REVIEW OF GAMMA SUBMISSIONS AND THE ERAWA'S VIEWS ON GAMMA

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25 July 2018

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EXECUTIVE SUMMARY

This paper has examined the ERAWA's views on gamma, and submissions on this issue from both Frontier and the WA Major Energy Users. My principal conclusions are as follows.

Firstly, I largely concur with the ERAWA's views. The only major exception is the ERAWA's view that, despite using a domestic version of the CAPM, internal consistency requires that the estimate of gamma take account of the presence of foreign investors. My view is that consistency is lost rather than attained by adopting a model that assumes no foreign equity investors whilst estimating a parameter within that model (gamma) that reflects the presence of foreign investors. Since there is no suitable model that recognises the empirical reality that national equity markets are partially integrated, I favour estimating the cost of equity using a model that assumes complete segregation of national equity markets (such as the model currently used), and also from one that assumes complete integration of these markets, followed by exercising judgement in choosing between these two boundary values.

Secondly, I disagree with the three principal submissions from Frontier: that ATO data can provide a suitable estimate of gamma, that deficiencies in the ABS data warrant its rejection for estimating the utilisation rate for credits, and that errors in the analysis using financial statement data to estimate the distribution rate for credits disqualify the resulting estimate. The principal drawback with using ATO data to estimate gamma is that it implicitly estimates the distribution rate for the average firm rather than the BEE, and the empirical evidence is that the former could be less than 50% of the latter. In respect of the ABS data, there are deficiencies in it but not to the extent just described for the ATO data. In respect of estimates of the distribution rate using financial statement data, some of the errors alleged by Frontier are correct but correction of them does not change the estimate of 83% using 2000-2013 data and extension of the data to 2017 raises the estimate to 88%.

Thirdly, I see merit in all three points made by the WAMEU: that the company tax payments made by regulated firms are less than assumed by the AER, thereby raising the distribution rate; that the BEE is a mature business that has little need to retain earnings for growth, and this would raise its distribution rate for credits; and that the version of the CAPM used by the AER (the Officer model) implies that the BEE must be an Australian firm with equity

sourced exclusively from Australian shareholders, and that such shareholders can fully utilise the credits, and therefore the utilisation rate should be 1. However, there is enough room for doubt on the first question, that low tax payments will raise the distribution rate for credits, to warrant not adjusting the observed distribution rates. On the second question, this merely explains the high distribution rates observed for regulated businesses and does not affect the estimate per se. On the third question, I agree, and further recommend (as indicated above) that the cost of equity be estimated using a model that assumes complete segregation of national equity markets (such as the current model in conjunction with a utilisation rate for credits of 1), and also from a model that assumes complete integration of national equity markets, followed by exercising judgement in choosing between these two boundary values.

1. Introduction

The ERAWA has recently received submissions from Frontier (2018a) and the WA Major Energy Users (2018) relating to the ERAWA's Western Power Draft Decision. In addition, the ERAWA (2018) has prepared a chapter on gamma as part of its Draft Rate of Return Guidelines. This report reviews these three documents, starting with the ERAWA's current views.

2. The ERAWA's Current Views

I concur with the ERAWA's current views, subject only to the following points.

The ERAWA (2018, para 803, paras 852-853) refers to a report produced by me (Lally, 2015), using financial statement data from companies for 2000-2013 and estimating the distribution rate for imputation credits to be at least 0.83. This report has been supplanted by analysis by me for 2000-2017, which is presented in the Appendix and yields an estimate of at least 0.88.

The ERAWA (2018) defines the utilisation rate in a number of different ways. Initially, the ERAWA (2018, para 805) defines the utilisation rate as the "value to investors of utilising imputation credits per dollar of imputation credits distributed." The word "value" is extremely ambiguous, and could (wrongly) be interpreted as "market value". Subsequently, the ERAWA (2018, para 827, para 856) defines it as the proportion of distributed credits that are "utilised by the representative investor". This too is ambiguous, without a definition of the "representative investor". Subsequently, the ERAWA (2018, para 857) defines it again using the word "value". Finally, the ERAWA (2018, para 860) defines it as a weighted average over the utilisation rates of individual investors, with investors able to fully use the credits having a rate of 1 and those unable to use them having a rate of 0, and references Lally and van Zijl (2003) in support of this. Only the last of these definitions is correct. As noted by the ERAWA, the definition of any parameter in a theoretical model arises from a rigorous derivation of the model, the model in question is Officer (1994), Lally and van Zijl (2003) provide a rigorous derivation, and Officer (1994) does not. All other definitions are superfluous and potentially wrong.

The ERAWA (2018, para 812) characterises Officer (1994) as defining the utilisation rate in market value terms. I do not think this is correct. Officer initially defines gamma 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 "gamma 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 gamma for the marginal investor…*"

This implies that gamma 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 gamma, with the first two quotes providing definitions of gamma whilst the last two provide definitions of the utilisation rate. Furthermore, as previously noted, Officer provides no formal derivation of his model and therefore it is not possible to determine unambiguously how the parameter gamma is implicitly defined in his model.

The ERAWA (2018, paras 819-821) notes that it has adopted a domestic version of the CAPM (the Officer model) and that there are foreign investors in the Australian equity markets. Accordingly, it argues that internal consistency requires that the estimate of gamma take account of the presence of these foreign investors. I do not agree. Consistency is lost if one adopts a model that assumes no foreign equity investors whilst estimating a parameter within that model (gamma) that reflects the presence of foreign investors. However, it does not follow from this that the ERAWA is necessarily 'wrong' to do so. The Officer model assumes complete segregation of national equity markets whilst the empirical reality is otherwise (there is some but not complete integration) but there is no suitable model for addressing partial integration. So, there is no easy solution to this problem. The usual approach has been to use the Officer model combined with parameter estimates for the utilization rate (and the MRP) that reflect the fact of partial integration. This is done not only by the ERAWA in defining the utilization rate to incorporate foreigners but also by anyone who favours the use of ATO data or DDO studies to estimate the utilization rate, as Frontier

(2018a) does, because both ATO data on the utilization rate and DDO studies reflect the presence of foreign investors. An alternative approach would be to estimate the cost of equity using both a model that assumes complete segregation and also from one that assumes complete integration, and then exercise judgement in choosing between the resulting two boundary values. Alternatively, one could use the Officer model along with an estimate of the utilization rate that ensured that the resulting estimate of the cost of equity was within the two boundary values. Lally (2013, section 3.9) shows that the required estimate of the utilization rate would have to be close to 1 to satisfy this test. So, the usual approach fails this test and is therefore very unsatisfactory. Furthermore, the last approach described here would then have to engineer an estimate of the utilization rate to ensure that the test just described was not failed. This is a minimalist position. I therefore favour the second of these possibilities, involving estimates of the cost of equity under both complete segregation and complete integration of national equity markets followed by exercising judgement in choosing between the resulting two boundary values.

The ERAWA (2018, para 832) defines the distribution rate as the "fraction of imputation credits created that are assumed to be distributed to shareholders." The word "assumed" should be replaced by "estimated".

The ERAWA (2018, para 883) implicitly defines the utilisation rate as the market value per $1 of distributed credits, which is contrary to its earlier (and correct) view that it is the weighted average over investors' utilisation rates.

The ERAWA (2018, para 884) claims that use of ATO data on the redemption rate for credits (to estimate the utilisation rate) assumes that "the market value of a redeemed franking credit is equal to its face value whilst an unredeemed franking credit has no value." Such an assumption would be required if the utilisation rate were defined as the market value per $1 of distributed credits, but the ERAWA does not define the utilisation rate in that way. Given that it instead (properly) defines the utilisation rate as a weighted average over the utilisation rates of individual investors, no such assumption is required. Instead, as noted by Lally (2016b, pp. 18-19), the assumptions underlying use of the redemption rate to estimate the utilisation rate (as defined by the ERAWA) are that local investors redeem all of the credits they receive, foreigners redeem none of the credits they receive, local investors choose Australian stocks with the same ratio of imputation credits to equity value as do foreign

investors, and hold them over the full one-year period in question. Furthermore, the last two assumptions are not likely to hold because local investors (who can use the credits) are likely to tilt their portfolios towards Australian stocks (because they alone can use the imputation credits) and some of them are also likely to engage in tax arbitrage around dividend ex-days (buying just before and selling just after the ex-day). The ERAWA (2018, para 885) notes the penultimate assumption.

The ERAWA (2018, para 848, para 895) refers to discussions between the AER and the ATO. Since then, there have been further discussions and these reinforce concerns with the FAB data held by the ATO (AER, 2018c, page 435).

The ERAWA (2018, para 898) refers to dividend drop-off (DDO) studies providing am "observed" market value for the distributed credits. The word "observed" is not appropriate; although market values can be observed for separable assets, distributed credits are not separable assets, and therefore the result of a DDO study is only an estimate of the market value per $1 of distributed credits and this estimate will fluctuate depending upon the sample data used (in the normal statistical fashion). Similarly, in the ERAWA (2018, para 904), the word "average" should be replaced by "estimated". Similarly, in the ERAWA (2018, para 906), the word "observed" should be deleted. The ERAWA (2018, para 113) uses the correct wording.

The ERAWA (2018, para 905) refers to arbitrage in the context of dividend drop-off studies. However, arbitrage relates to a situation without risk and there is risk in this context, i.e., an investor who buys cum div and sells ex-div is exposed to the risk of new information arriving within this period, thereby changing the price.

The ERAWA (2018, para 905) also characterises perfect capital markets as ones in which no new information arrives. This is not correct; a perfect capital market is one in which no investor can materially affect prices and there are no transactions costs, costs of acquiring information, taxes, or restrictions on investors' portfolio choices. It is implicit in this definition that new information does arise.

3. Frontier Submissions[1]

Frontier (2018a, section 2, section 3) critiques the ERAWA's views on gamma in its recent decisions. However, the ERAWA (2018) currently adopts a different approach to gamma than in its previous decisions.

Frontier (2018a, section 3) argues that the ATO data provide a reliable estimate of gamma, being credits redeemed/credits created. However, as noted in Lally (2018, section 3.3), this argument suffers from two principal drawbacks. Firstly, in addition to the estimate of gamma appearing within the cash flows, the Officer model requires an estimate of the utilization rate in order to estimate the MRP, that estimate would presumably have to use the ATO data if gamma were estimated from the ATO data, and the unreliability of the ATO data in estimating the credits distributed (and hence the utilization rate) would then be problematic.

Secondly, such an approach necessarily uses the same set of companies for estimating both the utilization and distribution rates, there is no necessity to do so, and good reason for not doing so (because one might not want to use all firms for estimating the distribution rate, which is firm-specific, whilst one would want to use all firms to estimate the utilization rate because it is a market-wide parameter). Frontier's preference for this approach using ATO data is particularly remarkable because they emphasise that the distribution rate is firm-specific and critique other approaches to estimating it that do not use highly relevant firms (Frontier, 2018a, section 4).

In respect of the question of why all firms might not be suitable for estimating the distribution rate of the BEE, there are two primary points here. Firstly, unlisted firms should be excluded because the regulated businesses are listed firms or subsidiaries of listed firms[2], and listed firms have much higher distribution rates than unlisted ones (Frontier, 2016, Table 4 reports

[1] These submissions are attached to submissions by ATCO (2018), and the latter includes gamma submissions. However these latter submissions are merely a summary of points raised by Frontier, so I focus upon the Frontier submissions.

[2] Lally (2016a, section 2.3) provides information on businesses regulated by the ERAWA and QCA. In respect of those regulated by the AER, these are identified by the AER (2017, Tables 3.1-3.4) and all of them that are entirely or majority privately-owned appear to be listed or owned by firms that are listed. For example, Ausnet Services and the APA Group are listed in Australia, whilst Powercor Australia, Citipower and SA Power Networks are owned by Cheung Kong Infrastructure (which is listed in Hong Kong) and Spark Infrastructure (which is listed in Australia).

estimates of about 50% for unlisted firms and 75% for listed firms). Since it is always sensible to distribute credits if possible, and the only restriction on doing so is the size of the firm's cash dividends, the presumed cause of the difference in distribution rates between listed and unlisted firms is lower dividend payout rates in unlisted companies. Furthermore, listed companies are generally widely held, and therefore most shareholders have very little knowledge of the actual state of affairs within these companies. Accordingly, dividends can be used to credibly signal the true state of affairs and the higher the dividend the stronger the signal of the firm's profits (Copeland et al, 2005, Ch. 16). These considerations are much less pronounced for unlisted companies, which might explain the lower payout rate and hence the lower distribution rate for imputation credits. Furthermore, unlisted firms include sole traders who have corporatized in order to reduce their tax bill, and this requires a low dividend payout rate.

Secondly, the ATO data includes firms that made profits and thereby generated credits but then made losses and liquidated without distributing the credits.[3] Such firms would tend to have low distribution rates and, as with unlisted firms, would not be suitable for estimating the distribution rate for the BEE. For example, suppose the ATO database comprised two firms: a regulated one that paid taxes of $100m and distributed all of the credits, and another one that paid taxes of $100m but then made losses and liquidated without distributing the credits. The regulated firm would have a distribution rate of 1 whilst that for the other firm would be zero, and the aggregate rate would be 50%. So, the aggregate rate of 50% would significantly underestimate that for the regulated business.

To assess the implications of this point for the validity of the gamma estimate arising from the ATO data, the ATO data offers two estimates of the distribution rate: 0.47 using dividend data and 0.71 using FAB and company tax data (Frontier, 2018a, para 43). Frontier (2018a, para 48) also claims that the ATO data for all firms yields an estimate for gamma of 0.31. So, if the best estimate of the distribution rate for the BEE is 0.88 using financial statement data for the top 20 firms (see Appendix) and the best estimate of the distribution rate of firms in aggregate is 0.47 using ATO data, the ATO estimate of gamma of 0.31 for firms in aggregate requires adjusting upwards to 0.31*(0.88/0.47) = 0.58 in order to reflect the distribution rate for the BEE. Alternatively, if the best estimate of the distribution rate for the BEE is 1 using

[3] This point was made by ATO staff during a meeting with AER and ENA representatives on 21 June 2018, which I participated in as an advisor to the AER.

financial statement data for the regulated energy network businesses (as will be shown shortly in this report) and the best estimate for the distribution rate of firms in aggregate is 0.47 using ATO data, the ATO estimate of gamma of 0.31 for firms in aggregate requires adjusting upwards to 0.31*(1/0.47) = 0.66. These illustrations invoke Frontier's estimates of parameters from the ATO data. By contrast, using ATO data on all firms, the AER estimates gamma at 0.35 (AER, 2018b, Table 2) and the distribution rate at 0.57 using dividend data (AER, 2018c, page 432). If these two figures are correct, the revised estimates of gamma above of 0.58 and 0.66 become 0.54 and 0.61. All of these results are shown in Table 1 below. So, using unadjusted ATO data to estimate gamma could underestimate it by 50%.

Table 1: Revised Estimates of Gamma Using ATO Data

Gamma (ATO)	Distn Rate (ATO)	Distn Rate (BEE)	Gamma (Adjusted)
0.31	0.47	0.88	0.58
0.31	0.47	1	0.66
0.35	0.57	0.88	0.54
0.35	0.57	1	0.61

Frontier (2018a, sections 4.1 – 4.3) argues that the 20 companies examined by Lally (2015) and favoured by the AER are unsuitable because these companies have substantial foreign income, this is not a feature of the BEE, and foreign income drives up the credit distribution rate. It is true that these companies have substantial foreign income and that this is not a feature of the BEE. However, on the question of whether foreign income drives up the distribution rate, Frontier does not offer any empirical evidence. This claim has been made previously by Frontier (2016, section 2.3). In response, Lally (2016b, section 3.5) shows that the proportion of profit from foreign operations is monotonically decreasing in the distribution rate, which is in the opposite direction to that claimed by Frontier, and the correlation between the two variables is the very striking figure of -0.95. Lally (ibid) also provides an explanation for this: firms with foreign operations retain a larger proportion of their operating cash flows in order to undertake these investments, this reduces their dividends, and therefore their distribution rate for credits. By contrast, the example offered by Frontier in support of their claim that foreign operations raise the distribution rate assumes

(without presenting any evidence) that firms with foreign operations have the same payout rate as those without foreign operations. Frontier (2018a) offers no response to Lally's (2016b, section 2.3) empirical analysis or the explanation offered for it. Furthermore, consistent with this empirically evident inverse relationship between the extent of foreign income and the credit distribution rate, removal of the firms with the highest proportion of profits from foreign operations from the 20 examined by Lally (which ought to be welcomed by Frontier) would *raise* the distribution rate. In particular, removing the two firms with the highest such proportion in Lally (2016b, Table 1) from the set of 20 firms examined (being BHP and Rio Tinto) would raise the aggregate distribution rate from 88% to 95% (see Appendix). This reinforces the point that the appropriate estimate for the distribution rate of a firm without foreign operations is *more* than 88%.

Frontier (2018a, section 4.3) argues that the appropriate firms for estimating the distribution rate for the regulated businesses should match the businesses in their dividend payout rate and in their level of foreign income (zero), rather than being the largest listed firms as used by Lally (2015). However this approach conflicts with Frontier's preference for estimating gamma directly using ATO data (as described above) because such ATO data is for all firms and therefore implicitly estimates the distribution rate using all firms. Furthermore, if a small subset of firms were to be chosen so as to match the regulated businesses in some way, there would be considerable subjectivity in doing so, both over the criteria for selecting them and over the firms that approximately satisfied the criteria, and Frontier do not offer any such set of firms.

Nevertheless, if a small subset of companies were to be chosen, the natural choice would be the set of energy network businesses firms used by the AER (2018a, Table 3) to estimate the optimal gearing and beta for the regulated businesses: APA Group, Ausnet Services, DUET Group, Envestra (now Australian Gas Networks), and Spark Infrastructure. In respect of the APA Group, the distribution rate was 0.84 over the 2007-2017 period[4]. However APA's Franking Account Balance is always positive and yet most of its distributions are unfranked. Prima facie, this is inefficient behavior and therefore its distribution rate should be treated as

[4] As shown in their financial statements, the Franking Account balances at 30 June 2007 and 30 June 2017 were \$0.1m and \$4.4m respectively, and the only franked dividends paid in that intervening period were \$52m in the 2016-2017 year. These dividends involve distributed credits of \$22.3m and therefore the company tax payments over this ten-year period must have been \$26.6m (\$22.3m + \$4.4m - \$0.1m). The distribution rate is then \$22.3m/\$26.6m = 0.84.

1. In respect of AusNet Services, the Franking Account Balance was smaller in 2017 than in 2007, which implies a distribution rate of 1 for all credits created in that ten-year period. In respect of DUET, the Franking Account Balance for the latest available financial statements (2016) is not disclosed but the dividends paid shortly after balance date were unfranked, implying a zero Franking Account Balance at that time. Accordingly, the distribution rate for all earlier credits generated from company tax payments must be 1. In respect of Envestra, I am unable to locate recent financial statements. Finally, in respect of Spark, recent financial statements do not record either the Franking Account Balance or whether dividends are franked, and therefore the distribution rate cannot be estimated. So, of the three firms for which the distribution rate can be estimated, the rate is 1 for two of those firms and should be 1 for the third (all over at least the last ten years). This limited evidence supports my earlier conclusion that the appropriate estimate for the distribution rate of the benchmark firm is at least 0.88.

Frontier (2018a, section 4.4) argues that the use of financial statement data by Lally (2015) to estimate distribution rates for credits presumes that all credits distributed by these firms are immediately available for shareholders to redeem, but that this might not occur because some of the immediate recipients are companies and trusts, who in turn would not pass them to the ultimate beneficiaries until these intermediaries in turn paid a dividend. So, some credits might be trapped or delayed. This is possible. However, delay per se in distributing the credits is not relevant for the present purposes. If all of the credits that are released from the companies that ultimately generated them (the "source companies") were released to intermediaries and did not reach their ultimate users for (say) two years, the credits received by the ultimate users within a particular year would be those released by the "source companies" to the intermediaries two years previously and the distribution rate to ultimate users within a year would be the same as the distribution rate by the "source companies" to the intermediaries in the same year except to the extent that the distributions to intermediaries were growing over time. So, if this growth rate were (say) 5% per year and the delay in transmitting the credits from the "source companies" to the ultimate beneficiaries were two years, the credits received by the ultimate beneficiaries within a particular year would be 90% of those distributed by the "source companies" to intermediaries in the same year, as follows:

$$\frac{Credits\ received\ by\ ultimate\ users\ in\ yr\ t}{Credits\ released\ by\ source\ companies\ in\ yr\ t} = \frac{1}{(1.05)^2} = .90$$

Furthermore, the extent to which shares in Australian companies are owned by other companies and trusts is minor. In particular, in respect of the analysis by the AER (2018b, Table 3) of the ownership of Australian listed equity, their underlying analysis estimates the listed equity value at $1,761b of which $534b is held by the "Rest of World". Of the remaining $1,227b held by Australian entities, only $125b is held by companies (10%). Furthermore, they do not record trusts as a category. So, if 10% of shares were held by intermediaries, they delayed the pass through of the credits to the ultimate beneficiaries by two years, and the growth rate in dividends were 5% per year, the credits received by the ultimate users in a particular year would be 99% of those released by the source companies in the same year as follows:

$$\frac{Credits\ received\ by\ ultimate\ users\ in\ yr\ t}{Credits\ released\ by\ source\ companies\ in\ yr\ t} = \frac{1 + 9(1.05)^2}{10(1.05)^2} = 0.99$$

Similarly, even if the intermediaries constituted 30% of the owners of shares and the delay were three years, the credits received by the ultimate beneficiaries in a particular year would still be 96% of those released by the source companies in the same year. Thus, the impact of delays in the transmission of credits from the source companies to the ultimate users would seem to be immaterial.

This leaves the issue of whether credits are trapped in the intermediaries and therefore never passed on to the ultimate users. A reasonable assumption is that the intermediaries distribute the same proportion of credits received as the source companies, and the best estimate for both is the figure of 88% (see Appendix). So, if intermediaries constitute 10% of the owners of shares, the proportion of credits distributed by the source companies that reached the ultimate users would be 87%:

$$0.88[0.9 + 0.1(0.88)] = 0.87$$

The shortfall from 88% in the absence of intermediaries is therefore only 1%. Even if the intermediaries constituted 20% of the shareholders in the source companies, the distribution rate would still be 86% compared to 88% without the effect of the intermediaries. All of this strongly suggests that the presence of intermediaries who might delay or trap the passing on

of the credits to the ultimate users does not materially reduce the distribution rate defined as credits received by the ultimate users within a year as a proportion of those released by the source companies in the same year.

Frontier (2018a, section 4.5 and Appendix) argues that there are a number of errors in the analysis in Lally (2014, Table 2) relating to estimating the aggregate distribution rate of the largest 20 firms in the ASX over the 2000-2013 period. However these alleged errors are only significant if they materially change the estimate for the aggregate distribution rate, and Frontier does not present a revised estimate of the aggregate distribution rate. This is particularly remarkable because Frontier (2018b, Appendix) does so in an earlier submission to the QCA that is otherwise identical (and the aggregate distribution rate is claimed there to be 0.79). Furthermore, in focusing upon Lally (2014, Table 2), Frontier (2018a) ignores correction of an error here by Lally (2015, Table 1), and referred to in Lally (2016b, page 26), which reduces the aggregate distribution rate from 0.84 in Lally (2014, Table 2) to 0.83. Frontier (2018a) is aware of this correction because Frontier (2018b, para 43) alludes to it. Furthermore, in contesting most of the dividend data in Lally (2014, Table 2), which comes from the firms' financial statements, Frontier (2018a) cites evidence from Morningstar, who also obtain the data from the firms' financial statements. Morningstar is therefore an inferior source of information.

Since the analysis in Frontier (2018b) embraces that in Frontier (2018a), and also includes the critical translation of alleged errors by Lally (2014) into a revised aggregate distribution rate, it is more sensible to focus upon Frontier (2018b) than Frontier (2018a). The Appendix analyses this work, relating to the 2000-2013 period, and still yields an aggregate distribution rate of 0.83, after making some corrections to the figures in Lally (2015, Table 1), primarily due to inclusion of data from the 2013 Financial Statements in those cases in which such statements were not available at the time the analysis was conducted by Lally in late 2013, and the inclusion of dividends paid by Rio Tinto Plc that were previously incorrectly omitted. The difference between this revised figure of 0.83 and Frontier's (2018b) figure of 0.79 is due to a wide range of errors in Frontier's analysis, comprising omission of some companies without good cause, apparently underestimating dividends by omitting those dividends paid under Dividend Reinvestment Plans, and errors in determining Franking Balances arising from conflating the Franking Balance with the maximum fully franked dividends that could be paid, incorrectly including the effect of some events after balance date, and the use of

annual average rather than year-end exchange rates when converting US$ to A$. These errors are detailed in the Appendix. The Appendix also notes where I accept Frontier's corrections to my earlier work.

In addition, the Appendix extends the analysis up to 2017, and the effect is to raise the distribution rate from 0.83 to 0.88. Furthermore, as discussed in Lally (2016b, section 3.5), figures determined in this way are lower bounds because they include companies with foreign operations, such operations are not relevant for estimating the distribution rate of regulated Australian business, and the effect of foreign operations appears to be to depress the distribution rate. For example, deletion of BHP and Rio Tinto (the two firms with the highest proportion of foreign income amongst those examined in Lally, 2016b, Table 1) would raise the figure of 0.88 to 0.95.

Frontier (2018a, section 5.1) argues that the equity ownership approach provides an upper bound on the estimate of the redemption rate. Prima facie, this claim has no relevance to the ERAWA's (2018) approach because the equity ownership approach provides an estimate for the utilisation rate *U* in the Officer model, and this is a weighted average over the utilisation rates of individual investors (as recognised by ERAWA, 2018, paras 859-861). However, the argument presented by Frontier (that local investors may not be able to redeem all credits due to the 45 day rule) would equally imply that the equity ownership approach provided an upper bound on the estimate of *U*, and therefore should be addressed. The claim that some local investors cannot use all credits on dividends received by them (due to the 45 day rule) is true. However, it is implausible that there is any material group of Australian investors who hold Australian stocks for less than 45 days around an ex-dividend date, because the penalty from doing so would be large (loss of the imputation credits) and the disadvantage from simply expanding their ownership period enough to avoid the 45 day rule would seem to be less substantial. Furthermore, any overestimate of *U* that results from ignoring such investors is likely to be dwarfed by the *underestimate* of *U* that results from assuming that no foreign investors can use the credits (which is unlikely to be true given the incentives that such investors would have to circumvent the legislation, the track record of successful efforts in circumventing legislation more generally, and the legislative responses to these efforts).

Frontier (2018a, sections 5.2-5.3) notes some concerns expressed by the ABS over the quality of its data on the proportion of equities held by local investors, notes that this proportion has

been significantly revised by the ABS, and that one feature of these revisions is surprising. Implicitly, Frontier is suggesting that these concerns are sufficient to warrant rejection of the ABS data. Rightly, Frontier (2018a, para 116) argues that the quality of the ABS evidence must be assessed relative to the quality of the alternatives for estimating the utilisation rate, and the ATO evidence favoured by Frontier suffers from two considerably more significant problems than anything in Frontier's critique of the ABS data (as detailed earlier). In respect of one of these points, Table 1 above shows that the appropriate estimate of gamma could be over twice that arising from the ATO data simply because the ATO data reflects the distribution rate for credits of the average firm rather than the BEE. Accordingly, and notwithstanding the concerns presented by Frontier about the ABS data but consistent with Frontier's view on the need to compare the quality of competing estimators, I favour use of the ABS data for estimating the proportion of Australian equities held by local investors.

Frontier (2018a, section 6) claims that the ERAWA (and the AER) define the utilisation rate as the proportion of credits that can be redeemed, that consistency requires that this be redemptions by shareholders in the BEE, and therefore that this requires information about the equity ownership structure of the BEE. This argument has no relevance to the ERAWA or the AER because neither the ERAWA nor the AER defines the utilisation rate in this way. Instead, both the ERAWA (2018, paras 859-861) and the AER (2018b, page 9) define the utilisation rate as a weighted average over the utilisation rates of individual investors, in accordance with rigorous derivations of the Officer model. The redemption rate for credits is at most an estimator of this parameter.

Frontier (2018a, section 7) argues that the dividend drop-off analysis by SFG is superior to that performed by the ERA. However, this has no relevance to the ERAWA's (2018) current views, which embody no opinion on this particular question.

Frontier (2018a, section 7.3) critques the ERAWA's process in the 2016 DBP Final Decision for combining results from the SFG and ERA studies involving dividend drop-off data. Again, this has no relevance to the ERAWA's (2018) current views.

4. WA Major Energy Users Submission

The WA Major Energy Users (WAMEU, 2018, page 42) argues that the company tax payments made by firms are less than assumed by the AER, and therefore that gamma rises; so, the observed gamma is too high. To appreciate this point, which relates purely to the distribution rate, the distribution rate *F* calculated from a set of *n* companies is as follows:

$$F = \frac{\sum_{j=1}^{n} DIST_j}{\sum_{j=1}^{n} TAX_j} = \frac{\sum min\left[TAX_j, \frac{3}{7} DIV_j\right]}{\sum TAX_j}$$

For some firms, the dividend payments are the binding constraint (insufficient to distribute all credits). So, if the tax payments for these firms rise and assuming that their dividends will not rise (but may fall), the distribution rate *F* will fall. Accordingly, if the AER's model assumes higher tax payments than these firms actually make, a consistent estimate of *F* will be smaller than that observed. By contrast, for other firms, the dividends are not the binding constraint (the dividends are large enough to distribute all credits). Accordingly, if the AER's model assumes higher tax payments than these firms actually make, a consistent estimate of *F* will still be 1. The overall impact will depend upon the mix of these firms and the extent to which their actual tax payments are less than those implied by the AER's model.

To illustrate this point, suppose that two firms are used in this analysis: firm 1, with actual tax payments of $100m and dividends of $200m, and firm 2, with actual tax payments of $100m and dividends of $300m. The conventional estimate of *F* would then be

$$F = \frac{\frac{3}{7}\$200m + \$100m}{\$100m + \$100m} = \frac{\$186m}{\$200m} = 0.93$$

Suppose firm 1 pays the appropriate amount of tax whilst firm 2 pays $20m less than implied by the AER's model (and therefore the amount implied by the AER's model is $120m). So, to obtain an estimate of *F* that is consistent with the AER's model for tax, the tax payment by firm 2 must be raised by $20m to $120m, thereby raising *F* to 0.94. If additionally firm 1 pays $40m less than that implied by the AER's model, a consistent estimate of *F* requires raising the tax payment of firm 1 by $40m to $140m, thereby lowering *F* to 0.79 if firm 1's dividend (and hence attached credits) did not fall.

Clearly, there would be considerable difficulties in assessing the extent to which tax payments made by each of the firms used to assess *F* are less than that assumed by the AER's model, and therefore by how much the observed value for *F* should be changed. Furthermore, the possibility remains that any increase in taxes paid would lead to an increase in that firm's dividend in order to ensure that the additional credits thereby created were distributed. In view of these difficulties, I do not favour any such adjustment.

The WAMEU (2018, page 69) argues that the BEE is a mature business that has little need to retain earnings for growth, and this would raise its distribution rate for credits. This is consistent with the real growth rate in the RAB of regulated energy network businesses of only 1.9% per annum since 2013 (ENA, 2018, page 25), and also consistent with my empirical estimate for the distribution rate of 1 for each of the regulated energy network businesses (as discussed above). However the number of firms is small (3) and I therefore consider evidence from the 20 largest ASX firms, which produces an estimate of at least 0.88 (see Appendix). It is a matter of judgement how these two pieces of information are used, and I favour some weight on both. Accordingly the appropriate estimate is larger than 0.88.

The WAMEU (2018, pp. 69-70) also argues that the version of the CAPM used by the AER (the Officer model) implies that the BEE must be an Australian firm with equity sourced exclusively from Australian shareholders, and that such shareholders can fully utilise the credits, and therefore that the utilisation rate should be 1. This matches my own view (Lally, 2018, pp. 17-18). However, as described above, I further recommend that the cost of equity be estimated using a model that assumes complete segregation of national equity markets (such as the current model in conjunction with a utilisation rate for credits of 1), and also from a model that assumes complete integration of national equity markets, followed by exercising judgement in choosing between these two boundary values.

5. Conclusions

This paper has examined the ERAWA's views on gamma, and submissions on this issue from both Frontier and the WA Major Energy Users. My principal conclusions are as follows.

Firstly, I largely concur with the ERAWA's views. The only major exception is the ERAWA's view that, despite using a domestic version of the CAPM, internal consistency

requires that the estimate of gamma take account of the presence of foreign investors. My view is that consistency is lost rather than attained by adopting a model that assumes no foreign equity investors whilst estimating a parameter within that model (gamma) that reflects the presence of foreign investors. Since there is no suitable model that recognises the empirical reality that national equity markets are partially integrated, I favour estimating the cost of equity using a model that assumes complete segregation of national equity markets (such as the model currently used), and also from one that assumes complete integration of these markets, followed by exercising judgement in choosing between these two boundary values.

Secondly, I disagree with the three principal submissions from Frontier: that ATO data can provide a suitable estimate of gamma, that deficiencies in the ABS data warrant its rejection for estimating the utilisation rate for credits, and that errors in the analysis using financial statement data to estimate the distribution rate for credits disqualify the resulting estimate. The principal drawback with using ATO data to estimate gamma is that it implicitly estimates the distribution rate for the average firm rather than the BEE, and the empirical evidence is that the former could be less than 50% of the latter. In respect of the ABS data, there are deficiencies in it but not to the extent just described for the ATO data. In respect of estimates of the distribution rate using financial statement data, some of the errors alleged by Frontier are correct but correction of them does not change the estimate of 83% using 2000-2013 data and extension of the data to 2017 raises the estimate to 88%.

Thirdly, I see merit in all three points made by the WAMEU: that the company tax payments made by regulated firms are less than assumed by the AER, thereby raising the distribution rate; that the BEE is a mature business that has little need to retain earnings for growth, and this would raise its distribution rate for credits; and that the version of the CAPM used by the AER (the Officer model) implies that the BEE must be an Australian firm with equity sourced exclusively from Australian shareholders, and that such shareholders can fully utilise the credits, and therefore the utilisation rate should be 1. However, there is enough room for doubt on the first question, that low tax payments will raise the distribution rate for credits, to warrant not adjusting the observed distribution rates. On the second question, this merely explains the high distribution rates observed for regulated businesses and does not affect the estimate per se. On the third question, I agree, and further recommend (as indicated above) that the cost of equity be estimated using a model that assumes complete segregation of

national equity markets (such as the current model in conjunction with a utilisation rate for credits of 1), and also from a model that assumes complete integration of national equity markets, followed by exercising judgement in choosing between these two boundary values.

APPENDIX: THE DISTRIBUTION RATES OF COMPANIES

This Appendix provides the data underlying the analysis in Lally (2015, Table 1), corrected where appropriate (and the principal source of corrections is inclusion of data from the 2013 Financial Statements in those cases in which such statements were not available at the time the analysis was first conducted in late 2013, and the inclusion of dividends paid by Rio Tinto Plc). In addition, these figures are compared to those in Frontier (2018b, Table 7), and explanations offered for the differences. Finally, the analysis is also extended to 2017.

CBA (Parent)

The Franking Balance (FB) for the Parent for 2017 is $1,067m, as reported in the Financial Statements. The FB for the Parent for 2013 is $742m, as reported in the Financial Statements. The FB for 2000 is $450m, as reported in the Financial Statements.[5] This figure for 2000 is for the Group but the figures for the Parent are presumably the same because the dividends are the same. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements (and the Directors' Report for 2001 and 2002), and involving adding together the Interim Dividend for the year in question and the Final Dividend declared in the previous year but paid in the year in question:[6]

$1681m, $1785m, $1892m, $2062m, $2398m, $2645m, $3048m, $3426m, $3691m, $3588m, $4678m, $5096m, $5776m, $6174m, $6744m, $6994m, and $7237m

For the 2000-2013 period, the total multiplied by 3/7 is $17,900m, and represents the total distributions from the Franking Account (*DIST*). The company tax payments to the ATO (*TAX*) are then *DIST* plus the growth in FB, which is $18,191m.

[5] These figures are net of adjustments for tax not yet paid at balance date but payable in respect of profits for the year ending on the balance date in question, and for credits distributed with dividends paid after balance date but declared before balance date. The second of these adjustments could be reversed out but the first cannot (because the extent of these tax payments is not known). Accordingly, no adjustment is made. If the only adjustment were for dividends, the adjustment would be made and this occurs for some companies examined in this Appendix.

[6] There is sometimes ambiguity over whether the final dividend reported in the Dividends Note for a particular year has been paid in that year or merely declared and paid in the following year. If in doubt, I assume the former. The effect of any such errors on the distribution rate for credits would be slight.

Compared to this, Frontier's (2018b, Table 7) *DIST* is less by about 20%, likely due to Frontier mistakenly omitting the dividends under the Dividend Reinvestment Plan (DRP), which are approximately 20% of the total.[7]

For the 2000-2017 period, the figures are *DIST* = $29,535m and *TAX* = $30,152m.

BHP (Group)

The FB for the Group for 2017 is US$10,155m, as reported in the Financial Statements, which is converted at the prevailing exchange rate of 0.77 (US$ per A$1) as reported by the RBA, to yield $13,188m. The FB for the Group for 2013 is US$10,516m, as reported in the Financial Statements, which is converted at the prevailing exchange rate of 0.92 (US$ per A$1) as reported in the Financial Statements, to yield $11,430m. The FB for the Group for 2000 is $24m, as reported in the Financial Statements (and I accept Frontier's correction on this point). The fully franked dividends in $US are as follows, for the years 2001 – 2017 respectively, drawn from the Cash Flow Statements rather than the Dividends Note to the Financial Statements (because the former includes the dividends paid to the minority shareholders, but with checking against the information in the Dividends Note to check for partly franked dividends and any DRPs).

$524m*(26/51), $831m, $868m, $1576m, $1642m, $2126m, $2339m, $3250m, $4969m, $4895m, $5144m, $5933m, $6222m, $6506m, $7052m, $4217m, and $3502m.

The exchange rates used for the conversion (US$ per A$1) are the average over the financial year, as reported in the Accounting Policies Note in the Financial Statements (or the RBA otherwise) as follows:

0.53, 0.52, 0.58, 0.71, 0.75, 0.75, 0.79, 0.90, 0.75, 0.88, 0.99, 1.03, 1.03, 0.92, 0.84, 0.73, and 0.75.

For the 2000-2013 period, converting at these rates and adding up, the total multiplied by 3/7 is $19,971m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $31,377m.

[7] The DRP dividends are estimated from the difference between the (cash) dividends reported in the Cash Flow Statement and the total dividends reported in the Dividends Note.

Compared to this, Frontier (2018b, Table 7) uses the wrong FB 2013 $US figure (by incorrectly including the effect of events after balance date) and converts it at the wrong exchange rate (the average rate for the year rather than the year end rate).

For the 2000-2017 period, the figures are *DIST* = $31,076m and *TAX* = $44,240m.

Westpac (Parent)

The FB for the Parent for 2017 is $1,063m, as reported in the Financial Statements. The FB for the Parent for 2013 is $1,247m, as reported in the Financial Statements. The FB for the Group for 2000 is -$56m, as reported in the Financial Statements, but this is likely to be similar to the figure for the Parent because the dividends are very similar. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements for the years 2000-2013 and otherwise from the Statement of Changes in Equity:

$1017m, $1157m, $1304m, $1474m, $1667m, $1981m, $2270m, $2583m, $2994m, $3700m, $4500m, $4931m, $5568m, $5837m, $5752m, $6129m, and $6301m.

For the 2000-2013 period, the total multiplied by 3/7 is $15,062m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $16,365m.

Compared to this, Frontier (2018b, Table 7) uses the wrong FB figures for both 2000 and 2013 by incorrectly including the effect of events after balance date. In addition, its *DIST* is less by about 15%, likely due to Frontier mistakenly omitting the dividends under the DRP (which are approximately 15% of the total).

For the 2000-2017 period, the figures are *DIST* = $25,356m and *TAX* = $26,475m.

ANZ (Parent)

The FB for the Parent for 2017 is $171m, as reported in the Financial Statements. The FB for the Parent for 2013 is $265m, as reported in the Financial Statements. The FB for the Parent for 2000 is zero, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$995m, $1155m, $1333m, $1598m, $1877m, $2068m, $2363m, $2506m, $2452m, $2667m, $3491m, $3691m, $4082m, $4694m, $4906m, $5001m, and $4609m.

For the 2000-2013 period, the total multiplied by 3/7 is $12,976m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $13,241m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 30% less, likely due to Frontier mistakenly omitting the dividends under the DRP (which are approximately 30% of the total).

For the 2000-2017 period, the figures are *DIST* = $21,209m and *TAX* = $21,380m.

NAB (Group)

The FB for the Group for 2017 is $1,115m, as reported in the Financial Statements. The FB for the Group for 2013 is $1,047m, as reported in the Financial Statements (Frontier's correction to my earlier work on this matter arose from the 2013 Statements not being available to me at the time leading to me using the 2012 figure). The FB for the Group for 2000 is zero, as reported in the Financial Statements. The fully franked dividends for the Group are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:[8]

$2080m, $2355m - $120m, $2360m - $120m, $2503m, $2586m*0.9, $2661m*0.8, $2788m*0.9, $3124m, $3069m, $3102m, $3490m, $3955m, $4249m, $4553m, $4670m, $5161m, and $5216m.

For the 2000-2013 period, the total multiplied by 3/7 is $15,862m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $16,909m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 20% less for unknown reasons.

For the 2000-2017 period, the figures are *DIST* = $24,262m and *TAX* = $25,377m.

[8] In some years, the dividends are only reported for the Parent in the Dividends Note, but the dividends reported in the Cash Flow Statement for the Group and Parent are almost identical, so the figures in the Dividends Note can be extrapolated to the Group.

Telstra (Group)

The FB for the Group for 2017 is $9m, as reported in the Financial Statements. The FB for the Parent for 2013 is -$85m, as reported in the Financial Statements, and this should be similar to the figure for the Group because the dividends are very similar (and I accept Frontier's correction on this point). The FB for the Group for 2000 is $74m, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Cash Flow Statements rather than the Dividends Note to the Financial Statements (because the former includes the dividends paid to the minority shareholders, but with checking against the information in the Dividends Note to ensure all were fully franked and there was no DRP):

$2316m, $2831m, $3345m, $3186m, $4131m, $4970m, $3479m, $3498m, $3517m, $3494m, $3489m, $3491m, $3508m, $3567m, $3700m, $3787m, and $3736m.

For the 2000-2013 period, the total multiplied by 3/7 is $19,395m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $19,236m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 10% higher for unknown reasons.

For the 2000-2017 period, the figures are *DIST* = $25,733m and *TAX* = $25,668m.

Woolworths (Group)

The FB for the Group for 2017 is $2,577m, as reported in the Financial Statements. The FB for the Group for 2013 is $1,943m, as reported in the Financial Statements. The FB for the Group for 2000 is $418m, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$500m, $312m, $381m, $428m, $500m, $613m, $788m, $1006m, $1174m, $1349m, $1457m, $1516m, $1597m, $1703m, $1753m, $1471m, and $860m.

For the 2000-2013 period, the total multiplied by 3/7 is $4,980m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $6,505m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 25% less and this is likely due to Frontier mistakenly omitting the dividends under the DRP (which are approximately 25% of the total).

For the 2000-2017 period, the figures are *DIST* = $7,460m and *TAX* = $9,619m.

Wesfarmers (Group)

The FB for the Group for 2017 is $786m, as reported in the Financial Statements. The FB for the Group for 2013 is $243m, as reported in the Financial Statements. The FB for the Group for 2000 is zero, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$245m, $459m, $446m, $500m, $546m, $725m, $889m, $997m, $1487m, $1330m, $1562m, $1793m, $1990m, $2164m, $2600m, $2272m, and $2235m.

For the 2000-2013 period, the total multiplied by 3/7 is $5,558m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $5,801m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 10% less, and this is likely due to Frontier mistakenly omitting the dividends under the DRP (which are approximately 10% of the total).

For the 2000-2017 period, the figures are *DIST* = $9,531m and *TAX* = $10,317m.

CSL (Group)

The FB for the Group for 2017 is not reported but is presumably zero because the 2017 dividends are unfranked. The FB for the Group for 2013 is not reported but is presumably zero because the 2013 dividends are unfranked. The FB for the Group for 2004 is $20m, being the amount of retained profits that could be distributed as fully franked dividends of $47m (as reported in the Financial Statements) multiplied by 3/7. Earlier Financial Statements could not be located. The fully franked dividends are as follows, for the years 2005 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$85m, $58m, zero, $50m, $138m, zero, $27m, $9m, zero, zero, zero, zero, and zero.

For the 2000-2013 period, the total multiplied by 3/7 is $157m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $137m.

Compared to this, Frontier (2018b, Table 7) omits CSL but provides details earlier in its Appendix and therefore the omission appears to be an oversight.

For the 2000-2017 period, the figures are *DIST* = $157m and *TAX* = $137m.

Woodside (Group)

The FB for the Group for 2017 is US$2,032m, as reported in the Financial Statements, which is converted at the prevailing exchange rate of 0.78 (US$ per A$1) as reported by the RBA, to yield $2,605m. The FB for the Group for 2013 is US$2,545m, as reported in the Financial Statements, which is converted at the prevailing exchange rate of 0.895 (US$ per A$1) as reported by the RBA, to yield $2,844m. The FB for the Group for 2000 is $173m, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements (with the dividends for 2009 – 2017 reported in $US and converted at the average exchange rate over the year shown in brackets below as US$ per A$1 from the RBA):

$560m, $446m, $413m, $347m, $447m, $713m, $847m, $929m, US$574m (0.79), US$773m (0.92), US$866m (1.03), US$979m (1.04), US$1738m (0.97), US$1764m (0.90), US$1730m (0.75), US$640m (0.74), and US$826m (0.77).

For the 2000-2013 period, the total multiplied by 3/7 is $4,218m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $6,888m.

Compared to this, Frontier (2018b, Table 7) uses the wrong exchange rate to convert the FB US$ 2013 figure (using a rate used by BHP, despite the fact that the year ends of these two companies differ by six months). In addition, Frontier's *DIST* is about 15% less, and this is likely due to Frontier mistakenly omitting the dividends under the DRP (which are about 15% of the total).

For the 2000-2017 period, the figures are *DIST* = $6,877m and *TAX* = $9,309m.

Rio Tinto (Group)

The FB for the Group for 2017 is US$5,014m, comprising the retained earnings that could be distributed as fully franked dividends of US$8,542m (which is net of the outflow of credits on the final dividend declared in financial year 2017 of US$3,158m but paid in the next financial year) plus that dividend, as reported in the Financial Statements, multiplied by 3/7. Converting at the exchange rate of US0.78 per A$1 as reported in the Financial Statements yields $6,428m. The FB for the Group for 2013 is US$6,987m, comprising the retained earnings that could be distributed as fully franked dividends of US$14,298m (which is net of the outflow of credits on the final dividend declared in financial year 2013 of US$2,005m but paid in the next financial year) plus that dividend, as reported in the Financial Statements, multiplied by 3/7. Converting at the exchange rate of US0.89 per A$1 as reported in the Financial Statements yields $7,850m. The FB for the Group for 2000 is $445m, comprising the retained earnings that could be distributed as fully franked dividends of zero (which is net of the outflow of credits on the final dividend declared in financial year 2000 of $1,038m but paid in the next financial year) plus that dividend, as reported in the Financial Statements, multiplied by 3/7. The fully franked dividends in $US are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$812m, $826m, $882m, $1062m, $1143m, $2573m, $1507m, $1933m, $876m, $1754m, $2236m, $3038m, $3322m, $3710m, $4076m, $2725m, and $4250m.

The exchange rates for the conversion (US$ per A$1) are the average over the financial year, as reported in the Exchange Rates Note in the Financial Statements:

0.52, 0.54, 0.65, 0.73, 0.76, 0.75, 0.84, 0.86, 0.79, 0.92, 1.03, 1.04, 0.97, 0.90, 0.75, 0.74, and 0.77.

For the 2000-2013 period, converting at these rates and adding up, the total multiplied by 3/7 is $11,320m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $18,725m.

Compared to this, Frontier (2018b, Table 7) uses the wrong FB figures in both 2000 and 2013 in $US (by incorrectly including the effect of events after balance date) and converts the 2013 figure at the wrong exchange rate (the average rate over the year rather than the year end rate). In addition, Frontier's *DIST* is about 10% too high for unknown reasons.

For the 2000-2017 period, the figures are *DIST* = $19,358m and *TAX* = $25,342m.

Westfield (Parent)

The FB for the Parent for 2017 is $4m, as reported in the Financial Statements. The FB for the Parent for 2013 is $83m, as reported in the Financial Statements (Frontier's correction to my earlier work on this matter arose from the 2013 Statements not being available to me at the time leading to me using the 2012 figure). The FB for the Parent for 2000 is $25m, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$47m, $55m, $56m, $82m, $185m, $71m, $64m*0.6, $194m, $195m*0.6, 0, $115m, 0, 0, $164m, 0, 0, and 0.

For the 2000-2013 period, the total multiplied by 3/7 is $411m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $469m.

Compared to this, Frontier (2018b, Appendix) excludes the company on the grounds of a merger having occurred in 2004. However, even if this were relevant, Frontier could have included the company using data from 2004. The effect of doing so, and therefore deleting the first four years' dividends above and replacing FB 2000 by FB 2004 ($2m instead of 0) would be inconsequential.

For the 2000-2017 period, the figures are *DIST* = $481m and *TAX* = $461m.

Macquarie (Group)

The FB for the Group for 2017 is $199m, as reported in the Financial Statements. The FB for the Group for 2013 is $297m, as reported in the Financial Statements. The FB for the Group for 2008 is $133m, as reported in the Financial Statements. Earlier Financial Statements

could not be located. The fully franked dividends are as follows, for the years 2009 – 2017 respectively, and drawn from the Dividends Note to the Financial Statements:

$880m, $122m*0.6, 0, 0, 0, $1159*0.4, $931m*0.4, $1208m*0.4, and ($816m*0.4 + $646m*0.45).

For the 2000-2013 period, the total multiplied by 3/7 is $408m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $572m.

Compared to this, Frontier (2018b, Appendix) excludes the company on the grounds that it did not exist until 2008. This is not valid grounds for excluding the company, with data used from 2008.

For the 2000-2017 period, the figures are *DIST* = $1,238m and *TAX* = $1,304m.

Origin Energy (Group)

The FB for the Group for 2017 is zero, as reported in the Financial Statements. The FB for the Group for 2013 is zero, as reported in the Financial Statements. The FB for the Group for 2000 is zero, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$23m, $34m, $13m, $53m, $94m, $134m, $158, $201m, $554m, $439m, $442m, $538m, 546m, 0, 0, 0, and 0.

For the 2000-2013 period, the total multiplied by 3/7 is $1,384m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $1,384m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 10% less for unknown reasons.

For the 2000-2017 period, the figures are *DIST* = $1,384m and *TAX* = $1,384m.

Suncorp (Group)

The FB for the Group for 2017 is $456m, as reported in the Financial Statements. The FB for the Group for 2013 is $551m, as reported in the Financial Statements. The FB for the Group for 2000 is $70m, being the amount of retained profits that could be distributed as fully franked dividends of $136m (as reported in the Financial Statements) multiplied by 0.34/0.66. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$229m, $300m, $305m, $335m, $458m, $920m, $573m, $993m, $729m, $440m, $444m, $511m, $769m, $1088m, $1386m, $1025m, and $911m.

For the 2000-2013 period, the total multiplied by 3/7 is $3,002m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $3,483m.

Compared to this, Frontier's (2018b, Table 7) FB for 2000 is $136m, which is the retained profits that could be distributed as fully franked dividends rather than the FB. In addition, Frontier's *DIST* is about 15% less, and this is likely due to Frontier mistakenly omitting the dividends under the DRP (which are approximately 15% of the total).[9]

For the 2000-2017 period, the figures are *DIST* = $4,892m and *TAX* = $5,278m.

QBE (Group)

The FB for the Group for 2017 is $199m, as reported in the Financial Statements. The FB for the Group for 2013 is $272m, as reported in the Financial Statements (and I accept Frontier's correction on this point). The FB for the Group for 2000 is -$8m, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements (with the dividends for 2010 – 2013 reported in $US and converted at the average exchange rate over the year shown below as US$ per A$1 from the RBA):

$19m, $37m, $34m, $126m, $241m, $344m, $566m, $396m, $255m, US$217m (0.92), US$139m (1.03), US$146m (1.04), US$349m (0.97), $342m, $574m, ($288m*0.5 + $411m), and ($302m*0.3 + $453m*0.5).

[9] The data for Suncorp shown in Frontier (2018c, Table 7) is actually for QBE, and vice versa.

For the 2000-2013 period, the total multiplied by 3/7 is $1,238m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $1,518m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 30% smaller for unknown reasons.

For the 2000-2017 period, the figures are *DIST* = $2,004m and *TAX* = $2,211m.

Brambles (Group)

The FB for the Group for 2017 is US$57m, as reported in the Financial Statements, and converting at the balance date exchange rate of US0.77 per A$1 (from the RBA) yields $74m. The FB for the Group for 2013 is US$72m, as reported in the Financial Statements, and converting at the balance date exchange rate of US0.92 per A$1 (from the RBA) yields $78m. The FB for the Group for 2006 is US$139m, as reported in the Financial Statements, and converting at the balance date exchange rate of US0.74 per A$1 (from the RBA) yields $188m. Earlier Financial Statements could not be located. The fully franked dividends in $US are as follows, for the years 2007 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$356m, $66m, $34m, $65m, $75m, $80m, $128m, $118m, $108m, $90m, and $87m.

The exchange rates for the conversion (US$ per A$1) are the averages over each of the financial years (from the RBA):

0.79, 0.90, 0.75, 0.88, 0.99, 1.03, 1.03, 0.92, 0.84, 0.73, and 0.75.

For the 2000-2013 period, converting at these rates and adding up, the total multiplied by 3/7 is $1,261m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $1,252m.

Compared to this, Frontier (2018b, Table 7) uses the wrong FB figure for 2013 due to converting at the wrong exchange rate (the average rate over the year rather than the year end rate). In addition, Frontier's *DIST* is about 20% smaller, despite obtaining data back to 2000,

and is likely to be due to mistakenly omitting the dividends under the DRP (which are about 20% of the total).

For the 2000-2017 period, the figures are *DIST* = $2,021m and *TAX* = $1,907m.

Santos (Group)

The FB for the Group for 2017 is US$399m, as reported in the Financial Statements, and converting at the balance date exchange rate of US0.78 per A$1 (from the RBA) yields $511m. The FB for the Group for 2013 is $845m, as reported in the Financial Statements. The FB for the Group for 2000 is $360m, as reported in the Financial Statements. The fully franked dividends are as follows, for the years 2001 – 2017 respectively, drawn from the Dividends Note to the Financial Statements (with the dividends for 2016 reported in $US and converted at the average exchange rate over the year shown below as US$ per A$1 from the RBA):

$180m, $200m, $198m, $213m, $243m, $268m, $269m, $286m, $327m, $350m, $263m, $285m, $289m, $341m, $298m, US$66m (0.74), and 0.

For the 2000-2013 period, the total multiplied by 3/7 is $1,445m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $1,929m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 10% less, for unknown reasons.

For the 2000-2017 period, the figures are *DIST* = $1,756m and *TAX* = $1,908m.

AMP (Group)

The FB for the Group for 2017 is $275m, as reported in the Financial Statements. The FB for the Group for 2013 is $196m, as reported in the Financial Statements (Frontier's correction to my earlier work on this matter arose from the 2013 Statements not being available to me at the time leading to me using the 2012 figure). The FB for the Group for 2002 is $80m, as reported in the Financial Statements. Earlier Financial Statements could not be located. The fully franked dividends are as follows, for the years 2003 – 2017 respectively, drawn from the Dividends Note to the Financial Statements:

$51m, $322m, $392m, $556m, $685m, $765m, $412m, $351m, $315m, $399m, $475m, $710m*0.7, ($399m*0.8 + $414m*0.85), $828m*0.9, and $837m*0.9.

For the 2000-2013 period, the total multiplied by 3/7 is $2,024m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $2,140m.

Compared to this, Frontier's (2018b, Table 7) *DIST* is about 15% less, and likely to be due to mistakenly omitting the dividends under the DRP.

For the 2000-2017 period, the figures are *DIST* = $3,167m and *TAX* = $3,361m.

Amcor (Group)

The FB for the Group for 2016 is zero, as reported in the Financial Statements (the 2017 Statements could not be located). The FB for the Group for 2013 is zero, as reported in the Financial Statements. The FB for the Group for 2000 is not reported in the Financial Statements but is presumably zero because the 2001 dividends are not fully franked. The fully franked dividends are as follows, for the years 2001 – 2016 respectively, drawn from the Dividends Note to the Financial Statements:

$88m, $103m, $120m, $106m, $98m, $55m, $23m, 0, 0, 0, 0, 0, 0, 0, 0, and 0.

For the 2000-2013 period, the total multiplied by 3/7 is $254m (*DIST*). The *TAX* is then *DIST* plus the growth in FB, which is $254m.

This matches Frontier's (2018b, Table 7).

For the 2000-2017 period, the figures are *DIST* = $254m and *TAX* = $254m.

Aggregate

For the 2000-2013 period, aggregating over the values for *DIST* and *TAX* for these 20 companies, the results are $137,962m and $165,415m respectively, implying an aggregate distribution rate of 0.834.

For the 2000-2017 period, aggregating over the values for *DIST* and *TAX* for these 20 companies, the results are $216,344m and $244,677m respectively, implying an aggregate distribution rate of 0.884.

Considering the period from 2013-2017, *DIST* grew by $78,382m while *TAX* grew by $79,262m, yielding an aggregate distribution rate over this period of $78,382m/$79,262m = 0.99. Consequently, the distribution rate over the entire period from 2000 grew from 0.834 to 0.884. Furthermore, the higher distribution rate in the last four years is not skewed by the result for one firm; amongst the seven firms with the largest distributions (the four banks, BHP, Rio Tinto, and Telstra, which account for 81% of distributions over the entire period), the lowest distribution rate for the last four years is 0.86.

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