A regulatory process for estimating gamma

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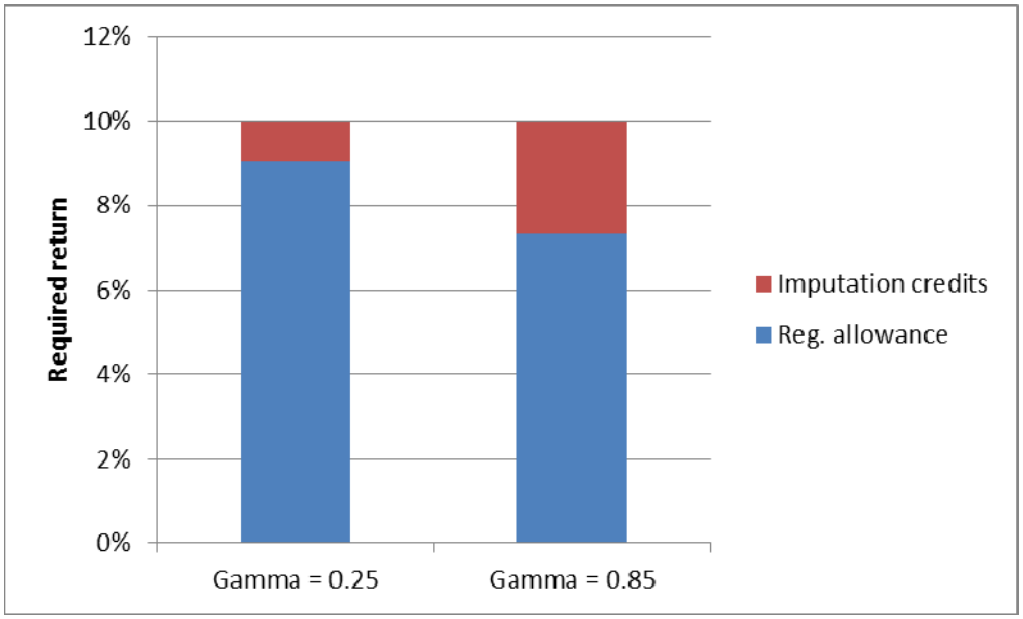
What is gamma and why do we have to estimate it ?

Officer (1994)

- Officer (1994) shows that within his framework gamma determines how much of the required return on equity comes from imputation credits.
  - Use CAPM to determine the total required return on equity.
  - Gamma then determines how much of this comes from imputation credits.



Effect on allowed revenues

- On every $1 billion of equity capital, and with an allowed return on equity of 10%:
  - Gamma=0.25 reduces revenue by $10 million per annum.
  - Gamma=0.85 reduces revenue by $27 million per annum.

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Q1: Should gamma be estimated as $\gamma = F \times \theta$?

The standard regulatory approach

- All Australian regulators, including the QCA, estimate gamma as the product of:
  - The distribution rate, *F*; and
  - The value of distributed credits, theta.

Consistent with the submissions of stakeholders

- Aurizon submits that gamma should be estimated as the product of these two components.
- The QRC submits that gamma should be estimated as the product of these two components.

Proposals

Proponent	*F*	*Theta*	*Gamma*
ACT	0.7	0.35	0.25
Aurizon	0.7	0.35	0.25
QRC	0.7	0.7	0.5
Lally (2013)	0.85	1	0.85

Q2: What value should be adopted for the distribution rate, *F* ?

Almost unanimous support for an estimate of 0.7

- ATO data shows that 70% of created credits get distributed.
- 0.7 estimate has been adopted by AER and ERA in their draft Guidelines and by the ACT.
- 0.7 estimate has been proposed by Aurizon.
- 0.7 estimate has been proposed by QRC and McKenzie and Partington.

AER states that the accepted approach is (a) *simple and intuitive*, (b) *based on long-term data from a reliable source*, and (c) h*as wide support from experts and stakeholders*.

QCA uses estimate of 0.8

- The QCA has adopted an estimate of 0.8 since its inception.
- Not updated for new data, new evidence, or changes in regulatory practice for over a decade.

Lally (2013) proposes 0.85

- Estimate is based on a sample of only 10 firms.
- QCA rejected that approach in its 2004 WACC review, when a sample of 8 firms was used to produce an estimate of 100%.

Q3: Should theta be estimated on the basis of empirical evidence or theoretical assumption ?

Lally (2012, 2013) proposes theta should be set according to theoretical reasoning

- Lally (2012, 2013) proposes that theta should be set to 100%.
- This is done by "ignoring foreigners" (or at least the extent to which they affect equity prices), in which case all imputation credits are assumed to go to resident investors – despite clear empirical evidence to the contrary.

Reasons for preferring an empirical estimate to a value set by theoretical reasoning

1. No other regulator adopts a 100% value for theta based on theoretical reasoning.
2. All other WACC parameters are estimated with reference to empirical evidence.
3. If theta is to be estimated as it would be if there was no foreign investment, consistency would demand that all other WACC parameters must be estimated on the same basis.
4. The QCA has previously rejected the approach of using theoretical reasoning to set the value of theta (Lally 2004 made the same recommendation).
5. The Lally "test" that demonstrates the superiority of his theoretically reasoned estimate is based on the assumption that the government bond yield would remain the same even if the foreign investment which currently accounts for 80% of those bonds was withdrawn.

Q3: Should theta be estimated on the basis of empirical evidence or theoretical assumption ?

The Lally (2012, 2013) test

- Test is based on the assumption that the government bond yield would remain the same even if the foreign investment which currently accounts for 80% of those bonds was withdrawn.

As at the end of 2011, 75 per cent of CGS were held by non-residents, up from 60 per cent five years earlier. To date, the strong demand for CGS relative to their supply seems to have only brought about a reduction in yields.

RBA Statement on Monetary Policy (May 2012)

The yield on 10-year Commonwealth Government securities (CGS) …remains very low by historical standards. CGS yields remain underpinned by strong demand from international investors for AAA rated sovereign debt. The most recent data show that the share of CGS held by foreign residents was stable in the June quarter at around 77 per cent.

RBA Statement on Monetary Policy (Nov 2012)

If CGS yields are higher in the absence of foreign investment (which seems likely), the Tribunal's 0.25 gamma passes the "test."

Q4: Can redemption rates be used to estimate theta?

"Redemption" or "utilization" rates

- The redemption rate can be estimated using:
  - ATO redemption data; or
  - Estimates of domestic ownership of Australian equities.

Reasons for rejecting the use of redemption rates

1. Observing that a credit has been redeemed tells us nothing about how much of its value was impounded into the stock price. It only tells us that the credit had some positive **value** to the investor who redeemed it.
2. The ACT has recently held that redemption/utilisation rates cannot be used to estimate theta.
3. The National Gas Rules and National Electricity Rules have recently been amended to clarify that gamma is a measure of **value** and not utilisation.
4. Problems with the data mean that the redemption rate cannot be reliably estimated in any event:
   - Lally (2013) and others recognise that ATO redemption data is flawed to the extent that it is unusable; and
   - Estimates of domestic ownership of Australian equities are based on ABS data for which the ABS itself has posted quality warnings.

Q5: What data period should be used to estimate theta?

Standard regulatory practice

- Australian regulatory practice has been to use data from the current tax regime that began in 2000.

results using data prior to July 2000 are of much less interest as estimates of the current value

SFG's study uses data since July 2001 for the very good reason that a relevant change in the tax regime occurred at that time"

Lally (2013)

McKenzie and Partington (2013)

- MP review a number of empirical studies, most of which pre-date 2000.
- They note that the mean estimate from these studies is 0.53.
- They increase this to 0.7 by placing more weight on Partington's studies (all of which pre-date 2000) on the basis that "naturally we would tend to give our own studies greater weight."

Q6: What are the current empirical estimates of theta?

Dividend drop-off estimates

- SFG (2011, 2013) study performed for ACT and since updated estimates theta to be 0.35.
- Beggs and Skeels (2006) was rejected by the ACT.
- ERA (2013) has been rejected for publication.

The Tribunal is satisfied that SFG's March 2011 report is the best dividend drop-off study currently available for the purpose of estimating gamma in terms of the Rules.

No other dividend drop-off study estimate has any claims to be given weight vis-à-vis the SFG report value.

ACT (2011)

Alternative estimates

- Cannavan, Gray, Hall (2013). The most recent study using futures prices. Estimate of theta is 0.2.
- Labcygier and Wheatley (2012), NERA (2013), Siau, Sault, and Warren (2013). The most recent yield studies. Find no relationship between imputation credit yield and stock prices or returns. Consistent with theta of 0.

Aurizon submission

Conservative estimate consistent with regulatory practice

- Aurizon proposes:
  - Distribution rate of 0.7 (consistent with all stakeholder submissions)
  - Theta of 0.35 (consistent with the decision of the ACT and regulatory practice since then)
  - Gamma of 0.25.
- This is a conservative proposal in the sense that:
  - Other post-2000 estimates of theta suggest lower values
  - The dominant market practice is to make no adjustment in relation to imputation credits.

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