

Draft Final report for Optus

Review of a report by Frontier Economics estimating
the consumer benefits from declaring a domestic
mobile roaming service in Australia

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- The Australian Competition and Consumer Commission (ACCC) has recently received submissions in response to its draft decision on its declaration inquiry into domestic mobile roaming in Australia. The declaration of domestic mobile roaming by the ACCC would require mobile network operators (MNOs) to offer a domestic mobile roaming service to other MNOs, at regulated prices and conditions
- In particular, VHA has submitted a report by Frontier Economics (Frontier) which estimates the consumer benefits from declaring domestic mobile roaming in Australia
- Optus has asked Analysys Mason to prepare an expert report reviewing Frontier's methodology and conclusions
- This document is Analysys Mason's final report and is structured as follows
 - first, we show that the Frontier's economic model is a complicated way of passing an assumed rent to a consumer surplus
 - second, we explain that there is no evidence for the claimed excess profit of AUD616 million
 - third, we demonstrate that the market evidence contradicts the connection between geographic coverage and market share
 - fourth, we highlight that even if there is 'excess profit', the model used by Frontier is the wrong one
 - finally, we note that if coverage was as important as Frontier assumed, the economic benefit would allow Optus and VHA to invest themselves without needing national roaming.

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Frontier's economic model is a complicated way of passing an assumed rent to a consumer gain, and it has a number of flaws and wrong assumptions

- Frontier's economic model is a complicated way of taking an assumed rent, AUD616 million, and passing it through to a consumer surplus after national roaming has removed Telstra's ability to extract this assumed economic rent. The consumer surplus is approximately the same number, AUD685 million, and we believe the minor difference arises due to rounding and opaque price rebalancing related to the equilibrium of the Differentiate Bertrand Model. In Frontier's application, the differentiated Bertrand model does not add any independence or robustness to the initial assumption of an amount of rent
- The output of the model rests fundamentally on the assumed rent, and assumes the rest of the ARPU gap is roaming area costs
- Frontier sets out that 1/2 to 2/3 of the rent is related to *other* competitive advantages, unrelated to coverage, but Frontier does not deduct any rent or associated higher costs for these competitive advantages from the ARPU premium
- We think it is implausible that all other competitive advantages of Telstra are not represented in the ARPU premium, but are absorbed in the baseline fully competitive market ARPU assumed by Frontier. The adjustment of the ARPU gap with 1/2 to 2/3 being related to other factors leaves only 33–50% of the ARPU gap for coverage-related rent and national roaming area costs
- Frontier's ARPU gap of AUD10 suffers from a number of flaws relating to the time period of calculation, and the inclusion of mobile broadband revenues (which depress ARPU). We estimate that the ARPU difference between Telstra and Optus or VHA, when expressed on a consistent basis, is likely to be materially lower than AUD10, and around AUD4–8 (see later slide)
- We estimate that if there was the suggested AUD5 per month of coverage costs, per Telstra subscriber, this would be sufficient to support nearly 4000 radio sites. On this basis, we believe a AUD5 roaming cost (charge) is implausible. Such a high roaming charge would support a business case for Optus and VHA to deploy hundreds of additional sites of their own, without the need to rely on Telstra's occupied legacy 2G/3G remote network

We conclude that the method and assumptions used by Frontier significantly and implausibly overstate the costs and benefits of national roaming

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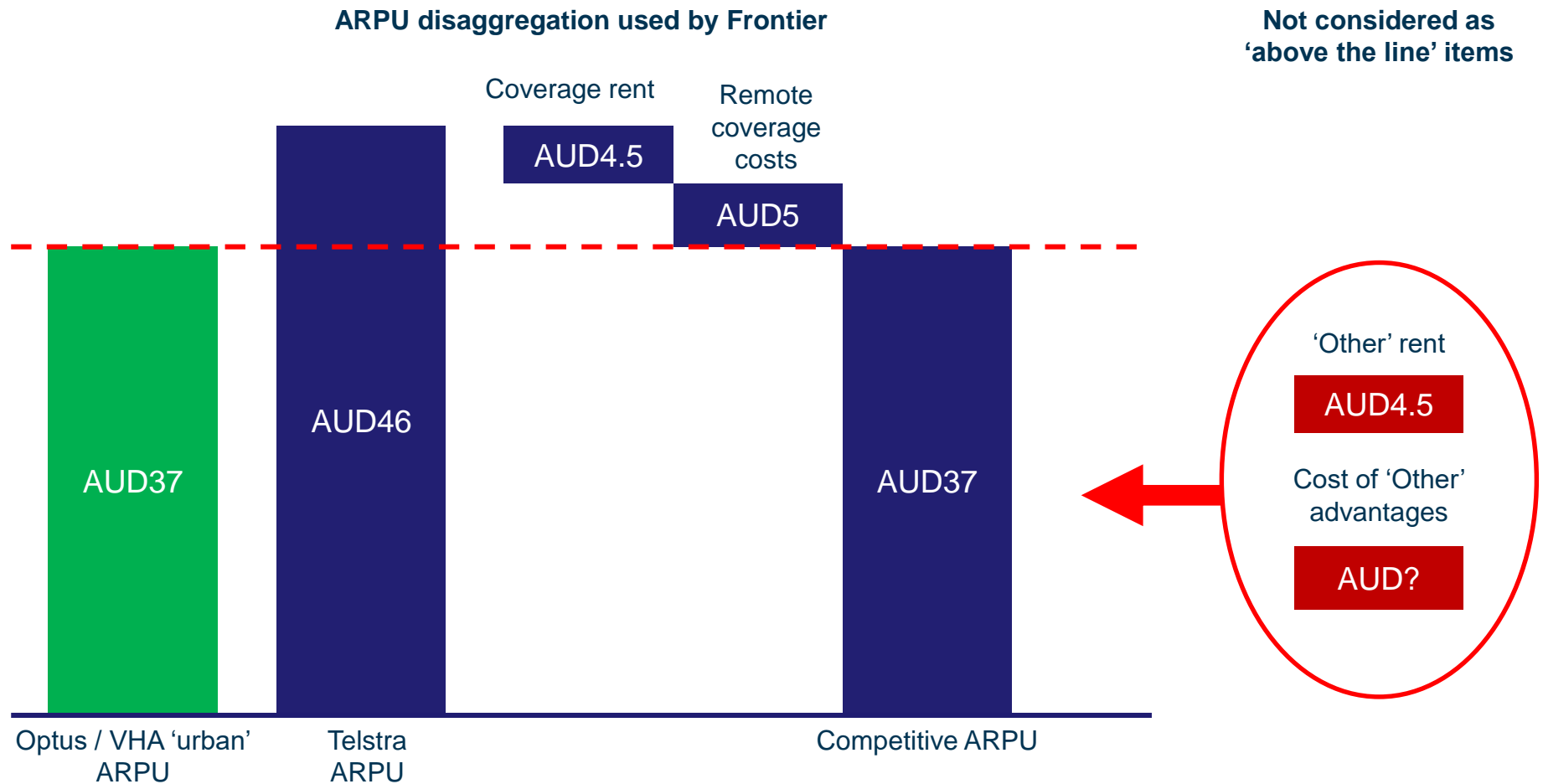
Frontier and the ACCC both agree that Telstra has other non-coverage advantages, but Frontier treats *all* the ARPU premium as coverage-related

- Frontier quotes AUD2.1 billion as Telstra's economic rent, a figure sourced from Richard Feasey's 2nd report.
 - the figure of AUD2.1 billion is not based on an analysis of Telstra's actual profit but on a thought exercise (looking at the impact of coverage differential on market share difference and therefore also including non-coverage factors leading to the difference in market shares) and paragraph 35 of Richard Feasey's 2nd report indicates that the figure of AUD2.1 billion should be treated with caution
- This AUD2.1 billion is used to estimate 20% of Telstra's ARPU being economic rent, although Frontier does not give an opinion on whether AUD2.1 billion is reasonable
 - Frontier accepts the view that Telstra has other competitive advantages over Optus and/or VHA, and reduces the 20% estimate to 10%
 - this is used to estimate the AUD4.5 rent figure which equates to AUD616 million of rent per annum*
 - Frontier then ascribes the remaining ARPU difference to the higher cost of national roaming, at AUD5 of ARPU
- **Frontier is implicitly saying that Telstra gains an absolute total amount of rent of AUD1.2 billion, half of which is due to Telstra's coverage advantage; not AUD2.1 billion, but a similar order of magnitude in total**
- The two deductions (coverage rent, coverage cost) made by Frontier to Telstra's ARPU account for **the full ARPU difference, ignoring the other half of the rent for non-coverage factors (another AUD4.5 per subscriber, or AUD616 million)**

Frontier's methodology does not make adjustments to Telstra's ARPU premium for non-coverage competitive advantages

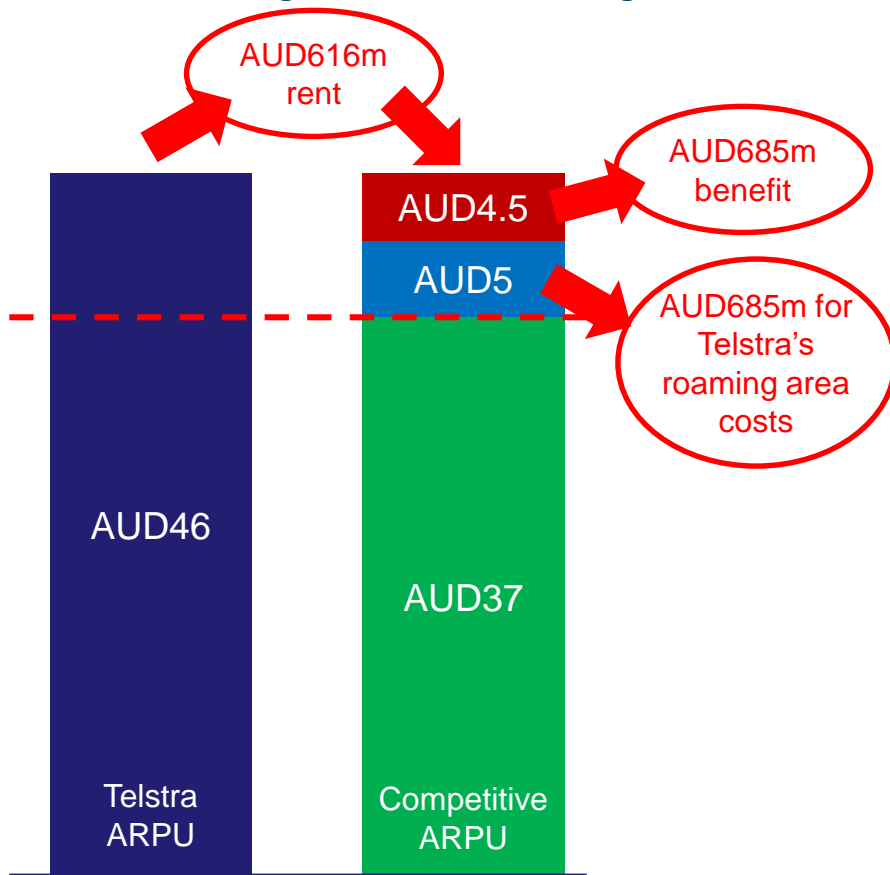
- In Frontier's approach, no adjustments to Telstra's ARPU are made for non-coverage factors:
 - the 'other' 10% of rent, i.e. at least AUD616 million of excess profit is not mentioned
 - any higher costs arising from the non-coverage factors are not mentioned, but we think that these must exist: quality of service, customer support and wider retail presence add costs to the mobile business
- We do not think it is plausible that the 'other' rent and any associated higher costs are contained within the base ARPU because Frontier assumes that the base ARPU is the competitive level
 - the competitive ARPU in Frontier's model is supposed to represent 'urban-only' networks which have the same quality as the urban part of Telstra's network
 - Optus and Telstra have similar market shares in the urban areas (and VHA had a more similar urban market share in the past), therefore these 'urban' networks do appear comparable and without competitive (dis)advantages
- Rent should be gained from ARPUs *above* the competitive level, not *within* the ARPU which Optus and VHA can also achieve
 - instead, we think Frontier should have set aside at least the 'other' half of the ARPU difference as rents and costs relating to other factors. However, this would leave insufficient ARPU premium to support either AUD4.5 per month in rent, AUD5 per month in roaming costs (charges), or both
- **See the following slides for an illustration of these deductions**
- Alternatively, as the claimed 'other' AUD616 million of rent is available to be converted to consumer surplus, the ACCC (and Frontier's case) could take an equally valid approach to target and regulate away the other non-coverage advantages of Telstra

Frontier implicitly treats the 'other' rent and any associated cost differences 'below the line'. We do not think this is plausible

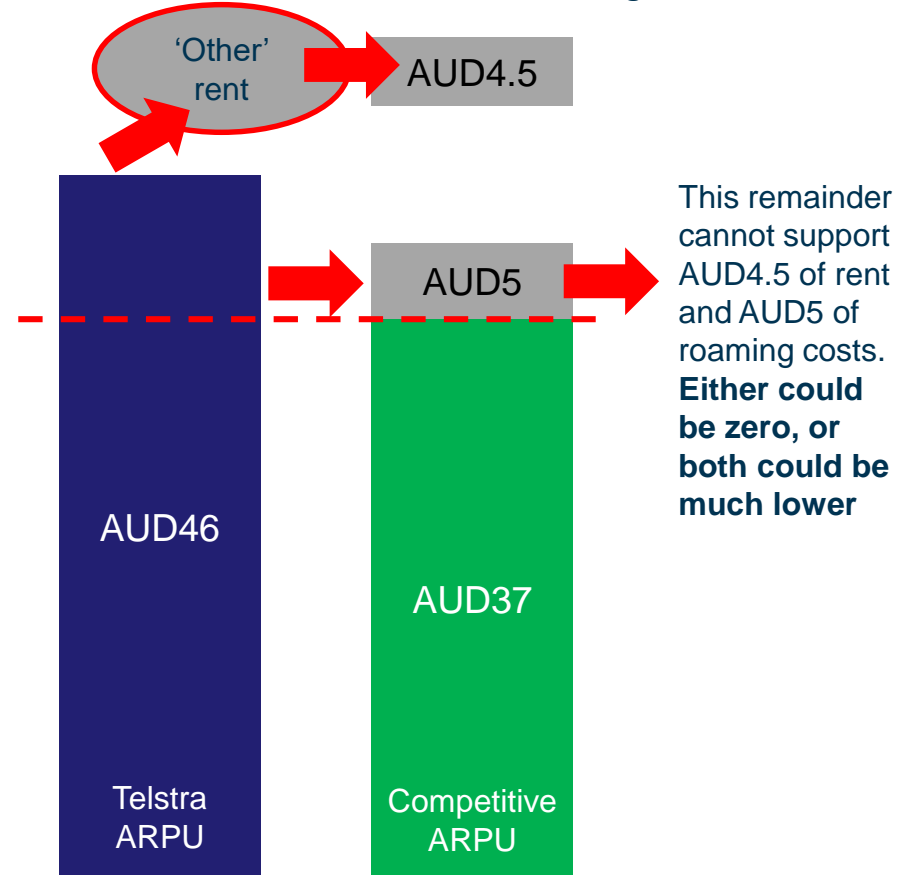


If 'other' rent is part of the ARPU premium, then there is insufficient economic space for Frontier's rent and/or roaming cost calculations

Frontier's approach uses a complex model to pass the assumed rent through to the end result with only coverage as the differentiating factor



If 'Other' rent is considered within the ARPU premium, then there is insufficient remaining ARPU to support Frontier's claims of rent and/or roaming area costs



The evolution of ARPU over time shows that the ARPU differential is not as constant or as high as claimed by Frontier [1/2]

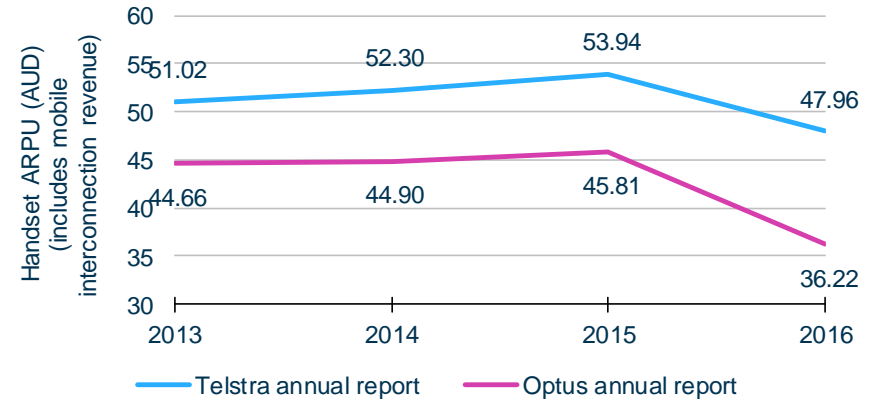
- In its analysis, Frontier claims an ARPU difference of AUD9–10 between Telstra and Optus/VHA
 - AUD46.30 for Telstra
 - AUD35.80 for Optus
 - AUD37.97 for VHA

- Frontier's ARPU calculations are inconsistent and incorrect because:
 - Frontier based Telstra's ARPU on Telstra's 2016 financial year (ending 30 June 2016) and does not therefore include a full year of the ACCC's latest Mobile Termination Access Service (MTAS) price reductions for voice and SMS termination
 - Frontier's calculation of VHA's and Optus's ARPUs reflects a full year of wholesale revenue reductions
 - VHA's reported ARPU is a blend including mobile broadband, whereas reported ARPU for the other operators reflects just handset user revenues

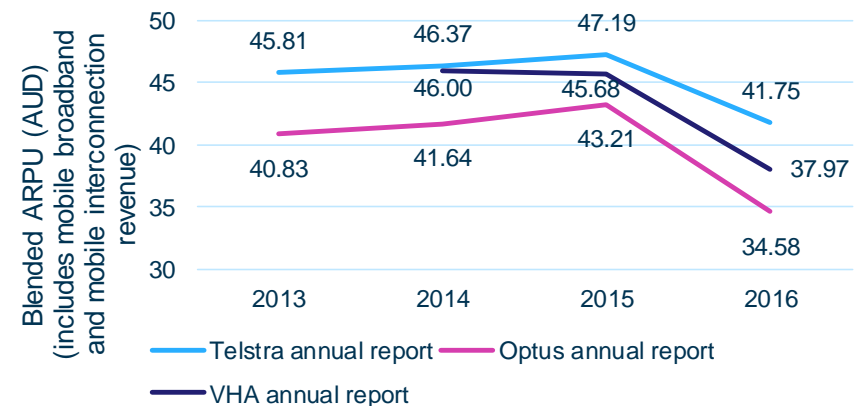
The evolution of ARPU over time shows that the ARPU differential is not as constant or as high as claimed by Frontier [2/2]

- We have used the reported financial data of each operator, over time, to construct the time series for handset and blended ARPUs
- The evolution of handset ARPU over time shows that
 - the increase in the gap to 2016 is likely due to the reduction in MTAS rather than any change in coverage
 - there was a smaller gap in the past despite there being a significant difference in geographical coverage (Telstra covered 2.1 million km² and Optus 700 000 million km² in 2011)
 - the gap between Telstra and Optus before the MTAS reductions was AUD8 in 2015 and AUD6 in 2013
- The evolution of blended ARPU over time shows that
 - the inclusion of mobile broadband reduces the absolute level of the ARPU (as the ARPU for mobile broadband is lower) and reduces the gap between Telstra and Optus or VHA
 - in particular, Frontier compared handset ARPU for Telstra and Optus to blended ARPU for VHA
 - the gap in blended ARPU is AUD4–7 in 2016 and no more than AUD5 in past years
- The ARPU difference is a key driver of the estimated welfare gain
- Frontier’s analysis would give significantly different results depending on which year it is applied

Handset ARPU over time

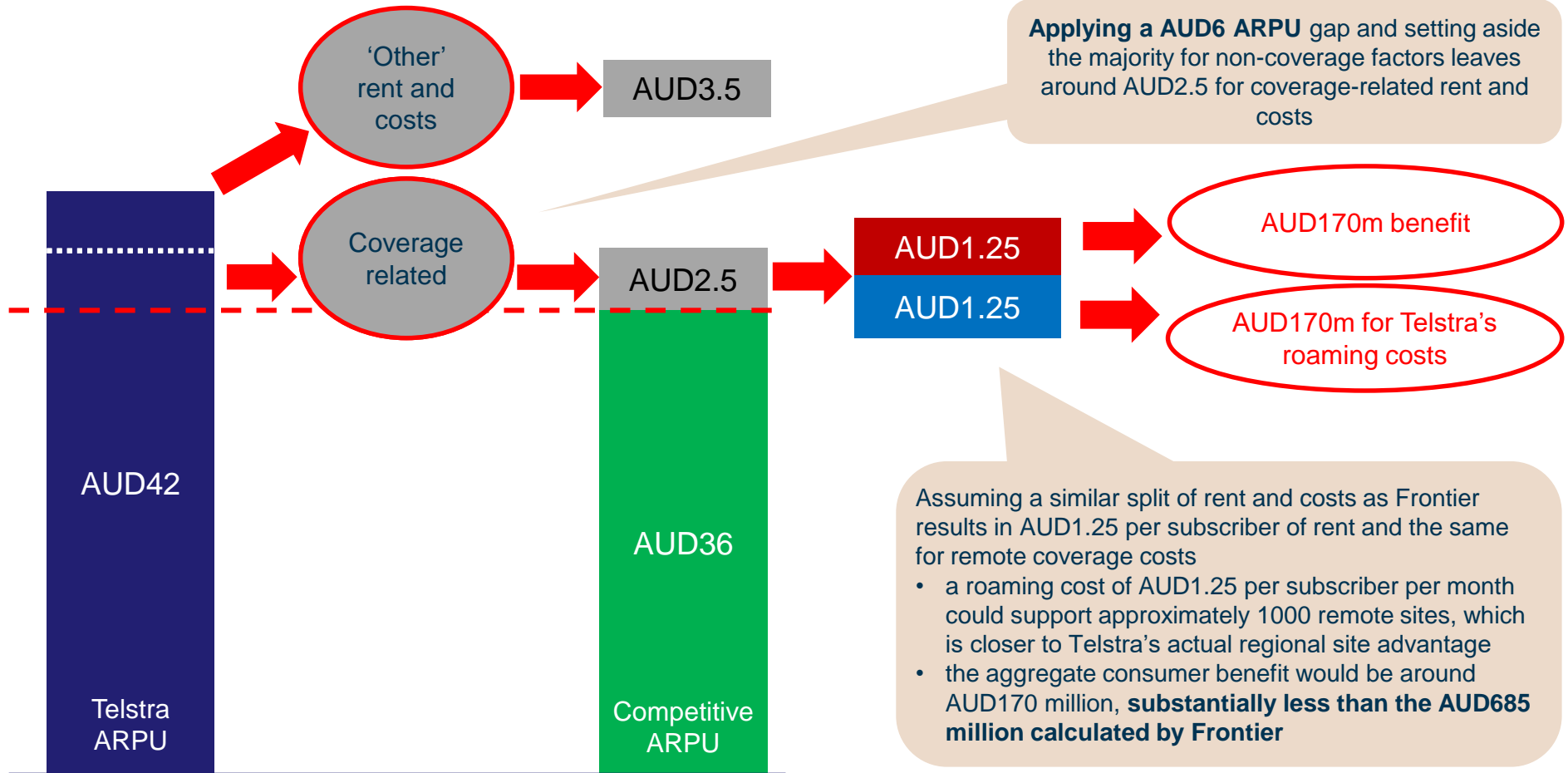


Blended ARPU over time



If Frontier corrected the ARPU gap and allocated more than half of the gap to non-coverage factors, it would result in ¼ of the claimed consumer benefit

If the revised ARPUs are used, then the consumer benefits are divided by 4



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Optus and VHA’s regional market shares show that they are not ‘urban-only’ and that VHA’s lower market share is not due to lack of coverage

- Based on the data used by Frontier, we can estimate the three operators’ market shares in regional areas (see table opposite)
- This data indicates that Optus and VHA both have an established market share in the regional markets
 - hence customers all over the country (except probably within the 1–2% who live outside Optus or VHA’s coverage) are buying products which do not offer Telstra’s level of geographical coverage (i.e. they are willing to accept less than 1 million km² of network coverage)
 - this indicates that around a third of regional customers do not strongly value Telstra’s level of geographical coverage, and 2.4 million km² of coverage is not required to attract some regional customers
 - characterising Optus and VHA’s offers as ‘urban-only’ is therefore misleading and incorrect as a substantial number of their customers already come from regional markets
- In addition, Optus and VHA have very similar coverage yet Optus’s share is nearly 1.5× that of VHA in regional markets
 - similar to urban areas, the level of regional coverage does not appear to explain the market share difference between Optus and VHA
- We conclude that other factors must explain why VHA does not have at least 30% market share, similar to Optus’s 30% share

Breakdown of 2016 market share

	National market share (excluding MVNOs) ¹	Urban market shares (weighted average across capital cities) ²	Regional market share ³
Telstra	50%		~69%
Optus	30%		~19%
VHA	20%		~13%

¹ Page 24, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – Telstra version

² Figure 16, page 39, “The consumer impact from domestic roaming” (Frontier Economics) based on Table 1 of the draft decision

³ Calculated based on assumption that 61% of population is in urban areas, sums to 101% due to rounding in data provided

VHA's under-performance in urban areas compared to Optus shows that coverage is not the main reason explaining VHA's lower market share

- Across the six main cities (population 14.6 million, 61% of the population), Optus and Telstra have similar market shares (✂ and ✂ respectively), as shown in Figure 16 of the Frontier report
- VHA, however, has a substantially lower market share (✂) than Telstra and Optus in 2016
 - VHA's under-performance in urban market share cannot be explained by its lack of full national coverage, as Optus does not show any under-performance as a result of its similar lack of full national coverage (through commercial roaming VHA and Optus have nearly identical coverage)
 - VHA's national market share was substantially higher in 2010, at 27%. This can be compared to its national market share of 18% in 2016
 - VHA's urban market share must have been much higher in 2010, in order to reach its national market share of 27%, and we estimate it would have been much closer or greater than the 33.3% urban share parity
 - we believe that other factors must be causing VHA's low market share, which, if corrected, would result in an urban market share distribution close to 34:33:33

Market shares in urban areas

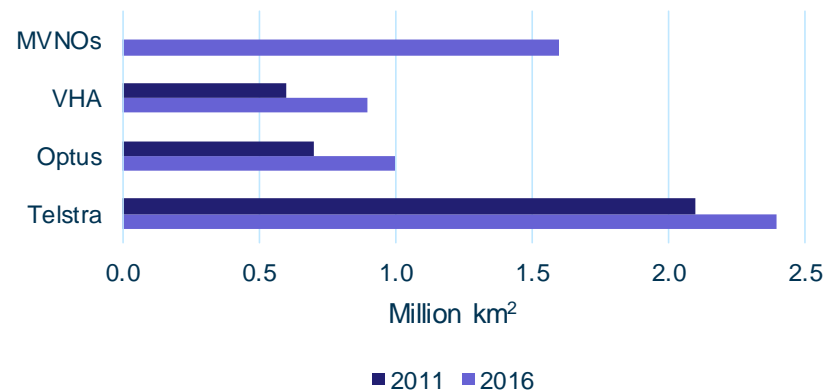


The large benefit claimed by Frontier today arises from the assumption that all Telstra customers, including all urban Telstra customers require and pay rent for Telstra's remote coverage network. This assumption does not take into account VHA's decline relative to Optus and Telstra. VHA's smaller share relative to Optus is due to factors other than the lack of access to Telstra's regional network.

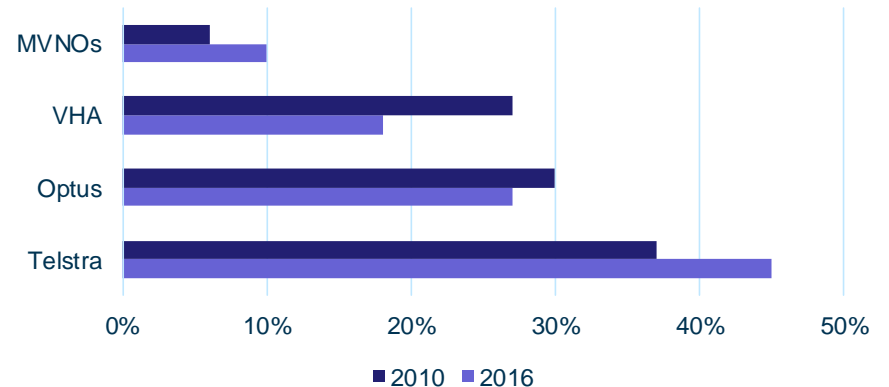
There is no correlation between the evolution of geographical coverage and retail market share over the period 2011–2016

- There is no correlation between the evolution of geographical coverage and retail market share over the period 2011–2016
 - Optus has increased its coverage by more than 40%, yet its retail market share has decreased by just 3%
 - VHA has increased its coverage by more than 50% (taking into account the commercial roaming agreement with Optus), yet its retail market share has decreased by 6%
- The changes in the market since 2010 cannot be ascribed to a lack of national roaming:
 - Optus has had substantially less coverage than Telstra (though increasing over time) throughout this period, and similar coverage to VHA (through commercial roaming), yet Optus has not experienced the same decline in market share as VHA
 - VHA’s market share should have approached that of Optus as a result of gaining a significant increase in coverage
 - VHA’s decline relative to Optus cannot only be due to a lack of access to Telstra’s network
- All operators cover more than 95% of the population, which represents the vast majority of the population that lives in the regional areas (at least 34% of the 39%)

Evolution of geographical coverage (2011–2016)¹






Evolution of market share (2010–2016)²



¹ Frontier’s report for 2016, https://www.accc.gov.au/system/files/Telstra%20main%20submission1_0.PDF, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) –Telstra version and <http://forums.whirlpool.net.au/archive/1802948> for 2011

² ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) –Telstra version

The port-in information provided by VHA confirms that not all Telstra customers value Telstra's level of geographical coverage

- In its analysis, Frontier assumes that all Telstra customers (49% of the market) are Type 3 that value full national coverage (i.e. Telstra's level of geographical coverage) and currently buy "national products" (i.e. Telstra's products)
 - this would imply that all Telstra customers require full national coverage such that the assumed economic rent can be extracted from those customers
- However, VHA's own port-in data shows that approximately  of VHA's new subscribers currently port-in from Telstra (based on Figure 19, taking Telstra and Telstra MVNO customers of  plus  respectively)
 - these port-ins from Telstra are already trading from a provider offering 'full national coverage' to a provider offering 'only regional coverage'
- This demonstrates that:
 - a proportion of Telstra's network users do not actually require and value full national coverage
 - Telstra cannot extract an economic rent for national coverage from its entire subscriber base, as a proportion of those customers are already switching to VHA and Optus and avoid paying that suggested rent

VHA port-in data



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The differentiated Bertrand competition model is not the right model to analyse the differentiated coverage situation in Australia

The Differentiated Bertrand model is not applicable to analyse the differentiated coverage situation

- The differentiated Bertrand competition model requires some specific assumptions
 - firms competing on price while offering similar but somewhat differentiated products
 - the differentiated products need to be substitutable in order for price competition to work between the suppliers (the diversion ratios identify the closeness of the competitive dynamics between different firms supplying the similar products, in a matrix form)
- In Australia, the split between urban-only products and national products is largely artificial given 1) the use of national pricing, and 2) the fact that the rural population is largely covered by Optus (only around 200,000 people are in Telstra-only areas)
- Even assuming that two separate products existed, the two-way substitutability assumed in the Frontier model would not be the case in reality; the so-called 'national products' could be a substitute for urban-only products, but the reverse is not true
- In addition we note that the differentiated Bertrand model ignores any potential impact on investment, consistent with the guidance given to Frontier by Norton Rose Fullbright⁽¹⁾

A Stackelberg model would better account for differentiated coverage and investment effects

- A Stackelberg competition model would be a better approach to take into account differentiated coverage and impact on investment
 - in this model, firms compete on the amount of output (here the level of national coverage) with a leader/first mover (here Telstra) picking the output that will maximise its payoff given the expected response of the followers (here Optus and to a lesser extent VHA)
 - the effect of domestic roaming would be to change the cost function of the followers (i.e. make it more variable), which would allow them to expand their amount of output profitably and therefore affect the response of the leader. This would reduce the leader's (Telstra's) incentive to maintain the largest coverage network for competitive advantage)

⁽¹⁾ "we have not been instructed to consider any other/additional effect through the potential impact on Telstra's (or other operators') incentives to invest" page 9 of Frontier's report)

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If coverage was as important as Frontier assumed, the economic benefits would allow Optus and VHA to invest rather than pay wholesale roaming

- We have estimated the annualised cost of a radio site to be around AUD168 000
- The assumed AUD5 per month of roaming cost for Telstra's subscribers would support nearly 4000 radio sites. This indicates that the suggested AUD5 roaming charge is implausibly high
- The total annual cost to deploy 600 sites to cover 1 million km² is AUD101 million. This cost could easily be supported by a small proportion of the welfare gain suggested by Frontier
- In Frontier's model, approximately 1.8 million subscribers are projected to move from Telstra to Optus or VHA
 - to Optus and VHA, these subscribers cost AUD5 per month in wholesale roaming charges paid to Telstra
 - this amounts to AUD108 million in wholesale payments per year
- We estimate that the wholesale payments to Telstra (AUD108 million per annum) would be sufficient to cover the costs of more than the 600 additional radio sites
- Deploying own infrastructure also brings significant capacity and technology benefits as 4G would be available, without any reliance on Telstra's legacy (and already occupied) remote radio network

Investment scenario, assuming 10% WACC

Description	Unit	Value	Comment / Source
Site capex (site and tower)	AUD thousands	800.0	Optus estimate
Annual cost (site and tower)	AUD thousands per annum	105.2	Assumes 15-year lifetime
Site capex (electronics)	AUD thousands	100.0	Analysys Mason estimate
Annual cost (electronics)	AUD thousands per annum	18.7	Assumes 8-year lifetime
Site power and rent opex	AUD thousands per annum	20.0	Analysys Mason estimate
Site backhaul opex	AUD thousands per annum	24.0	Analysys Mason estimate of AUD2000 per month
Total site annual cost [A]	AUD thousands per annum	167.9	Sum of above components
Assumed cell radius	km	25.3	600 [B] rural sites can cover 1 000 000 km ² ⁽¹⁾
Annual cost for remote coverage	AUD million per annum	101	Based on A × B

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