ATTACHMENT 15.1
THE 'UTILISATION' ESTIMATE OF GAMMA

ATCO 2020-24 PLAN

EIM # 97444633

PUBLIC

31 August 2018

The ‘utilisation’ estimate of gamma

REPORT PREPARED FOR ATCO GAS AUSTRALIA

August 2018

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1	**Executive summary**	**1**
1.1	Instructions	1
1.2	Key findings	1
1.3	Author of report	4
2	**Background and summary of ERA approach**	**5**
2.1	Context	5
2.2	Two approaches to estimating gamma under a utilisation rate interpretation	7
2.3	The ERA approach to estimating gamma	8
3	**The reliability of the ATO tax statistics**	**13**
3.1	Overview	13
3.2	Explanation of issues raised in relation to ATO tax statistics	13
3.3	Recent AER note in relation to ATO tax statistics	17
3.4	Recent meetings with ATO staff	18
3.5	Concerns with the ERA's approach to ATO tax statistics	19
3.6	Updated ATO estimate of gamma	20
4	**The reliability of the 20 companies approach to estimating the distribution rate**	**21**
4.1	Overview	21
4.2	The objective – what is the ERA seeking to estimate?	23
4.3	Do the 20 largest companies differ from the BEE in characteristics that are relevant to the distribution rate?	23
4.4	Distribution rate from comparator firms	26
4.5	Other problems with the 20-firms figures	27
5	**The reliability of the equity ownership estimates**	**29**
5.1	Equity ownership is an upper bound for the redemption rate	29
5.2	The Australian Bureau of Statistics has expressed concerns about the quality of equity ownership data	29
5.3	ERA assessment of the reliability of equity ownership estimates	30
5.4	Updated equity ownership estimates	30

Contents

6 The ERA's new interpretation of theta and implications for estimation 40

6.1 Market value or cash flow interpretation 40

6.2 Whose redemption rate is relevant? 41

7 The use of dividend drop-off analysis 43

8 Conclusions on the best 'utilisation' estimate of gamma 44

8.1 A process for working through the relevant issues 44

8.2 Weighing of strengths and weaknesses 46

9 Appendix: Estimation issues with the 20-firms approach 48

9.1 Overview 48

9.2 Issues with Franking Account Balance figures 49

9.3 Issues with dividend figures 53

9.4 Miscellaneous errors 55

1 Executive summary

1.1 Instructions

1 Frontier Economics has been retained by ATCO Gas Australia to comment on the various approaches that have been proposed to estimate the Gamma parameter within a 'utilisation' or 'cash flow' framework, whereby "the value of dividend imputation tax credits" is interpreted as the proportion of created credits that are able to be redeemed by shareholders.

1.2 Key findings

2 Our key conclusions in relation to the estimates of gamma adopted by the ERA in its recent decisions, and the approach laid out in the Draft Rate of Return Guideline, are set out below.

3 In its 2013 Rate of Return Guideline, the ERA defined gamma in terms of the market value of imputation credits (i.e., the amount investors would pay to purchase an imputation credit) and sought an estimate that was consistent with that definition. This approach was adopted because, under the regulatory model, the return to shareholders is reduced by the estimated "value" of imputation credits. If a credit is worth $X to shareholders, the allowed return can be reduced by $X.

4 More recently, the ERA has determined that its previous decisions in relation to gamma were estimating the wrong thing – that gamma is not the market value of credits but rather "the proportion of the tax paid at the company level [which] is really a withholding of personal tax."[1] This 'cash flow' or 'utilisation' interpretation of gamma seeks to determine how much of the corporate tax paid by the BEE will be returned to its shareholders via the redemption of imputation credits. In my view, this interpretation requires consistent estimation of the distribution rate and the utilisation rate. That is, some proportion of credits will be distributed to the BEE shareholders, who will then redeem some of those credits. The corporate tax allowance is then reduced by the amount of credits that are redeemed back by the BEE shareholders.

5 Under the 'cash flow' interpretation of gamma it would make little sense to take the proportion of credits distributed to the BEE shareholders and to pair that with the proportion of credits redeemed by some *other* group of shareholders.

[1] ERA, June 2016, DBP Final Decision, Paragraph 86.

6 The ERA's Draft Guideline concludes that listed equity represents the most suitable estimate of the BEE.[2] Consequently, it would follow that the 'cash flow' estimate of gamma would be based on the proportion of credits distributed to and redeemed by shareholders in listed firms. This would involve pairing the Lally 83% distribution rate[3] with the equity ownership estimate of 47% for listed equity, producing a gamma of 0.39.[4]

7 Alternatively, one may reach the conclusion that the BEE is better represented by all equity. For example, the Draft Guideline specifically notes that "some regulated businesses are unlisted."[5] In this case, the best estimate of gamma would be the direct estimate of 0.34 from tax statistics. This approach has the great benefit of not requiring any estimate of the contentious distribution rate because it can be computed directly from 'credits created' and 'credits redeemed.'

8 That is, under the cash flow approach, to gamma, one seeks to estimate how much of the corporate tax paid by the BEE will be returned to its shareholders via the redemption of imputation credits – so that the corporate tax allowance can be reduced by that amount. This requires a decision to be made about what group best represents the shareholders of the BEE, such that the proportion of tax redeemed by that group can be estimated in an internally consistent manner.

9 I also conclude that there are material concerns about some of the evidence that the ERA has relied upon:

a. In Section 4 of this report, I conclude that the 20-companies estimate of the distribution rate should not be used because:
    i. It is an unreliable estimate that should not be relied upon until the discrepancies identified in this report have been addressed;
    ii. It does not provide an estimate of the distribution rate for the BEE because the 20 firms differ materially from the BEE; and
    iii. It assumes that distributed credits immediately flow to shareholders, which is not the case.
b. In Section 0 of this report, I conclude that the equity ownership estimates should not be relied upon because:

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[2] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraphs, 852 – 854.

[3] If the ERA maintains confidence in that estimate in spite of the issues set out in Section 4 of this report. Alternatively a lower estimate could be adopted, as set out in Section 2.3.2.

[4] Or less, if a lower estimate of the distribution rate is used.

[5] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraphs, 875.

i. They do not allow for the 45-day rule, or any other reason why domestic investors do not redeem credits. Consequently, they are at best an upper bound;

ii. The source of the equity ownership estimates is data from the Australian Bureau of Statistics (ABS), which has expressed quality warnings about this data;

iii. The 2017 revision of the ABS estimates are unsettling for many reasons including:

1. The method for compiling the data has not changed. There is still the same reliance on survey responses, there is still the same mis-match between components of the data, and there are still the same problems with estimating the market value of equity for some sectors.

2. The historical estimates for some sectors have changed materially in the update. The fact that an historical number can be materially changed almost 20 years after the event is clearly troubling.

3. The revision to the estimates is based on a 'backcasting' exercise whereby estimated splits between domestic and foreign equity from recent data is 'backcasted' to the historical data, replacing the estimates that were made at the time the historical data was collected.

4. The revised estimates result in very little volatility in the estimates for listed equity and more volatility in the estimates for all equity, when the reverse would be expected ex ante.

5. The plausible impact of the GFC that was evident in the 2014 data has now been removed in the 2017 revision. That is the GFC impact has now been removed from the historical record.

c. In Section 6 of this report I explain that dividend drop-off analyses estimate the market value of credits. If gamma is no longer interpreted as the market value of credits, then estimates of the market value of credits would not be relevant.

1.3 Author of report

10 This report has been authored by Professor Stephen Gray, Professor of Finance at the UQ Business School, University of Queensland and Director of Frontier Economics, a specialist economics and corporate finance consultancy. I have Honours degrees in Commerce and Law from the University of Queensland and a PhD in Financial Economics from Stanford University. I teach graduate level courses with a focus on cost of capital issues, I have published widely in high-level academic journals, and I have more than 20 years' experience advising regulators, government agencies and regulated businesses on cost of capital issues. I have published a number of papers that specifically address beta estimation issues. A copy of my curriculum vitae is attached as an appendix to this report.

11 My opinions set out in this report are based on the specialist knowledge acquired from my training and experience set out above. I have been provided with a copy of the Federal Court's Expert Evidence Practice Note GPN-EXPT, which comprises the guidelines for expert witnesses in the Federal Court of Australia. I have read, understood and complied with the Practice Note and the Harmonised Expert Witness Code of Conduct that is attached to it and agree to be bound by them.

2 Background and summary of ERA approach

2.1 Context

12 I begin by noting that there is broad agreement between the ERA and all experts that gamma (γ) should be estimated as the product of two parameters:

a. The distribution rate (F), which represents the proportion of imputation credits created that are attached to dividends and distributed to shareholders; and

b. A second parameter, theta (θ), which is variously defined as "the value of distributed imputation credits" or as "the utilisation rate."

13 Most of the regulatory debate centres on the appropriate method for estimating theta and, in particular, whether theta should be interpreted as:

a. *The market value of imputation tax credits*. This is an estimate of the amount shareholders would be prepared to pay to purchase a credit. If this interpretation is adopted, estimation methods that are designed to estimate the market value from the market prices of traded securities should be adopted to estimate theta; or

b. *A utilisation rate*.[6] This is an estimate of the proportion of corporate tax paid that is returned to the shareholders via the redemption of credits. If this interpretation is adopted, estimation methods that are designed to estimate the proportion of credits that are redeemed should be adopted to estimate theta.

14 Whereas the market value approach seeks to estimate the amount that investors would be prepared to pay to purchase an imputation credit, the 'utilisation' or 'cash flow' approach seeks to estimate the proportion of credits that will be utilised or redeemed.

15 The AER developed the 'utilisation/cash flow' approach to gamma in its 2013 Guideline materials, stating that:

> We propose that the value of imputation credits within the building block revenue framework is an estimate of the expected proportion of company tax which is returned to investors through utilisation of imputation credits.[7]

16 In the AER's recent concurrent evidence sessions, the experts agreed that the AER's approach to gamma is not consistent with any equilibrium asset pricing

[6] Or 'redemption proportion.'

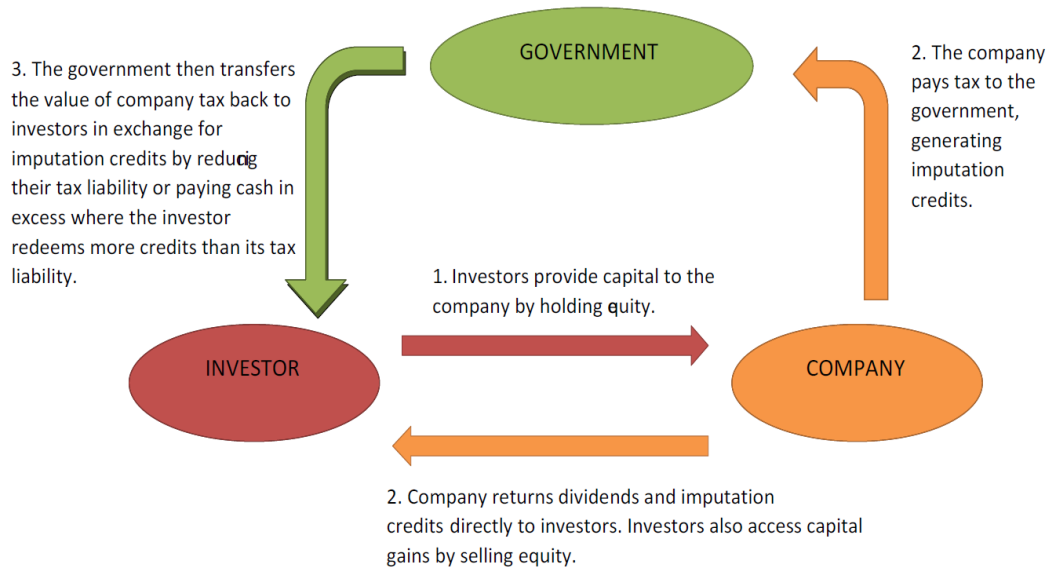
[7] AER, December 2013, Rate of Return Guideline: Explanatory Statement, *Accounting and Finance* 52(1), p. 158.

model.[8] Consequently, there is no model or theory to guide the estimation. Rather, gamma is simply defined to be the proportion of company tax which is returned to investors through the utilisation of imputation credits.

17 Under the AER's definition of gamma, which the ERA now follows, what is relevant is the proportion of company tax paid by the BEE that will be redeemed against the personal tax obligations of its shareholders. The AER documents this 'cash flow' interpretation of gamma in the 2013 Guideline, as shown in Figure 1 below. The AER demonstrates that it is the ability of shareholders in the BEE to redeem credits that underpins its cash flow definition of gamma. In particular, the figure shows that what is relevant is the utilisation of credits by the same investor that provides capital to the regulated firm.

Figure 1: AER 'cash flow' interpretation of gamma

Figure H.1 How imputation credits become a return to investors



Source: AER, December 2013, Rate of Return Guideline, Explanatory Statement Appendices, Figure H.1, p. 143.

18 In a number of reports on gamma that have been submitted to the ERA, I explain why I consider that, within the ERA's regulatory framework, gamma should be interpreted as a market value concept, and I continue to hold to this view.

19 The ERA also adopted the market value approach to gamma in its 2013 Rate of Return Guideline, but has since departed from that approach and now adopts a 'utilisation' or 'cash flow' interpretation of gamma, falling in line with the AER on this point.

[8] Joint Experts' Report, Proposition 7.02, pp. 69-70.

20 In this report I have been asked to conduct all of our analysis within the 'utilisation' or 'cash flow' framework, where gamma is interpreted as the proportion of created credits that are available to be redeemed by the relevant shareholders.

2.2 Two approaches to estimating gamma under a utilisation rate interpretation

21 In the regulatory context, two alternative approaches have been developed for the purposes of estimating gamma under a utilisation rate interpretation:

a. *The ATO tax statistics approach.* This approach uses aggregate tax statistics data published by the ATO to calculate gamma directly as the proportion of created credits that are actually redeemed by investors in Australia. Under this approach, gamma is estimated directly as the ratio of total credits redeemed to total credits created, where each component is obtained from official ATO taxation statistics. Under this approach, the 'utilisation' gamma is estimated as:

$$\gamma = \frac{Credits\ redeemed}{Credits\ created}.$$

b. *The equity ownership approach.* Recognising that only some investors in Australia are eligible to redeem imputation tax credits, the equity ownership approach estimates theta as the proportion of domestic investors in the Australian equity market. This requires the additional assumptions that:

   i. Domestic and foreign investors hold identical portfolios of Australian stocks; and

   ii. Every credit distributed to a domestic investor will be redeemed by that investor. Thus, the 45-day Rule, and every other reason why a domestic investor may not redeem credits, is assumed to be irrelevant.

   The equity ownership estimate of theta must then be multiplied by an estimate of the distribution rate to obtain an estimate of gamma. Thus, under this approach it is necessary to construct separate estimates of two parameters from two different data sources and to then multiply them together:

$$\gamma = F \times \theta = \frac{Credits\ redeemed}{Credits\ distributed} \times \frac{Credits\ distributed}{Credits\ created}.$$

2.3 The ERA approach to estimating gamma

2.3.1 The ERA's approach prior to the 2018 Draft Guideline

22 In its recent decisions, the ERA has settled on an estimate of gamma by applying different weights to various sources of data, as summarised in Table 1 below.

Table 1: Summary of ERA data sources used to estimate a 'utilisation' gamma

Data sample	Distribution rate (*F*)	Utilisation rate (theta)	Weight
All equity	Maximum of range from ATO tax statistics.	Current equity ownership proportion for all equity.	"Primary reliance."
	Direct estimate of gamma from ATO tax statistics. No need to separately estimate two parameters.		"Not much weight."
Listed equity only	Primary reliance on estimates for largest 20 companies.	Current equity ownership proportion for listed equity.	"Primary reliance."
	Primary reliance on estimates for largest 20 companies.	Range of dividend drop-off analyses.	"Limited weight."

Source: ERA, 2016, DBP Final Decision, Appendix 5, Table 2, p. 46.

2.3.2 The ERA estimates of the distribution rate

ATO tax statistics – the all equity distribution rate

23 In the first row of Table 1, the ERA estimates a distribution rate for all equity from tax statistics published by the Australian Taxation Office (ATO). The distribution rate is estimated as the ratio of two items:

$$F = \frac{Credits\ distributed}{Credits\ created}.$$

24 Whereas there is a single known figure for 'credits created' (that being equal to total corporate tax paid), the figure for 'credits distributed' must be reverse engineered using one of two approaches:

a. The 'franking account balance' (FAB) approach estimates 'credits distributed' from information about the increase in aggregate franking account balances over the relevant period; and

b. The 'dividend' approach estimates 'credits distributed' from information about corporate dividends paid over the relevant period.

25 The two approaches produce different estimates of the distribution rate – approximately 70% for the FAB method and approximately 50% from the dividend method. The reason for the difference is because the reverse engineering of 'credits distributed' from the ATO data is a difficult task that requires a set of assumptions about how credits might flow through the system as they are distributed between trusts, corporate structures, and superannuation and managed funds.[9]

26 The ERA notes that the ATO data establishes a range for the distribution rate of 50% to 70%,[10] and then concludes that the upper bound of 70% is sufficiently reliable to be adopted as its estimate of the distribution rate, stating that:

> …it is generally accepted that the cumulative distribution rate provides a reasonable estimate,[11]

and that:

> On this basis, the Authority considers it reasonable to conclude that the ATO FAB data supports an estimate for the distribution rate across all equity, listed and unlisted, of around 0.7.[12]

27 In the second row of Table 1, no estimate of the distribution rate is required at all. This is because the second approach estimates gamma directly as:

$$\gamma = \frac{Credits\ redeemed}{Credits\ created}.$$

28 This is because 'credits distributed' cancels out as that figure is obtained from the same ATO data in both places it appears in the equation below:

$$\gamma = F \times \theta$$
$$= \frac{Credits\ redeemed}{Credits\ distributed} \times \frac{Credits\ distributed}{Credits\ created} = \frac{Credits\ redeemed}{Credits\ created}.$$

29 Thus, a 'utilisation' gamma can be estimated directly from information about 'credits created' (which is equal to total corporate tax paid) and 'credits redeemed' by shareholders. The ATO obviously has reliable data about the amount of corporate tax paid to them and about the amount of imputation credits redeemed from them, and a direct estimate of gamma is produced by the ratio of those two terms.

[9] Hathaway, N., 2013, "Franking credit redemption ATO data 1988 to 2011," Capital Research, September.

[10] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Paragraph 188.

[11] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Paragraph 189.

[12] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Paragraph 190.

20 largest companies – the listed equity distribution rate

30 The ERA adopts an estimate of 80% for the distribution rate in relation to listed equity.[13] This figure is informed by a range of estimates that vary according to the weight applied to the 20 largest listed companies:[14]

a. The estimate for listed companies *excluding* the 20 largest companies is 70%;

b. The estimate based on *only* the largest 20 listed companies is 83%; and

c. Estimates that give some weight to the largest 20 listed companies range between these two figures.

31 The 80% figure adopted by the ERA is close to the top of the relevant range, indicating that material weight has been applied to the largest 20 companies.

32 This figure is used in the third and fourth rows of Table 1 above.

2.3.3 The ERA estimates of the utilisation rate or theta

Equity ownership estimates

33 The 'equity ownership' estimate of theta is constructed as the proportion of domestic equity that is owned by domestic investors. This requires the additional assumptions that:

a. Domestic and foreign investors hold identical portfolios of Australian stocks; and

b. Every credit distributed to a domestic investor will be redeemed by that investor. Thus, the 45-day Rule, and every other reason why a domestic investor may not redeem credits, is assumed to be irrelevant.

34 Under a 'utilisation' or 'cash flow' interpretation of gamma, the value that investors ascribe to any credits they might redeem is irrelevant – the proportion that are redeemed is all that is required.

35 The ERA's estimate of the domestic ownership proportion of all equity is 59%. This figure is used in the first row of Table 1.

36 The ERA's estimate of the domestic ownership proportion of listed equity is 47%. This figure is used in the third row of Table 1.

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[13] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Paragraph 195.

[14] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Table 1, p. 44.

Dividend drop-off estimates

37 The ERA also considers dividend drop-off estimates of theta. This approach uses stock market data to estimate the market value of imputation credits – the extent to which investors capitalise the value they ascribe to credits in the stock price.

38 As I explain below, this estimate would appear to be irrelevant to the estimation of gamma under a utilisation interpretation. The 'utilisation' or 'cash flow' gamma represents the proportion of credits that are redeemed and is entirely independent of the value that investors ascribe to those credits. There is no role at all for 'value' in a 'utilisation' estimate of gamma.

39 Nevertheless, in its recent decisions the ERA considers a range of dividend drop-off analyses and concludes that the evidence supports a range of 0.35 to 0.69 for the value of credits – that is, that investors value credits that are distributed to them at 35 to 69 cents in the dollar. The ERA then curiously uses this estimate of the market value of credits as an estimate of the proportion of credits that are redeemed in the fourth row of Table 1.

2.3.4 The ERA's recent estimates of gamma

40 The ERA's recent estimates of gamma are summarised in Table 2 below.

Table 2: Summary of ERA estimates of gamma

Data sample	Method	Distribution rate (*F*)	Utilisation rate (theta)	Gamma
All equity	Equity ownership	0.7	0.59	0.41
	ATO tax statistics	Direct estimate of gamma		0.34
Listed equity only	Equity ownership	0.8	0.47	0.38
	Dividend drop-off	0.8	0.35 to 0.69	0.28 to 0.55

Source: ERA, 2016, DBP Final Decision, Appendix 5, Table 2, p. 46.

41 The ERA then concludes that:

> …the Authority places most reliance on the equity share ownership approach. It suggests a point estimate for gamma of 0.4.[15]

[15] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Paragraph 211.

2.3.5 The ERA's approach in the 2018 Draft Guideline

42 In its Draft Guideline, the ERA proposes to estimate gamma as follows:

a. The distribution rate is set to 83%, based on the Lally 20 firms approach; and

b. The utilisation rate is set to 60%, based on the equity ownership estimate for all equity (including unlisted equity); such that

c. The product of these two estimates produces a gamma of 0.5.

43 The changes from the ERA's current approach to gamma are:

a. The ERA now disregards all evidence from the official tax statistics published by the Australian Taxation Office;

b. When estimating the distribution rate, the ERA now disregards all evidence from all but 20 firms;

c. The ERA now disregards the equity ownership evidence for listed firms;

d. The ERA now disregards dividend drop-off evidence; and

e. The ERA no longer pairs distribution rate and utilisation rate estimates for the same class of firms (i.e., taking both from listed equity or both from all equity).

44 Relative to its current approach, the ERA's proposed approach is to take:

a. The highest of all available estimates of the distribution rate (estimated with reference to 20 listed firms); and

b. The highest of all available estimates of the utilisation rate (estimated with reference to all listed and unlisted firms).

3 The reliability of the ATO tax statistics

3.1 Overview

45 In its recent decisions, the ERA has concluded that ATO tax statistics can be used to provide a reliable estimate of the distribution rate (as set out above), but cannot be used to produce a reliable estimate of gamma.

46 For example, the ERA has recently stated that:

> …the Authority does not place much weight on the [ATO gamma] estimate, or on its ability to inform a point estimate of the utilisation rate, given concerns about the robustness of the taxation data used for estimating the utilisation rate.[16]

47 This is a curious position to take given that the only item about which any questions have been raised affects the distribution rate but *not* the estimate of gamma. Questions have only been raised about how the ATO data might be used to estimate the quantum of credits distributed within a given year; there are no questions about the ATO's records of the amount of corporate tax paid or about the amount of credits that are redeemed from the ATO. The distribution rate requires an estimate of credits distributed:

$$F = \frac{Credits\ distributed}{Credits\ created},$$

whereas, as explained below, gamma does not:

$$\gamma = \frac{Credits\ redeemed}{Credits\ created}.$$

48 In its Draft Guideline, the ERA now concludes that the ATO tax statistics should be disregarded entirely due to concerns about the reliability of the 'credits distributed' estimate – even though that figure that is not needed to estimate gamma.[17]

3.2 Explanation of issues raised in relation to ATO tax statistics

49 The potential concerns with the ATO data were first identified by Hathaway (2013),[18] however they relate to a data item that is not needed for the 'utilisation'

[16] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Paragraph 212.

[17] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, pp. 159-161.

[18] Hathaway, N., 2013, "Franking credit redemption ATO data 1988 to 2011," Capital Research, September.

estimate of gamma. Rather, gamma is directly estimated from data items that are not subject to any concerns at all.

50 The issue is as follows:

a. Each year a certain amount of credits are *created*, some of those are *distributed* to shareholders, and some of those distributed credits are *redeemed* by shareholders.

b. The ATO provides data on the quantum of credits that are *created* each year and on the quantum of credits that are *redeemed* each year. There is no material concern about either of these items. These are the only two items that are needed to estimate gamma.

c. The ATO does not provide direct data on the number of credits that are *distributed* each year – so that quantity has to be derived. Two approaches have been proposed:

   i. The franking account balance (FAB) approach – whereby the amount of distributed credits is derived as the sum of all credits created less those that are retained by firms as reported in the firms' franking account balances;[19] and

   ii. The dividend approach – whereby the amount of distributed credits is estimated by tracking dividend payments and making assumptions about the flow of dividends between companies, trusts and life offices.

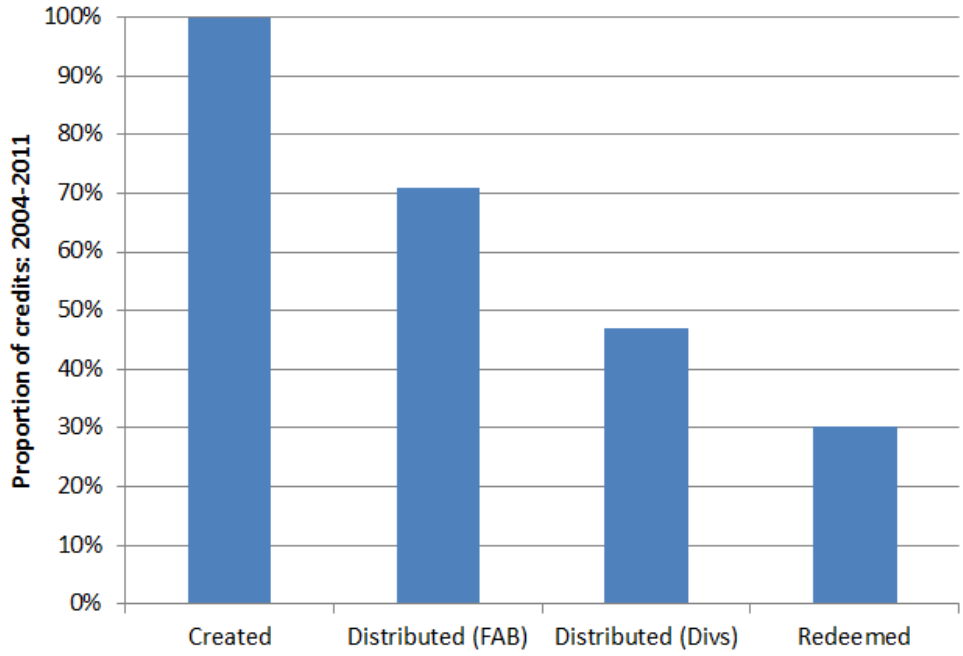
d. The FAB and dividend approaches produce different estimates of the amount of credits that are *distributed* each year.

51 The difference between the FAB and dividend estimates of the amount of credits distributed was first identified by Hathaway (2013).[20] His estimates are summarised in Figure 2 below.

[19] A firm's 'franking account balance' is a record of the face amount of imputation credits the firm has available for distribution.

[20] Hathaway, N., 2013, "Franking credit redemption ATO data 1988 to 2011," Capital Research, September.

Figure 2: Summary of ATO tax statistics



Source: Hathaway (2013), p. 9.

52 Figure 2 shows that the FAB method indicates that 71% of created credits are distributed, whereas the dividend method produces a distribution rate of 47%.

53 Under the "utilisation" interpretation of gamma, the ATO tax statistics can be used to estimate gamma as follows:

$$\gamma = F \times \theta = \frac{\text{Credits Distributed}}{\text{Credits Created}} \times \frac{\text{Credits Redeemed}}{\text{Credits Distributed}}.$$

54 Note that the amount of credits distributed cancels out, so we are left with:

$$\gamma = \frac{\text{Credits Redeemed}}{\text{Credits Created}}.$$

55 In this case, there is no issue with the measurement of either term, so no reason to consider the estimate to be unreliable. Hathaway (2013) recognises this point and reports that the proportion of credits redeemed to credits created is 30%.[21] He notes that Credits Redeemed is $127.6 billion and that Company Tax Paid is $421.5 billion, producing a ratio of 30%. He concludes that:

> This overall approach is reasonable as the tax statistics are unlikely to be in major error for amounts of tax paid and the amounts of tax credits claimed.[22]

[21] Hathaway (2013), Paragraph 99.

[22] Hathaway (2013), Paragraph 100.

56 Moreover, it is clear from Figure 2 above that the same outcome would be obtained whether one adopted the FAB approach:

$$\gamma = F \times \theta = \frac{\text{Credits Distributed}}{\text{Credits Created}} \times \frac{\text{Credits Redeemed}}{\text{Credits Distributed}} = \frac{71}{100} \times \frac{30}{71} = 0.30$$

or whether one adopted the dividend approach:

$$\gamma = F \times \theta = \frac{\text{Credits Distributed}}{\text{Credits Created}} \times \frac{\text{Credits Redeemed}}{\text{Credits Distributed}} = \frac{47}{100} \times \frac{30}{47} = 0.30 .$$

57 In an update to his 2013 report, Hathaway (2014)[23] is very clear about the fact that any uncertainty about the quantum of credits distributed is irrelevant to the estimation of gamma – because it is not needed. Hathaway notes that gamma can be directly estimated as the ratio of credits redeemed to credits created:

> From a net tax payment of $486 billion, the net utilisation of $148 billion represents an overall Australian average *gamma* of 31%.[24]

58 Hathaway (2014) concludes that:

> This overall approach is robust as the tax statistics are unlikely to be in major error for amounts of tax paid and the amounts of franking credits claimed. This approach does not allow us to obtain any estimates for the two factors that comprise gamma but it does give us a solid estimate of gamma.[25]

59 The fact that it is generally accepted that there are two different estimates of the amount of credits distributed does not mean that the ATO data should be abandoned entirely. The 31% figure does not require any estimate of the amount of credits distributed. It is a ratio of redeemed credits to created credits, and there has been no question raised about the reliability of either of these quantities.

60 Whereas the ATO has no direct reason to monitor the number of "Credits Distributed" in a given year, it would be extraordinary to suggest that either:

a. The ATO does not know how much corporate tax was paid to them in a given year, this being the "Credits Created" figure; or that

b. The ATO does not know how many credits were redeemed from them in a given year, this being the "Credits Redeemed" figure.

61 In a more recent report, Hathaway (2017)[26] has been even more explicit, stating that:

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[23] Hathaway, N., 2014, "Franking credit redemption ATO data 1988 to 2012," Capital Research, October.

[24] Hathaway (2014), p. 46. Note that the effect of including an additional year of data into the analysis increased the estimate of gamma from 0.30 to 0.31.

[25] Hathaway (2014), p. 46.

[26] Hathaway, N., 2017, Letter to Energy Networks Australia, December.

> The Company Tax item is the total company tax collected by the ATO during the relevant period and the Credits Redeemed item is the total amount of credits redeemed via the filing of personal tax returns. These two data items are 100% reliable as they are figures that relate directly to ATO tax collections. There is no reason to question the ATO's records of the amount of corporate and personal tax it has collected.[27]

62 Hathaway (2017) goes on to conclude that the ATO tax statistics can "clearly"[28] be used to provide a reliable utilisation estimate of gamma.

63 The 31% figure is relevant evidence that is unaffected by any concerns about the estimate of the quantum of distributed credits.

64 In my view, the ATO tax statistics approach produces a direct estimate of the proportion of created credits that are redeemed by shareholders. This is directly relevant evidence that should receive predominant, or at least some, weight when constructing a utilisation estimate of gamma.

3.3 Recent AER note in relation to ATO tax statistics

65 The AER has recently published a note summarising some discussions that the AER has had with ATO staff in relation to the reliability of ATO tax statistics.[29] This note raises a number of points, all but one of which relate to explanations for why the 'FAB' and 'dividend' methods provide different estimates for 'Credits Distributed.' That is, they relate to the one element of the tax statistics that is not needed to estimate gamma. These points simply confirm that the reason it is difficult to estimate 'Credits Distributed' from the ATO data is that the ATO has no need for that item. 'Credits Distributed' is an "informational" field that is not needed for any tax calculation. In this respect, the AER's note adds no new information – we already knew that:

a. There are issues with estimating the distribution rate from ATO data – the estimate can only be narrowed down to a range of 50 to 70%; and

b. The distribution rate is not needed to estimate gamma from the ATO data.

66 The only item in the AER's note that *could* affect the estimation of gamma is Point 4 in that note, which notes that the estimate of gamma could be affected by non-resident companies paying tax in Australia which do not generate franking credits. However, this effect is stated to be "small." Common sense provides an

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[27] Hathaway (2017), p. 1.

[28] Hathaway (2017), p. 2.

[29] https://www.aer.gov.au/system/files/AER%20-%20Staff%20note%20on%20tax%20data%20-%20March%202018.pdf.

explanation why the effect would be small – any non-resident company paying a material amount of company tax in Australia could simply establish a domestic subsidiary, pay the same amount of tax, but obtain the benefits of imputation credits. In subsequent work (see below), this issue has been found to be immaterial.

3.4 Recent meetings with ATO staff

67 In its Draft Guideline, the ERA notes that the conclusion of the ATO note commissioned by the AER was that:

> The ATO would not recommend using taxation statistics data as the basis for a detailed macro analysis of Australia's imputation system.[30]

68 The AER arranged a meeting on 21 June 2018, which I attended, to provide an opportunity for ATO staff to explain what the above quote means. In that meeting, ATO staff explained that their concerns related primarily to the problems with the FAB data. It has now been generally agreed that the FAB data should not be used and that the dividend data should be used to estimate 'credits distributed.' That is, there is agreement that the problematic FAB data should not be used for any purpose.

69 The ATO note also identifies that the question they were asked to address relates specifically to the franking account balance:

> The AER has sought input from the ATO regarding the use of Taxation Statistics data **to reconstruct the franking account balance**.[31]

and the ATO is clear in its answer to this question:

> It would be difficult to use this data to **reconstruct franking accounts**.[32]

70 Having reached agreement that the FAB data should not be used, the relevant question is simply whether the ATO has reliable data on:

a. Credits created, by the payment of corporate tax to the ATO; and

b. Credits redeemed from the ATO by shareholders,

as these are the only two quantities required to estimate gamma.

71 No question has been raised in relation to the data on 'credits redeemed' from the ATO. The only questions that have been raised in relation to 'credits created' by the payment of corporate tax to the ATO are:

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[30] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraph 848.

[31] ATO note of 9 May 2018, p.1, emphasis added.

[32] ATO note of 9 May 2018, p.1, emphasis added.

a. Some foreign companies pay corporate tax in Australia which does not give rise to the creation of credits; and

b. The ATO data relates to tax payable rather than tax paid, so would be overstated to the extent that companies default on their tax obligations.

72 Hathaway (2018) has investigated both of these issues and concludes that they are both immaterial.

73 In relation to foreign companies, Hathaway (2018) concludes that:

> Not only does the data for non-residents 'appear to be small at first glance' [as acknowledged by the AER] but it *is* small and not material…the effect of the non-resident data only changes the second decimal place of the gamma estimate. It is clearly not material in the overall scheme of gamma estimates.[33]

74 In relation to the difference between tax payable and tax paid, Hathaway (2018) notes that the vast majority (85%) of company tax is collected progressively throughout the year. Thus, even if 5% of the remaining tax payable was never recovered (which is an implausibly high figure for defaults on tax obligations) this would mean that tax payable and tax paid differed by only 0.75%, which has no material impact on the estimate of gamma.

3.5 Concerns with the ERA's approach to ATO tax statistics

75 In my view, there are a number of material concerns with the approach to ATO tax statistics in the ERA's Draft Guideline:

a. The Draft Guideline relies materially on the analysis of Hathaway (2013), but ignores the updated analysis of Hathaway (2017) and Hathaway (2018);

b. The Draft Guideline quotes from the ATO note of 9 May 2018, but does not recognise that the ATO was asked to address questions about franking account balances, which data is not required to estimate gamma;

c. The Draft Guideline does not recognise that the ATO data on 'credits created' and 'credits redeemed,' which is all that is needed to estimate gamma, is reliable and that neither of these quantities requires any FAB data at all; and

[33] Hathaway (2018), p. 5. Available at https://www.aer.gov.au/system/files/ENA%20-%20Capital%20Research%20Memorandum%20-%2028%20June%202018.pdf.

d. The current evidence demonstrates that the 'dividend' approach produces a reliable estimate of the distribution rate, but that there are problems with the FAB data reported to the ATO such that it should not be used. That is, there is a reliable approach and an unreliable approach that each produce different estimates. The conclusion that this undermines the credibility of both figures, and the implication that it also undermines *all* data produced by the ATO is unfounded.

3.6 Updated ATO estimate of gamma

76 The most recent estimate of gamma using the ATO data is 0.34. This estimate is constructed by taking the ratio of total credits redeemed to total credits created from 2004 to 2015 – the latest data available from the ATO.

4 The reliability of the 20 companies approach to estimating the distribution rate

4.1 Overview

Problems with FAB data

77 The ERA's Draft Guideline proposes to place 100% reliance on the Lally 20-firms estimate of the distribution rate. The Lally estimates are derived from franking account balances – a comparison of the change in FABs over a period to dividends paid over the corresponding period. Thus, the problems for individual firms that have been identified in the ATO FAB data also apply to the Lally FAB estimates.

78 For example, the ATO states that:

> It would be difficult to use this data to reconstruct franking accounts due to the dynamic nature of the tax system as it impacts on business.[34]

79 One example provided by the ATO is:

> Churn within consolidation groups.[35]

80 That is, some credits are extinguished within corporate structures without being distributed to shareholders. For example, BHP Ltd has distributed over $1 billion of imputation credits to BHP Plc under its 'dividend equalisation scheme.' Although these credits have been removed from the FAB, they have not been distributed to shareholders, so the FAB-based estimate of the distribution rate is overstated.

81 Similarly, as noted below, a number of firms have received large tax refunds that materially decrease their FAB. Under the Lally approach, these reductions are incorrectly treated as distributions to shareholders. Again, the result is an overstatement of the distribution rate.

82 It is difficult to reconcile the ERA's rejection of the ATO data (largely on the basis of problems with FAB data, although that FAB data is not needed for any purpose) with its 100% reliance on the Lally 20 firms approach (which relies directly on FAB data).

The benchmark efficient entity

83 As explained above, the ERA's estimate of the distribution rate for listed equity relies principally on data for the 20 largest Australian firms. Since the objective is

[34] ATO Note, p. 1.

[35] ATO Note, p. 1.

to estimate the distribution rate for the benchmark efficient entity (BEE), the 20-companies estimate will only be appropriate if the 20 companies are similar to the BEE in relevant respects.

84 In its 2018 Draft Rate of Return Guideline, the ERA has defined the BEE to be:

> An efficient 'pure-play' gas network business operating within Australia without parental ownership, with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.[36]

85 Importantly, the BEE is defined to operate "within Australia." However, the 20 largest Australian companies have material foreign income, which can be used to distribute credits to shareholders. Since the BEE has zero foreign income, by definition, it is materially different to the sample of the 20 largest firms in relation to a characteristic that is of primary importance to determining the distribution rate.[37] Consequently, the 20 firms approach does not produce an estimate of the distribution rate for the BEE. In this regard, Dr Lally (the proponent of the 20 firms approach) has recently recommended that firms with substantial foreign income are not representative of the BEE and should not be used for that purpose.[38]

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[36] ERA, 2018, Draft Rate of Return Guideline, Paragraph 67.

[37] I note that the 2017 DBP Final Decision (paragraphs 180-183) contains a discussion about a related, but quite separate point stemming from the report *Estimating gamma: Response to the ATCO Gas Draft Decision,* 23 December 2014. An appendix to that report noted that the QCA was the only regulator to have regard to the approach of estimating the distribution rate from a small sample of large listed firms. It also noted that the small sample approach estimates distributed credits as a proportion of Australian corporate tax paid, whereas the QCA had explicitly defined the distribution rate in terms of the proportion of total corporate tax paid. The point is that Australian corporate tax is equal to total corporate tax for the benchmark efficient entity (which has no foreign income, by definition), but not for the large multinational firms that were being used. The DBP Final Decision (Paragraph 182) seems to imply that the submission advocated for the distribution rate to be computed relative to total corporate tax paid. That is not the case. The purpose of that appendix was to demonstrate that Australian corporate tax is equal to total corporate tax for the BEE but not for large multinational firms and, consequently, that large multinational firms are not suitable comparators for estimating the distribution rate for the BEE.

[38] See the joint report of experts from the AER's concurrent evidence sessions at p. 76, available at: https://www.aer.gov.au/system/files/AER%20-%20Evidence%20Session%201%20%26%202%20-%20Expert%20Joint%20Report%20-%2021%20April%202018.pdf.

4.2 The objective – what is the ERA seeking to estimate?

86 There appears to be broad agreement among regulators and consultants that the distribution rate is a firm specific parameter. This implies that the relevant task is to estimate an appropriate distribution rate for the BEE.

87 For example, the AER notes that:

> …the distribution rate is a firm specific parameter.[39]

88 The AER also notes that there is broad agreement that when estimating the distribution rate, we are seeking an estimate of the proportion of credits that would be distributed by the benchmark efficient entity:

> There appears to be agreement between the service providers, SFG and us that the distribution rate is the proportion of imputation credits generated by the benchmark efficient entity that is distributed to investors.[40]

89 Dr Lally, the consultant used by a number of regulators, has also advised that the objective is to estimate the distribution rate for the benchmark regulated firm:

> …within the Officer (1994) model, the distribution rate is a firm specific parameter rather than a market average parameter.[41]

90 In its recent decisions, and in its Draft Guideline, the ERA has also stated that:

> …the distribution rate is the proportion of a firm's imputation credits that are distributed, and therefore is a firm-specific parameter.[42] [43]

4.3 Do the 20 largest companies differ from the BEE in characteristics that are relevant to the distribution rate?

91 There are two corporate characteristics that determine the firm's imputation credit distribution rate:

a. The dividend payout rate: Because credits can only be distributed by attaching them to dividends, a higher dividend payout rate will result in a higher credit distribution rate, other things being equal.

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[39] AER, 2017, TransGrid Final Decision, Attachment 4, p. 20.

[40] TransGrid Final Decision, Attachment 4, p. 65.

[41] Lally (2013 AER), p. 41.

[42] ERA, 2016, DBP Final Decision, Appendix 5 – Gamma, Paragraph 170.

[43] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraph 835.

b. Foreign profits: Because credits can be attached to dividends that are paid out of foreign profits, a higher proportion of foreign profits will result in a higher credit distribution rate, other things being equal.

92 To see why the point in (b) above arises, consider two firms, both of which generate taxable income of $100, pay $30 of corporate tax, and pay a dividend of $50 out of after-tax profits. If Company A operates solely within Australia, its tax will be paid entirely within Australia and it will therefore create $30 of credits.[44] Since credits can only be distributed by attaching them to dividends in the ratio of 3/7,[45] the total amount of credits that can be distributed is $\frac{3}{7} \times 50 = 21.43$. Thus, the distribution rate for Company A is $\frac{21.43}{30} = 71\%$.

93 Now suppose that Company B operates in Australia and overseas. Suppose this company generates taxable income of $50 and pays $15 corporate tax in Australia and the same overseas. Also suppose that it pays a dividend of $50 – so it is identical to Company A except that half of the profit and half of the corporate tax is outside Australia. Because Company B pays a dividend of $50, it is able to attach credits of $21.43.[46] However, Company B only has $15 of credits because it has only paid $15 of corporate tax in Australia. Therefore all of the credits will be attached to the dividend and the distribution rate will be 100%.

94 Thus, firms that differ materially from the BEE in terms of either of these two characteristics (dividend payout rate, or availability of foreign profits) will be inappropriate for the purpose of estimating the credit distribution rate.

95 The 20 largest Australian companies have (on average) material foreign profits. These companies tend to be very large multinational corporations that earn a substantial proportion of their revenues offshore.

96 I have computed the proportion of revenue generated in Australia for each of the 20 companies in the Lally sample. To do this I have obtained data from the Bloomberg FINANCIAL ANALYSIS tool under the SEGMENT-GEOGRAPHIC tab. For each of the 20 companies, I have computed the average proportion of Australian revenues over the last five years.[47] The average proportion across the 20 companies is approximately 59% Australian revenue and 41% foreign revenue. By contrast, the benchmark efficient entity has 100% domestic revenue, by definition. To the extent that these 20 companies are able

[44] Since credits are created by the payment of corporate tax within Australia.

[45] Dividend imputation legislation provides that credits are attached to dividends in the ratio of T/(1-T), where T represents the corporate tax rate – currently 30%.

[46] Note that *every* dividend can have credits attached to it, regardless of the source of the dividend.

[47] Some companies do not report Australian revenues exclusively, but a combination of Australian and New Zealand revenue. In such cases, I (conservatively) include all such revenue as being Australian.

to use foreign revenues to assist in the distribution of imputation credits, the estimate of the distribution rate will be over-stated.

97 I have also computed the proportion of domestic revenue for the ASX 200 firms that are not included in the Lally sample.[48] The non-20 firms have an average proportion of Australian revenue of over 75%. That is, the proportion of foreign revenues is lower than for the firms in the Lally sample, but the proportion of foreign revenues is still higher than for the benchmark efficient firm, and so expanding the sample to include the entire ASX 200 firms would mitigate, but not eliminate the problem.

98 Further expanding the sample to include all listed companies, or indeed all listed and unlisted companies, would mitigate the problem further. But the resulting estimate would remain an upper bound to the extent that the sample includes *any* firms that are able to use foreign revenues to assist in the distribution of credits.

99 In its recent decisions, the ERA has also recognised that the sample of 20 firms varies materially in terms of the dividend payout rate. For example, over the 2000-2013 period examined by Lally, the large mining firms had low dividend payout rates (as that period coincided with the mining investment boom) while Telstra had a very high payout rate.

100 Consequently, it is impossible for all 20 firms to be appropriate comparators on this dimension – as not all can have a dividend payout ratio that matches the BEE.

101 In summary, the sample of 20 firms has been selected on the basis of size. But size is not a characteristic that has any relevance to the credit distribution rate. The two characteristics that *are* relevant are the proportion of foreign profits and the dividend payout rate, and:

a. The sample of 20 firms differs materially from the BEE in respect of foreign profits – because the 20 firms have material foreign profits and the BEE has zero foreign profits, by definition; and

b. The sample of 20 firms has a wide range of dividend payout rates, so whatever the dividend payout rate for the BEE, it is not possible that all 20 firms would provide an appropriate match.

102 Consequently, it seems impossible for the sample of the 20 largest companies to provide an appropriate estimate of the credit distribution rate for the BEE.[49]

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[48] After removing those firms that are based offshore and which pay dividends in a foreign currency, but which are listed on the ASX nonetheless.

[49] The 2017 DBP Final Decision observes that the low dividend payout ratios for the mining firms in the sample of 20 constrained their ability to distribute credits, even though those firms had substantial foreign profits (paragraphs 185-186). However, the relevant point is that *for any given dividend policy* more foreign profits will mean a higher credit distribution rate. The fact that different firms have different dividend policies is beside the point. Foreign profits will be of more benefit (in terms of inflating the credit distribution rate) for firms with relatively higher dividend payout rates. But the

4.4 Distribution rate from comparator firms

103 In its Draft Guideline, the ERA notes that Lally (2018) concludes that the comparator firms may have a distribution rate higher than the 83% figure for the top 20 firms.[50]

104 Dr Lally considers the imputation credit distribution rate for five comparator firms: APA, AusNet, DUET, Envestra, and Spark Infrastructure.[51] However, there are a number of material problems with this analysis:

a. Dr Lally is unable to find the required FAB information in relation to three of those firms, although for one of those firms he *assumes* a closing FAB and proceeds on that basis.

b. For one of the two remaining firms, he replaces his empirical estimate of the distribution rate with his assessment of what he considers the distribution rate would have been if the company in question had adopted what he considers to be more efficient behaviour.

c. For the one remaining firm (AusNet), Dr Lally concludes that the distribution rate must be 1 because the 2017 FAB is less than the 2007 FAB. However, AusNet annual reports reveal that the FAB increased materially from $10.3 million in 2006 to $28.6 million in 2007 to $51.2 million in 2016. The FAB recorded for 2017 is -$26.4 million. The cause of this large reduction in the FAB is *not at all* related to the distribution of credits. Rather, it is due to AusNet receiving a large tax refund during that financial year. The 2017 AusNet Annual Report highlights:

> The reduction in franking credits that will arise from the receipt of tax refund for FY2017 from the ATO[52]

and notes that:

> The refund for FY2017 arises primarily from increased deferred tax resulting from differing tax and book depreciation profiles.[53]

105 This serves to highlight the dangers of using a high-level analysis of FAB data to estimate the distribution rate for any firm. Not every reduction in the FAB is caused by the distribution of credits. That is, the assumption that every reduction

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point is that, for *any* firm with *any* dividend payout rate, foreign profits will result in a higher credit distribution rate for that firm than would be possible without those foreign profits.

[50] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraph 853.

[51] Lally (2018), pp. 19-20.

[52] Ausnet 2017 Annual Report, p. 107.

[53] Ausnet 2017 Annual Report, p. 107.

in the FAB is due to credits being distributed to shareholders is inconsistent with the evidence.

106 Moreover, a materially different estimate of the distribution rate would be obtained if the sample period had started one year earlier (2006) or finished one year earlier (2016). So the estimates are unstable depending on the particular sample period that is used.

107 The 20-firms approach implicitly assumes that all credits distributed by each of the 20 firms are immediately available for end shareholders to redeem. However, any credits distributed to other companies or trusts will be retained by those entities until they pay a dividend or make a distribution. I am unaware of any data on the extent to which credits are trapped, or delayed, in these intermediate entities. However, it would be unreasonable to assume that the figure is zero, in which case the 20-firms approach would produce an upper bound for the distribution rate.

108 An obvious example of this problem relates to BHP, where the Australian company BHP Ltd has distributed over $1 billion of credits to the sister firm in the UK, BHP Plc, under the dividend equalisation scheme, which has recently come to the attention of a number of activist shareholder groups. Although these credits have been removed from the FAB, they have not been distributed to shareholders, so the FAB-based estimate of the distribution rate is overstated.

109 Similarly, a number of firms, including AGL and AusNet Services, have received large tax refunds that materially decrease their FAB. Under the Lally approach, these reductions are incorrectly treated as distributions to shareholders. Again, the result is an overstatement of the distribution rate.

110 It is difficult to reconcile the ERA's rejection of the ATO data (largely on the basis of problems with FAB data, although that FAB data is not needed for any purpose) with its 100% reliance on the Lally 20 firms approach (which relies directly on FAB data). That is, the concerns that have been raised in relation to the quality of FAB figures in relation to the ATO data also apply to the Lally approach as it also relies on the FAB data.

111 I note that no such issue arises when using the ATO tax statistics approach, because a distribution rate never has to be estimated – one has direct data on credits created and credits redeemed for each year. That is, the ATO publishes figures for credits created and credits redeemed. It does not publish figures for credits distributed – that figure must be derived using either the 'dividend' or 'FAB' approach.

4.5 Other problems with the 20-firms figures

112 In addition to the conceptual problems set out above, I have identified a number of questions in relation to the estimates for the 20-firms sample that should be

resolved before material weight is placed on them. Those issues, which are set out in the appendix to this report, include:

a. Inconsistencies relating to the year being reported. It appears that for some firms the FAB values are taken from the 2013 annual report and for others they are taken from the 2012 annual report.

b. Potential exchange rate differences. Some firms report in USD and I have been unable to replicate the AUD figures used in in Lally (2004), which does not explain how exchange rate conversions were performed.

c. Change in definition of FAB. In some cases, the Lally figures appear to be based on parent FAB in one case and group FAB in another. In some cases, pre-dividend figures seem to have been used and in other cases post-dividend figures are used.

d. Change in company structure: In some cases, the company has undergone a structural change over the 14-year period such that the 2013 firm is fundamentally different from the 2000 firm.

e. Figures inconsistent with annual reports. In a number of cases, the Lally figure differs from the figure in the relevant annual report for no apparent reason.

5 The reliability of the equity ownership estimates

5.1 Equity ownership is an upper bound for the redemption rate

113 The equity ownership approach, based on data compiled by the Australian Bureau of Statistics (ABS), provides an upper bound for the proportion of credits that are redeemed. Whereas the ATO data provides a direct estimate of the proportion of credits that are actually redeemed from the Tax Office, the equity ownership approach (at best) captures the effect of non-residents, but no other reason why credits might not be redeemed. That is, if any credit is not redeemed for any reason other than it being distributed to a non-resident, the equity ownership estimate will be overstated. Consequently, it should be interpreted as an upper bound for the redemption rate.

114 One example is the 45-day rule, which prevents domestic resident investors from redeeming credits that are distributed to them unless they have owned the relevant shares for more than 45 days around the dividend event. The equity ownership estimate implicitly assumes that every credit distributed to every domestic investor will be immediately redeemed, so must be interpreted as an upper bound to the actual redemption rate.

115 By contrast the ATO tax statistics provide a direct estimate of the amount of credits that are *actually* redeemed from the ATO.

5.2 The Australian Bureau of Statistics has expressed concerns about the quality of equity ownership data

116 The ABS has issued an express warning about the quality of the data that is used to construct the equity ownership estimates:

> The estimated market value of equity issued by some sectors is considered to be of poor quality. In particular, estimates of the market value of the amount issued by private corporate trading enterprises are considered poor because they are largely built up from counterpart and other information obtained from ABS Surveys of Foreign Investment and Balance Sheet Information. This sector covers equity issued by both listed and unlisted private corporate trading enterprises, of which there are over half a million.
>
> In terms of the analysis undertaken here, errors in the estimated market value of equity on issue will impact on the accuracy of estimates of the proportion of that equity owned by non-residents.

> A further concern relates to valuation. While both financial accounts and international investment statistics (from which the rest of the world data are sourced) are on a market value basis in principle, collection and estimation methods differ between the two sets of statistics…Because of the differences in the methodologies used, it is possible that there could be more variability in the market value estimates of equity held by the rest of the world than in the estimated market value of the equity on issue, thus causing some variation in the foreign ownership series derived from these data.[54]

117 Thus, even if the equity ownership estimate is to be used as an upper bound for the redemption rate, one would need to take into account the concerns that have been expressed about the quality of that data when determining the weight to be afforded to it.

5.3 ERA assessment of the reliability of equity ownership estimates

118 The ERA's Draft Guideline follows the AER's approach to using the equity ownership data. It contains no assessment of the quality of the equity ownership data and does not consider any of the troubling features of the revised estimates set out in the following section below.

119 The Draft Guideline also does not recognise that the equity ownership estimates can only provide an upper bound for gamma because they do not reflect the effect of the 45-day rule, or any other reason why a resident investor may not redeem a credit that is distributed to them.

5.4 Updated equity ownership estimates

120 In its recent Discussion Paper,[55] the AER has noted that the ABS has revised the figures on which the AER's equity ownership estimates are based:

> The September quarter 2017 ABS data has recently been released. We note that the ABS has undertaken some quality assurance work for the historical data through reviews of compilation methods and through source data across the National Accounts. The time series was opened back to 1988 in this review. The Finance and Wealth publication has incorporated the revisions as a result of the historical review.[56]

[54] See the ABS feature article that first explains the foreign ownership calculations at http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/5306.0Feature%20Article150Jun%201992?opendocument&tabname=Summary&prodno=5306.0&issue=Jun%201992&num=&view=.

[55] AER, March 2018, Discussion Paper: Value of Imputation Credits (AER Gamma Discussion Paper).

[56] AER Gamma Discussion Paper, p. 18.

121 However, material questions remain in relation to the quality of the equity ownership estimates based on this data. The problems that are evident, even in the updated data, include:

a. The method for compiling the data has not changed. There is still the same reliance on survey responses, there is still the same mis-match between components of the data, and there are still the same problems with estimating the market value of equity for some sectors.

b. The historical estimates for some sectors have changed materially in the update. The fact that an historical number can be materially changed almost 20 years after the event is clearly troubling. This is especially so when the change is not based on new data, but rather the application of different assumptions for how the same data should be processed into an estimate.

c. The revision to the estimates is based on a 'backcasting' exercise whereby estimated splits between domestic and foreign equity from recent data is 'backcasted' to the historical data, replacing the estimates that were made at the time the historical data was collected.

d. The revised estimates result in very little volatility in the estimates for listed equity and more volatility in the estimates for all equity, when the reverse would be expected ex ante.

e. The plausible impact of the GFC that was evident in the 2014 data has now been removed in the 2017 revision. That is the GFC impact has now been removed from the historical record.

122 The remainder of this section reviews the changes in the ABS data series 5232.0, and the implications for the measurement of domestic equity ownership, as performed by the AER.

5.4.1 AER approach

123 I follow the approach of the AER to estimate the share of equity owned by eligible investors, as set out in Section A.11 of the 2014 Ausgrid Draft Determination (Ausgrid DD). I note that the ERA has now fallen in line with the AER approach in relation to gamma. This approach uses data from the Australian National Accounts: Financial Accounts (ABS cat. 5232.0), specifically the listed and unlisted equity ownership series dating back to June 1988, with quarterly observations. The calculation methodology is stated to be consistent with that employed by the ABS

in its 2007 feature article.[57] The methodology includes determining the total value of equity outstanding at the end of the period, and determining the share held by the rest of the world. While the ABS further disaggregates foreign ownership shares by sector, the unrefined AER approach does not require or perform this disaggregation, instead taking one minus the foreign share to obtain the domestic ownership share. This procedure is performed for both listed and unlisted equity, and listed equity only.

124 This procedure yields Figures 4-2 and 4-3 of the Ausgrid DD, plotting the combined domestic ownership shares and the listed domestic ownership shares since June 1988.

125 A further refinement is applied to obtain an alternative equity ownership measure, filtering the data to "focus on the types of equity that are deemed to be most relevant to the benchmark entity, and the specific classes of investor that are expected to either utilise or waste the imputation credits they receive." This involves two specific refinements:

a. Exclude equity in those entities that are wholly owned by the public sector, stated to be equity owned by the central bank, central borrowing authorities, and public non-financial corporations.

b. Define the ownership share based on the classes of investor that are eligible to utilise credits, compared to those classes that may either utilise or waste credits, specifically comparing equity owned by households, pension funds and life insurance corporations to the aforementioned and government (national or state and local) and rest of world.

126 However it should be noted that the description is not entirely accurate. Analysis shows that when applying the two refinements on page 4-55 of the Ausgrid DD, the equity in listed national public non-financial corporations was included. While the listed state and local public non-financial corporations had insufficient equity to be definitive, I assume that these were included as well.[58]

127 Although somewhat contrary to the description, such an approach is consistent with the rationale stated: to "exclude from the calculation equity in entities that are wholly owned by the public sector." Between December 1997 and December 2006 the listed public non-financial corporations were not wholly owned by the public

[57] Australian Bureau of Statistics, *Feature article: Foreign ownership of equity*, September 2007. Available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Previousproducts/5302.0Feature%20Article10Sep%202007?opendocument&tabname=Summary&prodno=5302.0&issue=Sep%202007&num=&view.

[58] The September 2017 series does not separate the two listed public non-financial corporate series, although listed equity in state and local non-financial corporations appears to be minimal.

sector. As such, in the rest of this report I include equity in listed public non-financial corporations even if the "filter" is applied.

128 While the foreign ownership data is complete for all classes, this is not the case for all classes of owner. For certain quarters, for example, the values of equity owned by "other depository corporations" and "life insurance corporations" in listed "other private non-financial corporations" (OPNFC) is not presented, yet are included in the total of listed OPNFC equity. The reasons for this are not specified, but one plausible explanation is that the ABS were unable to classify a particular owner definitively, thus while the total is unaffected the individual component series were uncertain.

129 When presenting unfiltered ownership shares, the omission issue is not relevant; only the total and foreign amounts outstanding are relevant. However, this will be an issue in the refined share: "other depository corporations" and "life insurance corporations" are treated differently in determining eligible investors. I take the convention of allocating the ownership to the class that results in the lowest domestic ownership share, although the impact is minimal.[59]

130 The two refinements, applied simultaneously, yield alternative measures of domestic ownership shares, presented in Figures 4-4 and 4-5. These may be more accurately described as eligible ownership shares, giving the share of equity owned by eligible investors, as compared to investors who would waste imputation credits, in sectors deemed by the AER to be relevant. Thus they are used by the AER as a measure of the utilisation rate of imputation credits.

131 In interpreting the four resulting time series, the AER does not apply a formal process to determine the appropriate range and value of the ownership share, to use as a utilisation rate in setting the gamma parameter. Rather, it provides a separate range for combined and listed equity, with little guidance as to which weights, however informally defined, were applied to the alternative time series (unrefined or refined)[60], or even the date ranges that would be more informative for a determination. Rather it is concluded that a reasonable estimate for the rate is:

a. In the range [0.55,0.7] if all[61] equity is considered; and

b. In the range [0.4,0.6] if only listed equity is considered.

[59] It appears that the ABS either took this approach, or simply assumed these to be zero (both generate the same trend).

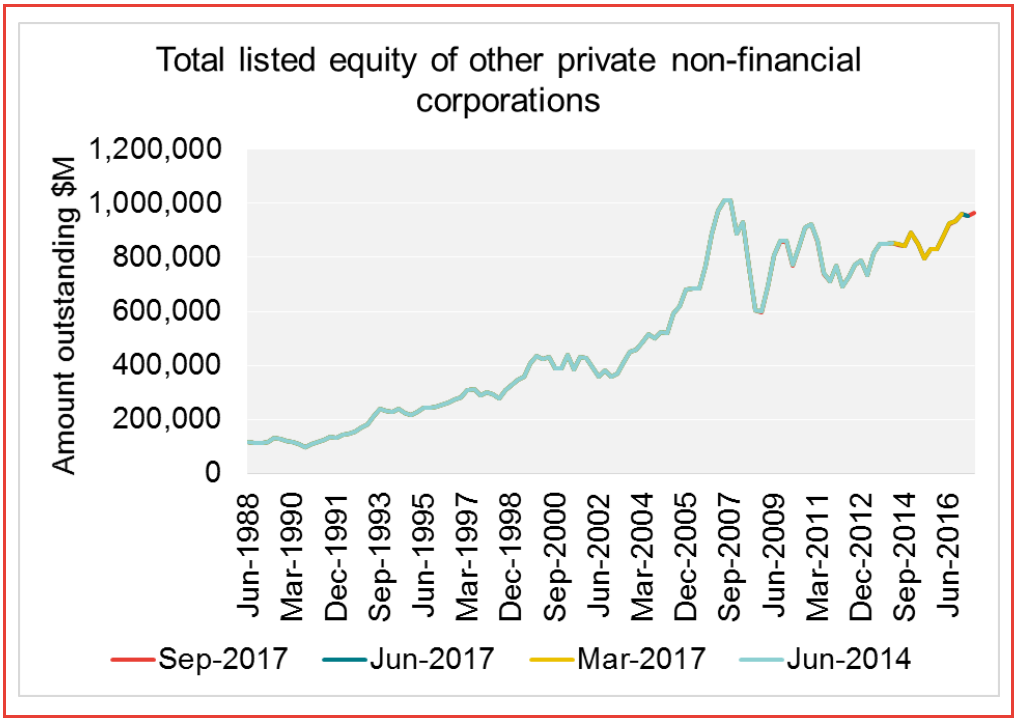
[60] It is stated that the evidence in all four figures are considered.

[61] In this context "all" refers to both listed and unlisted equity.

5.4.2 2017 ABS revision

132 In September 2017 the ABS released a highly revised Australian National Accounts (series 5232.0), with revisions to equity ownership, both listed and unlisted, dating back to the origin of the dataset, June 1988. The changes occurred for many of the individual ownership series, though not all were adjusted as a result of the revised methodology. As may be expected, the total listed equity of various classes remained largely invariant across ABS releases. Shown below in Figure 3, the four releases are identical, save for the extended coverage of later releases.

Figure 3: Total listed equity class example



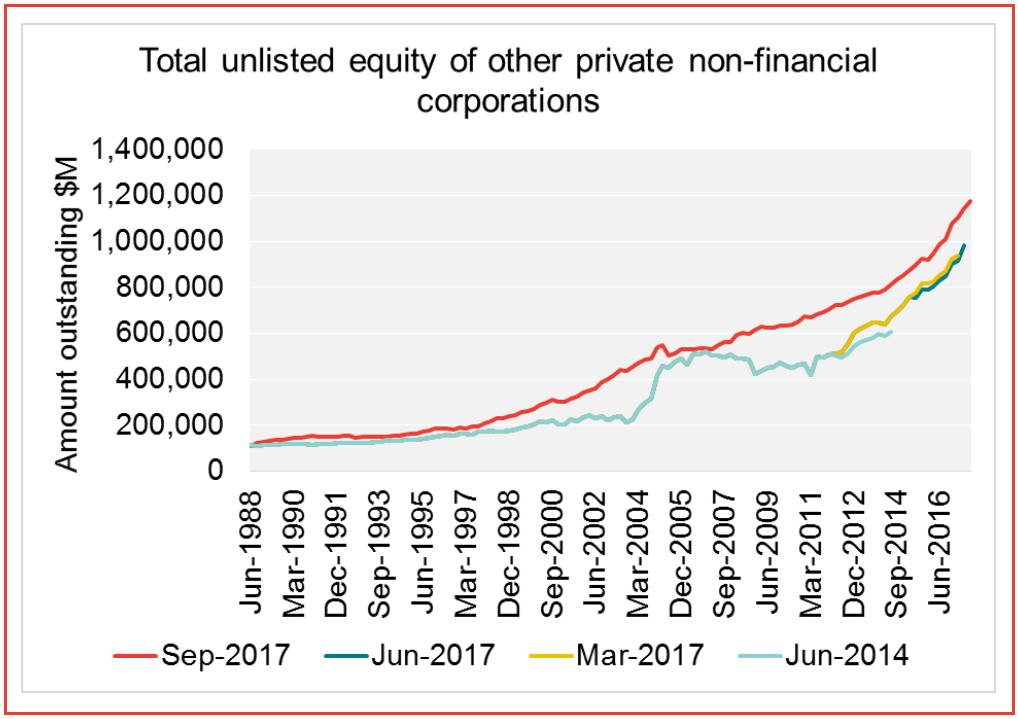
Source: ABS 5232.0.

133 However, unlisted equity totals differ considerably across releases, specifically between those prior to September 2017 and the September 2017 release. In Figure 4 below the revised total equity embedded in unlisted OPNFC deviated considerably from earlier revisions, reaching higher levels than estimated in previous revisions of the data series.

134 As the total equity embedded in various ownership classes may change across release, so can the components of equity. Even the various components of listed equity have changed considerably, as demonstrated in Figure 5, showing that the revised series estimates a considerably lower volume of listed equity in OPNFC owned by the rest of the world (ROW). This is concerning, as this leads to a lower foreign ownership share of this class of equity, a numerically important class in determining utilisation rate as per the AER approach.

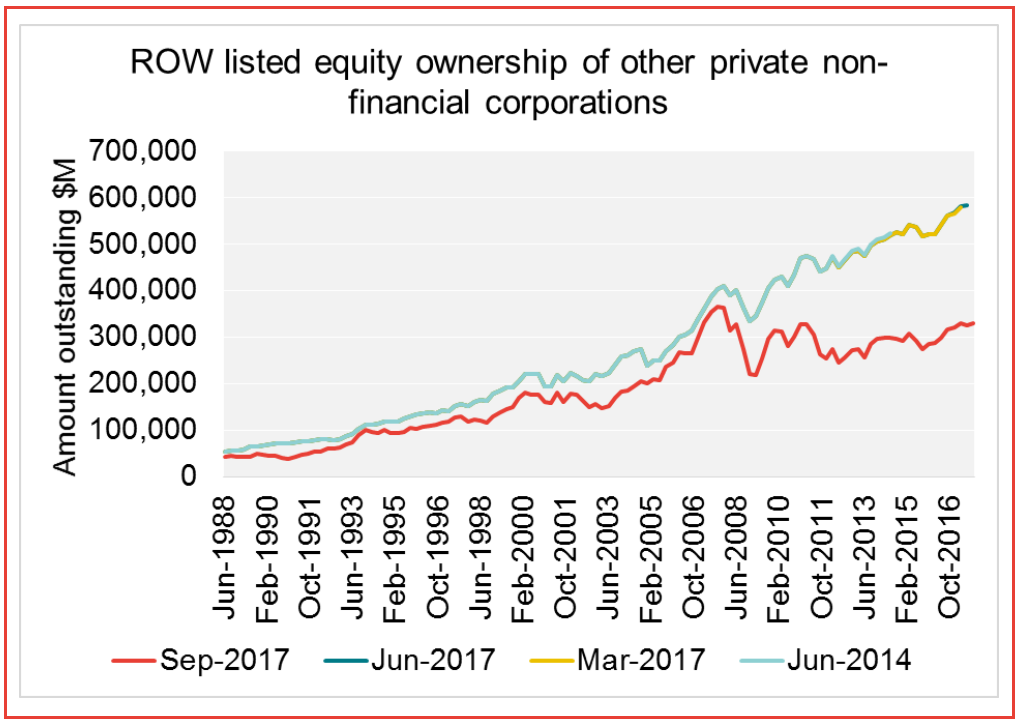
135 Conversely, the unlisted counterpart of OPNFC equity shows a higher share owned by foreign investors, in Figure 6 below.

Figure 4: Total unlisted equity class example



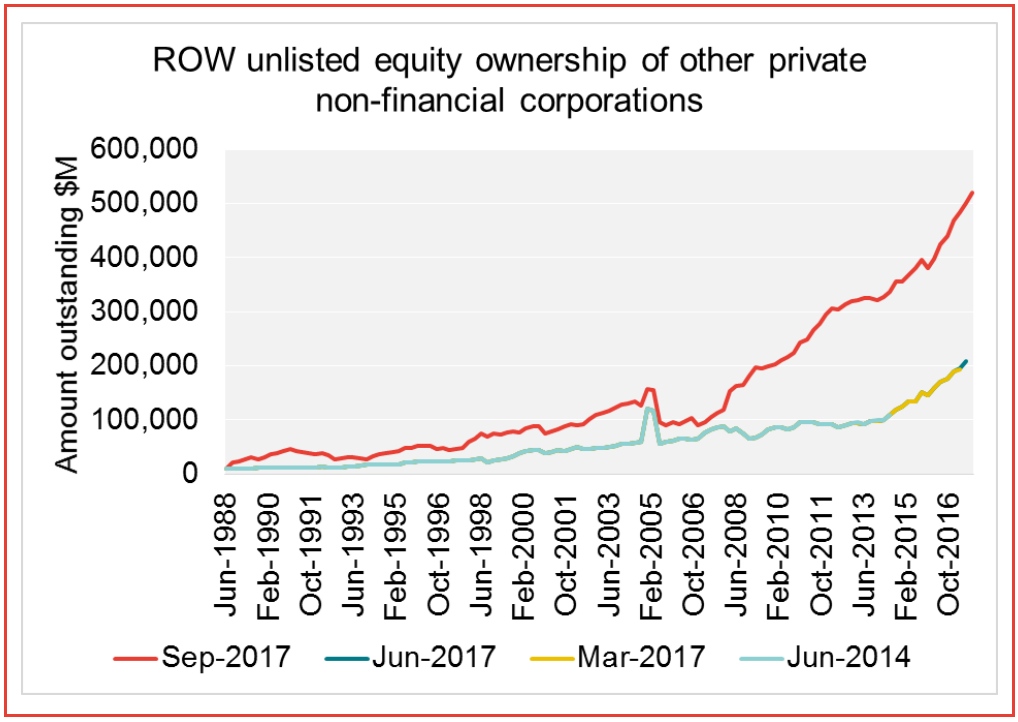
Source: ABS 5232.0

Figure 5: Listed equity class example



Source: ABS 5232.0

Figure 6: Unlisted equity class example

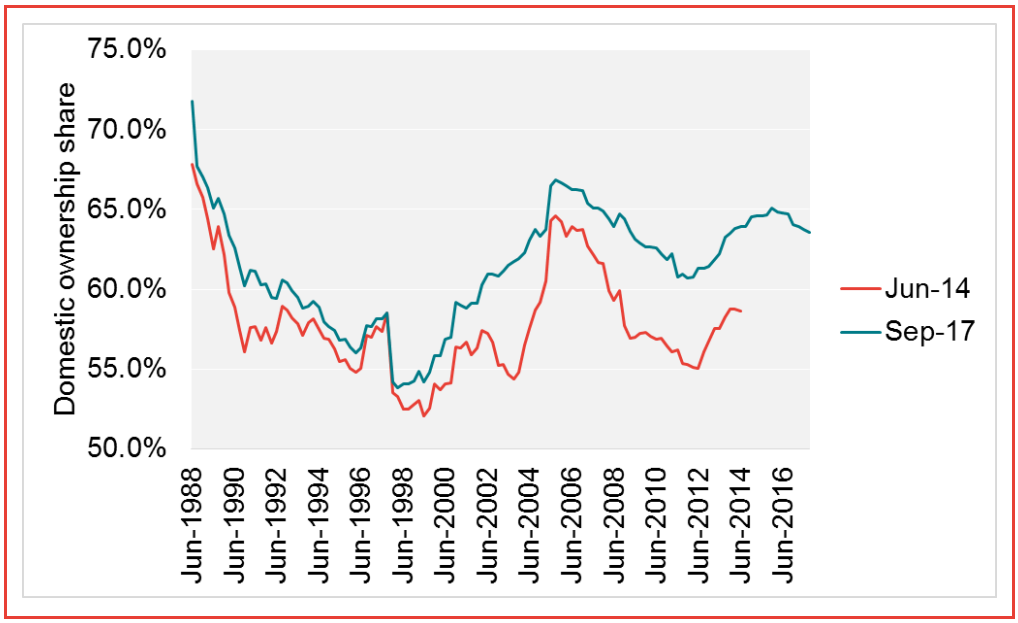


Source: ABS 5232.0

136 The result of the changes in the individual series is that the estimated ownership share series, as in Figures 4-2 to 4-5 of the Ausgrid DD, have changed considerably between the those based on the June 2014 ABS release (used in the Ausgrid DD) and the September 2017 ABS release, proposed to be used by the AER in the March 2018 Gamma Discussion Paper. Figure 7 and Figure 8 below replicate the figures in the Ausgrid DD, the "Jun-14" series, and compare against the ownerships shares obtained using the revised data, the "Sep-17" series.

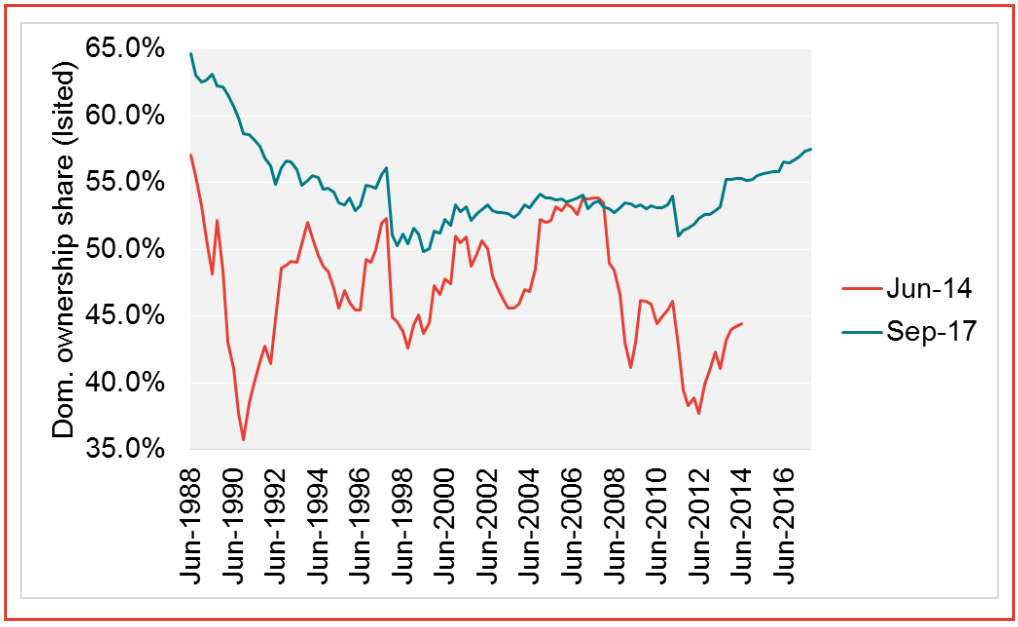
137 The revised series are almost invariably higher across the four approaches to the domestic ownership share, especially for listed equity.

Figure 7: Refined domestic ownership share of listed and unlisted Australia equity



Source: Frontier Economics analysis of ABS 5232.0

Figure 8: Refined domestic ownership share of listed Australia equity



Source: Frontier Economics analysis of ABS 5232.0

Puzzling impact on volatility

138 One concerning aspect of the series revision is not necessarily the substantial increase in the estimated ownership share, but the different patterns over time – particularly the variation/volatility. Listed equity in particular has very low variation in the domestic ownership share over the past 10 years, when estimated using the revised series. In comparison, we may infer that unlisted equity exhibits

considerably greater variation in the estimated domestic ownerships share. If we are to treat these shares as reflective of reality, this raises the question of how the foreign ownership share of unlisted equity is able to vary more than that of listed equity, the converse would be expected ex ante. Perhaps this is a result of a less than reliable methodology for deriving ownership of unlisted equity; with listed equity the total may be known due to the listing of the equity.

Impact of GFC is removed

139 Beyond the puzzling patterns/differences in variation, it is very surprising that ownership of listed equity was apparently not impacted by the global financial crisis, as measured by the September 2017 revision. This contrasts with the original June 2014 revision, which illustrates a clear decrease in the domestic ownership share for all series through the GFC.

Use of 'backcasting'

140 While the ABS statistics are constructed with assistance from specially conducted statistical surveys, yielding variation due to sampling error, the observation that the revision has impacted historical ownerships shares implies a different methodology for interpreting past raw data to obtain the ownership series. It is not entirely clear what the methodology is, how it changed, and why.

141 However, the Technical Note of the September 2017 release of the 5323.0 series offers guidance as to what may have resulted in the considerable changes. Perhaps of primary importance is the ABS Survey of International Investment. This survey provided data of the investments of non-residents in listed and unlisted equity of OPNFC, a major contributor to total equity.[62] The recent data suggested that the current estimates of ROW investment in listed equity of OPNFC were "too high" (as compared to unlisted equity), consequently the split of foreign listed vs unlisted ownership for this class was "backcast back to the mid 2000s", invariably increasing the share of OPNFC equity owned by ROW that is listed, relative to unlisted. This increases the ownership share of domestic investors in listed OPNFC equity (total listed equity in OPNFC is invariant across revisions, see Figure 3); whereas the increase in unlisted OPNFC equity owned ROW can coincide with an increase in unlisted equity (as seen in Figure 4). This yields an increase in the domestic ownership share of listed and unlisted equity, as seen in Figure 7, and a more drastic increase in the domestic ownership share of listed equity, as seen in Figure 8.

142 The Survey of International Investment surveys "approximately 1,000 enterprise groups from a total population of approximately 3,000 which are in scope of the survey", with participants supplying financial information allowing ABS

[62] OPNFC equity accounts for approximately 40-50% of total equity overt the periods covered.

researchers to infer the listed versus unlisted split of ROW investment in OPNFC equity. It is not clear whether the survey is able to reliably determine the listed vs unlisted equity composition of OPNFC equity owned by ROW. Nor is it clear that such a split, if measured accurately in one quarter of the survey, would be valid to apply to historic data through backcasting.

Conclusions on reliability

143 Regarding the reliability of the data provided, the ABS states the following:

> "… despite the described problems, the ABS considers that these statistics are of an acceptable standard for the purposes they are intended to serve."[63]

144 However it is not clear what purposes the ABS envisaged the data series serving, nor what is meant by an "acceptable standard". While this standard may be relative to what could be achieved through more expensive time-consuming methods, in the current context it is more worthwhile to compare the accuracy of gamma estimates obtained using ownership shares to those obtained using alternative methods, for example the SDG dividend drop-off method or ATO tax statistics.

145 Unfortunately, while statistical precision is able to be derived for such alternative methods, the ABS is ultimately unable to quantify the accuracy of the national accounts series:

> "Accuracy remains the main focus of ABS quality control. However, in the case of the national accounts, it is recognised internationally that an objective accuracy measure in the sense of proximity to the 'true value' is impossible to produce."[64]

[63] ABS 5232.0, Sep 2017, Explanatory Notes.

[64] ABS 5232.0, Sep 2017, Quality Declaration.

6 The ERA's new interpretation of theta and implications for estimation

6.1 Market value or cash flow interpretation

146 As noted above, two different interpretations have been proposed for theta:

a. *Market value*: Theta can be interpreted as the market value of a distributed credit – the price that investors would be prepared to pay for a credit if there was a market for them; or

b. *Cash flow*: Theta can be interpreted as the proportion of distributed credits that are redeemed by investors.

147 The market value interpretation can be implemented in two ways:

a. *Estimated from market data using econometric methods*: An example of this approach is dividend drop-off analysis where the market-clearing value of credits is estimated by examining the fall in stock prices when credits are paid out; or

b. *Derived from economic models under a certain set of assumptions*: An example of this approach is Lally and Van Zijl (2003)[65] where, under a certain set of assumptions, the market-clearing value of credits is derived as a complex weighted-average of the extent to which investors are able to redeem credits.

148 In its Draft Guideline, and in its recent decisions, the ERA has apparently adopted the cash flow approach to theta – defining it in terms of the proportion of credits that are redeemed by investors. Indeed, the ERA's current approach to gamma follows the approach set out in the AER's 2013 Guideline, which is as follows:

> We propose that the value of imputation credits within the building block revenue framework is an estimate of the expected proportion of company tax which is returned to investors through utilisation of imputation credits.[66]

149 The AER's definition of gamma, and the basis for it, seems to imply that what is relevant is the proportion of company tax paid by the BEE that will be redeemed against the personal tax obligations of investors in the BEE. The AER documents this 'cash flow' interpretation of gamma in the 2013 Guideline, as shown in Figure 1 above. The AER demonstrates that it is the ability of investors in the BEE to redeem credits that underpins its new definition of gamma.

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[65] Lally, M. and T. van Zijl, 2003, Capital gains tax and the capital asset pricing model, *Accounting and Finance*, 43, 187-210.

[66] AER, 2013 Rate of Return Guideline, Explanatory Statement, p. 158.

150 In relation to the basis for the cash flow / utilisation interpretation of gamma , the ERA has stated that:

> It becomes clear, then, that the term 'value of franking credits' and 'proportion of the tax paid at the company level [which] is really a withholding of personal tax' are interchangeable terms for gamma. From the shareholders' point of view 'distributed imputation credits are valuable to the extent that they can be used (or utilised or redeemed) to reduce personal taxes and/or have credits refunded'.[67]

151 That is, under the ERA approach theta is no longer defined as the equilibrium market value of credits, but rather is defined to be the extent to which credits can be redeemed by investors to reduce their personal taxes. Under the 'market value' interpretation, there is a single equilibrium market value in the economy and theta has been estimated in that context previously. However, the ERA has now moved away from that approach and instead follows the AER in defining theta in terms of the proportion of credits that can be redeemed to reduce personal taxes.

152 In summary, the 'cash flow' or 'utilisation' interpretation of gamma seeks to answer the question: of all of the corporate tax paid by the BEE, how much will be returned to its shareholders via the redemption of imputation credits? Under this interpretation, there is no need to consider econometric studies of market prices or theoretical economic models – one simply estimates the proportion of the tax paid by the BEE that is redeemed by its shareholders.

6.2 Whose redemption rate is relevant?

153 As noted above, the 'cash flow' or 'utilisation' interpretation of gamma seeks to determine how much of the corporate tax paid by the BEE will be returned to its shareholders via the redemption of imputation credits. In my view, this interpretation requires consistent estimation of the distribution rate and the utilisation rate. That is, some proportion of credits will be distributed to the BEE shareholders, who will then redeem some of those credits. The corporate tax allowance is then reduced by the amount of credits that are redeemed back by the BEE shareholders.

154 Under the 'cash flow' interpretation of gamma it would make little sense to take the proportion of credits distributed to the BEE shareholders and to pair that with the proportion of credits redeemed by some *other* group of shareholders.

155 The Draft Guideline concludes that listed equity represents the most suitable estimate of the BEE.[68] Consequently, it would follow that the 'cash flow' estimate of gamma would be based on the proportion of credits distributed to and redeemed by shareholders in listed firms.

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[67] ERA, June 2016, DBP Final Decision, Paragraph 86.

[68] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraphs, 852 – 854.

156 This would involve pairing the Lally 83% distribution rate[69] with the equity ownership estimate of 47% for listed equity, producing a gamma of 0.39.[70]

157 Alternatively, one may reach the conclusion that the BEE is better represented by all equity. For example, the Draft Guideline specifically notes that "some regulated businesses are unlisted."[71] In this case, the best estimate of gamma would be the direct estimate of 0.34 from tax statistics. This approach has the great benefit of not requiring any estimate of the contentious distribution rate because it can be computed directly from 'credits created' and 'credits redeemed.'

158 That is, under the cash flow approach, to gamma, one seeks to estimate how much of the corporate tax paid by the BEE will be returned to its shareholders via the redemption of imputation credits – so that the corporate tax allowance can be reduced by that amount. This requires a decision to be made about what group best represents the shareholders of the BEE, such that the proportion of tax redeemed by that group can be estimated in an internally consistent manner.

[69] If the ERA maintains confidence in that estimate in spite of the issues set out in Section 4 above. Alternatively a lower estimate could be adopted, as set out in Section 2.3.2 above.

[70] Or less, if a lower estimate of the distribution rate is used.

[71] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraphs, 875.

7 The use of dividend drop-off analysis

159 Under the 'cash flow' interpretation, gamma is defined to be proportion of corporate tax paid by the BEE that is redeemed by its shareholders. In this case, the *value* of those credits (i.e., the amount the shareholders would pay to purchase a credit) is irrelevant. For this reason, I agree with the ERA that dividend drop-off analysis is irrelevant under the 'cash flow' interpretation of gamma that the ERA now adopts.

8 Conclusions on the best 'utilisation' estimate of gamma

8.1 A process for working through the relevant issues

160 In the AER's recent concurrent evidence sessions, the experts agreed that the AER's approach to gamma (which the ERA has followed) is not consistent with any equilibrium asset pricing model.[72] Consequently, there is no model or theory to guide the estimation. Rather, under the 'cash flow' or 'utilisation' interpretation, gamma is simply defined to be the proportion of corporate tax paid by the BEE that is returned to its shareholders via the redemption of imputation credits.

161 The process set out below can be followed to ensure that the estimate of gamma is consistent with the ERA's new interpretation/definition of gamma:

a. Step 1: Determine whether and explain why:

   i. Gamma is based on a market-clearing weighted-average utilisation rate, as would be the case under an equilibrium asset pricing model; or

   ii. Gamma is the 'proportion of the tax paid at the company level which can be used (or utilised or redeemed) to reduce personal taxes' – the proportion of company tax paid by the BEE that is returned to investors by the utilisation of imputation credits.

b. Step 2: If (in Step 1) the ERA determines that gamma *is* derived from an equilibrium asset pricing model, the relevant model should be identified in order to determine how the weighted-average utilisation calculation should be performed. The ERA would then explain how its implementation is consistent with the relevant model. In this regard, I note that all known models require the weighted average to be taken over *all* of the wealth of each investor, and not merely the proportion of that wealth invested in Australia. This is why Lally (2018) has noted that the AER's approach (which the ERA now follows) is not consistent with any equilibrium asset pricing model.

[72] See the joint report of experts at pp. 69-71, available at https://www.aer.gov.au/system/files/AER%20-%20Evidence%20Session%201%20%26%202%20-%20Expert%20Joint%20Report%20-%2021%20April%202018.pdf.

However, if (in Step 1) the ERA determines that its interpretation of gamma is *not* consistent with any identifiable equilibrium asset pricing model (as the experts concluded in the AER's concurrent evidence sessions) the concept of the weighted-average utilisation rate is irrelevant.

That is, it would seem to be open to the ERA to define gamma in terms of an equilibrium asset pricing model. It would also seem to be open to the ERA to define gamma in terms of the proportion of corporate tax paid by the BEE that is returned to its shareholders via imputation credits. But it would not seem to be open to the ERA to define gamma to be the highest available estimate of the distribution rate multiplied by the highest available estimate of the utilisation rate.

c. Step 3: If (in Step 1) the ERA follows the AER's cash flow interpretation, wherein gamma is considered to be the 'proportion of the tax paid at the company level which can be used (or utilised or redeemed) to reduce personal taxes,' the relevant task is to estimate how much of the corporate tax paid by the BEE will be returned to its shareholders via the redemption of imputation credits – so that the corporate tax allowance can be reduced by that amount.

   This requires a decision to be made about what group best represents the shareholders of the BEE, such that the proportion of tax redeemed by that group can be estimated in an internally consistent manner.

d. Step 4: If (in Step 3) the ERA determines that the BEE is best represented by listed equity, the proportion of corporate tax returned to the BEE's shareholders would be estimated using the ERA's estimates of the proportion of credits distributed to listed equity shareholders (83%) and the proportion of credits redeemed by those shareholders (47%), producing a gamma of 0.39.

e. Step 5: The ERA may determine (in Step 3) that the BEE is better represented by all equity. For example, the Draft Guideline specifically notes that "some regulated businesses are unlisted."[73] In this case, the best estimate of gamma would be the direct estimate of 0.34 from tax statistics. This approach has the great benefit of not requiring any estimate of the contentious

[73] ERA, July 2018, Draft Rate of Return Guideline: Explanatory Statement, Paragraphs, 875.

distribution rate because it can be computed directly from 'credits created' and 'credits redeemed.'[74]

162 Under the cash flow / utilisation definition of gamma, there would appear to be no basis for multiplying (a) the quantum of credits distributed by the BEE to shareholders of the BEE, and (b) the proportion of credits that can be redeemed by some *other* group of shareholders.

8.2 Weighing of strengths and weaknesses

163 The Explanatory Statement concludes that the BEE is best proxied by a listed firm. However, there are three problems with the data that is available in relation to listed firms:

a. The 20-firms estimate of the distribution rate provides, at best, an upper bound because franking account balances can reduce for reasons other than the distribution of credits to shareholders.

b. The equity ownership estimate of the utilisation rate is, at best, an upper bound because resident investors do not (and cannot) redeem all credits distributed to them – a problem that may well intensify after 1 July 2019.

c. Combining two estimates from two different methodologies using two different data sources results in a compounding of estimation error.

164 The ATO tax statistics have the great benefit of providing a direct estimate of gamma from a single source of data. There is no need to separately estimate distribution and utilisation rates – the 'cash flow' gamma can be estimated directly as the ratio of credits redeemed to credits created.

165 Also, the ATO tax statistics provide a point estimate rather than an upper bound – the ATO records credits actually redeemed, rather than an estimate of the maximum amount of credits that could possibly be redeemed.

166 The only disadvantage of the ATO data is that it also includes unlisted equity, whereas the AER has concluded that listed equity provides the best proxy for the BEE. The AER considers that the distribution rate for listed equity may exceed that for unlisted equity. In this case, the ATO estimate would be a lower bound for the 'utilisation' gamma for listed equity.

[74] When one data source and method is used to estimate the distribution rate and an entirely different data source and method are used to estimate the utilisation rate, the two calculations will inevitably reflect a different estimate of 'credits distributed.' Moreover, when two estimates that are each subject to statistical estimation error are combined, there is a compounding of that estimation error.

167 The ERA has concluded that the relevant task is to estimate the utilisation/cash flow gamma for listed equity. Consequently, the ERA must weigh the various strengths and weaknesses of each approach in performing that task. For the reasons set out above:

a. The 20 firms/equity ownership approach produces an upper bound of 0.39. The 20-firms estimate for listed equity is an upper bound because the FAB can fall for reasons other than the distribution of credits to shareholders. The equity ownership estimate for listed equity is an upper bound because resident investors do not (and cannot) redeem all of the credits that they receive.

b. The ATO tax statistics approach produces a lower bound of 0.34. This is because the ATO data includes unlisted equity and the distribution rate for unlisted firms may exceed that for listed firms.

9 Appendix: Estimation issues with the 20-firms approach

9.1 Overview

168 The 20-firms estimate that is used in the UT5 Draft Decision is taken from an appendix to Lally (2014),[75] which is reproduced below in Figure 9.

Figure 9: Table 2 from Lally (2014)

Table 2: Distribution Rates for Companies and the Market

Company	B_{2000}	B_{2013}	*DIV*	*DIST*	*TAX*	*DIST RATE*
CBA (Parent)	450	742	35,496	15,212	15,504	0.98
BHP (Group)	0	11,308	46,794	20,054	31,362	0.64
Westpac (Parent)	257	1247	34,964	14,984	15,974	0.94
ANZ (Group)	0	265	29,750	12,750	13,015	0.98
NAB (Group)	0	1035	31,291	13,410	14,445	0.93
Telstra (Group)	74	0	45,255	19,395	19,321	1.00
Woolworths (Group)	417	1943	11,621	4,980	6,506	0.77
Wesfarmers (Group)	0	243	12,602	5,400	5,643	0.96
CSL (Group)	0	0	377	161	161	1.00
Woodside (Group)	173	3,260	8,034	3,443	6,530	0.53
Rio Tinto (Group)	2,215	7,434	4,388	1,880	5,219	0.36
Westfield (Group)	25	55	950	407	437	0.93
MacQuarie (Group)	133	297	1,915	821	985	0.83
Origin Energy (Group)	0	0	3,229	1,384	1,384	1.00
Suncorp (Group)	136	551	6,899	2,957	3,372	0.88
QBE Ins (Group)	-8	83	1,533	657	748	0.88
Brambles (Group)	188	78	2,946	1,263	1,153	1.10
Santos (Group)	360	993	3,082	1,321	1,954	0.68
AMP (Group)	80	191	4,248	1,821	1,932	0.94
Amcor (Group)	0	0	1,480	634	634	1.00
Total				122,934	146,279	0.84

Source: Lally (2014), Appendix, p. 40.

169 The approach that is adopted is as follows:

[75] Lally, M., 2014, *Review of submissions to the QCA on the MRP, risk-free rate and gamma*, 12 March.

a. The firm's franking account balance (FAB) is observed in 2000 and 2013. Any increase in the FAB is due to credits that have been created over that period, but not distributed.

b. Total dividends paid over the 2000 to 2013 period are collated, together with information about the proportion of those dividends that are franked. This information is used to produce an estimate of the quantum of credits distributed. For example, for every $100 of fully-franked dividends paid, $43 of credits will be distributed;[76]

c. The distribution rate is then computed as:[77]

$$\frac{Credits\ distributed}{Credits\ distributed + Credits\ retained} = \frac{Step\ b}{Step\ b + Step\ a}.$$

170 I have been unable to replicate the figures set out in the table above and have identified a number of questions in relation to those figures, as set out in the sections that follow. My view is that these issues should be resolved before any material weight is applied to the figures above.

171 One general problem that I have had in seeking to replicate the above figures is the lack of detail about how those results were constructed. For example, it is not clear whether financial years or calendar years are used for franking account balances and/or dividends, there appear to be some inconsistencies between whether group or parent FABs are used, whether FABs are measured before or after dividends, what is done when dividends are paid in foreign currencies, and what is done when firms are fundamentally restructured such that the 2013 firm is materially different from the 2000 firm.

9.2 Issues with Franking Account Balance figures

172 In attempting to replicate the figures in the FAB columns above, I sourced information from the relevant annual reports for the 20 companies. This process identified a range of issues, which fall into the following categories:

a. Inconsistencies relating to the year being reported. It appears that for some firms the FAB values are taken from the 2013 annual report and for others they are taken from the 2012 annual report.

b. Potential exchange rate differences. Some firms report in USD and I have been unable to replicate the AUD figures used in the table

[76] In general, the amount of credits distributed will be given by $Dividends\ Paid \times Proportion\ Franked \times \frac{Corporate\ tax\ rate}{1-Corporate\ tax\ rate}$, where the corporate tax rate is 30%.

[77] The denominator in the formula below is referred to as "Tax" in the Lally table.

above. Lally (2004) does not explain how exchange rate conversions were performed.

c. Change in definition of FAB. In some cases, the Lally figures appear to be based on parent FAB in one case and group FAB in another. In some cases, pre-dividend figures seem to have been used and in other cases post-dividend figures are used.

d. Change in company structure: In some cases, the company has undergone a structural change over the 14-year period such that the 2013 firm is fundamentally different from the 2000 firm.

e. Figures inconsistent with annual reports. In a number of cases, the Lally figure differs from the figure in the relevant annual report for no apparent reason.

9.2.1 Inconsistencies relating to the year being reported

173 In my analysis, I have used the 2000 and 2013 annual reports for all firms, whether their financial year ends on June 30 or December 31, and I have paired that with whatever dividends have been paid between the 2000 and 2013 financial years. Table 3 documents cases where the 2013 Lally figures are inconsistent with the relevant 2013 annual report.

Table 3: Inconsistencies relating to the year being reported

Company	Lally value for 2013 ($m)	FAB value found in 2013 annual report ($m)	Reference
QBE Insurance	83	272	QBE Insurance Group (2013), page 165
National Australia Bank Limited	1,035	1,047	National Australia Bank Limited, (2013), page 94
Westfield Group	55	82	Westfield Group (2013), page 77
AMP	191	196	AMP Limited (2013), page 74

Source: Annual reports and Lally (2014).

9.2.2 Potential exchange rate differences

174 Several FABs were reported in their respective annual reports in USD, requiring a conversion to AUD. In all instances where I found an annual report which reported in USD, I was unable to reconcile the FAB figure with the Lally estimate. In these instances, I applied the approach of using the exchange rate set out in the annual report itself. These cases are summarised in Table 4 below.

Table 4: Potential exchange rate differences

Company	Lally ($m)	USD value from annual report ($m)	Exchange rate used ($A1 = USD)	Frontier Economics' value in AUD ($m)	Reference
BHP Billiton Limited	11,308	11,340	1.03	11,010	BHP Billiton Limited (2013), pages 222 and 209 for USD value and exchange rate respectively
Woodside	3,260	2,545	1.03[78]	2,471	Woodside (2013), page 102
Brambles	78	71.8	1.0304	70	Brambles (2013), pages 81 and 43 for USD value and exchange rate respectively

Source: Annual reports and Lally (2014).

9.2.3 Change in definition of FAB

175 I have identified one case where the Lally figures appear to use a different definition of the FAB in 2000 and 2013, shown in Table 5 below. Westpac reports Adjusted and unadjusted FAB figures and the Lally calculations appear to be based on different definitions for 2000 and 2013. In addition, the Lally figures appear to have neglected to include the negative sign on the 2000 FAB figure.

[78] Woodside do not explicitly mention an exchange rate between AUD and USD. In lieu of them explicitly quoting an exchange rate, I have used the same exchange rate that BHP Billiton used.

Table 5: Instances where there has been a change in FAB definition

Company	Year	FAB definition used by Lally	Lally ($m)	Frontier Economics ($m)	Reference
Westpac	2000	Adjusted franking account balance at the end of financial year	257	-257	Westpac (2000), page 55
	2013	Adjusted franking account balance as at year end Franking account balance as at year end	1,247	585	Westpac Group (2013), page 149

Source: Annual reports and Lally (2014)

9.2.4 Change in company structure

176 I identified two instances where the companies being analysed had materially changed their structure over the 14 year period being considered. In these cases, the 2000 and 2013 companies are materially different such that it would be inappropriate to compare their FABs.

Table 6: Instances where there has been a company restructure

Company	Comment
Westfield Group	On 25 June 2004 the members of the Parent Company, Westfield Trust ("WTF") and Westfield America Trust ("WAT") voted in favour of combining the three entities by way of stapling their securities ("the Merger") to form the Westfield Group." (Westfield, 2004 page 9). This is problematic in this context for two reasons: 1) Westfield Group as it existed in 2013 did not exist in 2000. 2) Because the Westfield Group did not exist in 2000, there is no explicit FAB data for 2000 for a "Westfield Group." It is unclear what values Lally has used for the FAB value in 2000.
Macquarie Group	"The establishment of Macquarie Group Limited as a NOHC was completed on 13 November 2007." Macquarie (2008, page 7). This is problematic because no FAB data exists prior to 2008 for Macquarie Group. It appears that Lally has used the FAB data from Macquarie's 2008 report for the 2000 value.

Source: Annual reports and Lally (2014)

9.2.5 Other inconsistencies with annual report figures

177 In a number of cases, the Lally figures appear to be inconsistent with the figures from the relevant annual report, as summarised in Table 7 below.

Table 7: Inconsistencies with annual report figures

Company	Year	Lally figure ($m)	Annual report figure ($m)	Reference
BHP Billiton	2000	0	24	BHP Billiton Limited (2000), page 130
CSL Limited	2000	0	64.9	CSL Limited (n.d), page 13
RIO Tinto	2000	2,215	0	Rio Tinto (2000), page 80
Brambles	2000	188	-11.6	Brambles Industries Limited (2000), page 39
AMP Limited	2000	80	82	AMP Limited (2000), page 15
AMC	2000	0	9.6	AMCOR (2000), page 10
CSL	2013	0	None reported	CSL Limited (2013)
Telstra	2013	0	-85	Telstra (2013), page 94
Rio Tinto	2013	7,434	14,740[79]	Rio Tinto (2013), page 142

Source: Annual reports and Lally (2014)

9.3 Issues with dividend figures

178 I have obtained the relevant dividend data from Morningstar, which in turn sources it from annual reports. In general, the Morningstar dividend figures are materially different from those adopted by Lally (2014), as summarised in Table 8 below.

179 The material differences between the Lally and Morningstar figures led us to conduct an audit of the Morningstar figures whereby I have compared the Morningstar figures with the source data in the relevant annual report. I checked a random sample of 40 firm-year figures and found no discrepancies with any of them.

[79] This is the Australian dollar value of the FAB. Rio Tinto report on page 142 a value of US$14,298. Rio Tinto provide a table on page 52 of the same report which details the average AUD to USD exchange rate for 2013, which is 1AUD = 0.97USD and I use this value to convert from USD to AUD.

Table 8: Comparison of dividend data over 2000 to 2013 financial years

Company	Lally	Morningstar	% Difference from Lally
CBA	35,496	34,064	-4%
BHP	46,794	47,602	2%
WBC	34,964	30,647	-12%
ANZ	29,750	21,506	-28%
NAB	31,291	31,615	1%
TLS	45,255	49,630	10%
WOW	11,621	8,979	-23%
WES	12,602	11,747	-7%
CSL	377	2,924	676%
WPL	8,034	8,487	6%
RIO	4,388	28,213	543%
ORG	3,229	3,233	0%
QBE	1,533	6,239	307%
SUN	6,899	5,937	-14%
BXB	2,946	4,867	65%
STO	3,082	3,016	-2%
AMP	4,248	6,131	44%
AMC	1,480	4,254	187%

Source: Lally (2014) and Morningstar. Macquarie Group and Westfield have been removed from the table as major corporate transactions mean that there is no single consistent entity over the whole period.

Table 8 makes it abundantly clear that there are marked differences between the values Lally presents and those that the Morningstar database suggest. The difference in results is counterintuitive, as Lally (2013) again indicates that he too has gathered dividend data from the respective annual reports. Frontier has spot checked several pieces of Morningstar data and believe that they too take their dividend data directly from the annual report – again raising the question as to why these results are so different.

9.4 Miscellaneous errors

180 Throughout the process of replicating the Lally table, I identified that the tax figure for Rio Tinto appears to be calculated incorrectly (using Lally's own FAB and dividend data).

181 Given that tax is calculated as:

$$TAX = DIST + B_{2013} - B_{2000} \quad (1)$$

I insert the relevant figures from the Lally table as follows:

$$TAX = 1{,}880 + 7{,}434 - 2{,}215 = 7099 \quad (2)$$

182 However, the Lally table reports a *TAX* figure of 5,219. This has a material effect on the distribution rate for Rio, which changes from 36% to 26%.

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