



Additional Information in Response to Submissions on the Commerce Commission Letter of Unresolved Issues in relation to the proposed Sky-Vodafone Merger

23 November 2016

1 Introduction

The Commerce Commission has issued a Letter of Unresolved Issues (LOUI) in relation to the proposed Sky-Vodafone merger. The Commission has expressed concerns about the proposed merger creating both an incentive and an opportunity to increase prices for pay TV, broadband and mobile services. A number of reports have been submitted on behalf of Sky and Vodafone in response to the LOUI.

Both NERA and Howell & Potgieter make the point that to understand the effects of the merger, the Commission needs to give adequate consideration to demand-side effects. We agree with this methodological observation. A thorough analysis of expected consumer behaviour is necessary.

To assist the Commission in finalising its views, we have been asked to consider in more detail how consumers would be likely to respond to unilateral actions by the merged entity. Compared to the counterfactual of no merger, Sky-Vodafone would be able to coordinate changes in prices of the overall bundle with the prices of its constituent components. In addition, it would be able to take non-price action to differentiate its product offerings. Whether such actions would lead to sustained price increases would depend on consumer preferences and how these preferences are expressed.

Most relevant information about consumer preferences can be summarised through measures of price elasticity of demand, including own price elasticity, market demand price elasticity and cross-elasticity of demand. We have developed a simple approach to quantifying consumer behaviour based on assumptions and available information about consumer preferences. We use this approach to test whether a plausible range of assumptions is consistent with pro-consumer or anti-consumer market outcomes. This should assist the Commission to form a view about whether it can be satisfied, based on consumer behaviour that has a real chance of occurring, that no substantial lessening of competition is likely.

Overall, we conclude that NERA's and Howell & Potgieter's inferences about demand-side behaviour are not supported by the evidence. As we show, high level observations about consumers and their preferences can easily mislead. Rather, demand-side behaviour is best understood by looking at the individual components that make it up: variables such

as own price elasticity, cross-price elasticity and so on. By focusing on the plausible values of such variables and the consistency of assumptions, the Commission would be better able to form a view. We show that NERA's claim about demand-side behaviour impeding anti-competitive outcomes requires implausible assumptions and unrealistic inferences from the currently observed market conduct.

2 The Context

The proposed merger is occurring at the time of significant changes in the relevant markets. These changes will underpin the likely market conduct by the merged Sky-Vodafone. As the context to our modelling exercise, we highlight the following:

- The transition to the near-universal ultra-fast broadband / RBI coverage (98 percent of New Zealanders to have access to UFB/RBI by 2020 or possibly even ahead of that date) will likely increase churn in the broadband market. The point of switch-over to the fibre puts customers who might not otherwise have been likely to switch providers in play. This enhanced churn represents an opportunity for marked shifts in market share
- At the time of the churn event, product differentiation—in particular content differentiation—is likely to play a critical role. The ability to offer attractive triple- and quad-play bundles is likely to be a key differentiator that could lead to increases in market share. The bundles would need to be attractive relative to the alternatives available at the time. In other words, what would matter would be the relative price of the bundle compared to the cost of purchasing various components separately as well as any additional services that may be made available through the bundle without being available through separate components. []
- Once the transition to the ultra-fast broadband is completed, market churn is likely to settle down to more normal patterns
- While Sky has suffered approximately a [] drop in its subscribers in the last 5 years, []. This suggests that the relative importance of premium sports as a source of value has increased. This is not surprising, as services such as Netflix provide an alternative channel to access premium entertainment content, while there is no alternative channel to access premium sports content
- [] suggests that the remaining Sky customers are likely to be relatively less price elastic. As is common with other markets for differentiated products, we would expect that as marginal customers drop out, the remaining infra-marginal customers would have a higher willingness to pay and have more loyalty to the product
- Given the upcoming increase in broadband market churn, we expect that the best way to monetise the relative loyalty of the Sky Sports subscribers would be to use it to capture increased market share in the broadband (through triple-play) and mobile market (through quad-play and data usage growth). Once market churn settles down, the best way to monetise increased market share and price differentiation would be through price increases
- We understand that the cost of delivering pay TV through ultra-fast broadband is considerably lower than through satellite. [We also understand that the satellite contracts would come for renewal soon after the ultra-fast broadband/

RBI roll-out is expected to reach its targets.] Hence, as ultra-fast broadband approaches universal coverage, Sky would have an opportunity to discontinue satellite services or, at the least, to drive significant volumes of capacity usage from satellite (which would be a significant cost saving to Sky/Vodafone due to a reduction in the number of transponders required). This incentive and opportunity to migrate customers to OTT coincides with the incentive and the opportunity to capture increased market share in the broadband market.

Following the merger, Sky-Vodafone would be offering both stand-alone Sky products and bundles that include pay TV, broadband and possibly mobile services.

3 Current Vodafone-Sky Bundle

NERA report in response to LOUI emphasises that despite currently offering an attractive bundle of pay TV and broadband, Vodafone has not increased its market share in broadband. NERA interprets this as showing that “within the segment of customers who value Sky Sports highly enough to buy it...the fact that most Sky Sport subscribers do not take up the discounted Vodafone offer (i.e. the fact they are ‘leaving money on the table’) implies they (highly) value aspects of other RSPs’ offerings” (NERA para 6). This inference is central to NERA’s contention that Sky-Vodafone bundling post-merger would not lead to market foreclosure.

Indeed, on the face of it, the fact that only [] of Sky TV subscribers access pay TV via the Vodafone bundle is puzzling given the price differential. The Vodafone bundle is priced at approximately \$135 per month for the bundle which includes unlimited broadband, compared to the combined cost of about \$190 per month for purchasing Sky, Sky Sport and similar broadband service separately. NERA’s explanation for this fact is possible, but we think that given the observed market conduct, it is less plausible than alternative explanations.

First, as NERA itself quotes in the confidential part of its report, [] subscribers currently purchase Vodafone broadband and Sky stand-alone, while a total of [] subscribe to the bundle. Of the bundle subscribers, [] purchase Sky Sport. It would obviously be implausible to suggest that customers who subscribe to Vodafone broadband and Sky stand-alone rather than to the bundle do so because they value aspects of the unbundled offering, such as “a lower broadband price, free Lightbox and Spotify, bundled electricity and gas, etc” (NERA para 6). Since [] customers who are already with Vodafone and Sky clearly ‘leave money on the table’ by not being in the bundle, there must be an explanation for their behaviour that has nothing to do with preference for differentiated RSP offerings.

Moreover, in reality, there is little product differentiation between stand-alone broadband offerings. While RSPs obviously invest in branding and may seek to provide superior customer service, significant convergence in pricing and high level of churn indicate that consumers do not perceive such differentiation.

The table below illustrates the convergence in pricing.

Table 1: Broadband Prices by Brands

Broadband type	Vodafone	Spark	Slingshot	Orcon	2degrees	Trustpower

ADSL (unlimited)	\$94.99	\$94.99	\$89.95	\$90.00	Not available	\$104.00
VDSL (unlimited)	\$94.99	\$94.99	\$94.95	\$90.00	\$95.00	\$99.00
Fibre (unlimited)	\$90.99	\$99.99	\$89.95	\$135.00	\$95.00	\$129.00

Source: currently posted prices from respective websites

A more plausible explanation for the current bundle market share would consider both supply side and demand side factors.

On the supply side, there are a number of factors which would likely explain the currently low take up of the Vodafone bundle:

- Existing Sky customers face connection charges and other barriers to switch to the Vodafone bundle (obviously, Sky has no incentive to facilitate such switching, as it would be cannibalising its own customers while losing the retail margin along the way)
- [] This suggests that Vodafone may have limited incentive to market the relatively cheap bundle outside the areas where it has re-transmission arrangements with Sky. [] We expect that the standard wholesale offered by Sky to Vodafone is on the same terms as the offer to Spark. [] While Vodafone would clearly benefit from having more re-transmission customers, it may have little ability to differentiate between geographic locations in its marketing campaigns. The deep discount associated with the current Vodafone bundle would eat into its broadband margin, []

Obviously, these supply-side constraints will disappear after the merger.

There may also be some demand-side explanations for the observed consumer behaviour that are more plausible than the explanation proposed by NERA:

- It is only more recently, since the announcement of the merger, that Vodafone has started more actively promoting its Sky/Vodafone bundle. There is likely to be short-term inertia by some customers who have both Sky and non-Vodafone broadband subscription to switch to the Vodafone bundle, including potentially because they are currently locked-in to fixed term contracts with other broadband providers (but as can already be seen from the recent churn data, such inertia can be expected to decrease over time; it will fall further as contracts expire, multi-play bundles become more prevalent, as a result of UFB uptake, or in response to other churn events)
- Current customer behaviour is consistent with relatively low own price elasticity of demand for premium sports content. As we explain later in the report, such low elasticity would actually contribute to the ability of the merged entity to increase prices.

4 Quantification of increased product differentiation due to the merger

Despite NERA's assertions to the contrary, the evidence suggests that broadband market in New Zealand currently displays relatively little product differentiation. This phenomenon has led to a very competitive market – forcing major market participants to set prices for similar products to virtually identical levels. There is no doubt that market participants are investing in attempts to differentiate their offerings, including by bundling them with content (such as the Vodafone-Sky bundle, but also the Spark-Lightbox bundle). However, in the absence of the proposed merger, such bundling makes only limited contribution to product differentiation:

- The Vodafone bundle is segmented through supply-side constraints
- As advised by Spark, at present, Sky wholesale supply terms provide very little scope for product differentiation and innovation by the re-seller
- The additional offerings available through Lightbox and other content providers have limited value compared to Sky's premium sports content

The merged entity would have an increased ability to differentiate their products in the broadband and mobile markets. Following the merger, we would expect that Sky-Vodafone would reduce the supply-side barriers to switching to its bundle and would increase service differentiation between the bundle and stand-alone pay TV. In other words, the role of bundled premium sports content following the merger is likely to be very different to what it is now. In this context, we think that Howell & Potgieter miss the point when they note the presence of alternative broadband/content bundles to Vodafone-Sky, such as Spark/Lightbox, or when they refer to potentially numerous other forms of content, such as the "Internet of Things". Only premium sports content, which is largely New Zealand made or related to New Zealand interests, has the unique ability to attract a large proportion of households, and to be required in addition to all other forms of content. It is the premium sports content, rather than the rapidly growing and increasingly atomised entertainment and other forms of content, that will drive pricing and help differentiate its associated broadband and mobile products.

Even if Sky-Vodafone does not effectively foreclose access to its wholesale content by other RSPs, any increase in product differentiation and growth in market share in such a differentiated market would result in greater degree of pricing freedom. In this section, we consider how this effect can be quantified.

4.1 Measuring the effect of product differentiation on market shares

When two goods are substitutes, the diversion ratio quantifies how much of the displaced demand for one product switches to the other. In other words, if Vodafone increases its price and this leads some Vodafone customers to leave, the diversion ratio between Vodafone and Spark (or other next closest substitute broadband provider) will determine the fraction of these customers that will join Spark (or another substitute provider). In this case, it has a natural interpretation as the proportion of people using Vodafone who would consider Spark (or another provider) as their "second choice".

In a market with differentiated products, the diversion ratio is defined as the ratio of the cross-price elasticity of demand from Brand A to Brand B and own price elasticity of demand for Brand A.

Box 1.1: Equation for diversion ratio

$$\text{Diversion ratio}_{A-B} = \frac{\left(\frac{\delta Q_B}{\delta P_A}\right)}{\left(\frac{\delta Q_A}{\delta P_A}\right)} = \frac{\delta Q_B}{\delta Q_A}$$

Source: D.W. Meyer, *Quantitative Methods for Evaluating Unilateral Competitive Effects in Differentiated Products Mergers* (2011)

We propose to use diversion ratios to quantify the effects of increased product differentiation because under certain assumptions, diversion ratios can be inferred from the observed market shares.

In particular, if all sales lost by company A are captured by other companies in the market and if all these brands are “equally close” to each other, then the diversion ratio from Company A to Company B may be stated as follows:

Box 1.2: Another way of determining diversion ratios

$$\text{Diversion ratio}_{A-B} = \frac{S_B}{1 - S_A}$$

Where:

S_A is Company A’s market share

S_B is Company B’s market share

Source: Carl Shapiro, *Mergers with Differentiated Products*, 10(2)ANTITRUST, pp. 23-30 (1996)

The ability to derive diversion ratios from observed market shares relies on two assumptions. We believe that both these assumptions are met for the broadband market.

The first condition revolves around the idea that customers who drop out of one company due to a price rise will not stop using the service altogether. In the case of broadband, this is a reasonable assumption for the following reasons:

- Broadband internet is a product with very little or no substitute
- Broadband internet is increasingly important in daily life and is slowly becoming an essential commodity for everyday life. This is reflected by the relatively inelastic demand for broadband internet. Estimates for the elasticity for this product in the OECD in 2007 was in the range of -0.43¹. Dutz et. al. (2009) employ market data from Forrester for over 30,000 households to estimate elasticities of internet demand in the US. They find that the own-price elasticity of broadband declined from -1.53 in 2005 to -0.69 in 2008. This suggests that broadband internet is increasingly being viewed as an essential commodity in the developed world.
- As mentioned previously, most comparable products are priced similarly by the major companies in the New Zealand broadband market. Hence, if a customer

¹ R Cadman & C. Dineen, *Price and Income elasticity of demand for broadband subscriptions: A cross-sectional model of OECD countries*, (2008)

leaves one brand (say, due to a price hike), they can find another internet service provider at a similar price-point to what they were previously paying.

The second condition for using observed market shares to calculate diversion ratios is the assumption that all competitors to Vodafone provide a largely undifferentiated service. To put it another way, customers who have brand loyalty to Vodafone, if they are induced to switch to another service provider would tend to see little difference between them.

At present, product differentiation between broadband services appears to be very low—leading to identical prices for many comparable broadband products. After the merger, this condition would continue to hold in respect of broadband services. However, Sky-Vodafone would be able to differentiate its broadband offering through the triple- and quad-play bundle built around consumer loyalty to premium sports, while other RSPs would likely remain undifferentiated. In essence, a consumer would be choosing between a unique offering comprising broadband and exclusive premium content, and a number of commoditised broadband alternatives (that may include content available from a number of sources, e.g. music, general TV content, etc). We acknowledge that while the product differentiation is undoubtedly low, this may not mean that there is zero difference between the products offered by different providers. Consequently, the relative market shares outlined above may only be a close approximation of the diversion ratio. However, for the purposes of our analysis, this approximation is unlikely to affect the conclusions.

4.2 Cross-elasticity assumptions

Since diversion ratios can be defined both in terms of the cross-price elasticity of demand and the market shares of two companies in the market, we can link the cross-price elasticity of demand between the two companies and their market shares. Our analysis makes the following argument:

- Higher product differentiation for Vodafone will lead to lower cross-price elasticities of demand between Vodafone and other broadband providers (say, Spark). This is because a higher product differentiation will result in Spark becoming a less perfect substitute.
- Lower cross-price elasticities of demand between Vodafone and Spark will lead to a proportionally lower diversion ratio. Although we do not know the exact value for the own price elasticity of demand for Vodafone, assuming it remains constant, any change in the cross-price elasticity must lead to a proportional change in the diversion ratio.
- Since the diversion ratio and market shares are linked, a lower diversion ratio will translate into a lower market share for Spark and/or a higher market share for Vodafone.
- Since the total market share is fixed at 100% and a higher product differentiation for Vodafone is likely to lead to lower cross-price elasticity of demand with all its competitors, we can estimate the effect of a potential change in the cross-price elasticity in demand on the market share of Vodafone.

In this analysis, we use the observed market shares of different broadband providers to calculate the implied diversion ratios between the different companies. Since we can't be sure of the extent of product differentiation that is possible, and hence its likely future effect on the cross-price elasticity of demand between Vodafone and other broadband providers, we consider a range of changes in the cross-price elasticity of demand.

Our results show that even a minor change in the cross-price elasticity of demand can have a large impact on the market share in the broadband market. For example, a 10 percent

decline in the cross-elasticity of demand would translate into an increase in the broadband market share of Vodafone from the current 27 percent to about 36 percent.

4.3 Likely effects of product differentiation on the market

By definition, diversion ratios are highly sensitive to the cross-price elasticity of demand. This implies that market shares are equally sensitive. Cross-price elasticity of demand is the most direct proxy for the degree of product differentiation. The lower such elasticity, the greater the degree of product differentiation. In other words, relatively small increases in product differentiation can lead to significant changes in market outcomes: either an increase in the differentiated product's market share or an increase in its price or both.

In our view, significant investments by broadband and mobile companies in brand building and brand differentiation confirm such theoretical sensitivity. A 10 percent decrease in price elasticity means a reduction from say 2 to 1.8. A 30 percent reduction would mean a decline from 2 to 1.4. In our view, a reduction of such or greater magnitudes is likely in response to:

- Thorough integration of broadband and mobile branding with premium content branding
- Innovations and technical leadership in access to premium content not available to other RSPs
- The effect of bundling a product with low elasticity of demand (premium sports content) with other products facing more elastic demand in order to create a bundle with overall lower elasticity of demand.

In general, the diversion ratio analysis is used to assess the effects of horizontal mergers: a horizontal merger in a market with differentiated products would have a greater effect if it effectively takes out the nearest substitute than if the merger is between producers of products that are distantly substitutable. In the case of Sky-Vodafone, we are considering a vertical merger. However, the ability of the merged entity to create a substantial degree of product differentiation is conceptually equivalent to a horizontal merger that brings together producers of close substitutes and leaves only distant substitutes available in the market. This is the intuition behind the sensitivity of the market shares to cross-price elasticities.

While we are not able to make specific empirical predictions of likely changes in cross-price elasticities, the above analysis shows that to satisfy the Commission about its concerns expressed in the LOUI, Sky and Vodafone would need to demonstrate that the merger would have no material effect on product differentiation. Our reading of the publicly available business case for the merger suggests that, in fact, increased product differentiation and the ability to grow market share in broadband and mobile telecommunications as a result are not only plausible assumptions for the Commission to consider, but in fact likely to occur because they are key expectations from the merger.

5 Quantification of consumer response to coordination of bundle and stand-alone prices

In order to test the additional degree of pricing freedom that Sky-Vodafone could acquire following the merger, we have compiled a simple model that tracks consumer behaviour in response to an increase in Sky stand-alone price relative to the Sky-Vodafone bundle price. The model calculates the combined revenue of the merged entity under different

behavioural assumptions and identifies when it would be profitable to raise the Sky stand-alone price relative to the bundle price.

The model starts with the current uptake rates for the following services: Vodafone broadband, Sky-Vodafone bundle (including Sky Sports), broadband from other providers, and broadband from other providers with Sky (including Sky Sports). We also note that Sky stand-alone services include not only satellite but also Fanpass OTT. Following the merger, OTT services could potentially be excluded from the stand-alone but included in the bundle. For the purposes of our analysis, we treat any such changes as a relative price change.

Our model then calculates how these uptake rates would change in the event of a price increase depending on the assumptions about:

- **Price elasticity of demand for Sky stand-alone** – The assumption about price elasticity of demand for Sky Sports is the variable which determines how many non-bundle customers will drop out of Sky due to an increase in the price of the stand-alone pay TV subscription
- **Capture ratio** – This ratio determines the proportion of customers who, having dropped Sky due to the increase in its stand-alone price, then switch back to the Sky-Vodafone bundle (by changing their internet service provider). This ratio will depend on the strength of the preference for the broadband service provider and on the degree to which Sky-Vodafone choose to reduce the barriers for customers to switch from the stand-alone service to the bundle.

For a base case where the price of the bundle stays unchanged, an increase in the stand-alone price of Sky (including Sky Sports) would have the following effect:

- A reduction in revenue due to the loss of customers who have decided to drop Sky stand-alone subscription
- An increase in revenue from the infra-marginal customers who have chosen to retain their stand-alone pay TV, but are now paying a higher price for it
- An increase in revenue from the customers to divert to the Sky-Vodafone bundle.

We assume that pay TV costs are largely fixed, while broadband costs may include wholesale payments to Chorus. Despite some variable costs, we think it is plausible to assume that an increase in revenue as a result of a price increase would be associated with higher profits. Hence, we can compare revenues under different price, elasticity and capture assumptions to see under what conditions a price increase would be profitable.

We note that our calculation is a simplified representation of the demand-side response. The model does not attempt to predict the sequence of actions. For example, Sky-Vodafone may first try to capture more customers into the bundle through temporary price reductions on the bundle, and then coordinate price increases. Alternatively, coordinated price increases may be used from the start to drive customers into the bundle. We expect that Sky-Vodafone would adopt the strategy that maximises the capture ratio and drives up its market share in the broadband market.

5.1 Range of quantified effects

Table 2 shows the assumptions under which it would be either profitable or unprofitable to raise the price of Sky stand-alone. Clearly, the degree of pricing freedom would depend on the combination of the price elasticity of demand and the capture ratio. For example, if demand is relatively inelastic, a price increase would cause few customers to quit. In that

case, it would matter less if the majority of those customers chose not to divert to the bundle. On the other hand, if the price elasticity is high, and a price increase would likely lead to a significant loss of customers, it would only be sustainable if Sky-Vodafone expected to re-capture the majority of those customers back into the bundle.

Green shading in the table indicates combinations of price elasticities and capture ratios that would make an increase in the stand-alone price profitable, while red shading shows elasticity and capture ratio combinations where such a move would be detrimental to the merged entity.

Table 2: Effect of increasing stand-alone price

		Price Elasticity of Demand				
		1.0	1.5	2.0	2.5	3.0
Capture Ratios	1	Green				
	0.8					
	0.6					
	0.4	Green		Red		
	0.2	Green	Red			
	0	Red				

Our analysis shows that even with relatively high price elasticities, a significant and sustained price increase would be profitable as long as the merged entity could recapture a bit more than half of the customers into the bundle.

5.2 Reasonable values for price elasticity and diversion ratio

We have reviewed the literature and the available data to infer a plausible range for these variables.

5.2.1 Price elasticity of demand for Sky stand-alone

Literature on the price elasticity of demand of pay-tv suggests that the price elasticity depends greatly on the content that is being sold. For example, an analysis of the pay TV market in Japan revealed that basic channels had very high price elasticity: typically, more than 6. In contrast, special channels have elasticities that are well below unity. In the context of that analysis, basic service referred to public broadcasting channels and commercial channels while special channels referred to channels providing films and music.² Similarly, a Canadian study estimating demand for cable television services identified a wide range of elasticities depending on the nature of the content.³

The focus of our analysis is premium content delivered through Sky Sports. We note that in New Zealand every sport of national interest is exclusively controlled by Sky. This would suggest low price elasticity of demand for Sky Sport.

At the same time, we know from economic theory that a monopolist is unlikely to set its price on the inelastic part of the demand curve. If price elasticity of demand were less than

² Manabu Shishikura & Norihiro Kasuga & Akio Torii, 2005. "Analysis of Subscription Demand for Pay-TV,"

³ Stephen M. Law, *Estimating demand for Canadian Cable Television services* (2002)

1, it would have been profitable for Sky to increase the price of Sky Sports further. Hence, we think that research on price elasticities for similar services in other markets, combined with observed behaviour by Sky in New Zealand, would suggest that the elasticity of demand for the Sky Sports package could be expected to be somewhat, but not significantly, higher than 1.

5.2.2 Capture ratio

The relevant ratio is the proportion of Sky Sports subscribers who drop out due to the increase in the Sky stand-alone price and then switch to the Sky-Vodafone bundle to restore their access to their preferred content. In other words, a high capture ratio would indicate that consumers have limited brand loyalty to their broadband providers and regard various broadband services as near substitutes. A low capture ratio would imply high degree of loyalty to the current broadband service provider, to the extent that the customer would be willing to forgo their preferred sports content in order to remain with their broadband service provider.

High levels of brand loyalty would imply that the market shares of major players are relatively stable and that new entrants will find it difficult to gain market share. Our analysis of market churn data in the broadband market suggests that while there is some brand loyalty, there is increasing penetration by new entrants as well as a reasonable degree of customer churn. In the year to June 2016, both Spark and Vodafone—the two leading brands in the market—lost market share (Spark had lost 2.3% of the market while Vodafone had lost 0.6%), while relatively new entrants gained market share (2degrees had doubled its market share to 2.6% in this time)⁴. A recent survey by the Commerce Commission, dated 31st March 2016, found that 14% of the respondents had switched their mobile broadband provider in the past two years⁵. This churn occurred despite a relatively narrow range of prices in the broadband market. High churn during the switch-over to ultra-fast broadband should lead to a higher capture ratio.

This suggests that Sky-Vodafone should reasonably expect to re-capture a significant share of stand-alone customers. We recognise that measures to increase the capture—such as more aggressive promotion of the bundle and the elimination of barriers to switching—could increase the price elasticity of demand for the Sky stand-alone. However, as long as customers simply churn to the bundle, the merged entity would generally be better off: an increase in its broadband market share as a result of such churn would give it a further ability to introduce unilateral price increases in the broadband market (we discuss this effect in the next section).

Hence, we would expect Sky-Vodafone to make churning to the bundle easier. This would somewhat increase the price elasticity of demand for Sky (including Sky Sports) stand-alone, while also increasing the capture ratio.

5.3 Merged entity would likely raise prices through pricing coordination

We find that for a plausible range of price elasticity and capture ratio assumptions, Sky-Vodafone would have the incentive and the ability to increase the price of Sky stand-alone relative to the bundle. The existing gap between the price of the Vodafone-Sky bundle and stand-alone combinations of Sky and broadband suggests that this gap could be maintained

⁴ IDC market share data

⁵ Commerce Commission, 31 March 2016, “Summary of business mobile market segment study – 31 March 2016”

or increased to grow market share in the broadband market during the switch-over to ultra-fast broadband.

Conversely, we think that conditions under which the merger would not result in an increased unilateral pricing power—high demand elasticity and very low capture ratio—are generally implausible and inconsistent either with international research or with observed New Zealand market behaviour.

6 Overall ability to profitably increase prices and market shares

We expect that Sky-Vodafone will be able to differentiate its products in a meaningful way. This implies that the change in the cross-price elasticity of demand for Sky-Vodafone broadband offering is likely to be more than the small percentages we have modelled. Similarly, we think that through product differentiations and manipulation of features such as free connection or the provision of free modem, Sky-Vodafone would be able to achieve a high capture ratio into its bundle in the event of an increase in Sky stand-alone prices.

To illustrate the merged Sky/Vodafone's pricing incentives, we ask if 5 percent sustained increase in pay TV prices and 5 percent sustained increase in broadband prices would be possible under a plausible range of behavioural assumptions. We also examine whether the results are unduly sensitive to changes in assumptions.

A 5 percent sustained market-wide increase in pay TV prices should be defined as a weighted average of higher prices paid by the remaining Sky stand-alone customers and higher bundle prices attributable to the increase in the pay TV part of the bundle, weighted by the proportion of stand-alone and bundled consumers. Similarly, a 5 percent sustained market-wide increase in broadband prices should be defined as a weighted average of increased price for the broadband part of the bundle for Sky-Vodafone bundled customers, as well as any direct increase in broadband prices of competitors in response to prices increases the merged Sky-Vodafone.

However, we note that it is not practical to attribute an increase in the bundle price to changes in the content and broadband components of the bundle. Hence, to avoid double counting and to simplify our analysis we:

- Define a **5 percent increase in the market-wide pay TV price** solely as an increase in Sky stand-alone price, multiplied by the proportion of customers who remain on the unbundled pay TV service
- Attribute all changes in the bundle price to the increase in the broadband component of the bundle. We also do not consider the extent to which competitors may increase prices in response to greater product differentiation by Sky-Vodafone. Hence, we define a **5 percent increase in the market wide broadband price** as a rise in the price of the bundle, multiplied by the proportion of broadband customers who buy the bundled product.

In our calculations, we consider how market shares and price increases change depending on the assumed elasticities if we are concerned about a Sky-Vodafone price increase sufficient to achieve a 5% market-wide weighted average price increase. For each elasticity assumption, there is a different trade-off between price increases and the resulting market shares. So, for each point in the line, we calculate the price increase that would result in a 5% weighted average market share. For instance, under the assumption that the own price elasticity for Sky-Vodafone broadband is 1, it would be profitable for the entity to raise prices with a relatively small increase in its level of product differentiation. In this example,

the market share of Sky-Vodafone would increase from its current level of 27.3% to 34.3% despite a 13% price rise in its products.

As we have explained previously, the relevant aspects of consumer behaviour in response to price increases can be described by four variables:

- Price elasticity of demand for pay TV content
- Capture ratio of customers who switch from stand-alone pay TV to a bundle
- Cross-price elasticity of demand for Sky-Vodafone broadband
- Own price elasticity of demand for broadband.

The existing evidence suggests that the price elasticity of demand for pay TV content is likely to be slightly higher than 1, but not much higher since demand for premium content is fairly inelastic. In the chart below, we present a map of all possible combinations of consumer behaviours for an assumed price elasticity of demand for premium sports content of 1.5. Similar charts can be drawn for any other assumption about this demand elasticity.⁶

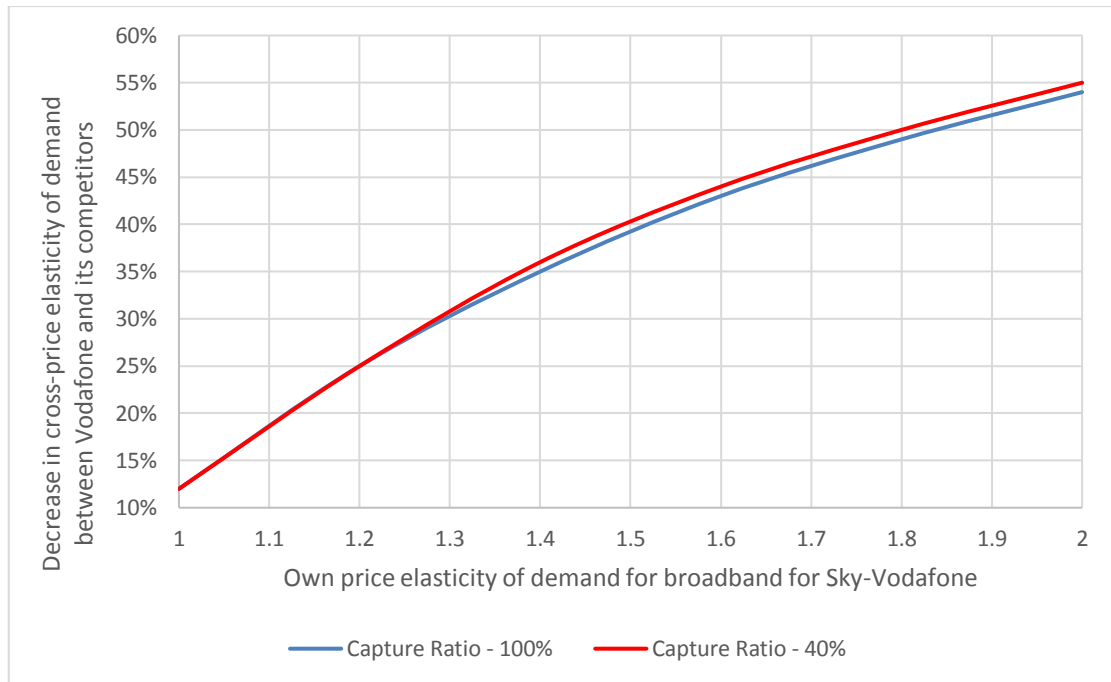
On this chart, areas above the curve show all possible combinations of the own price elasticity of demand for Sky-Vodafone broadband and required decreases in the cross elasticity of demand that would make sustained 5 percent price increases in both pay TV and broadband profitable. Areas below the curve show behavioural combinations that would make such sustained price increases unprofitable. If we were to draw this chart for lower assumed demand elasticities for premium sports content, the area under the curves would be smaller (i.e. there would be fewer behavioural combinations under which price increases would be unprofitable).

A curve drawn for any assumed capture ratio shows the minimum change in cross price elasticity of the broadband offering for any given own price elasticity of broadband that would be needed to make sustained price increases possible. Not surprisingly, for low own price elasticity, the required decrease in cross-price elasticity of demand from Sky-Vodafone to its competitors would also be low.

The chart is drawn on the basis of the actual current market shares. As can be seen, it turns out that assumptions about the capture ratio make relatively little difference to the overall results. This is because with the likely low elasticity of demand for premium content, an increase in Sky stand-alone prices after the merger would be profitable even with low capture ratios. Since capture ratios have little effects on the profitability of a broadband increase (they have some effect on broadband market shares, but the relative size of the broadband and pay TV markets makes the effect small), assumptions about capture ratios have correspondingly little effect on the map of behavioural assumptions required to make both price increases profitable.

⁶ A three-dimensional chart could be drawn to show all possible combinations of all of the above behavioural variables. However, the additional complexity would simply obscure the logic we wish to illustrate.

Figure 6.1: Combinations under which it will be profitable for the merged entity to raise pay TV and broadband prices by at least 5 percent on weighted average basis



The above map of possible combinations of behavioural factors suggests that the Commission would have to make some very strong and unusual assumptions to be able to conclude that the merger **would not** lead to sustained price increases:

- Despite evidence to the contrary, the Commission would have to conclude that bundling of unique sports content with a broadband offering, while making that content less attractive on the stand-alone basis, would have a negligible effect on product differentiation, and hence on the cross-price elasticity of demand.

There is little directly relevant quantitative research on the likely changes in cross-price elasticity due to greater product differentiation. One study we reviewed examined the effects of a sustained increase in advertising on the cross-price elasticity of various consumer goods.⁷ This research shows that advertising had the potential both to reduce cross-price elasticity through brand awareness and to raise it due to increased consumer awareness of prices. The study found that for many consumer goods, the net effect of advertising was counter-productive from the perspective of product differentiation in that it increased the cross-elasticity of demand. However, for a product with clear quality differences, a sustained increase in advertising achieved a net reduction in cross-price elasticity of 4 percent.

While this study is not directly relevant to the markets under analysis, it is instructive in that it shows some net reduction in cross-price elasticity can be achieved even without substantial changes to the nature of the product on offer. In the case of bundling premium sports content with broadband, we are

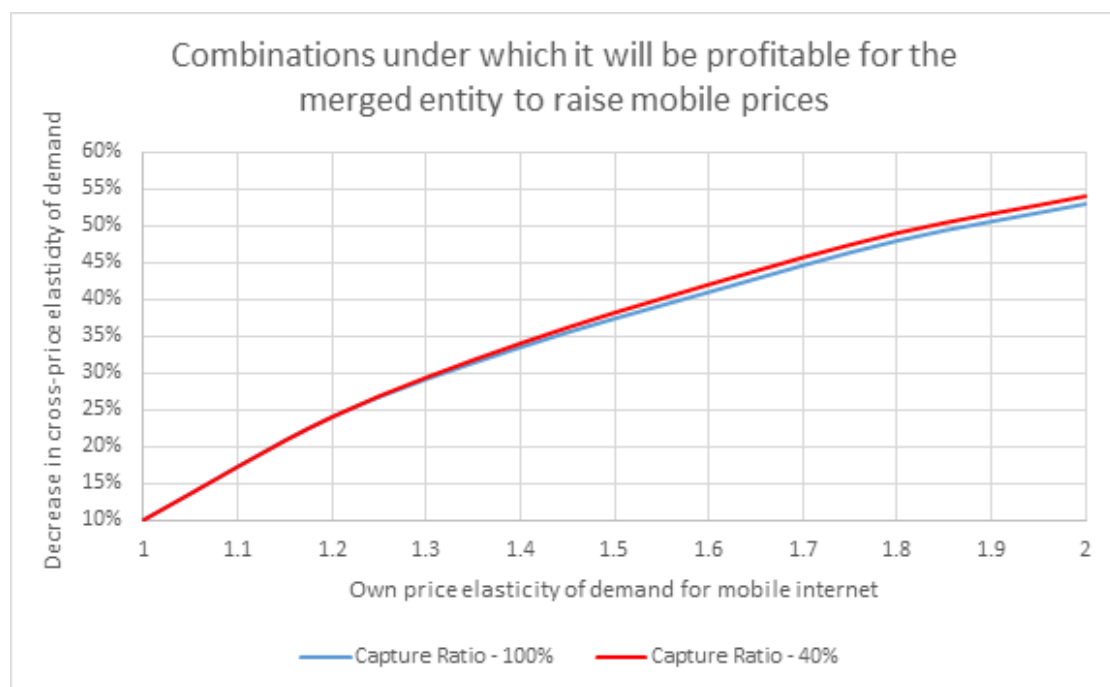
⁷ T Erdam, M Keane and B Sun, “The Impact of Advertising on Consumer Price Sensitivity in Experience Goods”, NSF Grant SBR-9812067, February 2004. This paper finds that price elasticity for Heinz tomato sauce, a horizontally differentiated good, falls by about 4 percent as a result of a 20 percent sustained increase in advertising.

considering an example of a significant increase in the nature of the product on offer. Control over premium sports content—and the ability to reduce the attractiveness of that content on a stand-alone basis—provides a significant product differentiator, which could lead to a material reduction in the cross-price elasticity

- If the Commission, in line with the available evidence, accepted that increased product differentiation and foreclosure of content would achieve a material reduction in cross-price elasticity of demand for Sky-Vodafone broadband, then its views about the likely price increases would hinge on the assumptions about own price elasticity of demand for Sky-Vodafone broadband. To conclude that a sustained price increase is unlikely, the Commission would have to believe that this elasticity is quite high. Again, the available evidence would suggest that such elasticity is likely to be low.

For this cross-submission, we have not had sufficient time to examine the likely behaviours in the mobile market. The chart below draws a similar map of behavioural assumptions required to enable a sustained price increase in the New Zealand mobile market, using the existing market shares as the starting point.

Figure 2: Map of Behavioural Assumptions for the Mobile Market



Not surprisingly, the map of assumptions for the mobile market looks very similar to the broadband map. Again, this suggests the Commission would have to make some very strong and unusual assumptions to be able to conclude that the merger **would not** lead to a sustained price increases in mobile prices.

7 Conclusions on demand-side effects

We agree with NERA and Howell & Potgieter that a thorough analysis of demand-side effects is necessary. As we show in this report, such relevant demand side effects can be fully described and measured through four variables:

- Price elasticity of demand for pay TV content
- Capture ratio of customers who switch from stand-alone pay TV to a bundle
- Cross-price elasticity of demand for Sky-Vodafone broadband
- Own price elasticity of demand for broadband.

The available evidence on these behavioural variables suggests that under a wide range of plausible and likely assumptions about consumer behaviour, the proposed merger would—through a combination of product differentiation and bundling effects—enable sustained 5 percent market-wide price increases.

To put it another way, in order to conclude that the proposed merger **would not** likely lead to sustained price increases, the Commission would have to accept NERA's contention that broadband offerings are currently differentiated—that is, even limited differentiation through advertising and non-unique content offerings is able to reduce cross-price elasticity of demand—yet, a substantial change in bundling behaviour and the ability to make stand-alone pay TV unattractive would have no further material effect on this elasticity. This does not appear logical.