, and this disadvantage would exist regardless of whether complete pass-through was applied at the individual firm or sector wide level. Such an outcome is not consistent with the long-term interests of consumers. The second disadvantage would apply if complete pass-through was applied at the individual firm level, and consists of encouraging firms to undertake actions that raise their corporate tax payments but are not desirable. For example, with complete pass through, a business would have the perverse incentive to reduce and possibly eliminate all debt financing because the higher corporate tax payments from doing so would be fully offset by the higher regulatory allowance whilst the advantages to the firm from doing so (lower personal taxes for investors, no bankruptcy risk, etc) would be retained by the firm. Accordingly, complete pass-through should be dismissed.

Thirdly, capping is a blunt instrument, which implicitly and wrongly attributes all shortfalls between the taxes paid by businesses and those allowed by the regulator under the current regime to tax minimization behavior by firms. Accordingly, it suffers from numerous disadvantages, including the potential for overestimating the extent of tax minimization activities by regulated businesses, leading to tax allowances and hence revenue allowances that would be too low to satisfy the $NPV = 0$ principle, which is not consistent with the long-term interests of consumers. Some of these disadvantages of capping would arise if the capping approach were applied at the individual firm level whilst the others would arise regardless of whether the capping approach were applied at the individual firm or sector wide level.

Fourthly, targeting tax minimization activities (including the use of non-corporate ownership structures) would replicate the efforts of the ATO but with much less chance of success, be administratively complex, require the AER to monitor all ATO actions in this area (so that the AER could alter its tax allowances in response to the ATO nullifying any tax minimization activities by firms), and when applied to the use of trusts would require estimates of personal tax parameters that would be very difficult to obtain. These disadvantages apply regardless of whether this approach is adopted at the individual firm or sector-wide level. If applied at the individual firm level, tax minimization activities would additionally tend to be legitimized. If applied at the sector-wide level, the level of tax minimization activity is likely to increase as firms seek to ensure that their tax payments do not exceed their tax allowances. Accordingly, I recommend against the AER targeting tax minimization activities.

Fifthly, targeting the corporate tax savings that firms enjoy from gearing above the AER's level, by adjusting each firm's tax allowance to reflect its actual gearing level, will certainly discourage such activity by firms because the advantage to the firm in the form of lower corporate taxes would be stripped from it whilst the disadvantages (higher personal taxes to its shareholders, higher bankruptcy risk, etc) would not be. However, the optimal leverage is firm-specific whilst the AER's level is a mere estimate of the average optimal level across the regulated sector. Thus, a firm might judge that its optimal leverage was above the level used by the AER. Consequently, such targeted adjustments by the AER would discourage potentially efficient behavior by firms; this is not desirable and is contrary to incentive regulation.

Sixthly, in respect of the carry-forward of tax losses not currently reflected in the AER's tax allowances, these would arise from unregulated activities or tax minimization activities associated with the regulated activities. The former is not relevant to a regulator and targeting of the latter by the AER would suffer from all of the disadvantages of targeting tax minimization activities that have been described above.

Seventhly, in respect of the use of Diminishing Value (DV) depreciation by businesses rather than the Straight Line (SL) method used by the AER, the former is superior in present value terms for any asset life and discount rate because it front-loads the depreciation and this always raises the present value. So, adoption of this approach by the AER would reduce the allowed revenues of businesses to the level consistent with the NPV = 0 principle, which is in the long-term interests of consumers. Furthermore, the effect is material, there are no adverse incentive effects on businesses from doing so, and it is as simple for the AER to use DV as it is to use SL. So, there is a clear case for the AER to use DV for all firms.

Eighthly, in respect of firms using shorter economic lives than prescribed by the ATO, some instances of shortening by firms are likely to constitute tax minimization, and therefore targeting of these by the AER would inherit all of the significant disadvantages of targeted adjustments for tax minimization activities discussed earlier. Furthermore, even if the shortening by firms were legitimate, there would be a significant administrative burden to the AER in replicating this, and the effect could be small. So, the merits of the AER changing its approach in this area are weak.

Ninthly, in respect of the low cost pool mechanism, use of this by firms could only materially affect their taxes if most of their assets (in dollar terms) cost less than \$3,000. It does not seem plausible that this is the case. So, subject to the AER verifying that most of the assets of a regulated energy network business (in dollar terms) do not cost less than \$3,000, the use of the low-value pool mechanism would not generate any material reduction in the tax allowances of businesses, and therefore can be ignored by the AER.

Tenthly, in respect of uplifts to the tax book values of assets, which can occur but are not recognized in the AER's tax allowances, the effect of these uplifts on the taxes paid could be substantial. Adjustment to the AER's tax allowances for the firms receiving them so as to

reflect such uplifts would reduce the allowed revenues of businesses to the level consistent with the $NPV = 0$ principle, which is in the long-term interests of consumers. This approach also appears to be free of any drawbacks. In particular, it would not target any tax minimization activities by businesses, it does not appear that it would discourage any efficient (or encourage any inefficient) behavior by firms, and the administrative effort in doing so (by requiring regulated businesses to inform the regulator of any such uplifts, followed by amendment of the regulatory tax allowance) would likely be small because such events are presumably rare. I therefore recommend that this be done. Furthermore, since these uplifts presumably arise from events that are at least partly beyond the control of a firm, they should be firm-specific.

Finally, in respect of the government-owned businesses, since their tax payments are in excess of those arising from the AER's model rather than less, there are no efficiencies to incorporate into the process of setting tax allowances. Furthermore, if the tax allowances for these businesses were raised to reflect the actual payments of these businesses, the businesses would face the perverse incentive to take actions that raised their tax payments, because they receive both the revenues and the taxes. In addition, their customers would be paying higher prices than necessary to satisfy the $NPV = 0$ principle, and this is not consistent with the long-term interests of consumers. So, apart from the recommendations above for the AER to switch to DV depreciation for all firms and to raise tax book values of particular firms if they are uplifted by the ATO, I do not recommend any change to the AER's current approach for these businesses.

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