

REVIEW OF SUBMISSIONS ON GAMMA

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CONTENTS

Executive Summary	3
1. Introduction	4
2. SFG	4
2.1 <i>The Distribution Rate</i>	4
2.2 <i>The Utilisation Rate: Definitional Issues</i>	7
2.3 <i>The Utilisation Rate: The Conceptual Test</i>	15
2.4 <i>The Utilisation Rate: Estimates from Dividend Drop-Off Studies</i>	18
2.5 <i>The Utilisation Rate: Other Issues</i>	21
3. Aurizon	21
4. AngloAmerican	29
5. Conclusions	29
References	31

EXECUTIVE SUMMARY

In its recent draft decision concerning the Maximum Allowable Revenue for Aurizon Network, the QCA estimated gamma at 47% comprising a distribution rate of 84% and a utilisation rate of 56%. In response, it has received submissions on this matter from SFG, Aurizon, and AngloAmerican, and I have examined these submissions.

Apart from AngloAmerican's agreement with my views on the utilisation rate, there is only one submission that I agree with aspects of. This is Aurizon's reference to analysis by the AER, relating to the proportion of Australian equities that are locally owned and in which Australian equity holdings by Australian companies and investment funds are deleted, and public sector owners of Australian equity are treated as if they cannot use the imputation credits. I agree with the treatment of companies and some aspects of the treatment of investment funds, and the result is to reduce the proportion of Australian listed equity held by local investors from 56% to 50% averaged over the past five years. I also agree with the QCA's view that any estimate based only on listed equity would be "conservative" because additional consideration of unlisted equity would significantly raise the figure, to 67%. In view of this, and my own preference for including unlisted equity, I consider that the QCA's estimate for the local ownership proportion of 56% is still conservative.

1. Introduction

In its recent draft decision concerning the Maximum Allowable Revenue for Aurizon Network, the QCA (2014a, Table 4) estimated gamma at 47% comprising a distribution rate of 84% and a utilisation rate of 56%. In response, it has received submissions on this matter from SFG, Aurizon, and AngloAmerican. This paper seeks to review those submissions.

2. SFG

2.1 The Distribution Rate

SFG (2014b, paras 34-36) observes that the QCA's preference for an estimate of 0.84 diverges from standard practice amongst other Australian regulators, who use 0.70, and implies that it should not then be used. However, any proposed procedure must rest upon its inherent merits rather than mere observation of existing practice. Without such an approach, no progress in any area is possible. Moreover, this is an approach that SFG is entirely sympathetic to. For example, SFG (2012a) supported the use of a trailing average for the cost of debt despite the fact that this practice was not used by any Australian regulator at the time. Naturally, SFG supported the use of this approach because of its perceived inherent merits. The same principle applies to the QCA's approach to estimating the distribution rate, which involves a different methodology to that used by other Australian regulators. The proposed methodology must stand or fall on its own merits.

SFG (2014b, paras 37-40) also argues that significant concerns about the reliability of the estimate of 0.70 are unwarranted. In particular, they cite four concerns raised by NERA (2013, pp. 5-9) and argue that these points are all immaterial and that some of them also give rise to upward bias (so that the figure of 0.70 is an upper bound). However, as noted in Lally (2014, page 28), there are a number of points that favour the QCA's estimate of 0.84 (drawn from Lally, 2014, Appendix, using financial statement data for firms) over NERA's estimate of 0.70 (based upon ATO data). Firstly, NERA (ibid, Table 2.2) estimates the distribution rate through two methods that ought to yield the same result, but instead produce significantly different results (70% and 53%) and this undercuts the credibility of the ATO data that they use. Secondly, if SFG are correct in arguing that the points raised by NERA are immaterial, then these points could not explain the discrepancy between the figures of 53% and 70% and therefore some other factor or factors as yet unidentified would have to explain the discrepancy, which further degrades the credibility of both of NERA's figures. Similarly,

if a Balance Sheet reports assets of \$10b and Liabilities and Equity of \$5b, and none of the explanations offered for the discrepancy would exert a material effect, then some other explanation must exist and, short of identifying it and assessing its implications, neither of the Balance Sheet numbers would be credible. Thirdly, the financial statement data underlying the QCA's estimate of 0.84 has several features that virtually guarantees protection against the problems in the ATO data: the financial statement data is audited, the researcher is able to personally identify the source data (the figures of interest for particular firms) rather than having to rely upon the aggregation exercise carried out by the ATO (and is therefore protected against double-counting and other aggregation problems), and the financial statement data is internally consistent, i.e., there are no unexplained discrepancies in the financial statement data whereas there are major inconsistencies in the ATO data (which casts doubt on all of it). SFG does not comment upon any of these three matters.

SFG (2014b, paras 44-67) also argues that the distribution rate is the ratio of distributed credits to corporate tax paid, that Lally (2013b, 2014) defines it as the ratio of distributed credits to created credits, that the credits created are less than company tax (because some company tax payments are to foreign tax authorities), and this leads to Lally's estimate of the distribution rate (which is adopted by the QCA) being too high. By analogy, they claim that the QCA has used an estimate of 'humidity' when an estimate of 'temperature' is instead required. However, in defining the distribution rate in the way that it does, the QCA (2014b, page 25) cites Officer (1994), and Officer is clearly assuming that the tax payments in question are made to the ATO and therefore generate imputation credits of exactly the same amount. To illustrate the latter point, consider the following from Officer (1994, page 2):

“If all the collection of tax from a company is rebateable (in the Australian terminology if all the franking credits can be used against personal tax liabilities)...”

These words reveal that Officer equates company tax payments with franking credits created, and this only holds if the tax payments are those to the ATO. So, when the QCA defines the distribution rate as the ratio of distributed credits to company tax payments, it (like Officer) means company tax payments to the ATO. Furthermore, NERA (2013, page 4) defines the distribution rate in the same way as Lally:

“The cumulative payout ratio estimates the total proportion of all imputation credits created that have been distributed by companies since the start of the tax imputation system on 1 July 1987.”

Furthermore, having defined the distribution rate in this way (“payout ratio” in their language), NERA then goes on to formalise this mathematically, and does so using “TAX” in the denominator, thereby equating “company tax” with “company tax paid to the ATO”. Consistent with this, the tax data that NERA uses is from the ATO, and ATO data would relate only to company taxes paid to the ATO. Furthermore, SFG relies on NERA in estimating the distribution rate at 0.70, and therefore implicitly accepts NERA’s definition, which accords with Lally. So, in referring to company tax, the QCA is referring to company tax payments to the ATO and these are identical to the imputation credits that are generated. The distinction claimed by SFG is therefore non-existent.

Naturally, one could define a distribution rate to be credits distributed divided by all company taxes (whether to the ATO or not). Thus, if companies had tax payments to foreign tax authorities, this distribution rate would be lower than otherwise. However, such a distribution rate is not the one referred to by the QCA or by Officer or by NERA. Nor would such a distribution rate have any relevance to the activities that the QCA regulates, which are Australian activities and therefore involve tax payments *only* to the ATO. Thus, if a typical Australian company has two sets of activities (part A involving tax payments to the ATO) and part B (involving tax payments to foreign tax authorities), and these tax payments are equal, and this typical business distributes credits equal to 80% of the ATO tax payments, the distribution rate for the ATO tax payments would be 80% whilst the distribution rate for all tax payments would be 40%. The distribution rate of interest to the QCA would be that for the part A activities, of 80%, not the aggregate activities. Pursuing this analogy further, if Australian companies undertook even more activities involving tax payments to foreign tax authorities, these activities in the limit could be so substantial that the distribution rate for credits relative to all company tax payments would be almost zero, even whilst the distribution rate for credits relative to the ATO tax payments remained at 80%. Again, this would be irrelevant; the distribution rate of interest to the QCA would be that for the part A activities (80%), not that the aggregate activities (almost zero).

In summary, SFG's claim concerning a difference in definitions between the QCA (2014b) and Lally (2013b, 2014) is wrong and also in conflict with a paper by NERA (2013) that they rely upon in arguing for an estimated distribution rate of 0.70. Furthermore, if there ever had been a difference in definitions, to the extent that some analysts were using tax payments to all tax authorities in determining a distribution rate and others were using only tax payments to the ATO, the latter would be the appropriate choice and this matches the analysis in both Lally (2013b, 2014) and the QCA (2014b).

SFG (2014b, para 68) also claims that two days after advising the QCA that the appropriate value for the distribution rate was 85% I advised the AER that a figure of 70% was within the reasonable range. This claim is false. My advice to the AER (Lally, 2013a), recommending a figure of at least 70%, is dated 23 November 2013 whilst my advice to the QCA (Lally, 2013b) is dated 25 November 2013. So, my advice to the AER is *before* that to the QCA, not *after* it. Furthermore, in the two day interval from 23 to 25 November 2013, I was able to perform more detailed analysis, which is shown in Lally (2013b, section 4.3) and led to the more precise advice of 85% in that paper. Since then, I have performed the additional analysis shown in Lally (2014, Appendix), leading to the revised figure of 84%. So, I have progressively undertaken more work in this area, leading to revisions in the advice that I have provided to regulatory bodies.

2.2 The Utilisation Rate: Definitional Issues

SFG (2014b, paras 75-76) attributes to the QCA the belief that the parameter SFG calls "theta" (and which I call the market utilisation rate for credits or simply the 'utilisation rate') is defined as the empirical redemption rate for the credits. This is consistent with wording by the QCA (2014b, page 24). However, this section of the QCA's paper summarises Appendix D, and the definition provided there is that the utilisation rate is the "value-weighted average over the utilisation rates (of imputation credits) of all investors in the market" (ibid, page 89). Furthermore, this Appendix repeatedly makes clear that the empirical redemption rate is merely an estimator of the utilisation rate. To clarify the distinction here, if investors who can use the credits (a utilisation rate of 1) have a value-weight of 70%, and the rest can't use the credits (a utilisation rate of zero), then the market utilisation rate would be 0.70. However, the empirical redemption rate could be more or less than this for various reasons. For example, investors failing to redeem credits that they could have redeemed them (through oversight) will cause the empirical redemption rate to fall below the market utilisation rate.

Alternatively, investors who can use the credits will tend to tilt their portfolios towards shares with imputation credits, which will cause the empirical redemption rate to exceed the market utilisation rate. Schemes in which investors who can use the credits temporarily hold shares around ex-days so as to gain the credits would be an extreme case of this.

SFG (2014b, paras 70-96) also argues that θ is the market value per \$1 of distributed credits rather than the empirical redemption rate. In support of this, they cite the National Electricity Rules (clause 6.5.3), which defines γ as the “value of imputation credits”. By implication, the utilisation rate must be the value per \$1 of distributed credits. However the word “value” is capable of being interpreted in many ways including “numerical value”, which has no particular market value connotations. Furthermore, the NER is not the arbiter on this matter. Instead, one must look to the relevant academic literature. This commences with Officer (1994), who initially defines γ as the “value of the personal tax credits” (ibid, page 1). This may or may not be a market value. Subsequently, he defines it as the “proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend” (ibid, page 4), which clearly is not a market value. He then states that “ γ can be interpreted as the value of a dollar of tax credits to the shareholder” (ibid, page 4), with a footnote to this stating that

“For example, if the shareholder can fully utilise the imputation tax credits then $\gamma = 1$, eg a superfund or an Australian resident personal taxpayer... Where there is a market for tax credits one could use the market price to estimate the value of γ for the marginal investor...”

This implies that γ is not a market price and is instead something that can be *estimated* from market prices. Furthermore, as is apparent in these quotations, Officer confuses the utilisation rate with γ , with the first two quotes providing definitions of γ whilst the last two provide definitions of the utilisation rate. Furthermore, Officer provides no formal derivation of his model and therefore it is not possible to determine unambiguously how the parameter γ is defined in his model. By contrast, papers by Monkhouse (1993) and Lally and van Zijl (2003) provide rigorous derivations of the Officer model. In these papers, γ is the product of a distribution rate for credits and a utilisation rate, and the latter is a weighted-average over the utilisation rates of individual investors; this is *not* a market value concept. So, if SFG or any other party use the Officer model, which is standard

regulatory practice in Australia, they must define parameters in the model in accordance with derivations of that model.

SFG (2014b, paras 97-100) also cites an equation from Lally (2013b, page 10) as follows

$$S_0 = \frac{Y_1 - TAX_1 + IC_1 U + S_1}{1 + R_f + \phi \beta_e} \quad (1)$$

and then claims that this equation shows that credits are relevant only to the extent that investors are willing to pay for them as opposed to the extent to which investors are entitled to the credits or actually redeem them. SFG appears to be claiming that the definition of a parameter within an equation can be determined from mere inspection of the equation in which it appears, as if the equation had merely ‘dropped from the sky’. However, this equation (like any other in a model that has been theoretically developed) arises from a set of assumptions and definitions coupled with the laws of algebra. If U_i is defined as investor i 's utilisation rate for imputation credits (the extent to which they can redeem them with the ATO), and a weighted average of these rates arises mathematically within the model, and that weighted average is denoted U , then this settles the matter and one cannot then substitute a different definition for this parameter U . Similarly, the symbol TAX_1 appears in the numerator of equation (1), and it is defined within the model as the corporate tax obligations for year 1. Using SFG's approach to defining parameters, and using SFG's arguments concerning the utilisation rate, one could argue that TAX_1 is actually the market value of the obligations rather than the obligations themselves. Of course, SFG have not done this but doing so would be comparable with what they have done with the parameter U and it would be equally wrong.

To investigate this issue further, suppose a market comprises some investors who can fully use the credits and some who can't, with equal weights.¹ In such a situation, U must be 0.50. However, an examination of market prices (such as with dividend drop-off studies) might yield an estimate for U of 0.20. There are at least two possible explanations for this. One is that the model that underlies the valuation of equities is something other than (1). The other is that (1) is correct but market prices nevertheless provide a poor estimate of U . In neither

¹ In the interests of avoiding here the contentious question of whether foreign investors are relevant, I assume that there are no other countries and therefore both classes of investors are locals.

case does U change its definition within the context of equation (1). It is still a weighted average over the utilisation rates of the various investor types. If SFG prefers a model of equity valuation containing a parameter defined as the market value of the credits, they need to build a model starting with such a definition; they cannot impose onto equation (1) their preferred definition for a parameter.

SFG (2014b, paras 101-106) list a number of reasons why the value of distributed credits as reflected in share prices may be less than the empirical redemption rate of those credits. SFG's purpose in doing so is to demonstrate that the empirical redemption rate is a poor estimator of the value of the credits. However, since both are merely approaches to estimating the weighted-average utilisation rate, this exercise does not reveal which estimator is better. The appropriate comparison is between each estimator and the weighted-average utilisation rate, and I therefore examine each of SFG's points with this point in mind.

Firstly, SFG claims that the credits distributed to non-residents can't be redeemed. However, this would not necessarily cause the empirical redemption rate to diverge from the market value (both would fall), nor would it cause either to diverge from the weighted-average utilisation rate so long as non-residents were included within that weighted average. Whether they should be included is a separate point.

Secondly, SFG claims that credits distributed to residents who sell the shares within 45 days cannot be redeemed. Again, this would not necessarily cause the empirical redemption rate to diverge from the market value (both would fall). However, it might cause both to diverge from the weighted-average utilisation rate, and therefore would identify an imperfection in both approaches to estimating the weighted-average utilisation rate. Conclusions in this area depend upon whether the investors (whose ability to use the credits is undercut by this 45 day rule) are engaged in tax arbitrage or not. In respect of tax arbitrage, in which investors who can in general use the credits (type A investors) buy shares from investors who can't use them (type B investors) shortly before the ex-days for dividends with imputation credits and sell them back shortly afterwards, the in-substance holders of the shares are still type B rather than type A investors. Thus, any rules that deny these credits to the type A investors will better align both the empirical redemption rate and the market value of the credits with the weighted-average utilisation rate. For example, suppose that (on average) type A investors hold 70% of Australian shares and therefore the weighted-average utilisation rate is 70%.

However, tax arbitrage leads to such investors holding 90% of Australian shares on dividend ex-days, leading to an empirical redemption rate of 90% in the absence of the 45 day and related rules. The effect of these rules would then be to reduce the empirical redemption rate to something between 70% and 90%, and therefore produce an empirical redemption rate that better reflected the weighted-average utilisation rate of 70%. On the other hand, for investors holding shares for a short period around the ex-dates of dividends with imputation credits but not for the purpose of tax arbitrage, the effect of these exclusion rules would also reduce the empirical redemption rate and the market value of the credits. However, the rules would also reduce the weighted-average utilisation rate so long as the utilisation rate for investors who can in general use the credits was reduced below 100% to recognise the possibility of being 'caught' by the rules. I expect this issue would be trivial because the proportion of investors who suffer from the exclusion rules and are not engaged in tax arbitrage is likely to be very small. Accordingly, the key issue is that rules that deny these credits to type A investors who are engaged in tax arbitrage will better align both the empirical redemption rate and the market value of the credits with the weighted-average utilisation rate.

Thirdly, SFG claims that some credits are not redeemed through oversight, and cite an empirical estimate of 8%. This would lead to an empirical redemption rate below the value of the credits and also below the weighted-average utilisation rate. However, the empirical estimate they offer (8%) includes those subject to the 45 day rule (which is not oversight and has been discussed in the previous paragraph) and those unable to claim them pre 2000 because rebates were not available (which is again not oversight and is also no longer the case). Thus, the extent of non-redemption through mere oversight would seem to be trivial.

Fourthly, SFG claim that there are delays up to two years in receiving the benefit of imputation credits. This would lead to the value of the credits being below both the empirical redemption rate and the weighted-average utilisation rate. Any such delay is not recognised in the Officer CAPM, and therefore implies that the model is deficient. However, all models make assumptions and they are generally abstractions from reality. SFG could just have readily observed that trading in shares incurs transactions costs, which are not recognised by the Officer CAPM. If SFG are concerned about the reality of particular assumptions in the Officer CAPM, they need to reconstruct the model to account for them, estimate the cost of equity using this new model, and then persuade regulators to adopt this new model. Merely

observing that the Officer CAPM makes some assumptions that are abstractions from reality is not sufficient.

Fifthly, SFG argue that there are administrative costs in using imputation credits. Again, this would lead to the value of the credits being below both the empirical redemption rate and the weighted-average utilisation rate. Since these administrative costs are not recognised in the Officer CAPM, this again implies that the model is deficient. The same comments made in the previous paragraph apply here.

Sixthly, SFG argues that imputation credits are taxed in the same way as dividends (for local investors). Presumably, SFG's point is that dividends are valued below face value because they are in general taxed more onerously than capital gains, and therefore imputation credits will also be valued below their face value. Again, this would lead to the value of the credits being below both the empirical redemption rate and the weighted-average utilisation rate. So, in estimating the weighted-average utilisation rate from market prices around ex-dividend days, adjustment would be required to reflect this taxation issue. Thus, SFG have effectively highlighted a shortcoming in market value data unless it is corrected (and the appropriate correction procedure is discussed in Lally, 2013b, footnote 6). Furthermore, the Officer model does not recognise that dividends are in general taxed more onerously than capital gains. So, SFG are again highlighting a deficiency in the Officer model.

Lastly, SFG argues that Australian investors will tend to purchase Australian shares that deliver imputation credits, this behaviour is costly to such investors in the form of loss of diversification, and this cost would cause the value of the imputation credits to be driven down to zero, and therefore below the empirical redemption rate.² However, whether the weighted-average utilisation rate is also driven down by this process depends upon whether foreign investors are included in the weighted-average. Furthermore, the process described here (which is a 'clientele effect') presumes that Australian investors can invest in foreign assets, which is true but inconsistent with the Officer model. Thus, in highlighting this issue, SFG are merely highlighting the inadequacies in the Officer CAPM.

² SFG's supporting analysis includes their Figure 3, which has the wrong title and fails to contain a utility function. However, the argument is still clear enough.

So, in summarising SFG's last seven points, some of these claims (that the value of the credits is below the empirical redemption rate) are correct. However, both approaches are merely estimators of the weighted-average utilisation rate and these points collectively do not suggest that the value of the credits is the better estimator.

SFG (2014b, paras 107-115) review various reports by McKenzie and Partington on the question of whether the parameter theta is by definition a market value or a redemption rate. In the latest of these reports, McKenzie and Partington (2013, section 4) are ambivalent on this question after reviewing Officer (1994). However, as noted above, Officer provides no formal derivation of his model and therefore it is not possible to determine unambiguously how even the parameter gamma is defined. By contrast, papers by Monkhouse (1993) and Lally and van Zijl (2003) provide rigorous derivations of the Officer model. In these papers, gamma is the product of a distribution rate for credits and a utilisation rate, and the latter is a weighted-average over the utilisation rates of individual investors. The utilisation rate is therefore neither a market value nor an empirical redemption rate, and these last two phenomena are merely estimators of the utilisation rate rather than definitions. Remarkably, McKenzie and Partington (2013) do not review these other two papers; had they done so, the ambiguity present in Officer (1994) would have been resolved.

SFG (2014b, paras 116-120) also reviews a report by Handley (2008) on the question of whether the parameter theta is by definition a market value, and they note that Handley defines gamma in value terms as follows (ibid, page 7):

“gamma is the value of one dollar of imputation credits.....gamma...represents a complex weighted average of the value of franking credits and level of risk aversion of all investors in the market – with the weights based on individual levels of wealth.”

In arriving at this definition, Handley argues that Officer (1994) is insufficiently precise and therefore refers to a paper by Brennan (1970) to assist him. However, Brennan does not deal with a dividend imputation regime and Handley fails to refer to any of the papers that do provide formal derivations of the Officer model. So, he defines gamma without reference to the derivation of the model in which it arises.

SFG (2014b, paras 121-136) also examines the work of Officer (1994), in order to shed light on the definition of “gamma”. After concluding that Officer’s statements on this matter are contradictory, SFG examines an example in Officer and presents an equation for equity value that is consistent with Officer’s example. That equation, at SFG’s para 130, is a special case of equation (1) above, in which expected cash flows are the same for all future years. Since it is a special case of (1), then all of my earlier comments about whether (1) reveals that gamma is a value concept also apply here. In particular, the definition of a parameter within an equation cannot be determined from mere inspection of the equation in which it appears. The equation (like any other in a model that has been theoretically developed) arises from a set of assumptions and definitions coupled with the laws of algebra, and therefore the only means of determining the definition of a parameter is to inspect a formal derivation of the model, in which the definition must be present. Such derivations have been presented by Monkhouse (1993) and Lally and van Zijl (2003), and reveal that gamma is the product of a distribution rate and the weighted average over investor utilisation rates for imputation credits.

SFG (2014b, paras 137-140) also examines a paper by Hathaway and Officer (2004), in order to shed light on the definition of “gamma”. SFG concludes that this paper points to a value interpretation. However, regardless of whether Hathaway and Officer can be interpreted in this way, the only authorities on this matter are rigorous derivations of the Officer (1994) model. As indicated above, such sources reveal that gamma is the product of a distribution rate and the weighted average over investor utilisation rates for imputation credits, and the latter is not then a market value concept.

SFG (2014b, paras 143-149) also argues that the market value of imputation credits can be estimated as the weighted-average of investors’ utilisation rates under certain restrictive conditions, implies (reasonably) that these conditions are unrealistic, and therefore that the weighted-average of investors utilisation rates is not a useful estimator. However, SFG are incorrectly implying that the weighted-average of investors’ utilisation rates is an estimator and the market value of the credits is the parameter to be estimated. The reverse is actually the case, i.e., the parameter to be estimated is the weighted-average of investors’ utilisation rates, because this is the parameter that appears in the Officer (1994) model, as revealed by formal derivations of it. Thus, if the market value of the credits does not coincide with this parameter under realistic conditions, the deficiency lies in the market value of the credits as an estimator of the parameter in the model.

SFG (2014b, paras 150-164) critiques the QCA's equity ownership approach to estimating the utilisation rate, on the grounds that it reflects the presence of foreign investors and therefore is inconsistent with the use of a CAPM that assumes complete segmentation of risky assets markets. I agree and I have conveyed this advice previously to the QCA (Lally, 2013b, section 3.2). Furthermore, the same problem exists in using market data to estimating the utilisation rate because market data also reflects the presence of foreign investors. Thus, it is somewhat ironic that SFG should favour market data and yet still criticise the QCA in this way.

2.3 The Utilisation Rate: The Conceptual Test

SFG (2014b, paras 171-177) argues that the QCA has acted inconsistently in adopting a utilisation rate that lies well outside the bounds established by the Lally conceptual test and yet claiming to have given some weight to that test. However, no numerical "bounds" were ever specified by Lally (2013b, section 3.7). Instead, the analysis suggests that a utilisation rate of 0.625 is likely to be too low, a rate of 1 is much more plausible, and "the only sensible estimate of the utilisation rate is at or close to 1" (ibid, page 38). More importantly, even if I had specified a value of 1 for the utilisation rate (which would involve an even higher average value and tighter bounds than I have recommended), there would still be no inconsistency in the QCA's behaviour of the kind claimed by SFG, as follows. The QCA (2014b, section 5) considers estimates of the utilisation rate from a variety of methods, comprising 0.35 for dividend drop-off studies, 0.53 from redemption rates, 0.56 from the equity ownership approach, at or close to 1 from Lally's conceptual test, and 0.75 from practitioner behaviour. An unweighted median would then be 0.56, which is the QCA's estimate. Furthermore, a variety of weighted medians (consistent with the QCA putting differential weights on the estimates) would also lead to a figure of 0.56. Placing some weight on a figure (such as 1) does not require that the overall estimate be equal to 1 or even close to it. Similarly, if three estimates of a parameter were 0, 10, and 100, the equally-weighted median would be 10, which differs substantially from the highest estimate. So, the QCA has not acted inconsistently in the way claimed by SFG.

SFG (2014b, para 177) also enquires how different the QCA's estimate of the utilisation rate would have been had it not applied some weight to the Lally test. This would depend upon the weights the QCA placed on the individual estimates. It is apparent from the discussion by

the QCA (2014b, section 5) that it gives the highest weight to the estimate of 0.56, the next highest to 0.53, and lower weights to the other three estimates (of 0.35, 0.75, and Lally's figure of at or close to 1). If Lally's figure is treated as being at least 0.75, and the weights here are 40% on 0.56, 30% on 0.53, and 10% on each of the other three estimates, then the weighted median would be 0.56, which corresponds to the QCA's choice. Furthermore, eliminating the weighting on Lally's estimate and reweighting the other estimates in the same relative proportions (of 45%, 33%, 11%, and 11%) would still produce a weighted-median of 56%. This is unsurprising; estimates accorded low weight will by virtue of that fact have little or no impact on a weighted-median if they are disregarded.

SFG (2014b, paras 178-180) argues that the Lally conceptual test requires estimates of the MRP and beta under both perfect segmentation and perfect integration, and that this is impossible. However, beta is a sensitivity measure to equity market shocks (which reflect underlying economic shocks), and therefore is unaffected by whether equity markets are integrated or not, i.e., the price shocks would still be transmitted to the extent that economies were integrated. Thus, regardless of the degree of equity market integration, the beta of an Australian asset against the Australian market portfolio is estimated by regressing the equity returns on the asset against the Australian market return. Similarly, regardless of the degree of equity market integration, the beta of an Australian asset against the world market portfolio is estimated by regressing the equity returns on the asset against the world market return. These statistical exercises are entirely feasible and the first of them is standard practice. Thus, SFG's claim that beta estimates under complete segmentation (defined against the Australian market portfolio) and under complete integration (defined against the world market portfolio) cannot be obtained is false. Turning now to the MRP, estimates are required for the Australian market under complete segmentation, the Australian market under the degree of integration currently prevailing, and the world market under complete integration. For the purposes of the conceptual test, only the differences (as opposed to the absolute values) are important. So, Lally (2013b, section 3.7) sets the first MRP at 6% consistent with the typical figure used by Australian regulators. Estimates of the two remaining parameters are then offered, based upon empirical evidence and some plausible assumptions. Mindful that both are debatable, Lally (*ibid*) considers a plausible range of possible values. None of this involves the impossible. At most, one could challenge the range of estimates that are provided and offer alternative ranges. SFG does not do this.

SFG (2014b, para 179) claims that the analysis underlying Lally's conceptual test does not "consider the possibility of any estimation error or any model error in converting real-world estimates to their theoretical-world values". However, in respect of estimation error, SFG (2014, footnote 99) immediately contradicts their own claim. In respect of model error, if SFG feels that alternative models are plausible and should therefore be considered, the onus lies on them to present these models and explore the implications for the conceptual test. SFG does not do this.

SFG (2014b, paras 181-184) argues that the QCA in acting inconsistently in rejecting MRP estimates from the Merton (1980) method as unreliable whilst placing some weight on Lally's conceptual test, which also rests on the Merton method. However, there is no inconsistency in the QCA's behaviour because they place low weight on both uses of the Merton methodology. The better point to make would be that I have acted inconsistently in using the Merton methodology in Lally (2013b, section 3.7) whilst rejecting it in Lally (2013c, section 2.14). However, the application of the Merton methodology discussed in Lally (2013c, section 2.14) involves estimating the absolute value of the MRP for the Australian market, and it is therefore necessary to estimate both future market volatility and the MRP-volatility ratio. These parameters are difficult to reliably estimate, better alternatives are available, and this explains my lack of enthusiasm for this approach (Lally, 2013c, section 2.14). By contrast, in using the Merton methodology for the conceptual test, it is not necessary to estimate the absolute level of the MRP but merely the differences in the MRPs under three scenarios (the world MRP under complete integration, the Australian MRP under complete segmentation, and the Australian MRP under the existing degree of integration). Consequently, it is not necessary to estimate market volatility (for either Australia or the world) or the MRP-volatility ratio. Instead, it is sufficient to estimate the ratio of the world variance to the Australian market variance. This is a much easier task. Furthermore, better alternatives to the Merton methodology for estimating differences in MRPs are not apparent. Thus, there is no inconsistency in using the Merton methodology for the conceptual test (Lally, 2013b, section 3.7) whilst not using it for estimating the absolute value of the Australian MRP (Lally, 2013c, section 2.14).

SFG (2014b, para 185) argues that the "first version of the Lally conceptual test relied upon government bonds having the same yield whether or not foreign investors are allowed to buy them", and that this is unsupportable. However the claim concerning the conceptual test is

false, and SFG does not even provide a citation in support of its claim. There is no first and second version of the test, merely an explanation in Lally (2013b, page 53) that the risk-free rate within the Officer CAPM is an exogenous parameter and therefore the observed value of it should be used regardless of how it is determined. Nevertheless, progress is occurring here because SFG now accepts that the observed value of the risk-free rate should be used in the Officer CAPM regardless of how it is determined. This eliminates a significant earlier concern raised by SFG (2012b, para 100).

SFG (2014b, paras 186-188) argues that Lally's conceptual test is "based on a scenario in which the market for government bonds is completely integrated and the market for all other assets is completely segmented", that this is "inherently contradictory", and that this undercuts the value of the conceptual test. However, the SFG words just quoted are an attempt by SFG to interpret the following words from Lally (2014, page 31): "...the CAPM only assumes that the market for *risky* assets is completely segmented. No assumption is made in this model about the market for the risk-free asset." So, having quoted me stating clearly that no assumption is made concerning the risk-free asset, SFG interpret this in the diametrically opposite fashion. The wording in Lally (2014) is correct; no assumption concerning the risk-free asset is made in the CAPM. Furthermore, as noted in Lally (2014, section 8.2), the conceptual test is concerned with risk premiums and therefore questions relating to the risk-free rate are completely irrelevant.

2.4 The Utilisation Rate: Estimates from Dividend Drop-Off Studies

SFG (2014b, paras 191-193) claims to have already addressed all of the concerns raised by the QCA (2014b, pp. 94-96) about estimates of the utilisation rate (or "theta") from dividend drop-off studies, and lists these points. The first point concerns the possibility that the results are affected by the presence of unrepresentative investors such as tax arbitrageurs. SFG (2014b) refers to SFG (2014a, pp. 35-37), who argue that the effect of tax arbitrageurs would be to raise the estimate of theta and, consistent with this, such estimates tend to be higher than those obtained from other empirical techniques. However, SFG's argument supports the QCA's concerns about the reliability of the results and could at most support the claim that results from dividend drop-off studies were biased up (which was not the point at issue). Even if upward bias were the point at issue, SFG's claim that the results from dividend drop-off studies tend to be higher than those from other empirical techniques is not correct. Lally (2013b, Table 2) lists estimates of the utilisation rate from five different methods that use

market prices. Averaging over the results for each method, the average result from the dividend drop-off studies (method 1) ranks third out of five. This is the middle of the distribution. Thus, SFG have not addressed the QCA's concern.

The second point concerns the use of a constant term in the regressions. SFG (2014b) refers to SFG (2014a, pp. 37-38), who presents their views on this matter. Lally (2014, pp. 35-36) presents contrary arguments, and SFG (2014a) naturally fails to address them because SFG's (2014a) paper predates Lally's. Furthermore, SFG (2014b) is perfectly aware of the response in Lally (2014) because SFG (2014b) cites the Lally (2014) paper. So, SFG has not dealt with this issue.

The third point concerns the interaction between the value of cash dividends and the value of imputation credits. Again SFG (2014b) refers to SFG (2014a, pp. 38-39), who presents their views on this matter. Lally (2014, page 36) presents a contrary argument. Again, SFG (2014a) naturally fails to address this because SFG's (2014a) paper predates Lally's. Furthermore, SFG (2014b) is perfectly aware of the response in Lally (2014) because SFG (2014b) cites the Lally (2014) paper. So, again, SFG has not dealt with this issue.

The fourth point concerns the deletion of the small-cap companies. Again SFG (2014b) refers to SFG (2014a, page 39), who presents their views on this matter. Lally (2014, pp. 36-37) presents a contrary argument. Again, SFG (2014a) naturally fails to address this because SFG's (2014a) paper predates Lally's. Furthermore, SFG (2014b) is perfectly aware of the response in Lally (2014) because SFG (2014b) cites the Lally (2014) paper. So, again, SFG has not dealt with this issue.

The fifth point concerns the reliability of the estimates from the regressions. SFG (2014b, para 192) claims that their views on this matter have been presented in SFG (2014c). However that latter paper contains no comments on gamma.

The sixth point concerns the comparison between the ERA and SFG studies. Again, SFG (2014b, para 192) claims that their views on this matter have been presented in SFG (2014c). However that latter paper contains no comments on gamma.

The seventh and eighth points concern the impact of higher trading volume around ex-dividend days. However this is the same point as the first discussed above.

In summary, SFG have not addressed any of the eight concerns raised by the QCA about estimates of the utilisation rate from dividend drop-off studies.

SFG (2014b, paras 194-200) argues that evidence of unreliability in the estimates of Vo et al (2013) cannot be extrapolated to SFG's work because of differences in the models examined (despite the data being almost identical). In support of this, they refer to SFG (2014a, paras 45-77). However these paras do not contain comments on this matter. The point here is that, using SFG's preferred approach involving model 4 and "robust regression", Vo et al (2013) obtain markedly different results from progressively removing the 30 most extreme observations (in absolute terms), and also when they rerun the model with various values of the "tuning constant" (as detailed in Lally, 2013b, pp. 21-22).³ By contrast, SFG progressively remove the 20 most extreme *pairs* of observations (the one that exerts the most upward effect on the franking credit coefficient and the one exerting the most downward effect) and find only trivial effect on the coefficient (see Lally, *ibid*). SFG's process for deleting outliers is unusual, and seems predisposed to *not* finding a material effect. However, even if these two methods for deleting outliers were of equal merit, it is disturbing that an acceptable process for deleting outliers (that of Vo et al, 2013) would yield such markedly different results from deleting only 1% of the observations. A possible response to this would be to note that SFG's results arise from a model in which the ex-dividend return is adjusted for market movements, Vo et al's (2013) sensitivity results arise from a model without this feature, and the market adjustment should be made. Consequently, it would be interesting to rerun Vo et al's sensitivity tests on SFG's model 4 with robust regression and the market adjustment. SFG (2014d, Appendix 9, Figure 16) do present such results for model 4 with GLS regression and the market adjustment, and find much less sensitivity than did Vo et al. However, the model used by SFG involves GLS rather than robust regression and SFG progressively delete only the 20 most extreme observations rather than 30. Furthermore, SFG do not examine the sensitivity of their results to the tuning coefficient. In view of all this, one is entitled to suspect that the sensitivities found by Vo et al (2013) do in fact extend to SFG's model 4 with robust regression and the market adjustment. Thus, SFG's

³ Robust regression is a type of regression in which outliers are given lower weight than in a conventional (OLS) regression.

claim that the unreliability in the estimates of Vo et al (2013) cannot be extrapolated to their own work is unsupported.

2.5 The Utilisation Rate: Other Issues

SFG (2014, para 201) claims that the QCA has not explained why it has rejected a utilisation rate of 1 based upon the conceptual test. However, this is not correct. The QCA (2014b, page 28) explains that it does not give high weight to this because of uncertainty about the bounds in that test.

SFG (2014b, paras 202-203) refer to earlier claims about market practice (SFG, 2014a, page 50), and claim that the QCA (2014b) does not comment upon them. However, all of these claims have been examined in Lally (2013b, page 50), and SFG (2014b) fails to address these contrary arguments.

SFG (2014b, para 204) notes the existence of imputation funds and argues that their existence demonstrates that gamma must be less than 1, because there would be nothing to gain by buying shares with credits if gamma were 1. However SFG's argument relates to the utilisation rate rather than gamma, and to the utilisation rate that is reflected in market prices. Furthermore the existence of such funds does not require that this utilisation rate be less than 1. It is sufficient that some investors *believe* it to be less than 1. Furthermore, I have never asserted that the utilisation rate reflected in market prices is 1 and it would be remarkable if it were because there are many foreign investors in the Australian equity market and they would drive the utilisation rate that is reflected in market prices below 1. Instead, I have argued that because regulators use a domestic version of the CAPM then they should use a utilisation rate of 1 so as to produce more sensible estimates of the cost of equity. In addition, not even the QCA (2014a) concludes that the utilisation rate is 1; it instead concludes that the rate is 0.56. So, the existence of these imputation funds is not inconsistent with either the QCA's views about the utilisation rate or my own views.

3. Aurizon

Aurizon (2014) repeats many of the arguments raised by SFG (2014b), and I therefore address only the new material presented by them, as follows.

Aurizon (2014, pp. 218-219) refers to the QCA's concerns about the ATO data used by NERA (2013) and Hathaway (2013) to estimate the distribution rate for imputation credits, and to Hathaway's concerns about the ATO data, but argues that Hathaway's concerns were limited to the dividend data and not also to the tax data used to estimate the distribution rate at about 70%. However, while Hathaway (2013) considers that estimates of the distribution rate using ATO tax data (about 70%) are more reliable than those using dividend data (about 50%), he is clearly not highly confident about the former figure. For example, he describes the discrepancy between these two approaches as "unresolved" (ibid, para 67) and acknowledges his imperfect understanding of the data with the words "or else I am missing something significant in these data" (ibid, para 74). Faced with a choice between the tax and dividend data from the ATO, Hathaway prefers the former but nothing in this line of reasoning contradicts the QCA's (and my) preference for a completely different (and superior) source of data.

Aurizon (2014, page 220) notes that Lally's (2013b, 2014) estimate of the market-wide distribution rate using companies with the highest market value presumes that the most valuable companies will tend to make the largest tax payments to the ATO, and describes these as "simply assertions with little analysis provided to support such claims". However the most valuable companies are likely to be those with the largest net cash flows, which would be strongly correlated with taxable income, which would be strongly correlated with total company tax payments, which would be strongly correlated with tax payments to the ATO. Empirical evidence for this strong association between equity value and company tax payments to the ATO is apparent in Lally (2014, Table 2), which lists the 20 Australian companies with the largest equity value (in declining order) and their company tax payments to the ATO. The top 10 collectively represent 50% of the value of the ASX200 (Lally, 2014, page 29), the next ten add a further 12% (ibid, page 30), and their total company tax payments to the ATO are \$128b and \$18b respectively (ibid, Table 2). So, the top ten are on average 4.2 times as valuable as the next ten and their company tax payments to the ATO are on average 7.2 times as large. Thus, value is strongly positively associated with company tax payments to the ATO.

Aurizon (2014, page 222) notes that Lally's (2014) estimate of the market-wide distribution rate of 84% covers only 62% of ASX200 market value, leaving 38% unexamined, and argues that the remaining 38% have lower dividend payout rates (60% versus 71%) and therefore

would have lower distribution rates. However, some firms are able to attach all of their credits to their dividends and therefore a lower payout rate might not lower their distribution rate. Even if it did, and in proportion to the reduction in the payout rate, the expected distribution rate of the remaining 38% would be $84\% * (0.60/0.71) = 71\%$. Accordingly the market distribution rate would be 79% as follows:

$$F = 0.84(0.62) + 0.71(0.38) = 0.79$$

This is still considerably closer to Lally's estimate of 84% than to the generally employed figure of 70% even when adopting assumptions that are most favourable to Aurizon. Furthermore, in response to the analysis in Lally (2013b), yielding a distribution rate of 85% using the top ten firms (with 50% weight), SFG (2014a, paras 78-88) argued that the remaining firms would have a smaller distribution rate and therefore the figure of 85% was too large. In response to this, Lally (2014) doubled the sample size and the only effect was to trivially reduce the distribution rate from 85% to 84%. It is not efficient to examine every company in the ASX200 on this matter. If Aurizon feels that a sample that covers 62% of market capitalisation is still not sufficient, the responsibility lies with them to increase the sample rather than to offer speculations on what the result of doing so might be, and they have not done so.

Aurizon (2014, pp. 226-227) argues that the QCA should, in estimating the utilisation rate, place no weight on an estimate of the redemption rate from ATO dividend data (62%) because the QCA rejects estimates of the distribution rate from the same source. Accordingly, the QCA should estimate the redemption rate from only ATO taxation data, and this yields an estimate of 44% rather than the QCA's estimate of 53% (from averaging over the figures of 62% and 44%). However, the QCA rejects *all* estimates of the distribution rate from ATO data in favour of estimates based upon financial statement data. Thus, when using ATO data to estimate the redemption rate, there are no implied grounds for the QCA favouring one estimate over the other. Furthermore, in adopting an overall estimate of 56% in the face of estimates from a range of methods (35% from dividend drop-off studies, 53% from the redemption rate, 56% from the equity-ownership method, 75% from surveys, and at or close to 100% from the conceptual test), the QCA appears to be using the median. Additionally, it places most weight on the equity-ownership method, followed by the redemption rate, and

then the other three methods (QCA, 2014b, pp. 100-101). So, in substance, it appears to be using a weighted median. Accordingly, for any allocation of weights to these methods that is consistent with its ranking of the methods, a reduction in the redemption rate estimate to 44% will not alter its weighted-median of 56%. For example, suppose the weights were 40% for the equity-ownership method, 30% for the redemption rate, and 10% for each of the other three methods. Reducing the redemption rate estimate to 44% would not then alter the weighted-median, of 56%.

Aurizon (2014, pp. 227-228) argues that the proportion of Australian listed equity owned by local investors is 42% over the 2009-2013 period rather than the figure of 56% used by the QCA, and refers to the AER (2014, pp. 52-57) in support of this. This reduction arises because the AER has removed public sector entities from the numerator of its calculation (because they can't use the credits) and it has also removed the equity held by both Australian corporates and investment funds from both the denominator and the numerator of their calculation (because they are mere conduits for imputation credits rather than destinations).⁴ In respect of public sector entities, the ability or inability to use the credits is without substance because any tax payments by public-sector entities have no net impact upon the financial position of the government sector, i.e., any such tax payments merely shift money from 'one pocket to the other'. Consequently, a literal interpretation of their tax status produces perverse estimates of the cost of capital of a regulated private-sector firm under the Officer (1994) model. To illustrate this point, suppose that all shares in Australian private-sector companies were owned by private-sector entities, the resulting average utilisation rate was 0.7, and therefore the cost of equity capital of regulated firm X were 8%. Now suppose that public-sector entities, which do not pay tax (and therefore could not use imputation credits), purchase a large proportion of shares in Australian private-sector companies. Adopting a literal interpretation of their tax situation, the average utilisation rate would then fall and therefore X's cost of capital would rise in accordance with the Officer (1994) model. If these public-sector entities were then subject to corporate tax, the average utilisation rate would rise and therefore X's cost of capital would fall. Such oscillations in X's cost of capital according to whether public-sector entities were subject to corporate tax is perverse. Accordingly, one should act as if public-sector entities can use imputation credits; variations

⁴ Both the QCA and the AER draw upon the ABS data in Tables 47 and 48 of the Australian National Accounts 5232.0: Finance and Wealth, at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/5232.0>.

in their ownership share of Australian companies and whether they are subject to corporate tax would not then affect the estimated cost of capital of a regulated business.

In respect of the AER's deletion of the equity held by Australian corporates from its calculation of the local ownership share of Australian companies, I agree with this deletion but because it otherwise leads to double counting of assets rather than because they are conduits (which should be dealt with by tracing the credits to their ultimate users). To illustrate the double counting issue, suppose that the Australian equity market comprises two (unlevered) companies as follows:

Coy A: Real assets of \$1000, and with 100 shares of value \$10 each, of which 10 are held by company B (of value \$100), 60 by local individuals (value \$600) and 30 by foreigners (value \$300).

Coy B: Real assets of \$900, plus the \$100 shareholding in company A, and with 100 shares of value \$10 each, held only by local individuals and foreigners in the same 2:1 weights as for company A (\$667 for individuals and \$333 for foreigners).

So, the proportion of equities held by local investors would appear to be 68.3%:

$$P = \frac{\$600 + \$100 + \$667}{\$1000 + \$1000} = 0.683$$

However the \$100 held by local companies, and included in the numerator, is part of the assets underlying the \$1000 of shares in company B, and therefore is double-counted. This double-counting is dealt with by ignoring company B's holding of shares in A and the corresponding shares issued by A, in which case the proportion of shares held by locals falls to 66.7%:

$$P = \frac{\$600 + \$667}{\$900 + \$1000} = 0.667 \quad (1)$$

The ABS statistics would show this scenario as presented in Table 1 below, with issuers of equity shown in the rows and holders of the equity in the columns. In this case, deleting the column headed "Coys" and then computing the proportion held by locals produces the correct result. This is the approach taken by the AER (2014, pp. 52-57).

Table 1: Issuers and Holders of Listed Equity

Issuer	Amount	Coys	Indivs	Foreigners
Coys	\$2000	\$100	\$1267	\$633

Finally, in respect of the AER’s deletion of equity held by Australian investment funds from its estimation of the local ownership share of Australian equity, the situation here is more complex. To illustrate the issues here, suppose that the \$100 of equity in company A that was held by Company B in the previous example was instead held by a Fund, which simultaneously had claims against it by individuals (\$67) and foreigners (\$33). The ABS statistics would then show the following, with issuers of equity shown in the rows and holders of the equity in the columns:⁵

Table 2: Issuers and Holders of Listed Equity

Issuer	Amount	Funds	Indivs	Foreigners
Coys	\$1900	\$100	\$1200	\$600
Funds	\$100		\$67	\$33

In this case, there is a choice for dealing with the double-counting: either delete the column headed “Funds”, or delete the row headed “Funds” and then allocate the \$100 of shares held by Funds between individuals and foreigners. In either case, the result is as shown in equation (1). The natural choice would be to delete the column headed “Funds” because the row headed “Funds” then remains and it has the allocation between individuals and foreigners. This is the approach taken by the AER (2014, pp. 52-57). However, one of the two types of funds included in the ABS statistics is Non Money Market Financial Investment Funds (NMMFIF), whose listed equity issues are only about half of the listed equity held by

⁵ Funds do not issue equity but instead issue “units”. However, these are equity-like claims and are therefore included by the ABS in its tables relating to equity.

them. The difference is due to unlisted equity issued by them.⁶ The situation would then be as follows:

Table 3: Issuers and Holders of Listed Equity

Issuer	Amount	Funds	Indivs	Foreigners
Coys	\$1900	\$100	\$1200	\$600
Funds	\$50		\$33	\$17

In this case, the double-counting applies only to the row headed “Funds”, and therefore it should be deleted. In respect of the equity held by these NMMFIF, imputation credits that are received by them are not usable by them but pass through to their owners, the majority of whom are local investors. So, in estimating the local ownership proportion of Australian equities, equities issued by NMMFIF should be deleted and equities owned by them should be allocated between local and foreign investors in proportion to the local ‘ownership’ of these NMMFIF (as shown in the deleted row of the table). By contrast, the AER deletes the column headed “Funds”.

I now conduct calculations consistent with these principles, starting with listed equity in September 2013. Table 47 of the Australian National Accounts gives total listed equity of \$1472b, from which the \$63b of equity issued by NMMFIF is deducted to leave \$1409b. Additionally removing all equity held by Australian companies (\$78b) and Private Non-Financial Investment Funds (PNFIF) (\$2b) further reduces this to \$1329b, and this is held by various categories of local investors (\$531b), NMMFIF (\$121b) and Rest of World (\$677b).⁷ In respect of NMMFIF, \$49b of the \$63b in claims issued by them are held by local investors (78%), and therefore 78% of the equity that they hold in Australian entities is in turn ultimately owned by local investors. So, the local ownership proportion is then

⁶ This is apparent from Table 22 of the Australian National Accounts 5232.0: Finance and Wealth, shown at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/5232.0>.

⁷ The local investors are the Pension Funds, Life Insurance Companies (which are defacto pension funds), Households, and various public sector entities.

$$P = \frac{\$531b + .78(\$121b)}{\$1329b} = 0.47$$

Repeating the process for September 2008 yields 52%. So, during the last five years, the local ownership proportion of listed equity has averaged about 50%.

Turning now to Unlisted Equity, as shown in Table 48 of the Australian National Accounts, the situation regarding the NMMFIF is now reversed with the unlisted equity issued by these entities significantly exceeding the unlisted equity held, principally because these funds also hold bonds and non-financial assets (as shown in Table 22 of the Australian National Accounts). The situation is now like that shown in Table 4 below.

Table 4: Issuers and Holders of Unlisted Equity

Issuer	Amount	Funds	Indivs	Foreigners
Coys	\$1900	\$100	\$1200	\$600
Funds	\$200		\$133	\$67

In this case, the double counting should be dealt with by removing the column headed “Funds”, consistent with the AER’s approach. Thus, in respect of the unlisted equity in Table 48 of the Australian National Accounts, the ‘column’ for NMMFIF should be removed, i.e., all equity held by these funds should be deleted rather than the equity issued by them. Doing so along with deletion of all equity held by companies and PNFIF yields local ownership proportions of 84% in September 2008 and 85% in September 2013. Forming value weighted averages over listed and unlisted equity at each of the two points in time, the proportion of Australian equity held by local investors is 68% in September 2008 and 66% in September 2013, for an average of 67%. My own preference is for including all equity, for reasons discussed in Lally (2014, pp. 34-35), and therefore the QCA’s figure of 56% is conservative. Furthermore, the QCA (2014, page 98) also describes its 56% estimate as “conservative” because additional consideration of unlisted equity would raise the figure to about 70%.

In summary, I disagree with the AER's treatment of public-sector owners of Australian equity and also with some aspects of their treatment of investment funds but I agree with their treatment of equity held by companies. The effect is to reduce the proportion of listed Australian equity ultimately held by local investors from the QCA's estimate of 56% to 50%, averaged over the past five years. By contrast, the figure for equity in general is about 67%. I also agree with the QCA's (2014b, page 98) view that any estimate based only on listed equity would be "conservative" because additional consideration of unlisted equity would significantly raise the figure. In view of this, and my own preference for including unlisted equity, I consider that the QCA's estimate for the local ownership proportion of 56% is still conservative.

4. AngloAmerican

AngloAmerican (2014, section 3.6) favours an estimated distribution rate of 85% in accordance with Lally (2013b), on the grounds that the companies examined there by Lally are all large and so too is Aurizon. However, AngloAmerican provide no evidence that size is a factor in determining a firm's distribution rate. So, for the reasons provided in Lally (2013b, section 4.2), a market-wide estimate is used and this favours the estimate of 84% in Lally (2014).

AngloAmerican (2014, section 3.6) also favours a utilisation rate of 1 in accordance with Lally (2013b, 2014). Naturally, I concur.

AngloAmerican (2015, section 5.7) argues that the utilisation rate for Aurizon should be higher than the QCA's estimate of 0.56 because Aurizon is a highly diversified business. However, the utilisation rate is a market-wide parameter in the Officer (1994) model and therefore features of Aurizon are irrelevant to its estimation.

5. Conclusions

I have examined arguments raised by SFG, Aurizon, and AngloAmerican. Apart from the latter firm's agreement with my views on the utilisation rate, there is only one submission that I agree with aspects of. This is Aurizon's reference to analysis by the AER, relating to the proportion of Australian equities that are locally owned and in which Australian equity

holdings by Australian companies and investment funds are deleted, and public sector owners of Australian equity are treated as if they cannot use the imputation credits. I agree with the treatment of companies and some aspects of the treatment of investment funds, and the result is to reduce the proportion of Australian listed equity held by local investors from 56% to 50% averaged over the past five years. I also agree with the QCA's view that any estimate based only on listed equity would be "conservative" because additional consideration of unlisted equity would significantly raise the figure, to 67%. In view of this, and my own preference for including unlisted equity, I consider that the QCA's estimate for the local ownership proportion of 56% is still conservative.

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