

2degrees/One NZ RAN joint venture

Report for Bell Gully and Simpson
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1. Introduction

1. Two Degrees Mobile Limited ("**2degrees**") and One New Zealand Group Limited ("**One NZ**") propose to form a radio access network ("**RAN**") joint venture ("**RANCo**").
2. We have been asked by counsel to the parties to review the empirical literature on RAN sharing and to apply this to the proposed joint venture. Our focus is on the effects of RANCo on price and quality in the retail and wholesale mobile markets. We assume that the counterfactual is a continuation of the status quo, i.e., a scenario under which each of 2degrees and One NZ own and operate separate RAN assets.

2. Effects on quality

3. There are a variety of dimensions of quality in retail and wholesale mobile markets, e.g., download speed. Quality outcomes are a function of network investment, including in spectrum, the core network, backhaul and the RAN.
4. In concept, sharing RAN assets would mean 2degrees and One NZ would compete on one less aspect of investment compared to the counterfactual – RAN asset investment (with implications for quality) would be jointly set through RANCo.
5. However, it is important to note the following:
 - A. The arrangements would include a right for each of 2degrees and One NZ to unilaterally deploy RAN assets. In particular, we understand that should either of 2degrees or One NZ have demand for additional RAN assets that the RANCo joint venture does not wish to deploy (e.g., to meet increased demand, or to service a particular enterprise customer via a standalone site), that party could do so unilaterally, either within the joint venture or independently.
 - B. [

]
6. These factors would reduce the degree to which RAN investment for 2degrees and One NZ would be jointly set.
7. Furthermore, 2degrees and One NZ would continue to compete on other aspects of investment, with implications for quality.

- A. They would continue to compete for and separately manage their spectrum. Spectrum is a key definer of capacity and quality for an MNO.¹
 - B. They would each continue to separately invest in and operate their core network. We are instructed that the core network is a key infrastructure element, given it allows an MNO to provide differentiated telecommunications products to end-users, by controlling accessibility on a user-by-user basis. For example, where a customer is on a capped data plan, it is the core network that will switch off the customer's access to data once they have reached their cap. The core network is therefore crucial for MNOs' ability to tailor products to particular users and find ways to innovate on product/service quality. In contrast, we note the view of 2degrees and One NZ that RAN assets are essentially homogeneous and do not lead to noticeable differentiation in terms of customer experience.²
 - C. They would continue to set their own prices, design their own plans and bundles (enabled by their respective core networks), and operate their own customer interaction processes, at both the retail and wholesale levels.
8. To provide some context, we understand from the parties that under the status quo their annual expenditure on RAN opex and capex as a percentage of total annual opex and capex expenditure was as follows:
 - A. 2degrees: []% in FY24 and []% in FY25.
 - B. One NZ: []% in FY24 and []% in FY25.
 9. Very importantly, we expect that RAN asset investments would be economic sooner under the joint venture, meaning that all else being equal quality would be higher under the factual than under the counterfactual.
 10. When European regulators have considered telecommunications infrastructure sharing arrangements between MNOs, they have tended to be more relaxed about passive than active sharing (and most concerned about spectrum sharing – noting there is no sharing of spectrum in the present case).³
 11. However, the empirical studies of the economic effects of active sharing have found that they increase quality (we return to the effect on price below). The most active researcher in this area has been Professor Marc Ivaldi of the Toulouse School of Economics. Professor Ivaldi is an Affiliated Academic of NERA and has reviewed this report.
 12. In the appendix to this report, we summarise the empirical studies of active sharing that are available to date. In summary they find that active sharing increases quality because higher traffic makes investments profitable which would not have been under separate networks.

¹ See, for example, Jonathan T. Elliott, Georges V. Hounbonon, Marc Ivaldi and Paul T Scott (2025) Market Structure, Investment, and Technical Efficiencies in Mobile Telecommunications, *Journal of Political Economy*, 133(5), 1401-1459; and T Randolph Beard, George S Fod, Lawrence J Spiwak and Michael Stern (2013) "Wireless Competition under Spectrum Exhaustion" 65 *Federal Communications Law Journal* 79 -98.

² See [174] and onwards of the clearance application.

³ See, e.g., section 3.6 of the European Commission's *Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements*, 1 June 2023; and the BEREC *Common Position on Mobile Infrastructure Sharing*, 13 June 2019.

13. Finally, it is important to emphasise that each of 2degrees and One NZ would continue to compete against Spark, the MNO with the highest market share.⁴

3. Effects on price

14. As already noted, it is our understanding that 2degrees and One NZ would continue to set their retail and wholesale prices independently. The parties would continue to operate their downstream mobile businesses independently of each other, and the joint venture.
15. We are instructed that the RANCo joint venture is expected to reduce RAN costs⁵ by [], compared to the scenario where the parties maintain separate RAN assets.
16. The empirical studies summarized in the appendix to this report find that the studied RAN asset sharing agreements have materially reduced retail prices or at worst had no statistically significant effect on prices.

⁴ NZCC, Telecommunications Monitoring Report, 29 June 2026 at page 216.

⁵ Site opex, site capex and non-site costs.

Appendix A. Summary of empirical literature on RAN sharing

A.1. Cojoc et al. (2020)⁶

17. Cojoc et al. investigate the effects of active network sharing in the mobile telecommunications market, focusing on prices, network quality and consumer welfare. They apply a structural model to two network sharing agreements ("**NSAs**") in the Czech Republic between O2 and T-Mobile Czech Republic (TMCZ), signed in 2013 and 2014. The agreements were for a geo-split arrangement.⁷
18. The authors apply their model by using data from sharing arrangements in the Czech Republic to simulate a counterfactual equilibrium where there are no network sharing agreements, which they then compare to the factual scenario.
19. The authors find that, compared to the counterfactual of independent network deployment, the geo-split arrangement led to lower costs and prices, and better network quality, leading to overall higher consumer welfare. They estimated that, on average, prices for TMCZ, O2 and Vodafone would be 14.8%, 14.6% and 12.5% higher without the NSAs, respectively. Additionally, they found that in the counterfactual, network quality (download speeds) for TMCZ, O2 and Vodafone would be 11.3%, 9.8% and 44.3% lower, respectively, and consumer surplus per quarter would have been 5.9% lower.⁸
20. When discussing their theoretical model, the authors state that the most direct pro-competitive effect is the reduction in infrastructure expenditure. Each operator needs to build fewer sites to provide coverage, leading to lower capex. The authors note that opex can also reduce, through sharing rental costs of a site, or the costs for energy consumption. The authors find that these costs do not only benefit the firm, but also consumers when these savings are passed on through lower prices or higher quality services.
21. The authors also note that quality improvements can occur through greater network coverage, or through network densification. For the second point, under the sharing agreement each operator will have a higher density of consumers through also serving consumers from the other operator in the agreement. Therefore, all else remaining equal, this increases download speeds as consumers could be served by less distant sites.

⁶ Cojoc, A., M. Ivaldi, F.P. Maier-Rigaud, O. März, "Horizontal cooperation on investment: Evidence from mobile network sharing", *TSE Working Papers 20-1100*: (April 2020). Note that this paper was not finalised, but was nevertheless placed on the Toulouse School of Economics website, on SSRN and published by the Centre for Economic Policy Research (Discussion Paper DP14770).

⁷ Under a geo-split arrangement, each operator operates the mobile network in a separate area, which the authors describe as its master area. In each operator's master area, subscribers from all operators in the agreement use the master operator's mobile network. This is in contrast to a joint venture where a company is formed which operates the parts of the shared network and provides the services to the sharing parties.

⁸ The authors also attempted to apply a joint venture arrangement instead of a geo-split arrangement. However, they did not get realistic results for the counterfactual. The authors were not surprised by this result (as it used data from the Czech Republic which is a geo-split), and said it simply confirmed that the Czech parties operate a geo-split arrangement.

A.2. Maier-Rigaud et al. (2020)⁹

22. Similar to Cojoc et al. (2020), the authors focus on the effects of active network sharing between T-Mobile and O2 in the Czech Republic. Using a difference-in-differences method, the authors estimate the effect of the NSA by comparing the prices of mobile service bundles in the Czech Republic to prices in a control group comprised of a set of European countries. Then, they estimate a structural model of demand and supply in the mobile telecommunications industry, which they use to estimate the effect on consumers' valuation of mobile services (which they use as a proxy for network quality), and on the cost of providing mobile services.
23. Their results show that the sharing agreements in the Czech Republic led to a reduction in usage-adjusted prices. They also note that the effect on price increased as usage increased, which indicates the agreements provided more beneficial effects to consumers with greater data requirements.
24. The results of their structural model show that the sharing agreements increased consumer valuation of mobile services, which they interpret as an increase in network quality, and the NSAs also reduced costs (the principal aim of the agreements). With a decrease in price, and increase in quality, they estimate an overall increase in consumer surplus.
25. The authors also describe the possible mechanisms behind these results when discussing the theoretical effects of NSAs. Like Cojoc et al. (2020), the authors state that the clearest procompetitive effect is through lower costs due to less network duplication. Then, to the extent that it affects the operators' marginal costs, the savings will be passed onto end consumers through lower prices.
26. The authors also note that what matters for investment in new sites is the profitability of adding a new site. Therefore, the reduced cost of building and maintaining network infrastructure may be used by the sharing parties to build a denser network than what may have been profitable under individual roll-out, thus increasing network quality.

A.3. Koutroumpis et al. (2023)¹⁰

27. The authors assess the impact of network sharing on consumer welfare, prices, and network coverage and quality. Using a difference-in-difference model at the operator level, the model captures market outcomes between operators that enter into NSAs, and operators that do not enter any agreement. This analysis covers 140 operators in 29 European countries, during the 2009 to 2019 period.
28. The authors find that there are large capex and profit benefits from sharing compared to operators who did not enter into sharing agreements. The authors also note that there was evidence that these cost savings were passed onto end consumers.

⁹ Maier-Rigaud, F.P., M. Ivaldi, C.P. Heller. "Cooperation among Competitors: Network sharing can increase Consumer Welfare", *SSRN Working Paper*: (May 2020).

¹⁰ Koutroumpis, P., P. Castells, K. Bahia. "To share or not to share? The impact of mobile network sharing for consumers and operators", *Information Economics and Policy*, 65: (December 2023).

29. It is important to note that the authors found that the effects on capex savings, profit margins, and price reductions were strongest with passive sharing. They did not find statistically significant results for price reductions, profits and capex reductions for active sharing; however, active sharing led to strong statistically significant positive effects for network quality including both download speeds and coverage. Additionally, at the market level, the authors also found a statistically significant reduction in HHI from active network sharing, which the authors claim highlights that the procompetitive effects of network sharing outweighed any potential concerns about the effects of a reduction in infrastructure-based competition.
30. The authors claim that the reduction in prices, and increases in network quality and coverage was driven by capex reductions, and higher returns on investment, which provided operators with both the ability and incentive to invest.



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