

Dated 16 June 2017

ATTACHMENT E

Re:

**Vodafone Hutchison Australia Pty Ltd submission to the Australian
Competition and Consumer Commission**

THE CONSUMER IMPACT FROM DOMESTIC ROAMING

15 June 2017



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EXECUTIVE SUMMARY

Context

At present, Telstra's mobile network in Australia covers a significantly larger area (2.4 million km²) than the networks of Optus (1.0 million km²) and VHA (0.6 million km² or 0.9 km² once its roaming agreement with Optus is taken into account). Given the large differences in geographic coverage between the different mobile network operators, the ACCC has been considering the merits of a domestic mobile roaming service declaration.

In its draft decision, the ACCC set out its intention not to declare a domestic mobile roaming service. The ACCC provisionally concluded that domestic roaming would not lead to significant consumer benefits, as demonstrated by stating:

"The ACCC also considers there is insufficient evidence to support the view that declaration, by increasing retail choice for consumers who value coverage, would improve overall competition in a way that would benefit consumers. We consider that the effect of declaration on retail prices is uncertain."¹

The ACCC has considered a wide range of submissions and evidence in reaching its draft decision. The evidence/analysis provided so far however, has not included a quantitative analysis of the likely consumer impact from a declaration of domestic roaming. Given this, Norton Rose Fulbright has instructed Frontier Economics Limited to prepare a report identifying likely mobile retail price movements (and consequently the likely welfare benefit to Australian consumers arising from those price movements), if the ACCC were to declare a wholesale domestic inter-carrier roaming service in regional Australia that achieved an equalisation of mobile coverage between the three mobile network operators. This report sets out our findings and demonstrates that such a welfare benefit could be very significant.

VHA/Optus offers are not a close substitute to Telstra's offers for a significant share of subscribers

Mobile operators are generally considered to compete for mobile subscribers with a range of differentiated products across the different dimensions that consumers care for, including geographic coverage, data allowances and speeds, quality of calls, range of handsets, retail presence and customer service. At present, Telstra is the only mobile network operator to be able to offer 'nationwide' geographic coverage on all of its retail products (we refer to such products as "national products"). It is also able to target customers who are interested in a lower level of geographic coverage through MVNOs. Given the more limited reach of the networks of VHA and Optus, they are only able to offer products with

¹ Page 4, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

a significantly lower level of geographic coverage (we denote these products as ‘urban-only’ products).

Geographic coverage has been recognised as an important factor in consumers choosing their mobile service provider. Indeed, based on the evidence available, it seems that a significant share of subscribers value geographic coverage, with the share of consumers that value coverage in regional areas being significantly higher than in urban/metropolitan areas: “*Telstra submitted that coverage is an important factor for consumers when selecting a mobile service provider. [c-i-c]*.”²

This means that among those subscribers who value geographic coverage (i.e., particularly those subscribers in regional areas), the products of Telstra’s rivals are seen as less strong substitutes to Telstra’s products. This seems to have been recognised by the ACCC, which states in the draft decision that: “*...the ACCC’s preliminary finding is that competition in regional mobile services areas is likely less effective than in the national market overall...*”³ Consistent with the above, the available evidence on market shares in urban and regional areas shows that Telstra has a significantly higher market share in regional areas than in urban areas.

[c-i-c]

One clear explanation for this difference in market shares is therefore likely to be that VHA/Optus’s ‘urban-only’ products are seen as poorer substitutes for Telstra’s national products, especially in regional areas [c-i-c].

Telstra’s pricing is not consistent with competitive outcomes

The ACCC concludes that Telstra’s advantage in competing for consumers who require or value wide geographic coverage may not necessarily lead to detriment for these consumers, because Telstra’s products are priced in a nationally-consistent way (i.e. Telstra’s prices are ‘uniform’ across Australia): “*We consider that national uniform prices mean that consumers benefit from effective competition in non-regional areas.*”⁴ However, where geographic competitive conditions differ, and providers choose to compete with geographically uniform prices, then the resulting national price can in general be expected to reflect the ‘average’ level of competition across the different geographic areas that a provider competes in. It is therefore correct, as a matter of principle, to consider that competition in urban areas will constrain the nationally uniform price of Telstra’s offers. Nevertheless, as long as Telstra is not facing effective competition in regional areas (and for a significant share of subscribers that value wide geographic coverage), the nationally uniform tariff will still be higher than the

² Page 30, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – Telstra version

³ Page 44, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

⁴ Page 3, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

(relevant) competitive benchmark⁵. How much higher is an empirical question, which will depend on the share of subscribers that value wide geographic coverage and the value they attach to such wide geographic coverage.

In practice, significant evidence has been provided indicating that Telstra enjoys a material pricing premium over its rivals. For example, ACCC has found price premia for data plans ranged from c. 300% for low cost plans (under \$25), to +42% for medium cost plans (\$40-\$59). A report by CIE has been submitted⁶ which estimated a Telstra price premium of \$10/month for postpaid, \$17 for pre-paid, and \$5 for postpaid SIM only. In considering the drivers of this price premium, [c-i-c] Indeed, the fact that not declaring a roaming service could enable Telstra to continue to charge this premium was evident from the significant increase in Telstra's share price which occurred when the ACCC announced its draft decision to not declare a domestic roaming service.

The positive impact of declaring a domestic roaming service

Under declaration, we assume for the purposes of our modelling, that Telstra will be required to offer domestic roaming in those areas where Optus or VHA do not currently have coverage. This would allow Optus and VHA to offer as extensive geographic coverage as Telstra. Therefore, Telstra will face more intense competition. Consistent with the ACCC's discussion of possible counterfactuals, we have modelled two options:

1. VHA and Optus launch products with national coverage, but still continue to offer urban-only products at lower prices than the national products.
2. Vodafone and Optus launch products with national coverage, but withdraw their existing products with urban-only coverage.

In order to quantify the impact of a roaming declaration on prices and consumer welfare we have used an economic model that captures the key features of the nature of competition between mobile operators and which has already been used, by the European Commission and others, to assess and quantify the impact of changes in policy/market structure on retail mobile prices. We adapted this model to reflect the specific circumstance of the Australian market, notably the more limited substitutability between 'urban-only' and 'national' products, using to the extent possible data and information on the Australian mobile market and mobile network operators as set out in the ACCC's draft Decision. The data/information and assumptions used are described in more detail in the main report.

A declaration can be expected to affect retail prices by enabling Optus and VHA to compete for mobile subscribers who value national coverage. This leads to intensified competition for these subscribers, which in turn leads to lower prices for national products. As prices for such products fall, some mobile subscribers

⁵ This seems to be recognised by the ACCC: '*As a result, consumers that strongly value coverage and perceive Telstra as the only viable mobile service provider may choose a higher priced mobile service than they would otherwise purchase if alternative providers were available*'. Page 44, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

⁶ CIE, Final Report, Telstra's Price Premium, November 2016 (prepared for VHA).

that used to purchase urban products now become attracted to national products. Furthermore, as urban products also compete with national products, the reduction in national product prices also leads to price reductions for urban products. Through our model, we have quantified the potential scale of these effects and hence estimated the likely positive impact on consumer welfare.

Results

The ACCC states that it is unclear whether there would be de-averaged prices or nationally consistent prices once a domestic roaming service is declared.

- We estimate that under de-averaged prices, there would be a significant reduction in the prices of national products (-8.4%) and a smaller reduction in urban-only prices (-3.0%). The greater fall in national product prices occurs because the choice of supplier for subscribers that value national coverage increases considerably with declaration. As a result, overall prices would fall by -5.6%. Given that both the prices of urban-only and national products are predicted to fall, no group of consumers would be worse off due to domestic roaming. This is inconsistent with the ACCC stating: *“The ACCC considers that the effect of declaration on retail prices is uncertain but that there is evidence to suggest that declaration may lead to worse outcomes for consumers in terms of retail pricing than the market would deliver without declaration.”*⁷
- As a result of the lower prices, we have calculated that consumer welfare could be expected to increase by a minimum of \$685m per year (or, in NPV terms, \$3.9bn over a 10 year period, assuming prices take four years to adjust to the levels our model predicts). In reality, the increase in consumer welfare is likely to be higher, as:
 - consumers that switch from urban to (more expensive) national products will benefit from the switch as they value coverage by more than the additional cost – and this benefit is not quantified, and
 - we have assumed conservatively that the reduction in prices would not lead to increases in overall demand – we would, however, expect the reduction in prices to lead in increases in usage, and we have not quantified this additional consumer benefit.
- We have also estimated the impact of declaring a national roaming service under nationally consistent prices. This would reflect the alternative scenario considered by the ACCC. Our analysis indicates that under this scenario, overall prices would fall by -3.9%, with a lower bound increase in consumer welfare of \$505m per year under this scenario (with an NPV of \$2.9bn over 10 years).

These results indicate that declaring a domestic roaming service could be expected to lead to significant consumer benefits through lower prices, and this is the case under both a de-averaged retail pricing structure, and a nationally uniform one.

⁷ Page 55, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

We note that these results are inconsistent with the ACCC's assessment of the impact of declaration under de-averaged prices: *"The ACCC considers that the effect of declaration on retail prices is uncertain but that there is evidence to suggest that declaration may lead to worse outcomes for consumers in terms of retail pricing than the market would deliver without declaration."*

1 INTRODUCTION

At present, Telstra's mobile network in Australia covers a significantly larger area (2.4 million km²) than the networks of Optus (1.0 million km²) and VHA (0.6 million km² or 0.9 million km² once it's roaming agreement with Optus is taken into account). Given the large differences in geographic coverage between the different mobile network operators, the ACCC has been considering the merits of declaring a domestic mobile roaming service.

In its draft decision, the ACCC set out its intention not to declare a domestic mobile roaming service. This is because the ACCC provisionally concluded that domestic roaming would not lead to significant consumer benefits, as demonstrated by the following quote:

"The ACCC also considers there is insufficient evidence to support the view that declaration, by increasing retail choice for consumers who value coverage, would improve overall competition in a way that would benefit consumers. We consider that the effect of declaration on retail prices is uncertain."⁸

The ACCC has considered a wide range of submissions and evidence in reaching its draft decision. The evidence/analysis provided so far however, has not included a quantitative analysis of the likely impact on consumers of declaring domestic roaming. Given this, Norton Rose Fulbright has provided Frontier Economics Ltd with the following instruction:

"Please provide a report identifying likely mobile retail price movements (and consequently the likely welfare benefit to Australian consumers arising from those price movements) if the ACCC were to declare a wholesale domestic inter-carrier roaming service in regional Australia that achieved an equalisation of mobile coverage between the three mobile network operators."

For clarity, we have been instructed to consider the impact that declaring domestic roaming is likely to have on consumers as a result of its impact on retail prices; we have not been instructed to consider any other/additional effect through the potential impact on Telstra's (or other operators') incentives to invest.

1.1 The structure of this report

The rest of this report is structured as follows:

- Section 2 considers whether current pricing in Australia is consistent with the outcome that would be expected in a competitive market where mobile operators would have similar levels of geographic coverage;
- Section 3 explains how we have modelled the impact of declaration;
- Section 4 sets out our estimate of the impact on consumers from the declaration; and
- Section 5 concludes.

⁸ Page 4, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

2 IS PRICING IN AUSTRALIA CURRENTLY CONSISTENT WITH A COMPETITIVE MARKET?

2.1 Substitutability between urban-only and Telstra's national products

In this section, we explain why there is likely to be limited substitutability between urban products with more limited geographic coverage (which we denote as 'urban only' products), offered by VHA, Optus and MVNOs that have access to similar levels of geographic coverage, and Telstra's products that provide access to much wider geographic coverage (which we have denoted as 'national' products).

2.1.1 Competition with differentiated products

Mobile operators are generally considered to compete for mobile subscribers with a range of differentiated products across the various dimensions that consumers value, including:

- geographic network coverage;
- quality of calls, data amounts and speeds;
- range of handsets; and
- content.

Prices will be set in order to cover the (incremental) costs of the services offered, with mark-ups over (incremental) costs reflecting the degree of differentiation between the products offered⁹ and the overall intensity of competition. All else the same, the greater the degree of (unmatchable) differentiation an MNO can offer, the greater the expected mark-up that it will be able to achieve (over incremental costs).

In competitive mobile markets with differentiated products, the gross profits earned by mobile operators (revenues minus corresponding incremental costs) should be sufficient to recover all the remaining costs of the mobile operators, in the long run. Persistent profits significantly below the level necessary to cover total costs (including the cost of capital) would in general be expected to lead to exit from the mobile market. Conversely, persistent profits above the level necessary to cover total costs (including the cost of capital), would be expected to lead to operators expanding or new players entering the market, unless there are barriers to such expansion or entry.

⁹ This type of model is referred to as a Differentiated Bertrand model of competition.

2.1.2 The significance of geographic coverage in mobile subscriber choice

The significance of geographic coverage for mobile subscriber decisions has been considered by both the ACCC and the consultation participants. Based on the evidence available, it seems that a significant share of subscribers value geographic coverage:

“Telstra submitted that coverage is an important factor for consumers when selecting a mobile service provider. [c-i-c]”¹⁰

ACCC also reports that:

“...Telstra also considered that consumers have a high willingness to pay for services as they move around and travel. ...[c-i-c]”¹¹.

Telstra also advertises its *geographic* coverage, unlike the other MNOs, who advertise *population* coverage:

“Advertising or marketing claims made by MNOs also emphasise coverage as a means of differentiating networks. For example, Telstra advertises that it has ‘Australia’s largest mobile network’. Optus advertises that its network reaches 98.5 per cent of the population; that its 4G network is available in more than 700 regional towns; and that it is working to improve services available to regional Australians by improving regional coverage VHA advertises that its 4G network covers 22 million Australians.”¹²

Telstra is also quoted as stating that *‘its consistent strategy has been to lead the race for coverage by continuing to push its network into regional and rural areas’¹³.*

ACCC quotes also two pieces of research¹⁴ (by ANU and Ovum) which indicate that geographic coverage (*‘deficiencies in network coverage’* or *‘better network coverage’*) is the second most important driver of switching or choice of service provider, after price (or value for money).

The above evidence indicates that geographic coverage should be expected to be an important driver of subscriber decisions for a significant share of Australian mobile consumers; and, that the superior geographic coverage of Telstra is both maintained and used by Telstra as a strategic advantage to attract mobile subscribers that value wide geographic coverage.

2.1.3 Consumer choices in urban versus regional areas

Given that coverage seems to be an important factor for many consumers, the fact that only Telstra can offer national coverage can impact on the level of competition in urban and regional areas. To illustrate this, it is useful to distinguish between urban and non-urban (or regional areas): we denote by

¹⁰ Page 30, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – Telstra version

¹¹ Page 31, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) –VHA version

¹² Page 30, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – Telstra version

¹³ Page 30, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

¹⁴ Page 35, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

urban areas those areas covered by major cities/metropolitan areas. Regional areas are the remaining areas of Australia – we note that regional areas will include geographies where VHA or Optus (or both) may also partially cover. At present, Telstra offers ‘national’ geographic coverage on all of its retail products (we refer to such products as “national products”). It is also able to target consumers who are less interested in a wide level of geographic coverage through MVNOs. Given the more limited reach of the VHA and Optus networks, they are only able to offer products with a significantly lower level of geographic coverage. The following table summarises the current competitive situation across different types of areas/products.

Figure 1 Use of different products across different types of areas

		Urban areas (61% of population)¹⁵	Regional areas (39% of population)
Products with urban-only coverage (i.e. products with limited coverage in more remote areas).	VHA and Optus’ urban-only products may appeal to a significant proportion of people living in urban areas provided that they do not travel too frequently and do not expect to travel in future.	VHA and Optus’s urban-only products are also able to gain some market share in regional areas. However, they are likely to be at a considerable disadvantage to Telstra, as even if subscribers have VHA and Optus coverage where they live, they may lose coverage once they travel to surrounding areas and/or other parts of Australia not covered by VHA/Optus.	
Products with national coverage (only Telstra’s products amongst the MNOs are considered to have national coverage)	Telstra is able to compete for subscribers that live in urban areas but still value national coverage for example if they travel frequently or expect to travel in future.	Telstra has a strong advantage in regional areas, given that it is the only operator that can offer national coverage. Whilst only 200k people live in Telstra-only areas, a significantly higher number of mobile subscribers live in regional areas ¹⁶ . These consumers will likely have a strong preference for Telstra, given that Telstra will be the operator likely to be offering widespread coverage in the areas surrounding where subscribers live (and the rest of Australia where VHA/Optus do not offer coverage).	

Source: Frontier

The stronger attractiveness of Telstra’s national products in regional areas is also recognised by the ACCC in its draft decision:

“Further, examining market share figures in particular parts of regional Australia also illustrates the importance of having continuous coverage in regional Australia. Telstra appears to be the preferred operator in major towns where all

¹⁵ This includes Sydney, Melbourne, Brisbane, Adelaide, Perth and Canberra region.

¹⁶ Page 39, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

three MNOs have coverage, but where Telstra is the only operator who has continuous coverage in the surrounding areas and connecting roads. For example, each operator has coverage in the centre of Kalgoorlie. However, VHA and Optus have far less extensive coverage in the surrounding areas than Telstra.”¹⁷

Telstra has also provided evidence that shows that geographic coverage **[c-i-c]**.

The above table and evidence indicate that Telstra faces weaker competition in regional areas than urban areas. This seems to have been recognised by the ACCC, which states in the draft decision that:

“However, while the ACCC has found that competition in the national market is generally effective, we acknowledge there is often little choice of effective network operator for those consumers who value geographic coverage.”¹⁸

and

‘...the ACCC’s preliminary finding is that competition in regional mobile services areas is likely less effective than in the national market overall...’¹⁹

Consistent with the above, the available evidence on market shares in urban and regional areas shows that Telstra has a significantly higher market share in regional areas than in urban areas²⁰.

[c-i-c]

This was recognised by the ACCC in the draft decision:

*“The ACCC received estimates of market shares in different parts of Australia from a number of parties. While these figures differed slightly, they consistently show market shares for mobile services in metropolitan areas are more evenly distributed than the national market. In many metropolitan centres Telstra’s share of the market is significantly smaller than it is nationally. **[c-i-c]***

Whilst the ACCC has discussed the significant market share advantage of Telstra in regional relative to urban areas, it does not seem to have tried to robustly identify the specific reasons that explain it. The ACCC discusses perceived ‘network quality’²¹ as a potential competitive advantages of Telstra. But it is not clear why this should be materially higher in regional relative to urban areas.

Telstra has also a wider retail network in regional areas²², but it is not clear that this is the cause rather than the result of its wider geographic coverage and hence higher regional market share.

We also understand that Telstra has rolled-out 4G technology more quickly than rivals **[c-i-c]**.

In summary therefore, whereas some evidence has been provided to explain the overall higher market share of Telstra, there is not compelling evidence that

¹⁷ Page 38, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

¹⁸ Page 3, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

¹⁹ Page 44, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

²⁰ ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

²¹ Page 34-35, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

²² Page 38, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

factors other than Telstra's superior geographic coverage can explain its materially higher *regional* (as opposed to overall) market share.

2.2 The impact of uniform pricing

Despite the ACCC recognising that competition differs across different regions, the ACCC concludes that Telstra's advantage in competing for consumers who require or value wide geographic coverage may not necessarily lead to detriment for these consumers, because Telstra's products are priced in a nationally-consistent way (i.e. Telstra's prices are 'uniform' across Australia):

"We consider that national uniform prices mean that consumers benefit from effective competition in non-regional areas."²³

However, where geographic competitive conditions differ, and providers choose to compete with geographically uniform prices, then the resulting national price can in general be expected to reflect the average level of competition across the different geographic areas that a provider competes in.

In particular, Telstra will be expected to set its national price based on the average level of substitutability between its national products and urban-only products. In urban areas, there will be reasonable substitutability between urban-only and national products – there is likely to be high substitutability for those subscribers who do not value national coverage, and weaker substitutability from those subscribers who do. In regional areas however, urban products will be a poor substitute for subscribers that value national coverage, which, as described above, are expected to be a significant share of regional subscribers.

Given the above, as a matter of principle, competition in urban areas can be expected to constraint the nationally uniform price of Telstra's offers. However, this still would not prevent Telstra from setting its prices above the competitive level – which would be the level of prices that would be observed if all MNOs had similar levels of coverage. How much higher will depend on the share of subscribers that value wide geographic coverage in urban and regional areas and how much value they attach to such wide geographic coverage.

2.3 Evidence on consistency of Telstra's pricing with competitive outcome

There is a range of empirical evidence that provides support to the hypothesis that Telstra is able to charge prices that are higher than they would be if its rivals were able to offer products with comparable geographic coverage:

- ACCC has found evidence of significant price premia in Telstra's offers compared to other offers²⁴: eg price premia for data plans ranged from c. 300% for low cost plans (under \$25), to +42% for medium cost plans (\$40-\$59), and evidence of less attractive offers (eg absence of unlimited voice calls in low or medium price plans, unlike rivals, including MVNOs). Indeed

²³ Page 3, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

²⁴ Page 40 and table 5, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

ACCC concludes that ‘...*there is no evidence that Telstra is under pressure to decrease its prices to gain new customers*’²⁵.

- NRF has submitted a report by CIE which estimated a Telstra price premium of \$10/month for postpaid, \$17 for pre-paid, and \$5 for postpaid SIM only, which amounts to an annual total of \$1.4bn paid each year for Telstra services above the average price for the same services by other providers.
- The impact of the announcement of ACCC’s draft decision on Telstra’s share price (please see chapter 4) indicates that declaration would be expected to have a material impact on Telstra’s future profitability.
- Telstra claims to have a low churn rate by international standards. Indeed, in 2015, Telstra even claimed that its churn rates were at “world class lows”²⁶.

2.4 Summary

A significant proportion of Australian consumers care about the extent of geographic coverage a mobile provider can offer them. This appears to be reflected in Telstra having much higher market shares in regional areas than in urban areas where it has less of a coverage advantage. Even though Telstra uses uniform pricing, this does not mean that competition in the urban areas will lead to Telstra’s prices being set at a level consistent with a competitive outcome, where rivals were able to offer products with similar levels of coverage. Indeed, the available evidence is consistent with Telstra enjoying a significant price premium over its rivals for comparable products. Whilst the causal evidence linking the price premium to Telstra’s materially superior geographic coverage may be less easy to observe and assess directly, we consider that the above evidence is consistent with Telstra’s significant and geographic coverage advantage leading to a material pricing premium.

In deciding not to declare a domestic roaming service, the ACCC has argued that there are other reasons that could explain Telstra’s regional market share advantage. Whilst it is not clear that there is compelling evidence that factors other than coverage can explain Telstra’s significant regional advantage, when modelling the impact of declaration, we have tried to reflect the ACCC’s view, by assuming that Telstra would maintain a significantly higher market share in regional areas than in urban areas after declaration.

²⁵ Page 43, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

²⁶ “Post-paid handheld mobile churn remained at world class lows, decreasing 0.1 percentage points to 10.7 per cent.” <https://exchange.telstra.com.au/telstra-delivers-growth-in-customer-base-income-and-net-profit-after-tax/>

3 DECLARATION OF DOMESTIC ROAMING

In this chapter we present an overview of our approach to modelling the introduction of domestic roaming, the data/information used and the assumptions made – with the detail provided in an Annex.

We assume for the purposes of our modelling/quantification of consumer benefits that declaration of domestic roaming by the ACCC would allow VHA and Optus to match the geographic coverage of Telstra's network²⁷, leading to Telstra facing stronger competition from VHA and Optus. This is likely to benefit consumers who value coverage in both urban and regional areas, but may also have a positive impact on consumers who do not value coverage, as there is likely to be some substitution between urban-only and national products for some consumers.

3.1 Retail pricing scenarios

In the draft decision, the ACCC also considers that there are (at least) two possible scenarios of domestic roaming in terms of the structure of prices²⁸:

1. Operators retain de-averaged (differentiated) pricing for urban and national products.
2. Operators all move to nationally consistent pricing and offer only national products.

We model both scenarios in order to assess the impact of declaration on retail prices, and hence on consumer welfare.

Which scenario is most realistic will depend on a number of factors including:

- **The nature of the domestic roaming rate.** The higher the (average) access price of domestic roaming (i.e., the domestic roaming charge), the more likely that de-averaged pricing will occur. If all three operators were to charge nationally consistent pricing under a 'high' roaming charge, then an operator would be able to increase its profits by continuing to offer/launching a (cheaper) urban-only product. If Optus or VHA continued to offer such a product, this would allow them to save the domestic roaming charge on such a product, which would therefore allow them to charge a lower price than for their national products. Such a product would be an attractive proposition to those consumers who do not value national coverage and would allow the operator to gain market share from its rivals. In response to this, it is likely that other operators would continue to offer/launch urban-only products.
- **Consumers' willingness to pay.** In general, operators are likely to find it profitable to price discriminate if they are able to segment consumers

²⁷ It may be that to achieve this, Telstra and VHA may also have to use Optus' network in some areas and Optus and Telstra may rely on VHA in others. However, we believe these cases are minimal in comparison to roaming on Telstra and would be very unlikely to affect the results. We have therefore only modelled domestic roaming on Telstra's network.

²⁸ It considers a third, which is that national pricing is withdrawn.

based on their willingness to pay. Therefore, if consumers' preferences for national coverage differ significantly, then providing de-averaged pricing would be a more profitable strategy.

We acknowledge that it is rare to observe de-averaged prices in other countries. However, we consider that the situation in Australia is different for a number of reasons:

- There are significant and persistent differences in the geographic coverage of the three operators, and a recognition that VHA and Optus will be unable to match Telstra's significant geographic coverage advantage absent roaming;
- Competitive markets would be expected to reflect significant differences in wholesale (incremental) costs in retail prices; and
- There are already urban-only products in place in Australia, so it would be a case of not removing urban-only products rather than launching new urban-only products.

Furthermore, MNO and MVNO pricing already reflects a significant level of differentiation and sophistication. We would therefore expect MNOs to develop, in practice, a range of tariffs that would aim to match the preferences of different subscribers, by using a mixture of 'pure' de-averaged pricing offers, and 'pure' nationally consistent pricing. For example, operators could include a certain number of roaming minutes within a consumer's tariff, but then charge for out-of-bundle usage. This means that consumers who use more domestic roaming will pay higher prices than those consumers who do not use it very much. This is similar to the way in which international roaming is often priced by mobile operators.

3.2 Economic model used

To model the impact of domestic roaming we have used an economic model that assumes that mobile operators compete by offering similar but differentiated products, such that operators can price at levels above their incremental costs, reflecting the degree of product differentiation and overall intensity of competition. This is known as a 'differentiated Bertrand model'. Similar models have been used by the European Commission to estimate the impact of mobile mergers on prices, including in Austria, Italy, UK, Denmark, Ireland and Germany

One of the advantages of this modelling approach is that it is not necessary to have detailed information on the nature/shape of demand for each mobile operator's products, as this is derived (indirectly) based on:

- Prices;
- Incremental costs; and
- Diversion ratios.

This information allows the model to reflect the current situation in the Australian mobile market. This is referred to as the 'factual' case. It is then possible to model the impact of changes in the industry structure and/or incremental costs (this is

the 'counterfactual' case). The modelling is also transparent and allows us to run a number of sensitivities.

In this case, a differentiated Bertrand model allows us to capture a number of different effects that could arise from domestic roaming:

- **The impact on Telstra's incentives.** Declaring domestic roaming will affect Telstra's incentives in ways that can be captured by our modelling approach:
 - Telstra will now face stronger competition from Vodafone and Optus, as they will be able to offer national products, which will reduce Telstra's market power in that segment of the market; and
 - Telstra will now make a wholesale margin on national products sold by Vodafone and Optus, so this will have some effect on how intensively Telstra will compete with Vodafone and Optus.
- **The impact on Vodafone and Optus' incentives.**
 - Vodafone and Optus will now face more aggressive pricing from Telstra, which put a downwards pressure on the prices that Vodafone and Optus can charge; and
 - Vodafone and Optus will take into account the substitutability between the different products that they each sell.

The key mechanism through which the declaration affects retail prices in the model, is that it enables Optus/VHA to compete for mobile subscribers that value national coverage by purchasing domestic roaming. This leads to intensified competition for such subscribers, which in turn leads to lower retail prices for national products. As prices for such products fall, some mobile subscribers that used to purchase urban products now become attracted to national products – this will be a function of the diversion ratios between different products. Furthermore, as urban products also compete with national products, the reduction in national product prices also leads to a pressure for price reductions of urban products. The modelling approach we use enables the quantification of these effects, and the estimation of the likely consumer welfare impact.

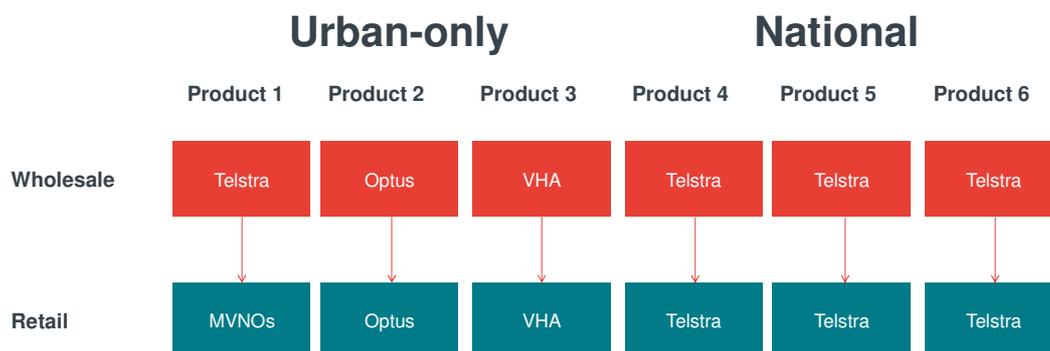
3.3 Input data and assumptions

3.3.1 De-averaged pricing

Under our de-averaged scenario, we assume that there are six (composite) products in the mobile market – three of these products provide urban coverage and three provide national coverage. Of the three urban products, one is provided by Optus, one by VHA and one by MVNOs hosted on Telstra network.

In the factual scenario which represents the market as it is today, Telstra provides all three of the national products, as no other operator has national coverage. However, we consider that the subscribers of two of these three products are not typical Telstra consumers, in the sense that they would otherwise (i.e. if the products did not differ in terms of their geographic coverage) prefer the product characteristics of Optus and VHA. The following figure summarises how we have modelled the current situation.

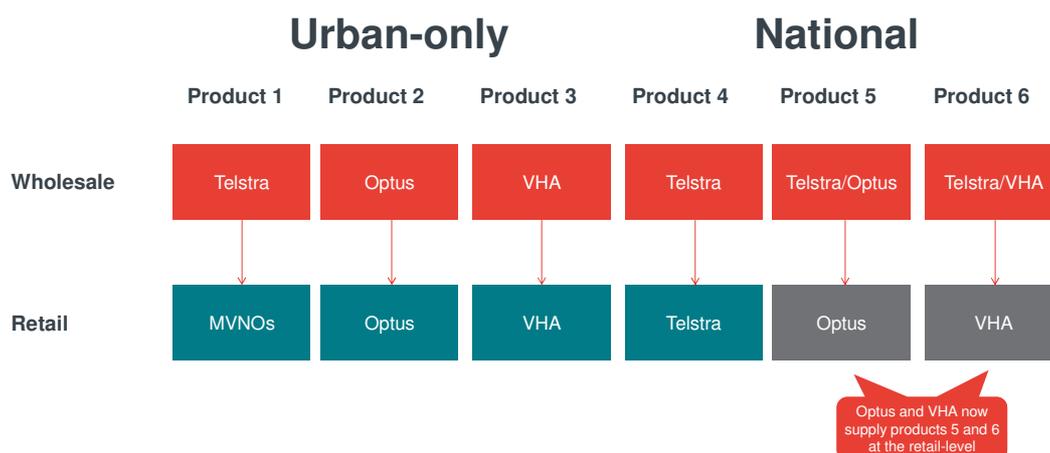
Figure 2 Products under current situation



Source: Frontier Economics

Following declaration, we have assumed that Optus and VHA would start offering products 5 and 6 at the retail-level although they would be relying on domestic roaming from Telstra at the wholesale-level.

Figure 3 Products with domestic roaming



Source: Frontier Economics based

As a result of VHA and Optus using domestic roaming, we assume that they have to pay a domestic roaming wholesale charge to Telstra which is based on the number of subscribers using products 5 and 6. We model this as a per subscriber charge, although the payments made to Telstra could be based on a usage basis (i.e. per minute, per SMS, per GB), which then results in an average charge per subscriber based on the average level of usage, or as some combination of per subscriber and usage charges.

3.3.2 Nationally consistent pricing

As well as assessing the impact on de-averaged pricing, we have also explored the likely consumer impact if operators were to use nationally consistent pricing. We have done this by assuming that operators would face a constraint that implies that they would have to set nationally uniform prices, whilst still facing competition from each other. This means that compared to de-averaged pricing,

the prices of urban-only²⁹ products will be higher and the prices of national products will be lower.

In practice, the way we obtain the results of the uniform pricing within our model is to increase the incremental cost of urban-only products and reduce the incremental cost of national products until the retail prices of urban-only and national offers are equalised. We have not made any direct adjustments to Telstra's costs/prices, given that it already offers national products, although there will indirectly be a change to Telstra's prices, as it will respond to the price changes by VHA and Optus.

3.3.3 Summary of other model input assumptions

The following table provides a summary of the input data/assumptions that we have used in our modelling.

²⁹ Although in this context the term "urban-only" makes less sense as all products would have national coverage.

Figure 4 Summary of input assumptions

	Approach	Data used
Market shares	In the factual case the market shares are as observed today. In the counterfactual, we assume that the overall market shares will converge to the market shares currently observed in urban areas, but Telstra will continue to enjoy a significant market share advantage.	We estimate that Telstra's market share would drop from 49% to [c-i-c] , whereas Optus and VHA's market shares would increase from 29% to [c-i-c] and from 20% to [c-i-c] respectively.
Domestic roaming charge	We have estimated the domestic roaming rate by estimating assessing the ARPU difference between Telstra and Optus/VHA and then subtracting an estimate of the economic rent that is currently being earned made by Telstra as a result of its superior geographic coverage.	An average roaming charge of \$5 per subscriber
ARPUs	We have derived ARPUs based on operators' financial reports	\$46.30 per month for Telstra, \$37.97 per month for VHA, \$35.80 per month for Optus and \$30 per month for the MVNOs
Margins	We have estimated margins based on the gross margins typically used by the European Commission in merger cases and confirmed by VHA as reasonable assumptions.	70% for Telstra, 60% for VHA and Optus, 40% for the MVNO
Diversion ratios	We have derived diversion ratios using two steps: <ol style="list-style-type: none"> 1. Estimate diversion ratios based on market shares 2. Application of an uplift to the diversion ratios within the urban-only segment and within the national segment. 	See Annex.

Source: Frontier

We provide in an annex a description of the data/assumptions used in relation to these inputs. We discuss next in the main report the derivation of the domestic roaming charge, as this is an important driver of the impact of domestic roaming on retail prices.

3.3.4 Domestic roaming charge

There are a number of different ways in which the domestic roaming wholesale charge could be structured:

- As a series of usage based charges, i.e. cost per minute, cost per message and cost per GB;
- A cost per subscriber;
- A combination of cost per usage and cost per subscriber or
- A fixed cost for a given amount of network capacity.

We consider that one of the first two options is the most likely. For the purposes of the modelling we have used a cost per subscriber. To derive the domestic roaming wholesale charge, we have applied the following steps:

1. We have estimated the difference in ARPUs between the different operators. At present, Telstra's ARPU is \$9-\$10 above the ARPUs of VHA and Optus.
2. Based on an overall estimate of Telstra's economic rent of \$2.1bn³⁰, we have estimated the proportion of the difference in ARPUs that might be attributable to Telstra's economic rents. Using this approach would suggest that c. 20% of the total ARPU could potentially be attributable to economic rents (based on the ratio of the estimate of the Telstra economic rent to Telstra turnover).
3. The ACCC's view on competition, as presented in the draft decision, suggests they consider that Telstra's economic rents are lower than this. Some of the economic rent earned by Telstra may be related to other competitive advantages unrelated to its superior geographic coverage. We have therefore adopted a more conservative assumption of economic rents representing 10% of Telstra's ARPU as a base case scenario. This means that approximately \$4.5 of the ARPU difference reflects economic rent. For the avoidance of doubt, we do not offer an opinion as to what Telstra's economic rent may actually be, and we later show a range of sensitivities for different domestic wholesale rates which would reflect differing views on this point.
4. We have then obtained the average wholesale domestic roaming rate by subtracting this estimate of economic rent from the ARPU differential, giving an estimate of a roaming charge of \$5 per subscriber.

3.4 Consumer welfare impact

Our modelling allows us to estimate the new prices and subscriber market shares for each of the products modelled, as a result of the introduction of domestic roaming. There are three types of consumers affected by the price changes:

- **Type 1:** Customers who do not place much value on national coverage and therefore currently purchase urban-only products;
- **Type 2:** Customers who currently purchase Urban-only products but would consider switching (i.e. they care about national coverage but not sufficiently to pay the current price premium; or they do not like Telstra's current offer); and

³⁰ Richard Feasey 2nd Report, paragraph 34.

- **Type 3:** Customers who value about national coverage and currently purchase Telstra's national product.

For the de-averaged pricing scenario, we have proxied the impact on consumer welfare by estimating the reduction in consumer expenditure if no consumers were to switch products (i.e. the impact on ARPU multiplied by current volumes). This should provide a *lower bound* on the impact on consumer welfare. The reason why this is a lower bound can be explained by considering the impact on the different types of consumers:

- **Type 1:** These consumers will continue purchasing an urban-only product, so the impact on them will depend on the price change for the urban-only products. Therefore, their change in consumer welfare will be equal to the change in expenditure for urban-only products, assuming that they do not switch to another urban-only product. Given this, our approach should be a reasonably accurate assessment of their change in consumer welfare. If anything, our approach can be considered as a lower bound, as consumers will only switch to another urban-only product (e.g. with higher usage) if that gives them higher consumer welfare than staying with their current product and being subject to the price change.
- **Type 2:** Since these customers may move to a national only product, the accurate measure of their consumer welfare change from a price change would be the additional value they gain from getting national coverage, minus the additional price they would pay to consume this product compared to what they paid before. Therefore the impact on these consumers will depend on i) how much more they value national products and ii) the change in the amount that they pay by upgrading to a national product. It is therefore more difficult to accurately capture the consumer welfare change for these consumers as we do not know how much they value it. However, by measuring the change in expenditure if they continued to purchase the urban product and just faced the price change for that product, our approach can be considered as a lower bound estimate for consumer welfare change. This is because those consumers who choose to switch products in response to the price changes will only do so if their gain in consumer welfare is higher than the gain that they would get by just staying with their current product and being subject to the price change.
- **Type 3:** These consumers will continue purchasing a national product, so the impact on them will depend on the price change for the national products. Therefore, their change in consumer welfare will be equal to the change in expenditure for national products, assuming that they do not switch to another national product. Given this, our approach should be a reasonably accurate assessment of their change in consumer welfare.

We have also considered the actual impact on consumer expenditure, which does not capture any gains for customers from getting access to better products.

For nationally consistent pricing, we have proxied the consumer impact by estimating a lower bound of the consumer welfare, following a similar approach as set out above for de-averaged pricing.

3.4.1 NPV calculations

Our modelling approach assumes that the move from factual to the counterfactual takes place ‘instantaneously’. In reality we might expect a more gradual adjustment of prices as competition from VHA and Optus in national products develops, particularly as a proportion of consumers will be on contracts and may not be able to obtain new prices until they renew their contracts. We therefore present the net present value (NPV) of our lower bound estimate of consumer welfare changes after applying a glide-path to price changes, meaning the new prices are reached after 4 years following a linear trend.

The NPV is calculated over 10 years, including the glide-path, using a social discount rate of 7%, which is the discount rate that the Australian government recommends using in Cost-Benefit Analysis³¹.

³¹ Australian Government (February 2016) – Cost-benefit analysis guidance note.

4 RESULTS

In this section, we show the results of the modelling exercise described above to estimate, for each scenario (i.e., de-averaged prices and national prices), the impact on consumers of declaring a domestic roaming service. In the following sections, we present:

- the results under de-averaged pricing;
- the results under nationally averaged pricing; and
- sensitivities tested on the results.

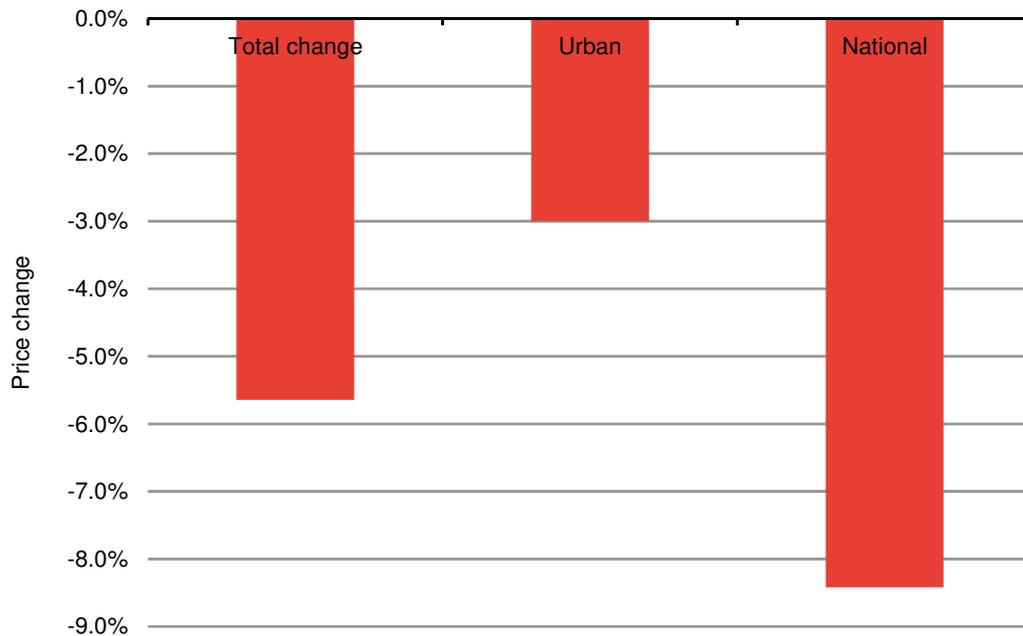
4.1 The consumer impact under de-averaged pricing

Under this scenario, VHA and Optus would continue to offer their urban-only products and would introduce additional products with national coverage reliant on domestic roaming. Our model estimates the impact of this scenario on prices, volumes, profits, market shares and consumer welfare. As explained above, for price changes the results show the weighted average prices based on the volumes in the factual scenario (i.e., absent declaring domestic roaming). As such, the price changes are not quality-adjusted. Similarly, when we consider the impact on consumer welfare, this is also based on these price changes and this is therefore a lower bound estimate.

4.1.1 Prices

We estimate that declaring domestic roaming would lead to a significant reduction in the prices of national products (-8.4%) and a smaller reduction in prices for urban-only products (-3.0%). Overall, therefore, prices fall by -5.6%, as shown in the figure below. The greater fall in prices for national products reflects the significant increase in competition for subscribers that value national coverage (following entry by VHA and Optus into the provision of national products). However, prices of urban-only products will also fall in response to the lower prices for national products, as there is still some substitutability between the two types of products.

Figure 5 Price changes due to domestic roaming under de-averaged prices (unadjusted for quality improvements)



Source: Frontier Economics

Note: weighted by factual volumes

As a result of the change in the relative price of national versus urban offers, some customers will switch away from urban only products to national products (we estimate this to be c. 6% of the customer base). These are customers for whom the trade-off between the value they place on national products and the higher prices for national products is such that they favour national products, once the relative price differential between these products declines.

4.1.2 Consumer welfare and expenditure

As a result of the lower prices, our estimate of consumer welfare benefit would be \$685m per year. This gain is distributed among subscribers to different products as illustrated below (please note in the chart the consumer welfare gain is presented as a reduction in consumer expenditure).³² Not surprisingly, a large amount of the benefit will accrue to consumers who currently purchase Telstra's national product and who will enjoy a significant reduction in prices post-declaration.

[c-i-c]

As explained earlier, this provides a lower bound on the consumer welfare impact due to domestic roaming, as some consumers will choose to switch products in light of the price reductions, and they will only switch if their consumer welfare increases by more than it would if they just stay with their current product and benefit from the price reduction. In addition there may be some switching

³² The calculation does not take into account welfare gains resulting from switching between urban and national offers, though the potential impact is described further below.

between providers as Telstra’s customers now have more choice of provider with national coverage and may prefer the features of Vodafone or Optus’ product.

It is reasonable to expect that it will take some time for the full effect of domestic roaming on prices to be felt. Under an assumption that it would take four years for the prices to converge to the levels predicted by the model under declaration, we estimate that the net present value³³ of our lower bound estimate of consumer welfare gain amounts to \$3.9bn over a 10 year period.

As described earlier it is useful to consider three groups of consumers affected by the changes:

Type 1: subscribers who do not place much value on national coverage and therefore purchase urban-only products in the factual;

Type 2: subscribers who purchase urban-only products in the factual but would consider switching (i.e. they place some value on national coverage but not sufficiently to pay the current price premium; or they do not like Telstra’s current offer); and

Type 3: subscribers who value national coverage and currently purchase Telstra’s national product.

With de-averaged pricing, Type 1 and Type 3 subscribers would be able to reduce the amount they pay for mobile services. Type 2 customers would increase the amount they pay because they switch to a national product, but are consequently consuming a higher quality product. The changes in actual expenditure by type, and in total, are shown in the table below.

Figure 6 Changes in expenditure per type of customer

Customer type	Change in expenditure (per customer per year)	Proportion of customers	Weighted average change in expenditure per year
Type 1	-\$13	46%	
Type 2	+\$78	5%	
Type 3	-\$46.4	49%	
TOTAL			-\$25.1

Source: Frontier

Furthermore, as mentioned earlier, we have been conservative and assumed that there would be no demand effect following the reduction in prices. This seems a reasonable assumption in terms of mobile participation, given the level of mobile penetration in Australia reported above. It is however quite likely that there would be increases in usage in response to the projected price reductions following declaration. This would lead to additional consumer benefits from declaration, which are not reflected in the above quantification

We note that these results are inconsistent with the ACCC’s assessment of the impact of declaration under de-averaged prices: *“The ACCC considers that the effect of declaration on retail prices is uncertain but that there is evidence to*

³³ We use the recommended social discount rate of 7% according to the Australian Government’s 2016 guidance on Cost-benefit analysis

suggest that declaration may lead to worse outcomes for consumers in terms of retail pricing than the market would deliver without declaration.”

4.1.3 Market shares and profits

The figure below shows that Telstra will see a fall in its market share following declaration, whilst both Optus and Vodafone see an increase³⁴.

[c-i-c]

Although this change would naturally lead to a reduction in profits for Telstra, this is in part mitigated by the wholesale revenues Telstra make from the national roaming product; overall the model predicts a (gross) profit reduction for Telstra of c. 18%.³⁵ Both Optus and Vodafone benefit from profit increases due to national roaming projected to be c. 5%-6%.

4.2 Nationally consistent pricing

In this section we present the results when modelling a scenario where Vodafone and Optus choose to offer only a national product. This assumes that some customers who would not previously have purchased a national product will use roaming to some extent. The other assumptions are as per the de-averaged prices scenario (set out in the introduction to section 4.1) and we present these results in comparison to the de-averaged pricing scenario.

4.2.1 Prices

If the domestic roaming service is declared and operators apply nationally consistent pricing, we estimate that there would be a considerable reduction in the prices faced by consumers of national products (-8.1%). In contrast, however, there could be a small increase in the prices faced by formerly urban-only customers (0.1%). This is because these customers now have access to services in roaming areas, whether or not they wish to use these.

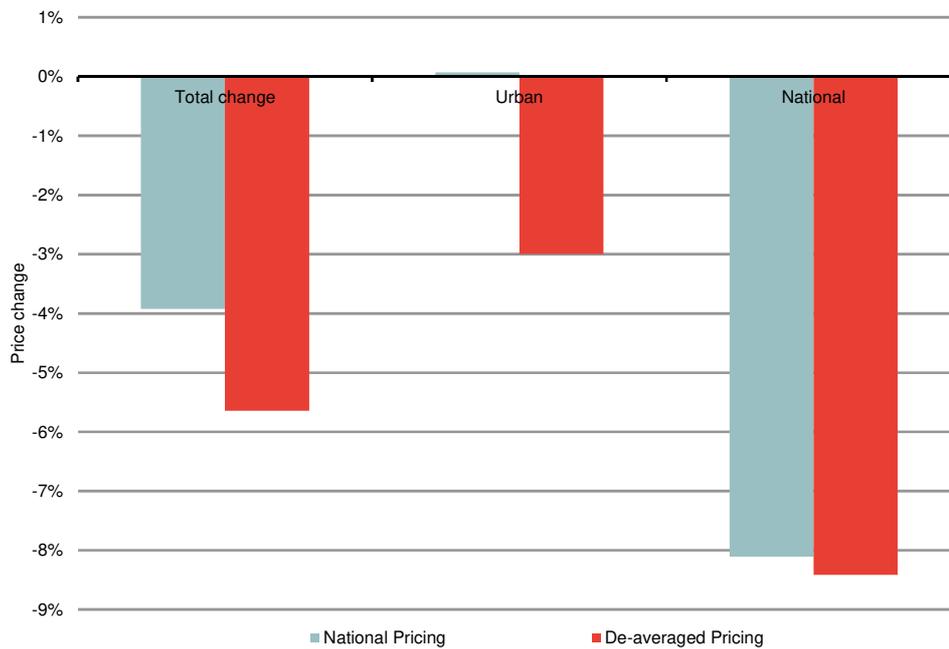
Taken in combination, our model predicts that overall prices would fall by -3.9%. This overall price change is smaller than in the de-averaged case as more customers would be expected to make use of the domestic roaming service (even if they do not value it highly), meaning the overall costs for VHA and Optus are higher than in the de-averaged case.

The weighted average price change for “urban-only” products and for “national” products is shown in the figure below.

³⁴ Based on the gross profits estimated in the model from the original gross (incremental) margin assumption.

³⁵ Based on our factual estimate of gross incremental profit margin – 70%, recall that this margin also reflects under our modelling assumptions an economic rent of 10% of ARPU/turnover.

Figure 7 Price changes due to domestic roaming under nationally consistent pricing (unadjusted for quality improvements)



Source: Frontier Economics

Note: weighted by Factual volumes

The model predicts that the overall roaming costs would increase under the nationally consistent pricing scenario, because more customers would begin to use roaming services as a result of lower (uniform) national prices. This makes intuitive sense as all subscribers are effectively required to purchase national products, so any customer that gains any benefit from roaming would be expected to use it (whereas with de-averaged prices there may still be some customers purchasing urban-only products who place some value on national coverage but not sufficiently to pay the premium even after the price changes).

4.2.2 Consumer welfare and expenditure

With nationally consistent pricing the change in consumer welfare is estimated to be \$505m per year. This provides a lower bound on the consumer welfare impact due to domestic roaming, as some consumers gain some benefit from having access to national roaming to which they would attach some value. As in the previous scenario, there may again be some additional welfare gain from switching between providers, as Telstra’s customers now have more choice of provider with national coverage.

The changes in actual expenditure are shown in the table below. This reflects the change in expenditure but ignores that type 2 customers now consume a product with national coverage which they place some value on.

Figure 8 Changes in expenditure per type of customer

Customer type	Change in expenditure (per customer)	Proportion of customers	Weighted average change in expenditure per year
Type 1	+\$0.3	25.5%*	
Type 2	+\$0.3	25.5%*	
Type 3	-\$44.6	49%	
TOTAL			-\$21.7

Source: Frontier

* assumed split between Type 1 and Type 2

As in the de-averaged case, it may take time for the full effect of domestic roaming on retail prices to be felt, so using a 4-year glide-path, we estimate that the net present value of the lower bound consumer welfare benefit is \$2.9bn over a 10 year period.

4.2.3 Market shares and profits

As in the de-averaged scenario Telstra now faces competition for customers who value national coverage. As a result, it will reduce its prices and see a reduction in its market share resulting from the introduction of national roaming. However in this scenario, Telstra reduces its prices by less than with de-averaged price, as in this scenario they do not have any competitive constraint from urban-only products in addition to national products. Telstra maintains slightly more market share with nationally averaged prices but generally the market shares do not differ significantly between the scenarios.

The reduction in profits for Telstra is as a result lower in this scenario as Telstra's wholesale revenues increase as more consumers using Optus and VHA's products would be expected to using roaming to some degree given nationally averaged pricing (as we explained above). In addition their price reduction is lower in this scenario; as a result Telstra profits are predicted to fall by 16% (2% less than with de-averaging).

4.3 Sensitivities

Under both scenarios, the modelling results presented above show that the declaration of a domestic roaming service would significantly enhance consumer welfare. As we set out below, this central conclusion also holds if we flex the key assumptions within our model, namely:

- the market share of products 5 and 6 (i.e. the split of customers purchasing the national product who may switch to Vodafone or Optus);
- the roaming access charge;
- the level of within-segment switching; and
- the social discount rate for NPV calculations.

The table below shows a comparison of our central results to the results using the alternative option (option 2) for the market share of products 5 and 6. This assumption would give more significant results in terms of price changes and

NPV of consumer expenditure reduction as it reflects a greater reduction in the market share of Telstra.

Figure 9 Comparison of main results under alternative market share option

	Option 1	Option 2
Price change (de-averaged)	-5.64%	-5.81%
Price change (national)	-3.92%	-4.89%
NPV consumer welfare(de-averaged)	\$3.9bn	\$4.6bn
NPV consumer expenditure (national)	\$2.9bn	\$3.5bn

Source: Frontier economics

Below we also present figures which show the range of results for the de-averaged pricing if alternative assumptions regarding roaming access charge and within-segment switching are used. **[c-i-c]** The results below show that more within-segment switching increases the price effect.

Additionally, as we would expect, the lower the roaming access charge, the larger is the margin Vodafone and Optus can make on national prices meaning they can price more aggressively to compete with Telstra.

[c-i-c]

Finally, the Australian Government's guidelines on cost benefit analysis suggest that in addition to presenting a central estimate using a 7% discount rate, sensitivities should also be presented using 3% and 10%. The table below shows the impact of these sensitivities on the NPV of the consumer welfare estimates.

Figure 10 Discount rate sensitivities

	3%	7%	10%
NPV consumer welfare (de-averaged)	\$4.9bn	\$3.9bn	\$3.3bn
NPV consumer welfare (national)	\$3.6bn	\$2.9bn	\$2.5bn

Source: Frontier Economics

4.4 Consistency with analysis by other parties

We have also sought to provide a check on our results by examining other data and information which address the pricing advantages that Telstra currently holds through its superior coverage.

4.4.1 The CIE report on Telstra's price premium

The CIE report seeks to identify the extent to which Telstra can charge more for its mobile plans as compared to competitors.³⁶ It does this by using the hedonic pricing method combined with regression analysis of the plans of the mobile operators. Through this method, it is possible to decompose the effect on price of various components of a mobile plan, for example amount of data, minutes included, and the identity of the mobile provider. The CIE finds that, for both post-paid and pre-paid regressions, Telstra earns a price premium over the average of other providers. The total premium afforded to Telstra sums to \$672m per year for post-paid and \$533m per year for pre-paid service. Therefore the total premium charged by Telstra over "similar" service offered by competitors is \$1.2bn per year, or \$1.4bn with mobile broadband users included.

In comparing the results presented by CIE to those in this report, it is important to consider two things. First, the figure of \$1.4bn per year proposed by CIE assumes that all plans are sufficiently similar. The premium therefore represents the additional value to consumers of Telstra's national coverage, which covers both Telstra's higher costs of providing coverage in regional areas and a premium paid to Telstra reflecting its market power. While declared domestic roaming would reduce the premium associated with market power, it would not reduce the premium covering higher costs. It is therefore likely that the \$1.4bn per year represents an upper bound on the annual benefits to consumers of a roaming declaration. This is consistent with our modelling assumptions.

4.4.2 Analyst reports

[c-i-c]

4.4.3 Change in share price

A final check is provided by changes in the Telstra price at the time of the ACCC's draft decision.³⁷ The following chart indicates that the markets attributed a strong positive value to the ACCC's draft decision, with many media reports noting the share price boost.³⁸

The following figure indicates the changes immediately following the decision. The closing share price increased from \$4.23 the day before the decision to \$4.40 on the day of the decision (Friday 5 May). The closing price then fell on the Monday to \$4.35. The change in share price again represents an upper bound for consumer effects, as the change in share price would be expected to reflect, *inter alia*, losses of profit for Telstra reflecting consumer switching and a loss of price premium. The change in price implied indicates that the decision was worth around \$1.4bn to \$2.0bn depending on whether the comparison point is the

³⁶ The CIE, *Telstra's Price Premium: The premium paid by consumers for fixed and mobile services*, November 2016.

³⁷ It is not possible to assess share price changes for VHA and SingTel Optus, as neither VHA nor SingTel are listed on the ASX.

³⁸ For example, see <http://www.smh.com.au/business/telstra-has-big-win-in-battle-for-bush-mobiles-20170504-gvywu2.html>

Monday or the Friday close. Again, the results of the modelling on the reduced price premium falls well within this bound.

Figure 26 Change in Telstra share price, April-June 2017



Source: Frontier

4.4.4 Conclusion

All the alternative sources of data provide results that are consistent with our modelling findings. Our estimated reduction in consumer expenditure of c. \$560m per year is, as expected, lower than the \$1.4bn price premium identified by CIE, similar to the Goldman Sachs results which did not account for the reduction in prices of other mobile operators, and fit within the gains achieved by Telstra when the ACCC's draft decision not to declare was released.

5 CONCLUSIONS

In this report we have summarised our approach and findings from empirically estimating the likely impact on consumers from the introduction of domestic roaming in the Australian mobile market. Using an economic model that captures the key features of the nature of competition between mobile operators, we have considered the impact under two scenarios for how VHA and Optus could react to the introduction of domestic roaming. Under both scenarios (geographically de-averaged and nationally consistent prices), our modelling suggests there could be a significant positive consumer welfare benefit from the introduction of domestic roaming, with our analysis indicating that de-averaged prices would lead to larger positive welfare benefits.

We estimate that with de-averaged prices, overall prices would fall by -5.6%. Using a glide-path to recognise that prices may change gradually, we estimate that this could generate, in NPV terms, a minimum of \$3.9bn consumer welfare gains over a 10 year period. With nationally averaged prices, we estimate an overall price reduction of -3.9%, and under a 4 year glide-path, a minimum NPV of consumer welfare gain of \$2.9bn over a 10 year period.

Our findings run contrary to the provisional conclusions of the ACCC stating:

“The ACCC also considers there is insufficient evidence to support the view that declaration, by increasing retail choice for consumers who value coverage, would improve overall competition in a way that would benefit consumers. We consider that the effect of declaration on retail prices is uncertain.”³⁹

In its draft decision, the ACCC set out its intention not to impose a domestic roaming declaration in the Australian mobile market on this basis of insufficient evidence. Our analysis however provides empirical evidence that the consumer benefits could be significant.

³⁹ Page 4, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) – VHA version

6 ANNEX – ASSUMPTIONS FOR MODEL INPUTS

6.1 Market shares

The draft decision confirms that Telstra currently has a significant market share lead in the overall mobile market:

“In terms of market share, Telstra has been the leader in the national mobile services market for a number of years with a clear market share advantage. As at June 2016, Telstra had a 45 per cent share of the national retail mobiles services market, followed by Optus at 27 per cent and then VHA at 18 per cent. The ACCC’s data also indicates that MVNOs’ market share is collectively around 10 per cent.”⁴⁰

However, as noted in Chapter 2, Telstra’s market share lead is substantially greater in regional areas than in urban areas (in large part reflecting its coverage advantage and the importance of coverage to those living in regional areas): *“The ACCC received estimates of market shares in different parts of Australia from a number of parties. While these figures differed slightly, they consistently show market shares for mobile services in metropolitan areas are more evenly distributed than the national market. In many metropolitan centres Telstra’s share of the market is significantly smaller than it is nationally.”* [c-i-c]⁴¹

Following declaration, Telstra would lose this coverage advantage. It is reasonable to expect that Telstra’s (and VHA’s and Optus’) market shares in regional areas would, as a result, converge towards market shares in urban areas over a period of time. Rather than assuming that the market shares in regional areas would fully converge to the market shares in urban areas, we have assumed that the gap in market shares falls by 60% [c-i-c]. This recognises that although coverage is the most significant reason why Telstra has higher market share in regional areas, it is not the only consideration for some consumers and that Telstra may differentiate its products in other ways as well.

To implement this, we have calibrated the model based on market shares by assuming that the market share of product 5 is equal to the market share that Optus would gain and that the market share of product 6 is equal to the market share that VHA would gain⁴². We have then used two options to estimate the change in market shares as there is a range of evidence on the distribution of market shares in different areas. In our modelling, we focus on Option 1, but also use Option 2 as a sensitivity.

Option 1

VHA submitted evidence to the ACCC about market shares across different urban areas, which was shown in Table 1 of the draft decision. To calculate an

⁴⁰ Page 24, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) –Telstra version

⁴¹ Page 25, ACCC Domestic mobile roaming declaration inquiry draft decision (May 2017) –Telstra version

⁴² [c-i-c]

overall market share in urban areas, we have weighted the different cities based on the size of their populations. Comparing these market shares with the current market shares (excluding MVNOs) suggests that Telstra's overall market share would fall by [c-i-c], whereas Optus' and VHA's market shares would increase [c-i-c] and [c-i-c] respectively following declaration.

[c-i-c]

Option 2

In the draft decision, Table 4 also presented data on market shares in urban areas. [c-i-c]. In particular, using Table 4 suggests that Telstra's market share would fall by [c-i-c], whereas Optus and VHA would gain [c-i-c] and [c-i-c] respectively.

[c-i-c]

6.2 ARPUs

We have estimated the ARPUs for each of the operators based on data in their financial reports. We have excluded revenues related to device sales or mobile broadband. The following table shows how we have derived the ARPUs.

Figure 11 ARPUs

	Data used	Estimated ARPU
Telstra ⁴³	Revenues of \$959m for pre-pay and revenues of \$5385m for post-pay. Subscriber numbers of 3.9m for pre-pay and 7.5m for post-pay.	$(959m+5385m)/(3.9m+7.5m)/12=\46.30 per month
Optus ⁴⁴	ARPU of \$21 for pre-pay and \$47 for post-pay. Subscriber numbers of 3.74m for pre-pay and 4.95m for post-pay.	$((\$21*3.74m)+(\$47*4.95m))/(3.74m+4.95m)=\35.80 per month
VHA ⁴⁵	Net ARPU of \$37.97 per month	\$37.97 per month
MVNOs hosted on Telstra's network	Estimate based on the assumption that MVNOs typically have lower ARPUs than the MNOs, but not significant to our results given that the MVNOs on Telstra's network have low volumes	\$30 per month

Source: Operators' annual reports

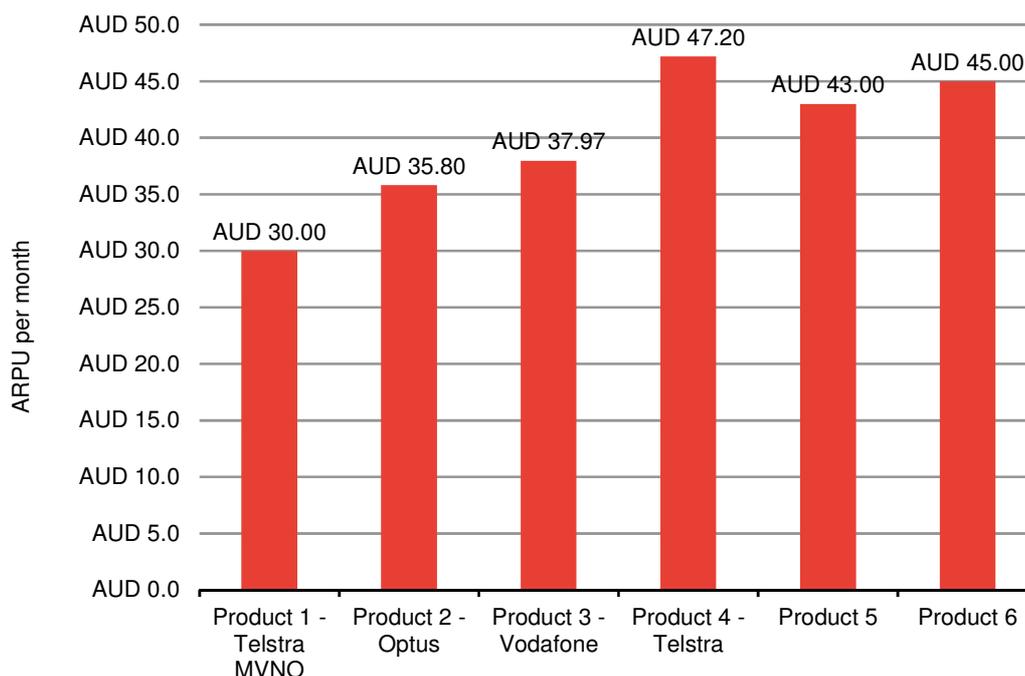
⁴³ <https://www.telstra.com.au/content/dam/tcom/about-us/investors/pdf-e/FY16-Annual-Report-single-pages.pdf>

⁴⁴ https://www.singtel.com/content/dam/singtel/investorRelations/financialResults/2017/Q4FY17_MDA.pdf

⁴⁵ <http://clients3.weblink.com.au/pdf/HTA/01841449.pdf>

We then have to decide how to split Telstra's ARPU across its three national products. We have assumed that product 4 has the highest ARPU, which would lead to Telstra still retaining the highest ARPU for this product after declaration. This is consistent with Telstra still maintaining other, non-coverage related, competitive advantages over Optus and VHA which it can reflect in higher prices. However, the distribution of ARPUs is unlikely to materially affect our results. The following figure shows the ARPUs used for each of the products under the factual situation.

Figure 12 ARPUs used under the factual case



Source: Frontier Economics

6.3 Margins

An input into the modelling is the incremental cost of providing the different products. We have modelled this by estimating the gross margins for each of the operators. In mobile mergers, the European Commission typically uses high gross margins for mobile operators (60%-80%), as it considers that a significant proportion of costs are fixed costs that would therefore not vary with the number of subscribers. VHA have confirmed that this is consistent with their view.

We have used a gross margin of 70% for Telstra, and a gross margin of 60% for Optus and VHA. This is based on the assumption that Telstra is more profitable than Optus and VHA, which is at least partly due to its coverage advantage. For the MVNOs hosted on Telstra's network, we have used a gross margin of 40%, given that MVNOs will typically have a lower gross margin than MNOs.

6.4 Diversion ratios

Diversion ratios measure the closeness of competition between various products. More specifically, they measure where a product's new customers come from. For example, they capture the proportion of VHA customers who switch from Optus and the proportion that switch from Telstra (and the proportion of Optus customers that switch from VHA and so on). Diversion ratios affect how operators respond when another operator changes its pricing. We have estimated the diversion ratios between the operators using a two stage approach:

Step 1

Our starting point is to assume that diversion ratios are based on market shares. This means that out of 100 customers that start using a new product, a greater proportion of these new customers will have come from products that have a high market share.

Step 2

In step 2, we apply an uplift to the diversion ratios within the urban-only segment and also apply an uplift to the diversion ratio with the national segment. This reflects the conclusion, discussed in Chapter 2, that whilst there is likely to be some switching between national products and urban-only products as the price of one or the other changes, it is more likely that a consumer of urban-only products would switch to another urban-only product than is suggested by market shares alone. Likewise, it is more likely that consumers of a national product would switch to another national product (as they would not regard an urban-only product as a sufficiently close substitute) than is suggested by market shares alone.

In order to inform the magnitude of the uplift, we have analysed porting data from VHA. The following figure shows that **[c-i-c]** of VHA's new subscribers switch from Telstra. However, based on market shares alone, we would expect 55% of VHA's subscribers to switch from Telstra⁴⁶. In total, **[c-i-c]** of VHA's subscribers come from urban-only products (i.e. non-Telstra products), whereas the expected proportion based on market shares would be 45%. This implies an uplift to diversion ratios of **[c-i-c]** within urban-only is reasonable. However, to recognise the fact that a small proportion of the subscribers who join VHA may come from Boost (who have national coverage), we have used an uplift of **[c-i-c]**. This uplift has been applied to the diversion ratios both within urban-only products and to the diversion ratios within national products.

[c-i-c]

The following table shows the diversion ratios that we have used.

[c-i-c]

We have assumed that there is no diversion from any outside goods (e.g. fixed products or consumers who are not currently using telecoms services). This is

⁴⁶ Based on ACCC data

because the vast majority of people in Australia are already likely to have a mobile subscription, given that there are 25.3m subscribers, but only 23.8m people. This is a conservative assumption, as lower prices would in general be expected to lead to higher levels of participation or demand for usage (which we also hold constant in our modelling).



GEORGE HOUPIS

Name:	Dr. George Houpis
Position:	Director
Nationality:	British/Greek



Dr George Houpis, a Director at Frontier Economics, is head of our Communications Practice. Working in the sector for over 22 years, he has considerable experience advising regulatory authorities and operators on the application of the EU regulatory framework, liberalization strategies, market analysis, fixed and mobile interconnection, regulation and costing of NGNs, broadband internet margins, spectrum refarming, USO design and costing, retail and wholesale price control design and implementation, development of standards and auctioning of spectrum. He brings his vast experience and strong analytical skills to bear when developing recommendations designed to achieve clients' strategic objectives, whatever the issue.

George has also advised clients on competition cases and disputes, including providing expert reports in cases including margin squeeze, mergers, interconnection and other disputes, and appeals of regulatory decisions before the UK and other competition authorities. George also has extensive quantitative experience, including the production and review of business plans and market forecasts and has provided support on a number of bids for telecommunications, TV and radio licences.

KEY EXPERIENCE

Telecommunications

George has been involved in a range of projects in the field of telecommunications, both in the UK and internationally, including:

- Providing support to TalkTalk and Sky in submissions to Ofcom on Openreach's cost of capital as part of the market review of the wholesale local access (WLA) markets and potential charge controls of local loop unbundling, wholesale line rental and VULA service
- Support to Orange Romania in relation to a Romanian CC investigation for abuse of dominance.
- Assist Vodacom SouthAfrica with 4G ICASA spectrum award dispute
- Analyse how mobile prices have changed in the UK over the past few years
- Help the NIC to understand what the UK needs "to become a world leader in 5G deployment". As part of this project, we have described the mobile ecosystem evolution and assessed potential future changes.

- Update of eircom's USO model for 2015/16 to support its application to ComReg for universal service funding. This will use the existing methodology developed in a previous project.
- Led the Frontier team providing economic advice to Slovak Telekom in the context of an abuse of dominance investigation by the European Commission.
- Led the team advising the GSMA in the context of assessing single wholesale networks (SWN) in mobile industry
- Led the team advising the GSMA in relation to the proposed acquisition of WhatsApp by Facebook
- Provided expert advice to two access seekers in the UK during an appeal assessing whether BT OpenReach was fulfilling its obligation to set access prices for high speed broadband (Ethernet) services on a cost-orientated basis. This was done as part of an appeals process before Ofcom, the UK telecoms regulator, and subsequently the CAT, the UK Competition Appeals Tribunal. George acted as an expert witness during the appeal process.
- Leading the Frontier team advising the GSMA in the context of promoting mobile broadband coverage through complementary government intervention policies, providing an expert report looking at the benefits of network competition in the mobile sector and preferred forms of government intervention policies to further support mobile broadband availability.
- Leading the Frontier team advising the GSMA in the context of evaluating the case for future mobile consolidation in the EU and emerging markets
- Led the team providing advice to a leading UK broadband provider on Ofcom's proposed ex-ante VULA margin test.
- Advising a CEE mobile operator in relation to a network sharing agreement, looking at the costs and benefits of two-way network sharing in three player markets.
- Advising a mobile operator on the MVNO remedies proposed as part of the assessment of mobile mergers in Germany and Ireland.
- Advice to Vodafone Netherlands in relation to outcomes of 4G spectrum auction
- Advice to the GSMA in the context of promoting mobile broadband coverage through complementary government intervention policies
- Advice to the GSMA in the context of evaluating the case for future mobile consolidation in the EU and emerging markets
- Advising a mobile operator on the costs and benefits of the introduction of the EU roaming regulation, including a detailed assessment of the impact of the introduction of the roaming regulation in different countries of the EU.
- Advice on the development of top-down and bottom-up cost models for a number of fixed and mobile operators for the setting of mobile and fixed interconnection rates.

- Supported OFTA (the Hong Kong Telecommunications Authority, now OFCA) as part of a number of competition cases. This included reviewing and commenting on the draft competition guidelines, considering issues including market definition, assessment of dominance, price fixing, market sharing, margin squeeze, predatory pricing, bundling and refusal to deal. (Confidential).
- Advice on the merits of the EC recommendation on the approach to the setting of mobile and fixed interconnection rates
- Advice on a dispute related to interconnection payments between a mobile and a fixed operator
- Advice on a margin squeeze case in mobile in an EU member state
- Advice on the merits of the use of LRIC to set mobile interconnection rates in the Netherlands
- Advice on an competition case related to on-net off-net differentials in an EU member state
- Advice on the appropriate approach to the interconnection regime between fixed and mobile operators in Hong Kong
- Advice for T-Mobile Austria on the appropriateness of using a 3G cost model to set mobile termination rates;
- Advice to Vodafone throughout the mobile termination rate review, including asset valuation for the estimation of the RAB in relation to 3G licence costs.
- Review of access pricing regime for next generation access networks in Singapore, for IDA.
- Recommendations on the appropriate form and scope of price control for eircom, on behalf of ComReg.
- Recommendations on the appropriate scope and form of price control, including on the level of X for the retail price control of Cable and Wireless Guernsey, on behalf of the OUR.
- Being appointed as the 3rd independent expert to advice on a dispute between an incumbent and a regulator in relation to the appropriate level of X for a retail price control.
- Advice on the appropriate form of wholesale price control for KPN on behalf of OPTA, including advice on length of price control, scope of price control, carry-over, and appropriate methodology for assessing efficiency improvements.
- Advice to a regulator on the development of a multi-year retail price control ahead of the planned privatisation of an incumbent, including advice on the scope and form of the price control, the length of the price control period, a comparative efficiency analysis to set the X, and the development of a financial model.
- Advice to a incumbent on comparative efficiency analysis and different methods for setting the X;

- Advice to a European regulatory authority on the appropriate approach to the regulation of broadband internet access, to ensure the development of a competitive market.
- Advice to European telecommunications operators on the application of margin squeeze tests in the broadband access market.
- Advising a UK mobile operator on the need for regulating international roaming charges.
- Advice to a major European telecommunications operator on market analyses of fixed telecommunications markets, assessment of market dominance, and recommendations on appropriate remedies, as part of the application of the new EU telecommunications framework.
- Assessment of effectiveness of competition, under the new European telecommunications framework; as part of the development of a seminar for an EU telecommunications regulator on market definition and effective competition, we reviewed the comparative performance of different EU countries so far.
- The development of scenarios for the convergence of the telecoms and audiovisual industries in the European Union, examining issues arising from the development of new services for operators, service providers and regulators, for DG XIII of the European Commission.
- Assistance with the review of the leased lines market for DG IV in relation to the assessment by the EU of the degree of competition in those markets;
- Leader of the licence value modelling for the business plan and revenue forecasts for one of the bidders for the third generation mobile licences in the UK. The analysis focussed on non-voice services and produced twelve year forecasts to support the bid for one of the five UMTS licences in the UK in 2000.
- Directing the project advising the TRA in Bahrain on the merits of further liberalisation of the mobile telecommunications market.
- Advice to a regulator, on the setting of appropriate fixed and mobile termination charges, as part of a project to resolve a dispute between mobile and fixed operators in a developing country.
- Directed the project advising the TRA in Bahrain on the issuance of FWA licences, from drafting the info memorandum, to the review and finalisation of the services and frequency licences, and the production of the Invitation to Tender.
- Project director for assignment to advise EETT (the Greek regulator) on auctioning of UMTS spectrum in Greece; this major 6 month engagement for the Greek telecoms regulator, involved economic analysis and modelling of the entry of a fourth player in the Greek market, recommendations on the award process (in co-operation with Professor Ken Binmore) and the reserve prices, assistance with the promotion of the process and support of the actual award process itself.

- Leader of the economics work stream in a project for the Radiocommunications Agency on the auctioning of BFWA spectrum in the UK; this involved the analysis of the economic impact and benefits of the provision of BFWA services in the UK, the development of the options for the award of BFWA licences and the support of the calculation of the reserve prices.
- Director of a project on the appropriate regulatory structure for the commercialisation of the island of Guernsey telecoms sector. The objective was to develop a structure that was compliant but not overly bureaucratic. This was followed by a further study to develop the related legislation (with Denton Wilde Sapte).
- Analysis of a worldwide market entry strategy for major international telecoms player. This engagement involved the identification of the potential world markets and the estimation of market size for the launch of a new product. A model was derived based on estimated supply and demand relationships for a number of developing economies using data from more than 50 countries. The model forecasted actual demand and suppressed demand and was used to estimate potential market size available to our client for the next 25 years. This was then translated into actual revenue using a number of assumptions on speed of entry, competition, market access and distribution channels.
- Economic modelling of the effects of deregulation of the satellite industry from complete liberalisation to very modest regulatory change, on tariffs and industry structure, operator efficiency and consumer welfare.
- Forecasting fixed line telecoms demand; a number of engagements involving the estimation of supply and demand for a number of developing economies. The model forecasted the development of tariffs (fixed and usage) and demand over a period of 15 years for a number of developing countries and countries in transition, taking into account the impact of liberalisation on real tariff trends.
- Forecasting mobile telephone demand and take-up; a number of engagements based on the development of a model that forecasts potential penetration and usage for mobile telephony in a number of developed countries, as well as forecast of the dynamic path of actual penetration to reach potential. The model was developed using statistical techniques and data from more than 20 countries and 5-6 years.
- Review of revenue forecasts (and the assumptions underlying them) produced to support bids for mobile licences and valuations for privatisation.
- The assessment of the impact of the Internal Market Programme on the European Audiovisual sector, for the Commission of the European Communities. The study examined the impact of the Television Without Frontiers Directive and other internal market measures on the market structure and the development of trade in the European audiovisual sector.

Other Experience

- Detailed advice to the UK postal regulator on establishing a liberalised regulatory regime for postal services. This included a review of Royal Mail Group – RMG’s volume projections, a comparison of the degree of efficiency achieved in different liberalised markets and an assessment of the impact of liberalisation on efficiency and quality of service.
- The examination of the economic structure of the nuclear industry and an assessment of the vertical contractual relationships, including an evaluation of arguments for and against vertical integration of the industry, as part of the UK government review of the industry
- Evaluation of cost efficiency differentials, for the UK regulator (OFFER). This job involved the evaluation of cost efficiency differentials between different UK regional electricity operators, using detailed cost data over four years.
- Assistance in the preparation of a submission to the Office of Fair Trading, demonstrating that a proposed expansion would not contravene existing competition rules. The engagement involved statistical analysis of price co-movements over a period of 4-5 years to assess the appropriate market. The application was successful and no further action was taken by the UK competition authorities.
- Statistical analysis for the Office of Fair Trading in relation to the review of the competitive implications of an agreement involving the restriction of competition for access to broadcasting rights.
- The evaluation of the economic arguments for or against referral to the MMC of a potential merger, as part of a bid defence assignment,
- Assessment of the consumer benefits from deregulation in a number of markets, including telecommunications, postal, transport, etc
- The assessment of the economic arguments underlying the structure of the post-office market, assessing also the implications of different arrangements for consumer welfare.
- Modelling and forecasts of the European passenger transport sector, as part of an assessment of the impact of changes in tax policy on passenger flows - this included modelling of the major routes of the EU, including London-Paris and London-Brussels.
- Estimation of a risk model, for a major UK financial institution. This project estimated the link between the risk faced by a major UK financial company and the key macroeconomic factors driving it, using time-series data and econometric techniques.
- Forecasts of the size of the UK lottery market, for one of the bidders for the national licence. This involved the development of an econometric model to forecast the market size of the UK market based on data from 20 other European countries.
- Preparation of TV advertising revenue forecasts. This assignment involved the preparation of the revenue forecasts for a UK/US consortium (NBC/MGN)

seeking to bid for the licence to run the third UK commercial television station (Channel 5).

- Attractiveness of the UK as an investment location, for the Department of Trade and Industry. This study assessed the inward investment attractiveness of the UK for French companies based on market research and interviews with French businesses, Trade Associations and Chambers of Commerce.
- International – two projects for the World Bank on the development of appropriate policy measures for the reform of developing country postal sectors.
- Project director on the valuation of a European postal organisation for the Government.
- Managed the review of the liberalisation options and the required regulatory options in the most recent review of the future of the UK Post Office for the UK Government; This included the review of ownership options and the valuation of the UK Post Office (jointly with DKB).
- Project director for project providing benchmarking evidence for two major support functions of the UK Post Office.
- Member of the team reviewing the efficiency of the UK Post Office, as part of its preparation for the introduction of an independent postal regulator in the UK.

Career

2004 to date	Director, Frontier Economics
2001 to 2003	Associate Director, Frontier Economics
1999 – 2001	Director, Strategy Group, KPMG
1997 – 1999	Senior Manager, Strategy Group, KPMG
1995 – 1997	Manager, Strategy, Economics and Marketing Group, KPMG
1993 – 1995	Consultant, Economics Group, KPMG
1989 – 1992	Teaching Assistant (Economics (Macro and Micro) and Mathematics), London School of Economics (LSE)
1991 – 1992	Research Assistant to Prof. S. Estrin, London Business School
1990 – 1991	Assistant to Dr T. Huertas, Chief of Staff – Europe, Citibank, London
1988 – 1989	Centre for Labour Economics at LSE

Education

1988 - 1994	PhD. In Economics, London School of Economics and Political Science
1986 – 1988	MSc and MPhil in Economics, London School of Economics and Political Science
1982 – 1986	B.A. in Economics, First Class honours University of Athens

Languages

Language	Fluency
English	Fluent
French	Fluent
Greek	Native
French	Conversational

Publications

- Journal of European Competition Law & Practice, "The economics and practice of margin squeeze imputation tests in telecommunications", 2011
- M.A. Crew and P.R. Kleindorfer (eds.)
 "Costing the universal service: evaluating the demand response", Carslake, Houpis and Strobel (2011),
 "A cross country analysis of the relative importance of the USO cost drivers", Carslake, Houpis and Strobel (2009)
 "Costing elements of the universal service", R. Bradley, P. Burns, G. Houpis (2009)
 "Estimating the net cost of the USO: A Case Study of Colombia", Houpis, G. et al (2006),
 "The distributional impact of tariff rebalancing" Burns, Carslake, Harvey and Houpis (2003)
- Houpis G. and Valletti T. (2005), "Mobile termination: what is the right charge?", *Journal of Regulatory Economics*, 2005, 28(3).
- 13th Conference of the International Telecommunications Society, September 2002.
 - "The setting of termination charges between mobile operators: is regulation necessary?", D. Elliott and G.Houpis.
 - "Margin squeeze test: how and when to apply it in the retail broadband services market", G.Houpis and M. Williams.
- The 9th KISDI International Conference (1997) in South Korea on "Convergence of telecommunications and audio-visual sectors".
- The Legal Board of the European Commission DG XII (1996).
- The 3rd Observatory Reseau (1996) in Milan, on "Multimedia: market perspective and changing regulation".
- Houpis, George et al (1994), "Allocation of geostationary orbit and frequency resources for Europe", *Telecommunications Policy*, 1994, 18(9)".

TOM OVINGTON

Name:	Tom Ovington
Position:	Manager
Nationality:	Danish



Tom Ovington is a manager at Frontier Economics and has considerable experience within our telecoms and competition practices, working for numerous high profile clients. He has advised on many of the topics set out in the Authority's ITT, including regulatory impact assessments, spectrum allocation, interconnection and access charging principles, abuse of dominance, accounting separation and mergers. He has previously supported the IDA in determining appropriate costing methodologies for a wide range of services. Elsewhere in the region, he helped OFCA decide whether parties should be allowed to form groups when agreeing on the Local Access Charge for international calls. In addition, he has also advised many high profile operators including Vodafone, Three, Slovak Telekom and TalkTalk. Outside of telecoms, Tom has considerable experience of regulatory issues in other sectors, including energy and post and has done secondments at both the energy and postal regulators in the UK.

Tom has an MSc in Economics (Distinction) from Warwick University and a BA in Economics and Management from Oxford University.

KEY EXPERIENCE

- Singapore IDA – Evaluated the case for different costing methodologies based on benchmarking and the Singapore context.
- OFCA (Hong Kong regulator) – Provided competition advice on OFCA's new regime for Local Access Charges for international calls.
- Three – Assessed the likelihood of strategic bidding in the upcoming auction for 2.3GHz and 3.4GHz spectrum.
- Three – Analysed how mobile prices have changed in the UK over previous years.
- Operator (confidential) – Advising on the appropriate market definition for an abuse of dominance case.
- TalkTalk – Developed a model to estimate the consumer impact from moving to a cost-based VULA price.
- Slovak Telekom (ST) - Supported ST during private damage claims proceedings following on the EC decision.

- TRA Bahrain - Worked with the TRA Bahrain across their fourth National Telecoms Plan (NTP4) whose aim was to set policy objectives for the wider telecommunications sector in line with broader government objectives of creating a productive and competitive global economy and ensure legislative continuity.
- Luxembourg regulator (ILR) – Devised a new set of accounting separation guidelines that will be applied to the SMP operator. A key part of the project was considering what information is needed to ensure that the SMP Operator is complying with the ex-ante regulation that the ILR has imposed on it.
- GSMA – Investigated the impact of in-country mobile consolidation on a range of outcomes including prices and investment.
- TalkTalk – Provided advice on Ofcom’s proposed ex-ante VULA margin test.
- GSMA – Assessed the case for mobile consolidation based on both conceptual arguments and empirical evidence.
- GSMA - Advised on the costs and benefits of using Single Wholesale Networks to deliver 4G services in several different countries. Considered the necessary regulatory framework that would need to be put in place to implement this.
- Scandinavia – Multiband spectrum auction/ Frontier advised a bidder during a 4G spectrum auction. In particular, Frontier led the competitive assessment and valuation worksteam both through using a discounted cash flow model of the sector and benchmarking of auction results elsewhere
- Vodafone – Assessed the appropriate market definition for White Label Access for fixed services as part of a damages claim.
- Vodafone – Analysed the appropriate costing methodology for legacy leased lines in the UK.
- Vodafone – Considered the case for mandated layer 1 access for high-speed broadband in New Zealand.
- Vodafone – Analysed the potential merits of Ofcom allowing EE to launch 4G services ahead of the other UK operators.
- Vodafone – Several projects analysing the possible impact of lower mobile termination rates on consumer outcomes (usage, call prices, penetration rates etc.).
- Vodafone – Provided competition advice on Vodafone’s proposed merger with Wind Hellas.
- Vodafone – Analysed the impact of access regulation in broadband markets on consumer outcomes.
- Passive Access Group – Analysed the appropriate form of price regulation for dark fibre access.
- Slovak Telecom – Worked across a range of areas (market definition, abuse of dominance, ladder of investment, consumer harm), as part of Slovak

Telecom's response to the Commission's allegation that it has abused a dominant position.

- Telecoms Regulatory Authority (TRA) UAE – Estimated the total contribution of the telecoms sector to the UAE economy and modelled the impact of potential price reductions.
- KCom – Used bottom-up Long Run Incremental Cost (LRIC) modelling to estimate an appropriate Fixed Termination Rate for KCom
- Telekom Austria – Analysed the state of the broadband market in Eastern Europe and estimated the potential benefits from greater broadband provision.

Damages

- Large operator (confidential) – Providing assistance on damages claims for a range of abuses, including margin squeeze, refusal to supply and regulatory overcharge. Co-authored an extensive guide on how to estimate damages for a broad range of abuses.
- Lufthansa– Performed empirical analysis of the impact that the air cargo cartel had on prices.
- AGC– Carried out empirical analysis to assess the impact that the carglass cartel had on prices.

Post

- Postcomm/Ofcom (Secondment) – Detailed modelling of Royal Mail's future volumes and revenues. Also analysed the scope for end-to-end competition.
- Postcomm/Ofcom – Evaluated Royal Mail's strategic plan for the next seven years to help Postcomm/Ofcom set its regulatory framework. This required a detailed analysis of Royal Mail's accounting information and benchmarking of Royal Mail's operational units.

Energy

- Northern Ireland Electricity – Provided advice on the price control review in Northern Ireland, with a strong focus on incentive schemes.
- Ofgem (Secondment) – Worked on a range of issues, as part of the fifth price control review of distribution network operators.
- Department of Energy and Climate Change (DECC) – Advised DECC on which policies to pursue to stimulate more R&D into low carbon technologies.
- Energy Network Association (ENA) – Assessed the cost and benefits of having locational charges on distributed generation as part of the CDCM.
- Centrica – Used detailed modelling to carry out a cost-benefit analysis of the gas mains repex programme.
- Centrica – Analysed the methodology for setting gas distribution charges and considered ways in which it could be improved.

Competition Policy

- Aggregate Industries – Helped Aggregate Industries prepare financial and market information to submit to the Competition Commission, as part of the ongoing market investigation into aggregates, cement and ready-to-mix concrete.
- Warner – Estimated possible price increases for the Universal-EMI merger.
- HSBC – Constructed models to predict the likely impact of proposed remedies on the Payment Protection Insurance (PPI) market.

Public Policy

- 3i – Assessed the key drivers of UK house prices and possible trends going forwards.
- NHS London – Conducted in-depth analysis into the extent to which local healthcare markets are operating effectively and benefitting from competition.

Strategy

- Unilever – Estimated the magnitude and impact of counterfeiting.
- RBS insurance – Detailed analysis on the trade-off between advertisement and pricing.

Career

2017 to date	Manager, Frontier Economics
2008 - 2016	Consultant/Analyst, Frontier Economics
2006	Summer Intern, Rothschild & Sons Ltd

Education

2007 - 2008	MSc Economics (Distinction – Examiners' prize for Top mark in the year), Warwick University
2004 - 2007	BA Economics and Management (High 2:1), Oxford University

ELEANOR MONAGHAN

Name:	Eleanor Monaghan
Position:	Consultant
Nationality:	British



Eleanor's work at Frontier Economics Ltd has focused particularly on the telecommunications sector and she has experience working for clients who are regulators, operators and other market stakeholders (such as the GSMA)

Her recent work in telecoms has included a review of UK mobile prices for a leading mobile operator, advice to a UK broadband operator on the proposed ex-ante VULA margin test and support to a European incumbent operator relating to a national roaming obligation dispute. Eleanor has also carried out several projects for the GSMA, including the analysis of the likely economic impact of Single Wholesale Networks in mobile communications. She has worked for a variety of other telecoms clients in the UK, Europe and the Middle East, undertaking a wide range of critical and constructive analysis, focusing particularly on the mobile sector.

Her work has often required a detailed understanding of the current status of regulation and the historical development of regulation and the lessons that can be learnt from this for future regulation. For example, in her recent work designing the ex-ante regulation for the telecommunications market in Saudi Arabia, Eleanor undertook an extensive benchmarking review in order to give the client a detailed understanding of the current and historical nature of regulation in this sector internationally.

Eleanor completed her MSc in Economics from Birkbeck University of London in 2016, and was awarded a Distinction. She also has a BA Honours in Economics (First Class) from Durham University.

KEY EXPERIENCE

Telecoms

- **Irish regulatory breach support, Irish fixed network operator (2017)** – part of the team supporting an Irish operator in considering the impact of a potential regulatory breach.
- **UK mobile price analysis, leading UK mobile operator (2016)** – carried out an analysis of how mobile prices have changed in the UK over the past few years.
- **UK spectrum auction, leading UK mobile operator (2016)** – part of the team supporting a UK mobile operator in their submissions for the

consultation on the upcoming PSSR spectrum auction focusing on the potential implications of the auction design on bidding incentives.

- **VULA margin test, UK broadband provider (2016)** – part of the team providing advice to a leading UK broadband provider on Ofcom’s proposed ex-ante VULA margin test. This involved the use of a differentiated bertrand model to estimate the impact of a change in VULA wholesale charge on the market.
- **National roaming obligation dispute, European incumbent operator (2016)** - supporting a European incumbent operator in a dispute with a new entrant regarding the terms of a national roaming obligation imposed on them as part of their 4G spectrum licence.
- **Market review, CITC - Saudi Arabian Communications regulator (2015 - 2016)** – undertook work to update the market review determining the level of ex ante regulation applied in the Saudi Arabian telecommunications market. This work involved determining the markets to be defined, using tools such as the SSNIP test, considering both product market definition and geographic market definition. And assessing the level of competition in the markets: considering both quantitative evidence (such as HHI and other measures of concentration) and qualitative evidence. As part of this work, Eleanor completed a comprehensive benchmarking study considering the approach to market reviews across a wide range of international comparators with particular focus on the European approach and EC recommendations. This work will help the client understand the market review process and inform future ex ante regulation in the market.
- **Mobile consolidation, GSMA (2014-15)** – Eleanor was part of a team advising the GSMA in the context of evaluating the case for future mobile consolidation in the EU and emerging markets. The work involved qualitative and quantitative analysis of the potential effects of mobile mergers in the EU and elsewhere, focusing on identifying specific conditions under which market consolidation may increase consumer welfare. Eleanor was particularly involved in considering the application of the Gross Upward Pricing Pressure Index (GUPPI) (a tool used by OFCOM and the European Commission) when considering the pricing implications of mergers to the mobile market. This work was useful to the GSMA to inform their stakeholders (mobile operators around the world) and regulators of the state of the current debate from an economic perspective.
- **Report assessing the case for Single Wholesale Networks in mobile communications, GSMA (2014)** – This work involved writing a report for the GSMA analysing the likely impact of countries establishing a single wholesale network. Eleanor focused on the detailed examination of the empirical and theoretical evidence on the economic benefits of network based competition, the economic theories surrounding vertical integration and privatisation and looking at the current proposals for SWNs in a number of countries.
- **Critique of analysis by a Finnish Telecoms Strategy consultancy, GSMA (2014)** – critique of the analysis undertaken by a Finnish telecoms strategy consultancy on European mobile data prices in countries with incumbent

operators and their subsequent conclusions about mobile consolidation in Europe. This work involved critically analysing the arguments and data presented in several recent publications in order to aid the GSMA's understanding of the validity of these claims.

- **Abuse of dominance case Response to Letter of Facts - a European incumbent operator (2013-2014)** - Economic advice to a European incumbent operator on their response to the Letter of Facts in an abuse of dominance investigation by the European Commission. This involved work considering market definition at geographical and product level and dominance including critical analysis of price data and other evidence presented in the Letter of facts. The work also involved analysis of the effects of any abuse of dominance on the incumbent, competitors and consumers.
- **Analysis of the appropriateness of using LRIC for Mobile Termination Rates in the UK, a mobile operator (2014)** – this work involved aiding a mobile operator in their response to Ofcom's forthcoming consultation on MTRs. The work involved a critical analysis of the key arguments presented by Ofcom in the decision to use LRIC as a basis for Mobile Termination Rates and analysis of the relevant market data to assess the validity of their case. Focused on analysing the evidence on competitive effects of MTRs set at LRIC and the evidence of allocative efficiency and overall impact on consumers.

Post

- **Regulation of wholesale access, ACM (2017)** – part of the team supporting the postal regulator in the Netherlands to assess the potential impact of different wholesale access regimes on the market. This involved detailed modelling analysis to take account of competitive reactions to price changes (using the differentiated Bertrand model framework).

Competition

- **Pre-notification advice, UK Online job-board (2014)** - Advised a UK online job-board on its acquisition of another website as part of the CMA merger notification process. Carried out analysis of potential unilateral effects using econometrics, data and financial analysis along with analysis of the key current market players and development of the online job-board sector.
- **Pre-notification advice, UK Environmental property risk reports provider (2013)** - Advised a UK provider of environmental risk reports for property transactions on its acquisition of a reseller of environmental and other search reports. Carried out analysis of the possibility of vertical foreclosure or efficiencies as a result of the merger. The merger was subsequently cleared by the OFT.
- **Estimation of cartel damages, a European Retailer (2013)** - Overcharge and pass-on estimation resulting from the activities of a cartel formed of suppliers of one of their products. This involved modelling the changes in cost and price structures for the several brands involved over the period of the cartel.

- **Estimation of cartel damages, a UK and European supplier (2013)** - Overcharge estimation resulting from involvement in a cartel in the supply of its UK products. This involved econometric analysis to identify a structural break in the price setting during the period of the cartel for a number of products.

Transport

- **Estimation of the impact of an additional runway on employment, a major UK airport (2014)** - Estimated the impact of building an additional runway on UK employment in 2025 and 2030 as part of the airport's submission to the Airports Commission. This involved an analysis of Direct, Indirect and Induced employment effects through the use of UK Input-Output tables, as well as modelling the impact of increased connectivity resulting from the additional runway on trade, FDI and tourism on GDP and employment.
- **Case Study on UK rail regulation, French rail regulator (2014)** - undertook a case study examining the system for regulating the rail network in the UK in order to provide international comparison and inform future regulatory and policy decisions.

Public Policy

- **Analysis of the Market Forces Factor, A group of London Hospitals (2013-14)** - Advised a group of UK London based hospitals on the appropriateness of the Department of Health's mechanism for refunding geographical differences in costs of provision of NHS healthcare services. Carried out extensive analysis into the current mechanisms for measuring cost differences and compared this extensively to data and evidence from the hospitals to understand the dynamics and changes over time and the synergy between actual costs and the MFF mechanism.
- **Case study UK Medical Education system, French Department of Health (2014)** – undertook a case study examining the system for the training, specialisation and location of medical staff in the UK in order to provide international comparison and inform future regulatory and policy decisions.

Career

2016 to date	Consultant, Frontier Economics Ltd
2014 - 2016	Analyst, Frontier Economics Ltd
2013 - 2014	Intern, Frontier Economics Ltd
2012 – 2012	Intern, Government Economic Service - Department of Health

Education

2014 – 2016	MSc Economics (Distinction), Birkbeck University of London
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2010 – 2013

BA with Honours in Economics (First Class), Durham
University
