NBN WACC – Response to stakeholder submissions

ACCC

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FINAL REPORT

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1. EXECUTIVE SUMMARY

The ACCC published their Draft Replacement Module Determination (draft determination) for NBN on 31st March 2026.[1] This drew on CEPA's advice as detailed in our Final WACC Methodology report.[2] The ACCC has now received submissions on its draft determination. We have been commissioned by the ACCC to assess seven of these submissions. We are to summarise the key issues raised and consider whether this changes our view of the appropriate methodology for determining the rate of return to be applied under the NBN SAU.

When making their decision the ACCC must have regard to the NBN SAU including the two WACC objectives. We observe that it is possible for the dual objectives of "*stability*" and "*market cost of capital*" to oppose each other. These objectives are not necessarily complementary and should instead be seen as trade-offs. Confronting such trade-offs is something any WACC methodology will need to do.

The key differences between our advice and NBN's proposal (as supported by submissions from Frontier Economics) are to do with the estimation of the risk-free rate (RfR) and market risk premium (MRP). The differences on the other parameters are less extensive.

In their February submission Frontier Economics is clear that they are asking the ACCC to move from the "*established approach*" on the estimation of RfR and MRP. Our view is that while improvements should always be sought, Frontier Economics' proposed approach would not improve the performance of the WACC estimate against the NBN SAU objectives. In some circumstances the estimates would appear to be significantly out of line with reasonable assessments of a market cost of capital. We therefore propose to retain the approach set out in our Final WACC Methodology report. This paper reiterates that approach and provides our responses to the main points raised in respondents' submissions.

Risk-free rate and market risk premium

We must estimate the MRP because it is unobservable. A range of methods have been considered to estimate the MRP. The historic excess returns (HER) methodology is one such method and the one we recommended in our Final WACC Methodology report. Every estimation approach is imperfect, and we must recognise the various trade-offs we are making.

Unlike the MRP we have a good proxy for the risk-free rate. In our Final WACC Methodology report we recommended estimating the risk-free rate based on the yield on ten-year Commonwealth Government Securities (CGS).

We continue to recommend that the ACCC estimates the risk-free rate based on ten-year CGS yields and combines this with an estimate of the MRP based on the HER methodology. Because the MRP is unobservable, no estimate can be determined to be definitively correct. Rather, any methodology will tend to produce estimates with particular properties. Estimates using our preferred methodology will reflect up to date data on the risk-free rate; and will produce an overall cost of equity that tends to respond to market conditions in a similar way to the cost of debt. Although not perfectly stable over time (neither in real terms nor nominal terms), changes in the cost of equity from one period to another will be relatively transparent, as they will reflect changes in the risk-free rate and relatively small movements in the long-term evidence on realised returns.

Submissions from respondents did not persuade us that a different methodology would produce estimates with superior properties. Some responses supported our approach, and we refer to these where helpful. Where responses proposed an alternative approach, this was generally on the basis of either: drawbacks with our methodology that we were aware of and took account of in our Final WACC Methodology report; or judgements with which we disagree.

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[1] ACCC (2026), Draft Replacement Module Determination.

[2] CEPA (2025), WACC Methodology.

We focus our attention on NBN's proposed approach, supported by Frontier Economics. There are two key issues with Frontier Economics' proposed methodology:

- Firstly, it abandons the consensus proxy for the risk-free rate and instead applies a 50% weight on a long-term average of the risk-free rate.
- Secondly, it applies a nominal total market return anchor to estimate the MRP.

This combination leads to historical estimates of the cost of equity below the risk-free rate. There is a risk that in a future with high expected inflation that this situation repeats.

Frontier Economics suggests that there are multiple methods for estimating the risk-free rate. While we accept that there may be variants of a 'current' or 'prevailing' proxy for the risk-free rate, we reject the idea that taking a long-term average is valid. It is insufficient to merely observe that investors have a long-term orientation when making investments in infrastructure assets such as NBN. If investors have long-term *forward-looking horizons*, it does not automatically follow that they will look to long-term *historic evidence* for the risk-free rate. To do so would imply risk-free rates are expected to mean-revert over some horizon. However, such mean-reversion should be apparent in the term structure of rates and could potentially be taken into account at regular regulatory resets. The risk-free rate in the NBN decision is held for the next three-year period not indefinitely.

A further issue with Frontier Economics' proposed approach is the application of a nominal total market return anchor. Due to the existence of the nominal anchor Frontier Economics' proposed methodology performs very differently from other potential methods during periods of high expected inflation. We examine the period 1988 to 1993 when expected inflation was higher than today. Frontier Economics' proposed method produces estimates materially lower than both the HER and the Wright approaches as well as below the risk-free rate. This is inconsistent with Frontier Economics' endorsement of the Wright approach as a potential alternative.

Frontier Economics accepts that their long-term approach applies a nominal total market return anchor. However, they reject the idea that their current approach also embeds this assumption. Our view is that Frontier Economics' calibrated DGMs used to estimate the MRP under their current approach also embed a nominal total market return assumption. Their calibrated DGMs embed an assumption that the nominal total market return is 12.16%. This is a sum of the average risk-free rate over the calibration period and Frontier Economics' input of 6.38% average market risk premium. This assumption drives the long-run growth rate in the DGM models and by extension has a significant influence on results. If a different nominal total market return were assumed the calibrated DGMs would give a different answer.

A key contextual feature of the present is relatively high risk-free rates combined with inflation persistently above the RBA's 2-3% target band. A future scenario with high rates and high inflation is "*plausible*". It is the likelihood of this scenario that most clearly highlights the issues with Frontier Economics' proposed methodology. By extension we are not convinced that Frontier Economics' methodology is superior to the HER in "*producing reliable estimates of the market cost of capital in a wide range of plausible market conditions"*.

Beta and gearing

There were five material issues raised associated with beta and gearing. Our responses are as follows:

- Our view is that tower comparators remain an appropriate comparator. The other comparators also vary in their use of long-term contracting relative to NBN.
- Our view is that our geographic filter remains reasonable, and Frontier Economics observes this does not drive material differences relative to their slightly broader geographic filter.
- Our view is that it is appropriate to undertake a relative risk assessment. We use this to justify a small downward adjustment from the midpoint of our range. We have assessed the evidence put forward on counterparty risk and retail-facing product differentiation and continue to conclude there is sufficient evidence for a downward adjustment. Furthermore, our view is that our range is conservative to the high

side. There are methodological decisions that would push the asset beta lower including removal of tower comparators, use of daily estimates and selection of the median rather than the mean.

- Our view is that the mean remains appropriate for summarising the evidence from the range of beta estimates.
- Stakeholders argued that Superloop should be removed as a comparator as they are primarily a reseller rather than operating telecommunications network infrastructure and their beta estimates were not statistically robust. On these grounds it is a close call whether Superloop should remain in or out of the comparator sample. We are inclined to keep Superloop as a comparator.

Cost of debt

NBN and Frontier Economics made seven recommendations on cost of debt. Six of these either align with what we proposed in our Final WACC Methodology report or are improvements that we agree with. One of these around debt issuance costs we only partially agree with. We have dropped Port of Melbourne's estimate of cost of debt issuance but maintain the AER's estimate. This produces a cost of debt issuance of 0.11% which is no change from our Final WACC Methodology report (at 2 decimal places).

2. INTRODUCTION

We have been asked to assess seven reports submitted in response to the draft NBN RMD decision:

- NBN (2026), NBN Supplementary RMA Submission on WACC, 13 February 2026 (submitted shortly before the draft decision).
- Frontier Economics (2026), Response to CEPA final report on a WACC method for the ACCC, 13 February 2026 (submitted shortly before the draft decision).
- Frontier Economics (2026), Method for calculating the return on debt allowance for final RMD and update of WACC, 12 May 2026.
- NBN (2026), NBN response to ACCC draft RMD: Part A – Building Block Model Proposal, 12 May 2026.
- NBN (2026), NBN response to ACCC draft RMD: Part A – Executive Summary, 12 May 2026.
- FTI (2026), ACCC Draft Replacement Module Determination for NBN Co – WACC, 12 May 2026.
- ACCAN (2026), ACCAN Submission to the ACCC's Consultation on the draft Replacement Module Determination.

2.1. NBN SAU REQUIREMENT

The NBN SAU sets out requirements for the rate of return. Specifically, 2G.2.4 states that:

"For the purposes of clauses 2G.2.1(a)(iii) and 2G.2.2(a)(iii), the rate of return will be determined by estimating a nominal vanilla WACC for Financial Year (t) which is: (i) commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to NBN Co in providing the NBN Access Service, Ancillary Services and Facilities Access Service, having regard to:

(A) the objective of producing reliable estimates of the market cost of capital in a wide range of plausible market conditions; and

(B) the objective of promoting stability in the rate of return over time;"

This regulatory framework is not the same as elsewhere. Similar language and concepts such as "*efficient financing costs*", "*benchmark efficient entity*" and "*market cost of capital*" are found in other Australian regulatory frameworks. However, while regulators commonly seek price stability, we are not aware of any Australian framework that explicitly places this objective on the rate of return. Price stability is typically achieved through other parts of the regulatory framework such as revenue smoothing across the regulatory period and modifications to depreciation profiles.

We also observe that its possible for the dual objectives of "*stability*" and "*market cost of capital*" to oppose each other. It is difficult to describe the market cost of capital as stable. Even for common financial instruments such as 10-year Commonwealth Government Securities rates move materially over short periods of time. The Commonwealth government regularly issues bonds and each time they go out to market they may find that rates available have shifted materially. This instability is as true for business as it is for government.

FTI recognises that where this trade-off arises "*the first [objective] is given primacy over the second, as it [the NBN SAU] provides that the WACC is to be commensurate with the efficient financing costs of a benchmark efficient entity…"*. We agree with this observation.

The existence of the stability objective does however suggest that if there are two methods for estimating the cost of capital that are similarly reliable overall, then the one that is more stable should be chosen. Our view, as expressed in the remainder of this paper, is that while the proposed approach by Frontier Economics is more likely

to provide stable estimates it is less likely to provide estimates commensurate with the efficient financing costs of a benchmark efficient entity.

2.2. KEY ISSUES RAISED

We have assessed the issues raised in the stakeholder reports. The key concerns in relation to the treatment of the risk-free rate and market risk premium are as follows:

- Issues with the HER methodology (Section 3.1).
- Our claim that Fronter Economics' method produces a cost of equity disconnected from market conditions (Section 3.3).
- The option of substituting the Wright method for Frontier Economics' calibrated DGMs (Section 3.3).
- Our claim that Frontier Economics' method produces a cost of equity below the risk-free rate (section 3.4).
- Our interpretation of the "internal inconsistency" problem (Section 3.5).
- Broader issues with DGMs unrelated to Frontier Economics' calibration (Section 3.6).
- Potential inconsistencies with our advice to UK regulators (Section 3.7).

Section 4 addresses issues raised with the comparator sampling methodology, beta and gearing.

Section 5 addresses issues raised with the estimation of cost of debt.

2.3. WACC UPDATE

Separately to this note we have produced an updated WACC estimate following the methodology set out in our Final WACC Methodology report but to a new cut-off of 30th April 2026. Relevant to this report is our updated beta estimates which we refer to. The table below provides our updated asset beta and gearing estimates.

Table 2.1: Updated asset beta and gearing estimates (30th April 2026)

	Asset beta range	Average gearing
Net debt gearing	0.32 – 0.37	36%
Gross debt gearing	0.29 – 0.35	42%

3. ASSESSMENT OF RFR/MRP ISSUES

We concluded in our Final WACC Methodology report that the risk-free rate should be estimated using the yield on 10-year Commonwealth Government Securities and the market risk premium should be estimated using the historic excess returns (HER) methodology. NBN and Frontier Economics propose an alternative and alongside this raise a series of issues associated with the HER methodology.

Frontier Economics' proposed alternative is to:

- estimate the risk-free rate as the average of the current yield on 10-year CGS and the historic average of 10-year CGS; and
- estimate the market risk premium as the average of the HER estimated MRP and a calibrated DGM estimated MRP.

Our view is we have an adequate proxy for the risk-free rate, and the use of historic rates is inappropriate.

In contrast, the market risk premium cannot be observed and must be estimated. Any estimation method will produce estimates with particular properties. These estimates can never be definitively shown to be correct or incorrect, but their properties may, depending on the regulator's objectives and market conditions, represent strengths or weaknesses.

We reject the idea that combining an MRP estimated using the HER with the risk-free rate is inappropriate. The HER methodology is not setting out to estimate something different from the prevailing rate. It is simply accepting that the best available evidence for the market risk premium is that recovered from ex-post returns from history. This does, by definition, make it unconditional on current market conditions, but as we stated in our Final WACC Methodology report "*If there was robust evidence on precisely how the MRP varied over time, then it would be reasonable for the ACCC's methodology to place significant weight on this. In the absence of such evidence, we do not consider that a variable estimate should be preferred over a stable unconditional estimate*.".

NBN and Frontier Economics have proposed a methodology which attempts to bridge this absence of evidence. In our view this results in estimates with less desirable properties than the approach we propose. There are fundamental problems with their proposed methodology that make it unsuitable for determining a WACC "*commensurate with the efficient financing costs of a benchmark efficient entity"*. Given the choice between HER and Frontier Economics' methodology we remain of the view that the HER better meets the NBN SAU requirements.

3.1. HISTORIC EXCESS RETURNS

Frontier Economics raises a series of issues with the historic excess returns (HER) methodology for estimating the MRP. These include:

- Producing an MRP unresponsive to market conditions, especially when compared with corporate bond spreads.
- Producing unintuitive movements in the cost of equity during financial crisis.
- Producing cost of equity estimates that are volatile.
- Contradicting RBA evidence for the period 2012-2020.

In our previous report we were very transparent about many of these issues and much of this is not new information. Indeed, Frontier Economics' report quotes our previous report as well as our report on the relationship between the RfR and MRP in arguing against the HER method. These issues with the HER method are well known. Despite this, HER has continued to be applied in Australia by both regulators and financial practitioners across a range of market conditions.

We covered regulatory practice in our previous report.[3] Regarding financial practice in Australia, we reviewed this in another previous report.[4] Financial practitioners most commonly apply a fixed MRP of 6% which aligns with the HER MRP estimate and this is used alongside the current risk-free typically with no adjustments. Many of the estimates we previously reviewed were produced in the period of relatively low rates between 2012 and 2020. This shows that financial practitioners were producing estimates more in line with the HER than Frontier Economics' methodology or the Wright approach during this period of relatively low rates.

This is clearly not proof that the method is sound, but the wide level of acceptability does at least suggest that these well-recognised issues are not terminal. The HER methodology can be successfully applied by both regulators to set revenue allowances as well as financial practitioners when advising Boards during potential transactions.

Frontier Economics argues that the HER performs poorly relative to the cost of debt. Specifically, they argue that the HER implied MRP falls below the debt risk premium during the start of the global financial crisis. This is a potential drawback of the HER approach and one that we were transparent about in our previous report.

We re-produce Frontier Economics' Figure 5 from their February report below. We have however applied Frontier Economics' actual recommended approach, which is an equal weighting of their "current" and "long-term" estimates. Frontier Economics is not proposing to adopt WACC estimates following their "current" approach so it is not clear why we would make a comparison to only that approach. The objective of the comparison is to compare outcomes of the proposed methodologies.

None of the proposed methods maintains material separation between the cost of debt and cost of equity during the onset of the 2008 financial crisis. This is shown in the figure below. While Frontier Economics' proposed methodology follows the cost of debt upwards it still allows the BBB cost of debt to exceed the cost of equity with an equity beta of 1 applied.[5] By extension the observation of poor performance relative to the cost of debt can be extended to Frontier Economics' methodology.

We also observe that performance relative to the cost of debt for both the HER and the Wright approach looks much more reasonable during the subsequent years. The cost of debt falls and both the HER and Wright approach estimates also fall relative to Frontier Economics' methodology.[6]

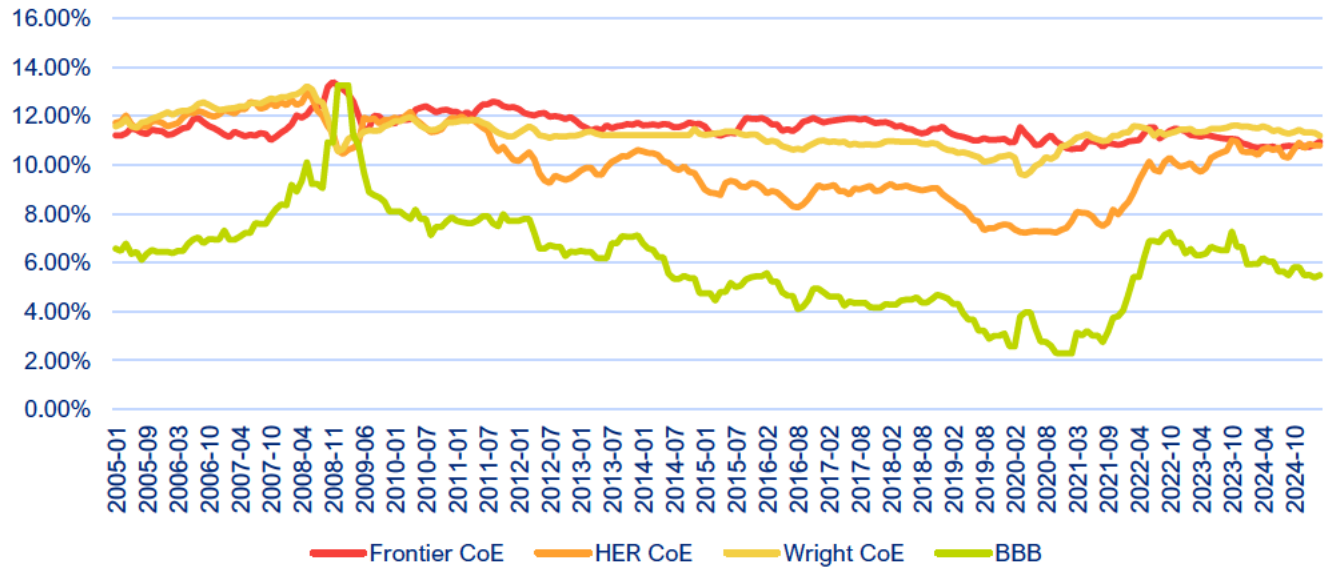
[3] CEPA (2025), WACC Methodology – Draft Report.

[4] See Appendix C in CEPA (2021), Relationship between RfR and MRP.

[5] This occurs in December 2008.

[6] Frontier Economics argues that a similar version of Figure 3.1 that we presented which included an indexed axis and common starting positions "obscures important information". Figure 3.1 allows a comparison without this indexation.

Figure 3.1: Comparison of cost of equity methods against cost of debt (10-year, BBB)



Note: Equity beta of 1 assumed.

Note: RBA data on indexed bond yields is missing for period June 2013 to October 2014 (Wright estimate held to constant value for this period).

It seems reasonable to expect that external factors that lower the cost of debt may also tend to lower the cost of equity. We consider this point further in the sub-section below on the relationship between the RfR and MRP.

Finally, Frontier Economics make an observation regarding the operation of the HER and state that "*In our September 2025 report, we showed that in order for CEPA's approach to be correct, one would have to assume that the expected return on the market is equal to the long-run historical average return on market plus the difference between the prevailing yield on Government bonds and the long-run historical risk-free rate*.". They provide the following equation:

$$E(r_m) = r_f + \overline{r_m} - \overline{r_f}$$
$$= \overline{r_m} + \left[r_f - \overline{r_f}\right],$$

The equation seems correct and represents the assumptions embedded in the HER methodology. For reference, the table below provides the equivalent equations for Frontier Economics' long-term approach and the Wright approach. In much the same way for Frontier Economics' methodology to be "*correct*" than you would need to assume the properties in these equations.

We wouldn't necessarily state it so strongly but Frontier Economics' comment on the HER approach applies to these two other approaches - *"this assumption appears nowhere in the CAPM or in finance theory. Nor is there any empirical evidence for its validity. There is no basis for such an assumption"*.

Table 3.1: Equations for various MRP methods

Method	Frontier long-term	Wright approach
Equation	$E(r_m) = \overline{r_m}$	$E(r_m) = \left(1 + \overline{r_m^{real}}\right)(1 + \pi^e) - 1$

3.1.1. Price stability

Frontier Economics highlights that the cost of equity under the HER approach is "*volatile*" and that:

"These outcomes are antithetical to the objectives of the nbn SAU, which were developed to ensure that consumers pay the efficient cost of the service that is provided to them without bearing the bill shock that comes with volatile regulatory allowances"

There are two NBN SAU WACC objectives and only the second relates to stability. Our view is that the two NBN SAU objectives are potentially in conflict in some situations and are better understood as trade-offs. Nonetheless, we must accept that there is a WACC stability objective embedded in the framework. This is unlike other regulatory frameworks. Where two methods meet the requirement of "*producing reliable estimates of the market cost of capital in a wide range of plausible market conditions*" we must select the methodology that provides the more stable estimate. The two methods that we are considering here are the HER relative to Frontier Economics' proposed methodology.

We observe that the NBN SAU WACC objective makes no reference to the stability of overall regulatory allowances.

Fixing the WACC to a single value to achieve stable regulatory allowances is likely to run into severe problems, as the following scenario illustrates. Frontier Economics' long-term approach would effectively fix both the RfR and MRP in nominal terms with very little movement over time. Without a doubt this would produce a stable nominal rate of return over time (albeit investors' real returns may be volatile). However, in a scenario where inflation continues to increase, the RBA may well intervene by raising rates further. Under this methodology the cost of equity could fall first below the cost of debt and then subsequently below the risk-free rate. This in our view would be a serious problem and would conflict with both the SAU WACC requirement around efficient financing costs and the first SAU WACC objective.

3.1.2. Relationship between RFR and MRP

Frontier Economics sets out statements from the RBA which it uses to support its assertion that the cost of equity is broadly stable. Frontier Economics summarises the RBA's view as follows:

"In both cases, the RBA Governor observed that, regardless of why it might be the case, there is clear evidence that the actual returns required by real-world investors did not mechanically fall one-for-one with the decline to historically low government bond yields… resulting in a relatively stable required return on equity capital."

Frontier Economics puts forward evidence from Governor Stevens in 2015 that states "*the equity risk premium observed ex post has risen even as the risk-free rate has fallen and by about an offsetting amount*". Governor Stevens went on to say "*the hurdle rates of return that boards of directors apply to investment propositions have not shifted, despite the exceptionally low returns available on low-risk assets*". Frontier Economics adds a statement by Governor Lowe in 2019 who stated "*it is worth noting that despite the marked decline in global interest rates (and some decline in the cost of equity), average hurdle rates of return for new investments in many countries have not changed much*."

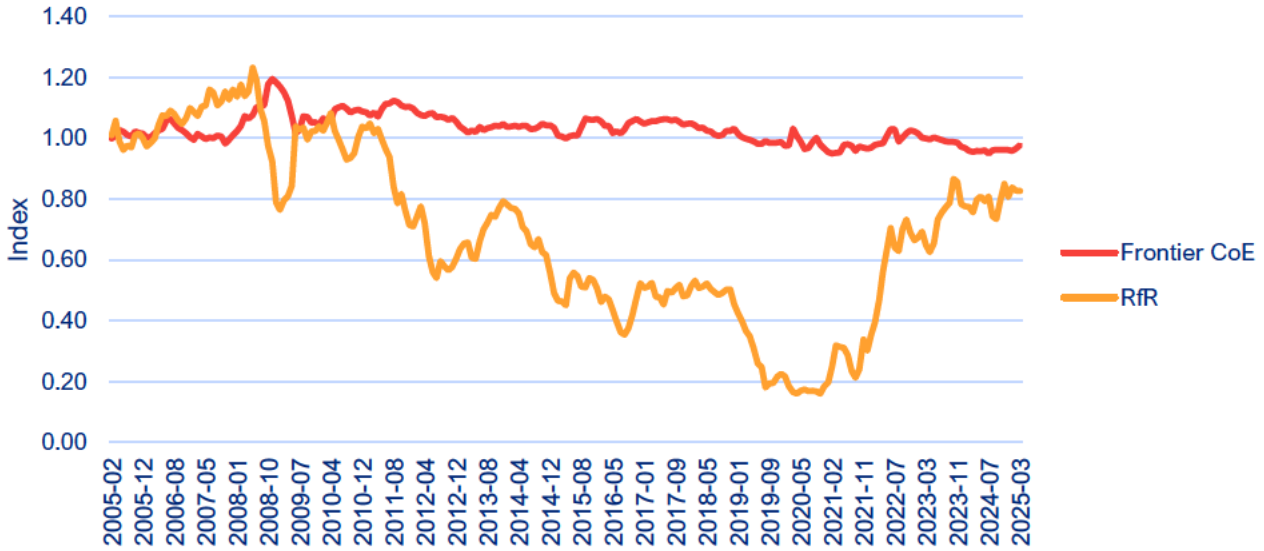
We would make three observations on this evidence:

- Firstly, there is an acceptance, most obvious in Governor Lowe's 2019 statement, that the cost of equity did decline during this period. Frontier Economics' method shows almost no adjustment (see Figure 3.4 below).
- Secondly, the Governors make repeated reference to hurdle rates.[7] This is a very different concept from the WACC. The RBA recognises these as separate concepts and has gone as far as publishing an analysis of the differences.[8]
- Thirdly, these observations are for a particular period in history and don't necessarily support the interpretation that the cost of equity is broadly stable across all market conditions.

[7] Hurdle rates should be distinguished from cost of capital and by extension the concept of "*efficient financing costs*" in the SAU. Hurdle rates typically refer to internal management decision rules about whether to proceed with a project. It is possible that this is equal to the firm's cost of capital though in practice hurdle rates can incorporate other considerations. By extension, hurdle rates are better understood as internal managerial thresholds that can incorporate the firm's cost of capital, opportunity cost considerations and capital scarcity amongst other considerations.

[8] RBA (2021), Why are Investment Hurdle Rates so Sticky?

Figure 3.2: Frontier Economics' estimated cost of equity relative to RfR (indexed to January 2005)



Note: Equity beta of 1 assumed.

Source: CEPA analysis of RBA data and data provided by Frontier Economics

We think it unlikely that the cost of equity fell precisely in line with the RfR as assumed by the HER during this period. We previously examined the relationship between the RfR and MRP.[9] Our report had two key empirical findings:

- Over the period 1936 to 2020 there was a weak negative relationship between the implied MRP and the RfR.
- In the period since 1993 to 2020, there was a strong negative relationship between the implied MRP and the RfR.

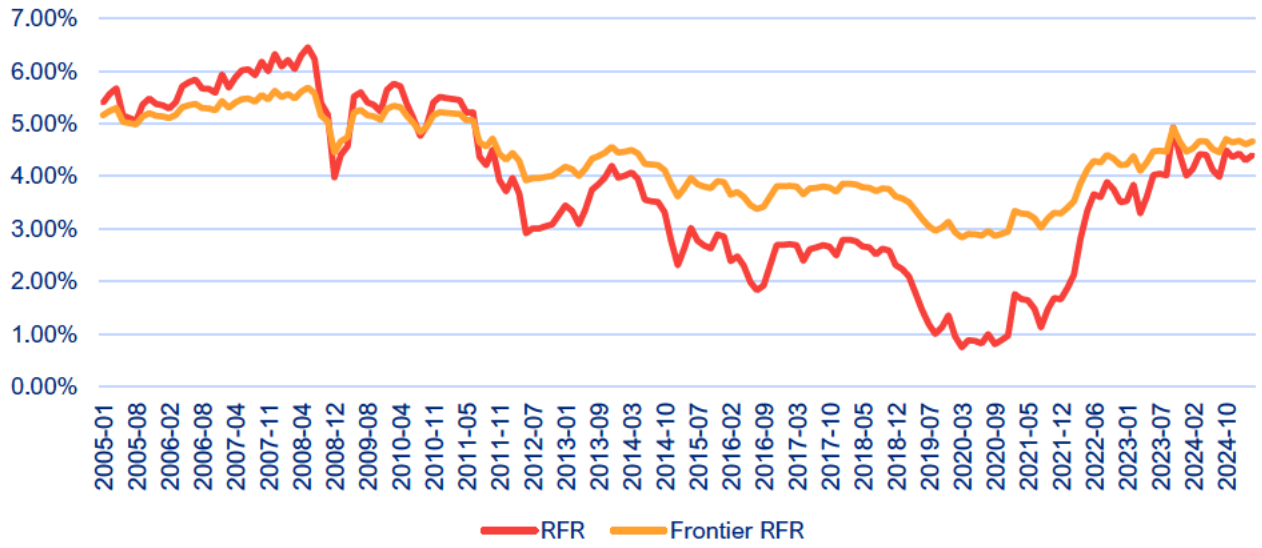
Though we didn't examine the 2008 to 2020 period specifically these findings appear to align well with the RBA's views of that period. Nonetheless, our findings suggest that the relationship may be regime dependent. The 1993 cut-off represents the beginning of RBA inflation targeting. The relationship was much weaker prior to this point.

3.2. LONG-RUN RISK-FREE RATE

One of our key concerns with Frontier Economics' method is the application of a long-run risk-free rate. The figure below shows our estimate of the risk-free rate using the yield on 10-year CGS relative to the risk-free rate that would be applied under Frontier Economics' methodology. We observe that from 2011 to the present Frontier Economics applies a higher risk-free rate than the yield on 10-year CGS would suggest appropriate. By extension, one of the key drivers of differences in the estimate of the cost equity during the period 2008 to 2020 is not caused by differences in estimates of MRP but instead differences in estimates of the risk-free rate.

[9] CEPA (2021), Relationship between RFR and MRP.

Figure 3.3: Frontier Economics' applied risk-free rate relative to the risk-free rate



Source: CEPA analysis of RBA data and data provided by Frontier Economics

Frontier Economics argues that the use of a long-run average risk-free rate is valid because:

"Unlike debt, there is no fixed horizon for equity investment. Therefore, when equity holders are making forward-looking investment decisions (particularly for long-lived assets), they do so having regard to their expected return conditional on prevailing market information, and their expected return over the long-run. Therefore, in our view, the most reliable way to estimate the required return on equity is to have regard to both conditional and unconditional estimates of the cost of equity."

Frontier also state that *"The period beginning in 1993 [used to estimate the long-run RfR] overlaps largely with the period from 1988 which is used (below) when estimating the historical average MRP."*

These arguments don't seem to support their methodology for several reasons:

- Frontier Economics uses 10-year CGS for the risk-free rate for both their long-term average and their prevailing estimate. This seems to implicitly assume that the appropriate horizon is ten years.
- Frontier Economics has not produced any evidence that the appropriate long-run risk-free that investors have in mind is 4.92%. Indeed, none of the estimates we previously reviewed made by financial practitioners supports this finding.[10]
- The 1993 to 2025 period used for the long-run risk-free rate is very different from the 1988 to 2025 period used to estimate the MRP. In particularly the 1988 to 1993 period had much higher expected inflation (see Section 3.4 below). This seems to point to an internal inconsistency in Frontier Economics' methodology.
- There are regular regulatory resets. At each reset the risk-free rate is updated. In this way the short-term rate is converted into the long-term. Given that these resets occur there seems no need to use a long-term estimate. The methodology is not asking investors to accept the risk-free rate today indefinitely.

The implicit assumption of using a long-term average to set efficient financing costs today seems to be that there is some level of mean-reversion. However, with the risk-free rate we don't need to make a judgement. We can observe a proxy for the risk-free rate, and we can even observe the longer-term yield curve to examine whether the market is pricing in mean-reversion. Frontier Economics reference "short-term" and "long-term" risk-free rates. It is

[10] See Appendix C in CEPA (2021), Relationship between RfR and MRP.

not clear you need a concept of the “long-term” risk-free rate nor why this concept is helpful in determining efficient financing costs. The difference for MRP is this must be estimated.

3.3. WRIGHT APPROACH

Frontier Economics considers the Wright approach to be internally consistent and analogous to their DGM approach, a view shared by NBN. NBN considers it an option to substitute the calibrated DGM estimate with a Wright estimate.

Both the HER and the Wright approach use historical data to calibrate their estimates, but they differ in their assumptions about the relationship between the RfR and the MRP:

- The HER assumes the MRP is stable and that the RfR and MRP are unrelated.
- The Wright approach assumes the total real market return is stable and that the RfR and MRP move in perfect inverse proportion.

On this basis, it is unclear why NBN argues that the Wright approach produces an estimate of the "*prevailing MRP*" while the HER does not. The only coherent interpretation is that both NBN and Frontier Economics are using "*internally consistent*" to mean that the total market return is assumed stable. If the real total market return is not stable, the Wright approach cannot produce an estimate of the prevailing MRP either.

Frontier Economics states that when applying the Wright approach, "*the resulting MRP should be paired with the same prevailing risk-free rate that was used when estimating that MRP*." However, the MRP is not independently estimated under the Wright approach it is merely the residual between the estimated total market return and the prevailing risk-free rate. Furthermore, the total market return has been estimated using historic outturn from a period where the historical risk-free rate was not the prevailing risk-free rate. It is therefore unclear how Frontier Economics can argue that pairing the HER with the prevailing risk-free rate is inconsistent, while treating the Wright approach as consistent. The distinction appears to rest only on the assumption that the total market return is stable over time.

In our Final WACC Methodology report we considered that a potential alternative to placing full weight on the HER is to place weight on both the HER and Wright. We highlighted two issues that would need to be resolved for us to be comfortable with this approach:

- Firstly, further backward- and forward-looking testing to understand how it can be expected to perform, especially as the Wright approach has not been actively tested by regulators and financial practitioners in Australia.
- Secondly, further consideration of the appropriate method for estimating expected inflation.

These issues are connected. When we produced the Wright estimates shown in our Final WACC Methodology report, we assumed constant inflation expectations of 2.5%. This implicit assumption seems to remove one of the Wright approach’s strengths relative to Frontier Economics’ proposed methodology. The Wright approach should be better placed to handle changes in inflation expectations relative to a methodology that uses a nominal total market return anchor.

We have attempted to improve upon the analysis we produced for the Final WACC Methodology reports by allowing expected inflation to move over time. We used RBA data and calculated breakeven inflation between nominal and indexed government bonds. The figure below shows expected inflation recovered using this method.

Figure 3.4: Breakeven inflation – 10-year CGS nominal/indexed

Source: CEPA analysis of RBA data

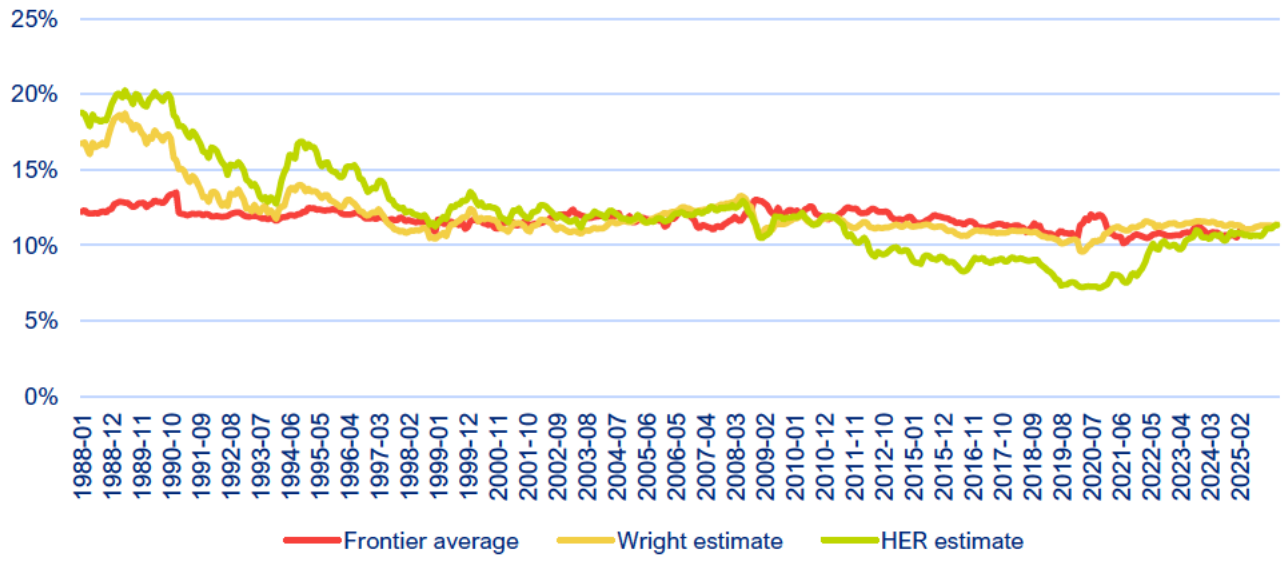
Note: RBA data missing indexed bond yield data for period June 2013 to October 2014.

The figure below shows the implied nominal market return recovered from three methods – the average of Frontier's long-term and current (calibrated DGM) methods, the Wright approach and the HER approach.

Unlike Frontier Economics' methodology the Wright estimate adjusts upwards when faced with high inflation expectations. During the period of relatively low risk-free rates from 2008 to 2020 the Wright estimate is on average lower than Frontier's estimate. Regarding the HER methodology Frontier concludes that it is "*difficult to imagine that a set of estimates could perform more poorly than the CEPA estimates [using HER] against the criteria of producing estimates that are reasonable over a wide range of plausible market conditions.*" Figure 3.6 below shows that Frontier Economics' methodology does not reflect movements in expected inflation relative to alternative approaches. This, alongside the fact that it can produce estimates below the risk-free rate, points to poor performance over a wide range of plausible market conditions.

Our view is that a method that accounts for expected inflation better meets the NBN SAU requirements. The first NBN SAU objective is that the methodology produces "*reliable estimates ... in a wide range of plausible market conditions*". We consider that inflation expectations outside the RBA's target band to be plausible in the future. We also observe that a combination of the HER and Wright approaches would better align with *"statements from the Reserve Bank of Australia (RBA) explaining that … required returns over the period 2009 to 2020 declined but did not fall one-for-one with the risk-free rate".*

Figure 3.5: Implied nominal required market return



Source: CEPA analysis of RBA data and data provided by Frontier Economics.

Note: RBA data on indexed bond yields is missing for period June 2013 to October 2014. Breakeven inflation applied for Wright estimate. Models calibrated to end 2024.

We observe that NBN has recognised the issue of failing to take account of expected inflation. In explaining how they see the difference between conditional and unconditional estimates NBN state "*The best unbiased forecast of the inflation rate over the next 12 months is not necessarily the long-term… Rather, the best unbiased forecast of the one-year ahead inflation rate would reflect prevailing, not long-term, market conditions*." They are however recommending an approach which fails to take account of expected inflation as demonstrated by the figure above.

Frontier Economics observes that:

"*During the period when CEPA says that the risk-free rate exceeded the cost of equity that would have been produced by our method (i.e., when the current risk-free rate was as high as 14%), the implied cost of equity under the CEPA approach would in some cases have exceeded 20% for a firm of average risk. That the required return on equity was that high clearly strains credibility*".

The above analysis should make it clear that an estimate of similar magnitude would be recovered using the Wright approach using breakeven inflation. Such high levels are driven by high expected inflation. Equity investors need to price in the expectation that the value of money was likely to fall in the future requiring higher *nominal* returns to compensate.

Frontier Economics argues that we are incorrect to suggest that their methodology results in cost of equity estimates that are disconnected from market conditions. The evidence presented above suggests that in high expected inflation environments Frontier Economics methodology materially disconnects from market conditions. This is not a surprising outcome given the *nominal* total market return anchor applied as discussed in Section 3.5.

3.3.1. Implementation issues

One of the key implementation issues with the Wright approach is how to estimate expected inflation. This is required because the Wright approach requires an input of the real total market return while the NBN SAU requires a nominal vanilla WACC. A previous report by Frontier Economics explains that forecast inflation has been estimated using the "QCA method".[11] This uses the short-term RBA forecasts for the first two years of the regulatory then a linear glide path from year 2 to the middle of the RBA target band (2.5%). A supporting Excel model provided by Frontier Economics indicates that the inflation forecast is 2.47% calculated.

For the Wright approach to produce reliable nominal estimates we need a reliable estimate of expected inflation. Inflation outturn has recently been persistently above the RBA's 2-3% target band. Despite this inflation expectations, at least as measured using breakeven inflation, remain bounded within the band. At this time, two practical options if the ACCC were minded to move forward with using the Wright approach are:

- Use the RBA target midpoint of 2.5%.
- Use the AER's methodology of combining the RBA's near-term forecasts for years 1 and 2 and then the RBA target midpoint of 2.5% for years 3 to 10.

At the current time both these methods give a similar answer, and this is also close to the breakeven inflation estimate.

However, this may not be the case going forward and by extension a more sophisticated method should be considered. We observe that when we previously examined this issue, we concluded that breakeven inflation without adjustment was superior to other options.[12] This could be something that the ACCC considers in the future if they were minded to move forward with applying the Wright approach.

[11] Frontier Economics (2025), WACC estimates and inflation forecasts for NBN Co's RMA.

[12] CEPA (2017), Best Estimate of Inflation Expectations: Assessment of Approaches.

Nonetheless, we are aware that this would be a major methodological decision that was not consulted on for the draft determination. By extension, we are not recommending a move to the Wright approach currently.

3.4. RETURNS BELOW RISK-FREE RATE

Frontier Economics state that we made an *"incorrect claim that the Frontier Economics' method results in a cost of equity below the risk-free rate*". Our claim is not incorrect. While Frontier Economics 'current' approach results in a cost of equity above the risk-free rate for the entire historical period examined, this is not their recommended method. Their recommended method is an average of their 'current' and 'long-term' methods. This average results in a cost of equity below the risk-free rate in historic periods.

While rejecting the premise, Frontier Economics goes on to argue that this result:

a. Doesn't matter for investors – "*Thus, it would be perfectly rational for an investor in very long-lived infrastructure assets to accept a relatively stable allowed return on equity even if that allowed return was to dip below the prevailing 10-year government bond yield for short periods."*

b. Won't happen again in the future – "*Thus the 'problem' that CEPA has identified can best be characterised as one that has not arisen for decades and would likely never arise under the RBA's monetary policy charter."*

Our view is that no rational investor will supply equity capital to a regulated entity if the returns available are below the risk-free rate. We are also not as sanguine about the Reserve Bank of Australia's (RBA's) capacity to control inflation. While we make no prediction regarding the future path of inflation and rates it seems prudent that a methodology should be capable of handling a scenario of relatively high expected inflation. Using the language of the NBN SAU, Frontier Economics in effect argues that a relatively high level of expected inflation alongside relatively high risk-free rates is not a "*plausible market condition".*

Frontier Economics' overall method embeds a nominal total market return assumption. This is what leads to a return below the risk-free rate in historic periods for the 'long-term' method and only marginally above for the 'current' method (while still insufficient on average to clear the risk-free rate). This nominal total market return anchor comes under significant stress when inflation and/or interest rates are high relative to the historical period used to calibrate the models. We discuss this further in the sub-section below.

3.5. NOMINAL TMR ANCHOR AND INTERNAL CONSISTENCY

A key difference between Frontier Economics' method and the Wright approach is the type of total market return 'anchor' that is used. Frontier Economics' method applies a *nominal* total market return anchor while the Wright approach applies a *real* total market return anchor. This nominal anchor is present in both Frontier Economics' 'current' and 'long-term' methods.

This is the key reason why a cost of equity below the risk-free rate is more likely under Frontier Economics' method than under the Wright approach. It is not possible for the HER to produce a cost of equity below the risk-free rate.

Frontier Economics confirms that their long-term method uses a nominal TMR anchor stating that "*Our unconditional (long-run average) estimate of the cost of equity does assume that the long-run average nominal market return is stable*."

Frontier Economics argues that their current approach makes "*no assumption at all about the stability of the total nominal expected market return*". Our view is that this is not correct. Frontier Economics' calibrated DGMs indirectly embeds an assumption regarding nominal market return albeit embedding a slightly different number than their long-run model (12.16% versus 11.30%). More specifically:

- The nominal market return provided by the model in any period is: k = RfR + MRP.
- The MRP is calibrated over the period such that the average MRP = 6.38%

- This assumption is equivalent to asserting that the average nominal total market return (k) is: mean(k) = mean(RfR) + 6.38% which is 5.78% + 6.38% = 12.16%.

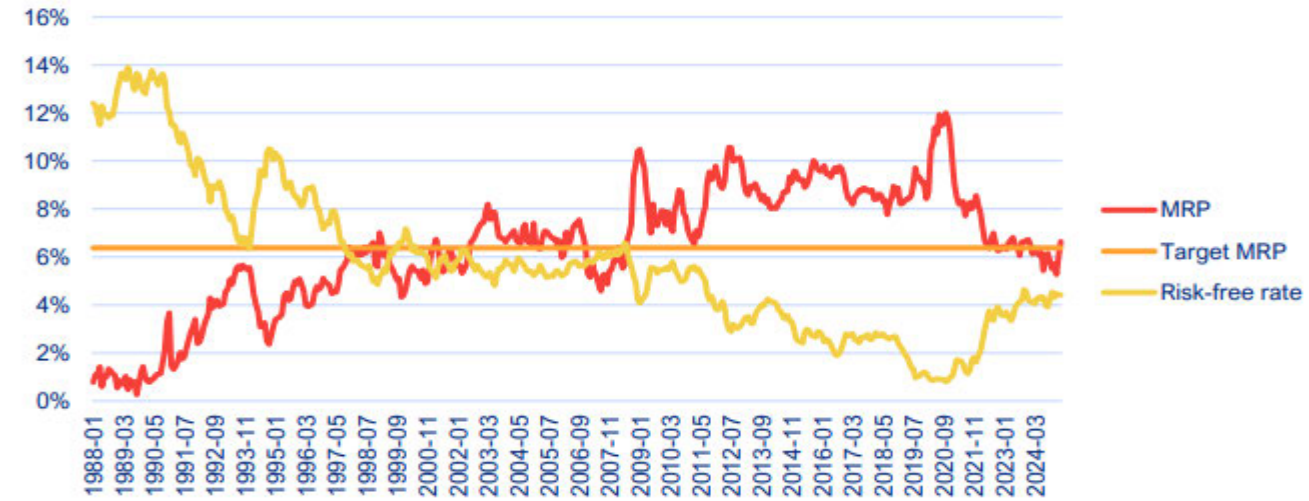
In summary, within Frontier Economics' DGM calibration an assumption of an MRP of 6.38% is equivalent to assuming 12.16% total nominal market return over the calibration period.[13]

If we were to change the MRP assumption (and by extension the nominal total market return assumption), then a different long-run growth rate would be produced. The MRP estimates of the model are not independent of the long-run calibration target. By extension, at least implicitly, the model assumes stability of the total nominal expected market return. Clearly, in any single period the MRP (and total market return) estimate is allowed to vary but over the calibration period the average must be achieved.

We demonstrated this in our previous report and re-produce the figure below. This shows the MRP output for Frontier Economics' DGM model across the historic period. The DGM calibration process requires that each DGM achieve an average MRP of 6.38% across the historic period and the model achieves this by calibrating the long-run growth rate. When there is a period of relatively high risk-free rates the model requires a relatively low MRP and vice versa. Otherwise, the calibration constraint cannot be met.

If a different nominal market return were assumed the calibrated DGMs would give a different answer.

Figure 3.6: Frontier calibrated DGM estimates



Source: CEPA analysis of data provided by Frontier.

The nominal anchor embedded in the DGM calibration process faces the same issues as the nominal anchor in the long-term methodology. Specifically, that inflation expectations are not constant and are unlikely to have been constant over the calibration period. This leads to the model producing biased results as inflation expectations move over time. For example:

- When inflation expectations are high relative to history the calibrated long-term growth value 'g' will be too low which in turn leads to an estimated MRP that is too low.
- When inflation expectations are low relative to history the calibrated long-term growth value 'g' will be too high which in turn leads to an estimated MRP that is too high.

Frontier Economics says we have misconstrued the "*internal consistency problem*". In our previous report we stated, "*we understand the words "internally inconsistent" to reflect an assumption that the total market nominal*

[13] Indeed, you could go as far as editing the MRP calibration target in Frontier Economics code and replacing this with a 12.16% total market return target and you would retrieve the same long-run growth rate.

return is in some way stable". Frontier Economics says that "*that is not what we mean by the internal consistency problem. CEPA's approach is internally inconsistent because it pairs together a conditional estimate of the risk-free rate with an unconditional estimate of the MRP*."

Regardless of whether our description was accurate, Frontier Economics' solution to the internal consistency problem is to assume a nominal total market return recovered from history across both their methods. This challenges the description of their 'current' estimate as a conditional estimate. At a minimum a conditional estimate would allow for the long-term growth parameter in the DGMs to vary, and by extension be conditional on market conditions.

Given the importance of the nominal market return assumption in Frontier Economics' methodology, it is worth considering whether this is appropriately calibrated. In particular given the current inflationary environment. The nominal market return assumption in Frontier Economics' 'current' model is 12.16% while in the long-term model it is 11.30%. The table below shows a Wright approach estimate using Australian data for the period 1988-2024. The Wright approach produces an estimate in real terms which is converted to nominal using expected inflation.

Table 3.2: Wright estimates of nominal total market return at various levels of expected inflation

Expected Inflation	Wright estimate (nominal TMR)
1%	9.9%
2%	11.0%
3%	12.1%
4%	13.2%
5%	14.3%

Source: CEPA analysis

We observe that as long as expected inflation remains in the 2-3% range Frontier Economics' nominal TMR assumption is similar to the Wright estimate. However, Frontier Economics' estimates are low relative to the Wright approach if expected inflation exceeds 3%. Frontier Economics is clear that their assumption is that expected inflation will not become unmoored from the 2-3% RBA target band.[14] Our view is that it would be prudent to adopt a methodology that allows for this possibility.

3.6. Other issues with DGMs

In this section we focus on comments raised by stakeholders that apply to DGMs more broadly rather than just Frontier Economics calibrated versions.

In our Final WACC Methodology we accepted that "*DGMs can provide useful information regarding the current MRP*". However, we outlined concerns with placing mechanical weight on them.

In response to this Frontier Economics raises three issues:

- Calibrated DGMs provide similar results to uncalibrated DGMs.[15]
- Unreliability because of lags in analysts' forecast updates is insufficient to reject their use.
- Sensitivities can be addressed by using multiple DGMs.

We accept that the unreliability caused by lags in analysts is not a terminal issue. As we said in our Final WACC Methodology we see no issue with using DGMs as a cross-check. Nonetheless, a clear improvement would be to

[14] Frontier Economics states that this "*'problem' [is one that] has not arisen for decades and would likely never arise under the RBA's monetary policy charter.*"

[15] Frontier Economics calibrated DGM sets the long-term dividend growth rate assumption such that over a given historic period, the average MRP estimate produced by the DGM is equal to the average MRP derived from the HER method.

ensure that stale analyst estimates are identified and explicitly removed. Given the way in which analyst forecasts are obtained from third party data providers this may be difficult.

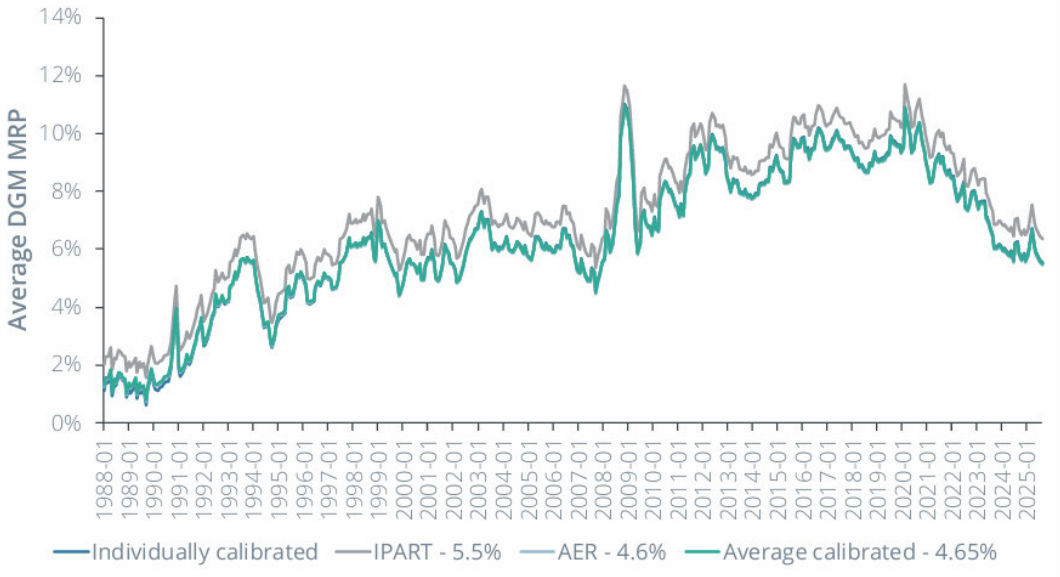
A fundamental issue common with both the Frontier Economics' calibrated DGMs and DGMs more generally has to do with the long-run growth rate. Frontier Economics Figure 8 is reproduced below. Figure 8 demonstrates that these models produce relatively low MRP estimates in the period 1988 to 1993. It is questionable whether these are plausible estimates of the MRP at the time. The reason these models produce such low estimates is that the long-run growth rate is assumed constant (at least in these implementations). This is despite strong evidence that investors in that period had materially higher inflation expectations. The long-run growth rate is a nominal value. As inflation expectations increase, we would expect long-run growth rates to also increase and vice versa (noting that the 'long-run' in DGM models is at most anything greater than 5 years and for many of the models much less).

We observe that 'classic' DGMs potentially have a better capacity to take account of expected inflation relative to Frontier Economics' calibrated version. For example, the AER's DGM uses real GDP growth for its long-term dividend forecast. This is adjusted for expected inflation to retrieve the nominal long-term growth rate that is then used in the model. Such an adjustment for expected inflation is not possible using Frontier Economics' proposed methodology.

If we accept that the growth rate is not plausible in the period 1988-1993 is it possible that the assumed value in the current period is also incorrect? The long-run growth rate is likely to move over time. This means that for the DGM estimate to credible there needs to be evidence that the long-run growth rate assumed is credible for current conditions. The use of multiple DGMs does not appear to address this weakness.

Figure 3.7: Frontier Economics' comparison of DGM estimates under various approaches

Figure 8: Comparison of the average of the four DGM MRPs under alternative long-term growth rate approaches



Source: Frontier Economics analysis of BVAL, Refinitiv, SPPR and RBA data.

Note: The estimates using the IPART growth rate are materially higher. The estimates from the other three approaches are so similar that they are practically indistinguishable.

Source: Frontier Economics

We observe that it is common in Australian regulatory processes that the historic HER estimated MRP acts as an anchor. We also consider that both Frontier Economics' 'long-term' and 'current' methodologies also embed this idea. When we say that DGMs can act as a cross-check we mean that they can act as a cross-check against the MRP estimated using HER. The table below provides the various DGM estimates estimated by us and by Frontier

Economics. The HER estimate is 6.30%. Given the set of DGM estimates below can we confidently conclude that the current MRP is above or below the historical average? Applying DGMs as an explicit cross-check in this instance doesn't point to a strong case to deviate from the HER estimate.

Table 3.3: DGM model estimates

Model[16]	MRP estimate
Fronter Economics calibrated DGM[17]	5.98%
ERA 2-stage model	4.66%
Bank of England (2002)	6.63%
Bank of England (2010)	5.96%
Damodaran (2013)	6.02%

Source: Frontier Economics and CEPA estimates

3.7. Consistency

There are two related issues associated with consistency:

- Consistency with our advice to UK regulators (such as Ofgem and Ofwat).
- Consistency with previous regulatory practice.

Frontier Economics references two previous CEPA reports:

- CEPA (2018), Review of Cost of Capital Ranges for Ofgem's RIIO-2 for onshore networks.
- CEPA (2024), PR24 Cost of Equity.

Looking first at our 2018 report. Frontier Economics' presents the range of evidence that CEPA considered in that report when we considered the appropriate total real market return. Frontier Economics has titled this figure "*Evidence CEPA relied on when estimating the total market return for Ofgem*".

For this report we were asked to comment on the range of possible estimates. This included considering a range of possible methodologies including DGMs. This was early in the process for determining the cost of capital methodology for RIIO-2.

Frontier Economics argues that we used estimates from three DGMs as the "*core body of evidence*" and "*did not relegate DGM estimate to a mere cross-check*". This conclusion seems to contrast with the fact that the estimates from the CEPA DGMs fell outside the proposed total market return range. In that report we observed that a "*potential exception [to the range] would be the CEPA DGM estimate, which currently provides an estimate slightly below this range. However, this is one data point and there are a number of specifications for DGM, which means we do not propose to adjust the CMA NIE range lower*." The CEPA DGMs were at most relegated to a cross-check if not to an even lesser position.

We also observe that in our 2018 paper we came to similar conclusions regarding methods that use nominal total market returns such as Frontier Economics' proposal. At the time we observed that "*taking the nominal total market return…is likely to overestimate the total market return due to historic inflation being higher than expected inflation*." In the period the report was written there was a risk of over-estimation. Methods like those proposed by

[16] Dates on models, for example (2002) refer to the model specification not the model estimation date.

[17] Frontier Economics (2026), Method for calculating the return on debt allowance for final RMD and update of WACC., 12 May 2026.

Frontier Economics which rely on an assumption of nominal total market return are unlikely to provide plausible estimates if expected inflation is different from the historical period used for estimation.

Moving to our 2024 report, Frontier Economics argues that "*CEPA's own advice to Ofwat, as recently as 2024, it used DGM evidence not solely as a cross-check but as one of the core approaches to inform its estimated TMR range*". Frontier Economics is right in that we used "*ex-post and ex-ante approaches*". However, Frontier Economics appears to have misunderstood the ex-ante techniques applied in that report.

Our starting point in that report was an estimate of the ex-post real total market return. This was adjusted for results from ex-ante methods. However, the "*ex-ante*" methods applied are not DGMs in the same sense as Frontier Economics applies the term. The models applied have no current market price, no current dividend yield and no forward-looking growth assumption. The outputs are not sensitive to current market conditions at all. Instead, these are return decomposition models which attempt to answer what part of historical returns were expected when investors made their investments and what was unexpected capital gain. The DGM framework is borrowed as a decomposition identity.

Separately, there are however a series of "*cross-checks*" considered including dividend discount models.[18]

In summary, neither of these reports place explicit weight on DGMs in the estimate. Instead, a range of evidence was considered, and a recommended number was picked from that range anchored by historic ex-post evidence. In short, DGMs acted as a cross-check against a total market return recovered from history. Our advice to the ACCC is not inconsistent.

Finally, we would also observe that Frontier Economics in the UK recommended a *real* total market return recovered from history as part of PR24 deliberations.[19] This contrasts with their *nominal* recommendation on behalf of NBN. They also recommended a "*TMR Glider*" which allows the total market return recovered to move somewhat with nominal risk-free rates. This seems to step the Wright approach towards the HER.

We appreciate that Frontier Economics in Australia is a separate office and they are free to deviate from the advice provided by their colleagues in the UK. This does however suggest that what is appropriate in the UK may not be appropriate in Australia. The regulatory practices which successfully underpin investment into the regulated sectors are different. Acknowledging this difference is crucial. FTI appreciate this point stating that:

"Given the inherent uncertainty in this exercise, the risk of regulatory error is high. In saying this, the ultimate test is actual investment in regulated infrastructure. To date, there is no evidence to suggest that there has been underinvestment, noting that over several decades of economic regulation in Australia, most Australian regulators have been applying the approach proposed by the ACCC."

What is important regardless of the overall framework is consistency of regulatory practice over time. Related to this, FTI seeks "*some guiding principles…under which such a departure [from the adopted approach…may be required*." Our understanding is the ACCC will revisit the WACC methodology for NBN at each reset. All regulatory frameworks must allow for evolution over time, that is one of their key advantages over more contractual forms of arrangement (such as long-term concession agreements). Our advice on this would be that the ACCC adopt a high bar for change of methodology. Formulating this high bar more precisely is difficult as it is hard to predict the future.

[18] See pages 69 to 72 of CEPA (2024), PR24 Cost of Equity.

[19] Frontier Economics (2024), Updated cost of equity cross-check evidence.

4. ASSESSMENT OF BETA AND GEARING ISSUES

4.1. SUMMARY OF ISSUES

The seven reports raise the following issues related to beta and gearing:

- Tower companies should not be included as part of the comparator sample.
- Differences in geographic filters applied.
- Weight to be placed on relative risk assessment.
- Use of mean relative to the median.
- Superloop should be dropped as a comparator.

4.2. INCLUSION OF TOWER COMPANIES

We included tower companies as part of our wide telecommunications sample and considered them sufficiently similar to NBN, in that they provide wholesale telecoms infrastructure, to include in the sample.

Frontier Economics disagrees with the inclusion of these companies as:

a. Tower companies receive fixed long-term contractual streams, and it is the stable nature of contracted revenues that differentiates them from NBN.
b. Frontier Economics sample already exceeds 70 companies, which removes the need to include tower companies.

Both we and Frontier Economics have adopted a broad comparator selection approach. The contracting arrangements of the various comparators are likely to vary. For example, we examined the wholesale share of revenue of the various subgroups in our draft WACC methodology report.[20] This could potentially act as a proxy indicator for longer-term contracting (though noting that this generalisation does not apply to NBN). This showed that the fixed telecommunications subgroup had a higher degree of wholesale revenue than the mobile telecommunications subgroup. This measure of wholesale revenue also suggests that satellite firms are likely to predominantly use longer-term contracting, and these have not been removed from Frontier Economics' sample.

A comprehensive filter for long-term contracting arrangements is likely to impact a much wider range of comparators than simply tower companies.

Given this variation in the other comparators and the fact that the estimates of the towers subgroup are used alongside a broader sample we remain of the view that tower companies should remain in the comparator sample. We note that their removal would reduce the lower bound of the asset beta range slightly to 0.31 – 0.37 (using net debt). With gross debt gearing, the removal of tower companies points to a 0.28-0.34 range.

4.3. GEOGRAPHIC FILTER

Frontier Economics continues to consider that our proposed country filter is "*reasonable*". We also agree with Frontier Economics' observation that questions around "*geographic filtering are complex*". The principled use of international comparators in Australian regulatory processes remains in our view an under examined area. Frontier Economics does however suggest that a different geographic filter could be applied. This includes countries that are either listed in an OECD country or a country classified as "*developed*" using FTSE Russell classification. This

[20] See Table 4.8 in CEPA (2025), WACC Methodology.

would result in additional firms listed in Iceland, Chile, Mexico, Turkey, Greece, Isreal and Poland being included while removing 1 firm listed in Taiwan.

We have updated our beta estimates to a new cut-off of 30th April 2026. The table below provides a comparison to Frontier Economics' estimates from 30th September 2025.

We note that one of our US-based comparators, WideOpenWest, was delisted on 31 December 2025.[21] We consider it appropriate to retain WideOpenWest using a cutoff date from immediately prior to the announcement of the transaction.[22]

Table 4.1: Summary of asset beta estimates

	CEPA (net debt gearing)	CEPA (gross gearing)	Frontier Economics
Mean	0.35	0.32	
Median	0.31	0.29	0.34
Mean range	0.32 – 0.37	0.29 – 0.35	
Median range	0.28 – 0.35	0.26 – 0.32	

Note: CEPA numbers shown above maintain Superloop as a comparator and reflect a roll-forward of the method only removing delisted comparators.

We agree with Frontier Economics conclusion that in this case the geographic filter does "*not appear to drive any material differences in the estimates*." This conclusion is based on the fact that our proposed range includes Frontier Economics' proposed estimate.

Rolling forward our approach to gearing, we calculate a slightly higher net debt gearing estimate of 36%, and 42% on a gross debt basis.

4.4. MEAN RELATIVE TO MEDIAN

Frontier Economics continues to prefer the median over the mean:

"In our analysis, we have recommended the use of a sample median rather than a sample mean. This is for a very simple reason: medians are less influenced by outliers in a sample, and where there is debate about whether to include or exclude certain types of comparators (such as tower companies) or individual comparators with unusually high or low betas, this is a valuable characteristic."

We considered the issue in our Final WACC Methodology report and did not consider the arguments raised to be sufficient to dismiss the mean as appropriate.

We acknowledge that the median mechanically places less weight on outliers. However, we consider it an open question whether this is appropriate. On one hand, we have set out to develop a comparator sample that should capture firms with similar systematic risk characteristics. Placing equal weight on each observation seems appropriate in this context. On the other hand, the resulting comparator sample shows a wide range of asset beta estimates. As Frontier Economics rightly observes when this occurs arguments around whether a certain comparator or comparator group are in or out becomes more consequential if the mean is used. The outliers are more determinative.

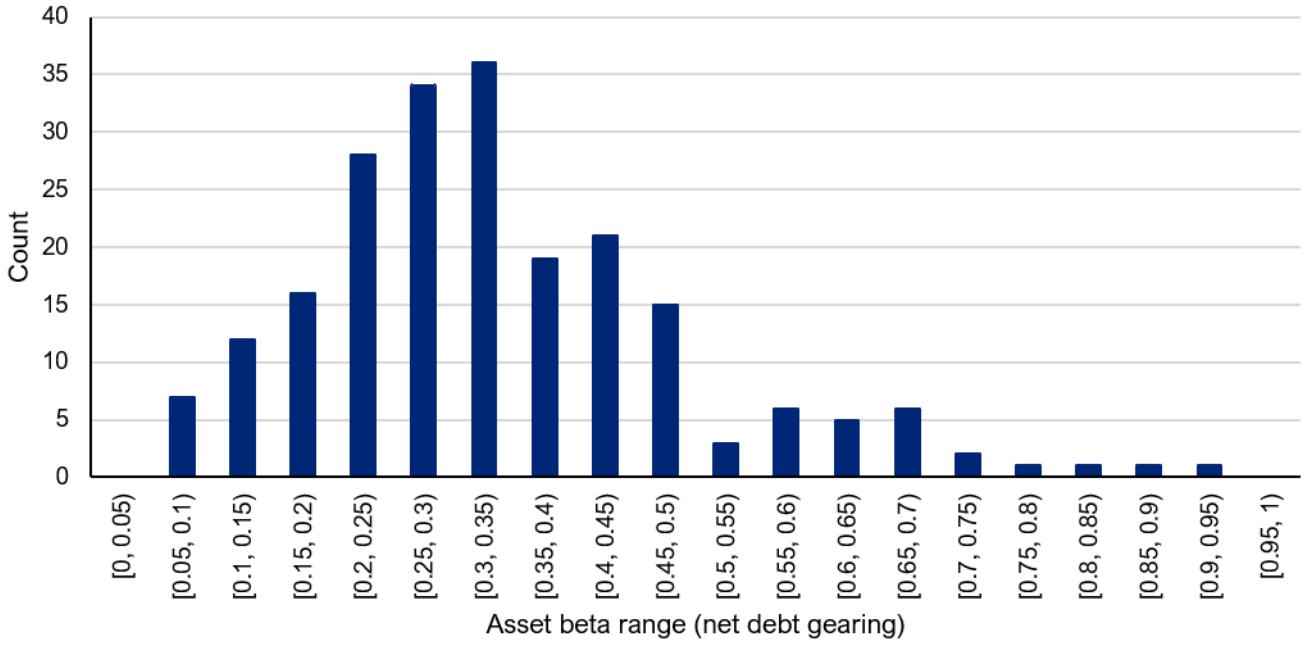
The figure below provides a histogram of asset beta estimates for our comparator sample. This includes all estimate types (weekly and four weekly) and the two time periods in a single figure showing the relative spread of evidence. There is clearly a clustering around 0.30-0.35 asset beta with a long tail to the right. We observe that our mean

[21] See here for further details.

[22] The transaction was announced on 11 August 2025 – we therefore include its betas as of 10 August 2025. See here.

estimate is 0.35, median is 0.32, which coincides with the bottom of our range. Even setting aside our relative risk assessment, 0.32 would seem supported by the evidence.

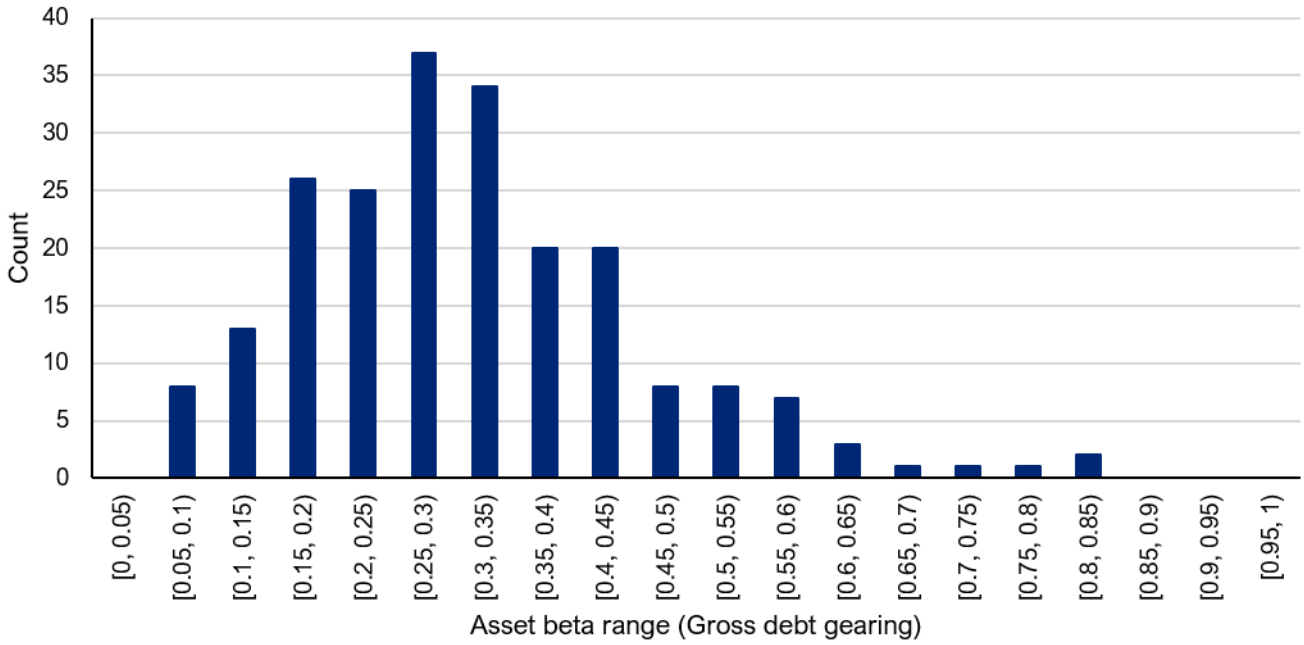
Figure 4.1: Spread of asset beta estimates (net debt)



Source: CEPA analysis of Bloomberg data

The estimates are correspondingly lower when considered on a gross debt basis, with a median estimate of 0.30 and a mean estimate of 0.32.

Figure 4.2: Spread of asset beta estimates (gross debt)



Source: CEPA analysis of Bloomberg data

In this case we continue to view the mean as an appropriate way of summarising the range of evidence.

4.5. EXCLUSION OF SUPERLOOP

There were two arguments put forward to exclude Superloop from the comparator sample:

- Firstly, Superloop should not be included as its historical revenues are primarily from resale activities.
- Secondly, there was a material difference between the weekly and four weekly estimates with a much greater difference than for other comparators.[23]

Our proposed comparator sampling criteria included a requirement that comparators operate telecommunications network infrastructure. A pure reseller would not meet this requirement. However, Superloop is not a pure reseller while historically earning most of its revenue from resale.[24] This suggests that Superloop's removal on this ground is a marginal decision. We are inclined to keep Superloop.

The material difference between weekly and four weekly estimates may indicate issues with statistical robustness of estimates. If there were only a few comparators in our comparator sample this would be a more significant issue requiring further investigation. However, as Superloop is included alongside a broad comparator sample we are inclined to keep Superloop within the range of evidence being considered.

We observe that were Superloop removed the mean range would move to 0.31-0.36 on a net debt basis, and 0.28-0.34 on a gross debt basis.

4.6. RELATIVE RISK ASSESSMENT

In this subsection, we discuss and respond to Frontier's criticisms of our relative risk assessment and the selection of a point estimate at the bottom of our range.

4.6.1. CEPA consultation position on relative risk assessment

We proposed the following methodology to develop a beta estimate for NBN:

- Establish a range of plausible central estimates by looking at the average beta under different estimation specifications[25]
- Conduct a qualitative relative risk assessment which points to NBN sitting towards the bottom of this range, based on its risk profile.

We previously set out our view that NBN is lower-risk than the comparator sample because Retail Service Providers (RSPs) may face systematic demand risk from:

- Counterparty risk from consumer bad debts, and
- Retail-facing product differentiation

that aren't immediately or fully passed through to NBN. NBN earns revenues monthly in advance for wholesale access – RSPs may elect to manage demand risks rather than change their wholesale orders.

Rolling our preferred approach forward to a 30th April 2026 data cut-off results in a mean beta range of 0.32-0.37 (net debt) or 0.29-0.35 (gross debt). On the basis of our preferred net debt estimates, we would propose an asset beta of 0.32 for NBN.

[23] FTI (2026), ACCC Draft Replacement Module Determination for NBN Co – WACC, 12th May.

[24] Frontier Economics indicates that in 2023 this was "*more than 50%*".

[25] In particular, 5-year and 10-year estimation windows, with weekly and four-weekly return intervals.

4.6.2. Frontier counter-arguments on relative risk assessment

Frontier challenges our methodology on two main grounds:

- First, our proposed range reflects estimation error, rather than risk differentials between firms.
- Second, Frontier argues that we have not provided sufficient evidence to justify our judgement that NBN is, on balance, lower-risk than the comparator sample.

In relation to the second of these grounds, Frontier makes the following arguments:

- NBN does not benefit from long-term revenue certainty through contracting,
- The evidence we presented that Telstra is more exposed to delinquent trade receivables than the wholesale comparators is not sufficient to demonstrate that retail-facing firms face substantially greater systematic risk, and that evidence on cyclical variation in bad debts would be more informative.
- We have not presented evidence that systematic counterparty risk is a material driver of beta estimates.
- Retailers do not offer significantly more differentiated products than NBN. Frontier argues that most differentiation in retail-facing service plans is due to NBN speed categories.

4.6.3. CEPA response on relative risk assessment

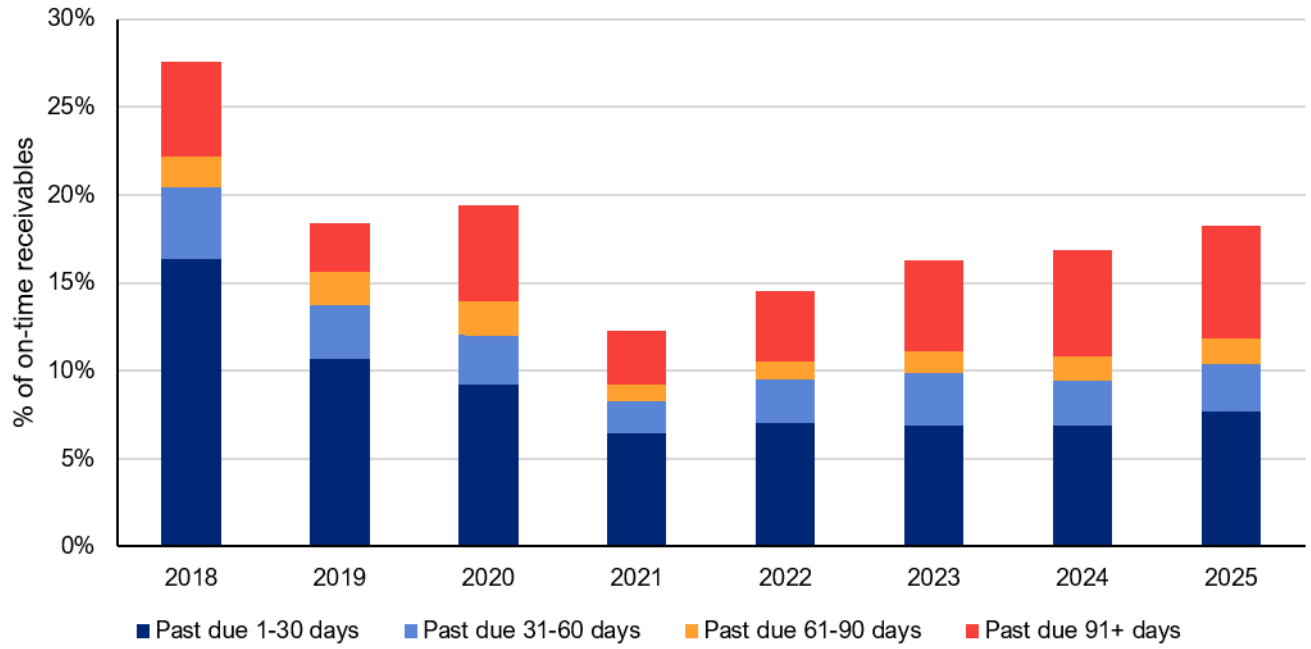
We agree with Frontier that NBN's revenues are primarily not contracted, and that RSPs are able to pass through a significant portion of the systematic risk they face to NBN by varying the volume and type of services they order each month.

However, we have not seen evidence that that all such demand risk can be passed through to NBN, and continue to consider that NBN is likely to be insulated from some systematic risk faced by the RSPs in our comparator sample.

Counterparty risk

We have conducted further analysis of the available data on counterparty risk exposure at NBN and its comparators over time. Figure 4.3 below presents the aging profile of Telstra's trade receivables over time:

Figure 4.3: Evolution of Telstra's trade receivables aging profile



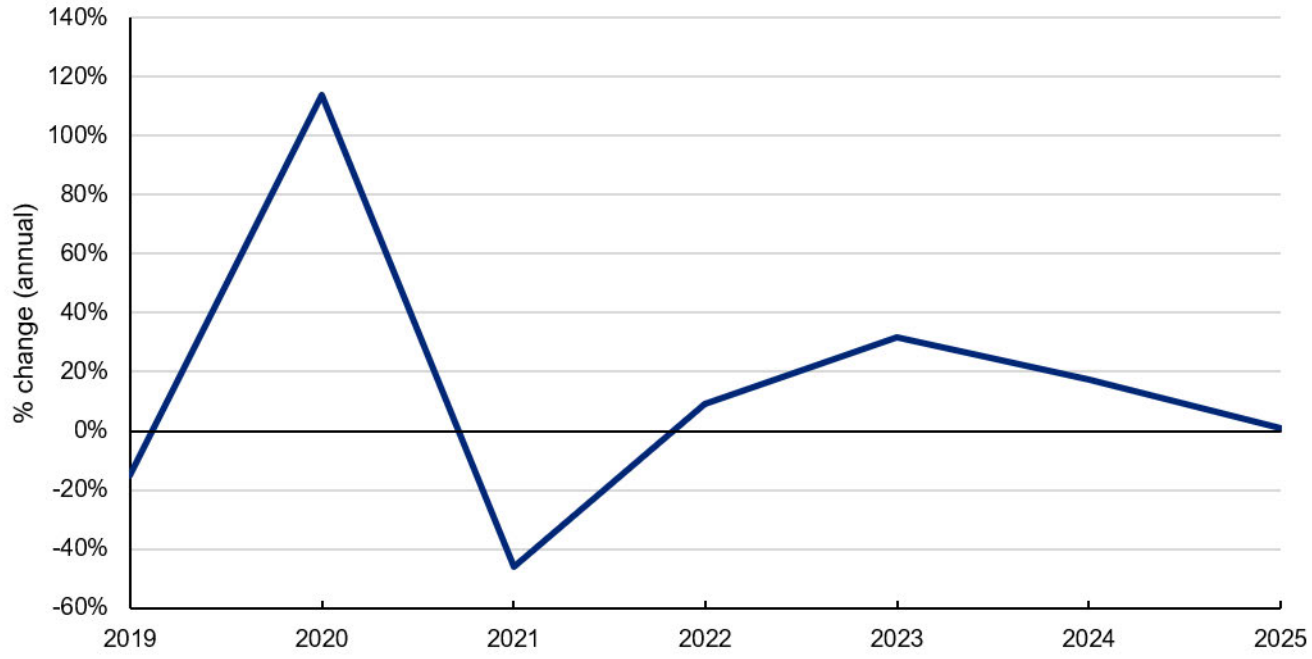
Source: CEPA analysis of Telstra annual reports data

This analysis indicates that Telstra is consistently exposed to a substantial share of delinquent trade receivables, which fluctuates between 12-28% of its on-time trade receivables. Meanwhile, NBN has consistently reported no material past-due or impaired receivables over the same timeframe[26].

As we have previously argued, RSPs face restrictions around their ability to disconnect services with past-due payments, meaning that fluctuations in RSP revenues associated with counterparty risk may not be passed through immediately to NBN.

We continue to consider it plausible that this risk is partially systematic in nature. In particular, Telstra's long-run (91-days or more) delinquent receivables[27] more than doubled in 2020, relative to 2019, as shown in *Figure 4.4* below.

Figure 4.4: Year-on-year change in Telstra's 91-day+ delinquent trade receivables



Source: CEPA analysis of Telstra annual reports data

Furthermore, both NBN and Telstra annual reports present analysis of the counterparty credit risk associated with their trade receivables. In particular:

- Telstra's 2025 annual report states that 19% of its receivables are due to counterparties with external credit ratings between B+ and B-.[28]
- NBN's 2025 annual report indicates that, of $418m of receivables, only $3m is from counterparties with a B+ or lower external credit rating, for an implied share of under 1%.[29] Only 9% of NBN's receivables are from unrated counterparties with a history of default (up from ~1.5% in 2024).

[26] Based on our review of NBN's annual reports.

[27] Telstra considers past-due receivables to be in default after 90 days – see page 144 of its most recent annual report.

[28] Telstra 2025 annual report, pp 144, available here. The equivalent 2024 figure was significantly higher at 40% of receivables.

[29] NBN 2025 annual report, pp. 206, available here. The 2024 implied share of high-risk receivables is also under 1%. A significant share of NBN's receivables are due to unrated counterparties. We could adopt a more conservative approach that assumes previously-defaulted counterparties are rated below B+, in which case the figure rises to 10% (up from 2% in 2024).

This analysis, while indicative and not comprehensive of our entire beta comparator sample, suggests that NBN faces:

- relatively low and less volatile exposure to impaired receivables on an outturn basis over time, and
- relatively low exposure to high-risk counterparties on a forward-looking basis.

We consider this (along with evidence previously presented) to support a small downward relative risk adjustment within a narrow range of central beta estimates.

Retail-facing product differentiation and competition

We agree with Frontier that NBN's wholesale offerings are largely differentiated by speed.[30] Frontier presents a selection of service plans offered by Telstra and Optus to illustrate that this speed differentiation is also reflected in the consumer-facing market.

However, RSPs may differentiate their offerings at the same wholesale speed level on the basis of customer service quality, bundled mobile/voice offers, inclusions (such as networking hardware, backup connections, or entertainment credits), or other benefits.

In short, the same wholesale speed tier can support multiple retail prices, based on the specific retailer and additional offerings. There is therefore scope for retail consumers to "trade down" between retail packages (or switch retail service providers) at the same NBN speed tier.[31]

This implies a degree of demand risk faced by RSPs that is not necessarily passed through to NBN.

To the extent that retail consumers may be more likely to "trade down" within the same speed tier by foregoing some retail-facing package benefits in response to a systematic shock to aggregate income, we continue to consider it plausible that this risk is partially systematic (though we note that quantitative evidence on this point is scarce).

4.6.4. Conclusion on relative risk assessment

The evidence we have presented above, while not decisive, continues to support our directional conclusion. We continue to consider it plausible that NBN is less systematically risky than the average sample company

Furthermore, it is standard regulatory practice to use judgement to triangulate within a range of estimates driven by estimation error. We do not agree with Frontier's criticism on this point.

We also note FTI's agreement with our relative risk assessment approach – FTI states that "*the systematic risk assessment undertaken by CEPA is a structured framework that enables transparent and reasoned decision-making. Based on the analysis undertaken by CEPA, we agree with its recommendation to select NBN's beta from the lower bound of the range*."

Our view remains that there are elements of our methodology that are conservative to the high side. For example, if we were to adopt several of Frontier Economics' proposed methodological changes, including:

- Removal of tower companies and Superloop,
- Use of gross debt gearing, and
- Use of medians to summarise across the comparator sample, rather than averages,

[30] See, for example, NBN's price list, available here.

[31] For example, the ACCC reported in September 2023 that "Vocus and Aussie Broadband gained almost 62,000 services in the June 2023 quarter, while the total number of residential broadband services on the NBN remained steady." See here for further details.

This would result in a median range of 0.23-0.31, which sits entirely below our preferred range with a midpoint of 0.27.

We propose to continue to reflect the balance of this evidence with a small downward adjustment away from the midpoint of our mean beta range (under our preferred approach) to the lower bound, and therefore propose an asset beta estimate of **0.32** for NBN.

5. COST OF DEBT

For NBN, we recommended that ACCC apply a 10-year trailing average approach applying a BBB credit rating. NBN and Frontier Economics agree with this overall methodology. There was a difference in the estimate (4.91% relative to 5.07% in FY 2027) and Frontier Economics set out to ascertain the difference. In doing this work they identified some methodological differences and made 7 recommendations which we address in the table below.

	Frontier Economics' recommendation	Our response
1	Recommend that the ACCC's approach use both RBA and Bloomberg data	We agree with this recommendation. This requires no change from the Final WACC Methodology.
2	Recommend that the ACCC's approach of extrapolating the RBA bond yield data to a target tenor of 10-years be adopted.	We agree with this recommendation. This requires no change from the Final WACC Methodology.
3	When making the final RMD, the ACCC should address nbn's proposal to use a sampling window of February and March for each historical tranche employed in the trailing average calculation.	Our understanding is this recommendation relates to setting of future sampling windows. More specifically, the tranches in FY 2027, FY 2028, FY 2029. Recommendation 4 below relates to the historic tranches. We agree with this recommendation going forward. NBN should be free to make an election for future sampling periods. This will require a minor adjustment to the Final WACC Methodology cost of debt calculation spreadsheets. Our view is also that NBN should be free to make an election at each future RMD varying the sampling window target date. Our understanding is the NBN SAU can incorporate such an election mechanism. This would set the expected return on debt in 2G.2.4(d)(ii) in accordance with the election. The return on debt true-up mechanism under 2G.2.6 would then be used once the outturn is known.
4	When making the final RMD, the ACCC should maintain the historical rates that were adopted when setting the return on debt allowance for the first regulatory cycle, until those historical rates drop out of the 10-year trailing average calculation.	We agree with this recommendation with one provision[32]. In general, cost of debt estimates should apply the historically agreed tranche values. We observe that NBN transitioned to the trailing cost of debt approach in 2023.[33] However, the ACCC stated that they were not satisfied with the WACC methodology. We would recommend that the ACCC satisfy themselves that the historical tranche values have been reasonably calculated. If so, they can be adopted.
5	When using the RBA data, the final RMD should adopt debt spreads that are sampled over two months, rather than on a single day in a single month, and then add those debt spreads to an estimate of the risk-free rate	We agree with this recommendation. This will require a minor adjustment to the Final WACC Methodology cost of debt calculation spreadsheets.

[32] We believe there are typos in Frontier Economics' Table 7 in Frontier Economics (2026), Method for calculating the return on debt allowance for final RMD and update of WACC. Specifically, the tranche ends for FY 2025 to FY 2029 should all be the March 3 months prior to the start of the financial year. For example, the tranche FY2027 should have a tranche end of March 2026.

[33] ACCC (2023), Proposed variation to the NBN Co Special Access Undertaking – Final Decision.

	Frontier Economics' recommendation	Our response
	sampled over 40 business days. This would reduce the risk of volatility and sampling error materially. The ACCC's approach to sampling the Bloomberg data is appropriate and requires no change—except to implement recommendations 4 and 5 above, and to average over 40 business days rather than 20 business days.	
6	There is a formula error where for all years from 2025 onwards the model using RBA data returns the BBB yield as on February 2025.	We acknowledge the error and have corrected the underlying spreadsheet. We have provided ACCC with an updated spreadsheet and estimate for their consideration.
7	An estimate of 12.5 bppa for debt raising costs (nbn's proposal) is more consistent with the regulatory precedent on this parameter and should be adopted by the ACCC in the final RMD.	Regarding the two estimates that Frontier Economics seeks to drop from the average: • On Port of Melbourne, we agree that this is an estimate of the cost of debt issuance prepared for Port of Melbourne and not decision by the ESC. While this has been prepared in accordance with the framework that the ESC monitors it has not had the same level of regulatory scrutiny as other estimates. We agree with its removal. • On AER estimates, while we agree that the methodology is different, we don't agree that this makes the estimate incomparable. The AER's estimates of cost of debt do vary by business. However, the Ausgrid decision of 0.0827% is similar to other recent decisions.[34] We do not propose its removal. This adjustment produces an identical mean and median of 0.11% (at 2 decimal places). This leads to no change from the Final WACC Methodology report estimate.

[34] See for example Table 1 in Incenta (2025), Benchmark debt and equity raising costs which shows debt raising costs by AER regulated network (excluding Marinus Link) varied between 8.10 bba to 8.79 bba.

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