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A critical analysis of the Rewheel paper, *"EU27 mobile data cost competitiveness report – May 2013"*

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COMMUNICATIONS CHAMBERS

Contents

1. Introduction

In May 2013 the Finnish consultancy Rewheel published its *EU27 mobile data cost competitiveness report*[1] ['the Rewheel Report']. This report presented Rewheel's own analysis of their proprietary database of European mobile prices.

In their analysis, Rewheel divide European national mobile markets into those they label 'progressive' and those they label 'protected'. Based on this analysis, Rewheel conclude that prices are substantially higher in protected markets than in progressive ones. They attribute this to 'non-competitive behaviour' by some operators, and recommended a range of regulatory actions in response.

In this report (commissioned by Vodafone) we undertake a critical analysis of Rewheel's approach. Our main findings are that:

- Some of the most attractive prices offered by MNOs via tied MVNOs (including incumbents) have been excluded by Rehweel. This means the report has overstated prices by as much as 50%.
- Independent MVNOs are also excluded without apparent justification. This means (for example) Rewheel overstates prices for typical usage baskets in each of Spain, Netherlands and Germany by between 23% and 171%.
- Rewheel appears not to have followed its own methodology when categorising some countries, and in others its methodology leads to perverse results. Consequently four markets - Cypus, Greece, Malta and Portugal - are inappropriately categorised as 'protected'. This group includes some of Rewheel's most expensive markets and correcting this one category of error in the report eliminates 47% of the gap in average pricing that Rewheel claims to have found between progressive and protected markets
- Rewheel declares mobile operators to be 'incumbent' either if they are a fixed operator anywhere in the world, or if they are a market-leading MNO within a European Member State. No reason is given as to why fixed operations outside the EU are relevant but mobile operations are not.
- It is hard to avoid the conclusion that Rewheel's inconsistent approach on this point is necessary to ensure that Three and Tele2 are categorised as 'challenger' and Telenor as

[1] Rewheel, EU27 mobile data cost competitiveness report – May 2013, 21 May 2013

‘incumbent’. Rewheel’s argument depends heavily on these categorisations. If incumbency is instead considered on a consistent basis, seven countries (including some of the lowest cost) become ‘protected’ rather than ‘progressive’. Note also that Tele2 is a single percentage point of market share in Latvia short of becoming an incumbent operator even under Rewheel’s own definition which would change Estonia (the lowest cost market in Rewheel’s view) to being ‘protected’.

- Rewheel asserts or implies ‘non-competitive’ behaviours, in particular maintenance of high mobile broadband prices to protect fixed broadband, and cross-border co-ordination of prices by multinational groups. When such behaviours are tested for directly - comparing prices to relative usage of mobile or to overlaps between operators in different markets - there is no evidence that supports these claims

The above findings suggest that Rewheel have made a number of assumptions in their analytical framework – excluding MVNOs, treating fixed and mobile incumbency differently, asserting a link between overlaps and prices – all of which are critical to obtaining their results but which otherwise appear to have no good justification. Changing these assumptions will alter dramatically both the price levels and categorisations of a large number of markets on which Rewheel’s conclusions depend.

When this is done, it becomes apparent that European mobile markets exhibit a wide range of prices, but that differences cannot be explained by Rewheel’s complex theories of market behaviour. Other, more conventional explanations of differences between market conduct, such as differences in the costs of providing mobile services, the demands of consumers or their willingness to pay, all offer much more plausible explanations of what we observe in Europe today.

2. Rewheel's dataset

Rewheel has undertaken its benchmarking analysis from its own proprietary data set of MNO tariffs. This means that it is not possible to check the reliability or methodology of that benchmarking in detail.

However, Rewheel is clear that it has omitted MVNOs tariffs. Rewheel excludes such tariffs because it feels MVNOs have a 'major retail handicap' as a result of relying on another operator's network.[2] While it may be true that MVNOs are not in as strong a position as MNOs, presumably the prices they publish reflect whatever handicap that may imply, and therefore it is inappropriate to exclude them.

Certainly consumers do not agree with Rewheel that MVNOs should be ignored. In the Netherlands their market share is 36%[3], in Germany 24%[4] and in Spain 10%[5]. (MVNOs appear to be less important in some of the markets Rewheel deemed to be lower priced – for instance, in Finland they have less than 2% share[6] and Buddecom describe the Estonian MVNO market as 'underdeveloped'.[7])

Moreover, even if there were a justification for excluding independent MVNOs (which we do not accept), there can be no reason whatsoever for excluding MVNOs owned by an MNO in the same country. Clearly such an MVNO has no problem with access to network economics. In effect, it is simply an independent brand of the parent MNO. In this section we consider first MNO-controlled MVNOs, and then MVNOs more generally.

Operator controlled MVNOs

Rewheel's exclusion of MNO-controlled MVNOs is a serious error, because they are often used by incumbents in particular to offer their most aggressive prices. This allows them to segment the market, retaining a brand premium for the main brand, while still serving more price sensitive customers.

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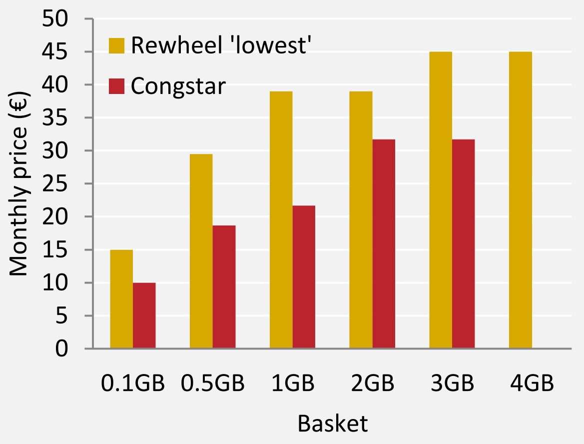
[2] Rewheel report p10
[3] Telegeography, *MVNOs increase Dutch market share to 35.9%, paper says*, 7 August 2012
[4] Telecom Engine, *Virtual mobile phone firms spy growth in Spain's recession*, 5 June 2013
[5] CMT, *Nota Mensual Marzo 2013*,21 May 2013
[6] Moody's, *Credit Opinion, Elisa Corporation*, 19 February 2013
[7] Buddecom, *Estonia - Telecoms, IP Networks, Digital Media and Forecasts*, 17 April 2013

Germany is a prime example. Deutsche Telekom offers services under its main T-Mobile brand, but it also runs a separate wholly owned brand, 'Congstar', established in 2007. This offers services on the same network, but at appreciably lower prices. Congstar's prices are on average 34% lower than the prices shown for Germany by Rewheel (supposedly the lowest available from any German MNO). Put another way, Rewheel has overstated Deutsche Telekom's prices at least 50%.

Figure 1: German pricing by basket[8]



Deutsche Telekom is not alone – all of the German MNOs have their tied discount brands, and in some cases they offer even more aggressive pricing than Congstar.

Rewheel's report devotes an entire chapter to the case of Germany, discussing its purported failures relative to other markets. This analysis depends entirely on a view that German prices are too high. Rewheel has this view simply because it has, by assumption, excluded the best tariffs available from German MNOs.

Nor is this issue confined to Germany alone. For example, in the Netherlands, the virtual brands of KPN, T-Mobile and Vodafone (Telfort, Ben & Simpel and hollandsnieuwe) offer tariffs up to 35% lower than Rewheel's 'lowest' tariffs for some baskets.

General MVNOs

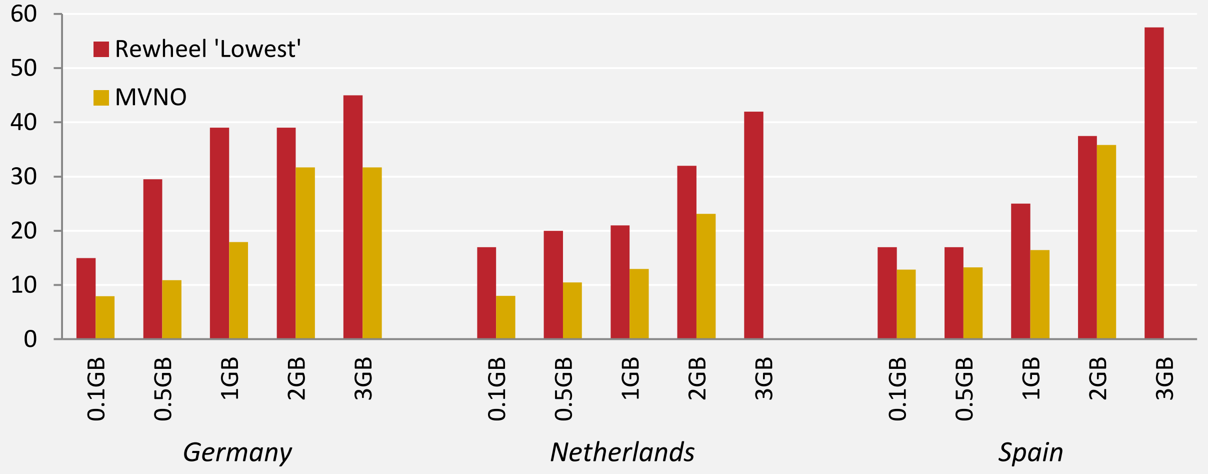
It is not only tied MVNOs that are able to offer attractive pricing. A limited review of MVNO pricing in Spain, Netherlands and Germany turned up numerous examples of prices that were lower than Rewheel's supposed lowest prices.

For some baskets, Rewheel overstated prices by at least 171% in Germany, 113% in the Netherlands and 52% in Spain (see Figure 2 overleaf).

Note that while MVNOs often do not offer bundles with over 2GB of data, this is not a material omission given that typical usage is less than 500 MB.[9]

[8] Rewheel report, Congstar website [accessed 7 June 2013]. Note that Congstar does not offer a 4GB product
[9] See page 30 for a discussion of sources for this figure, and Rewheel's overstatement of typical use

Figure 2: Select MVNO tariffs compared to Rewheel 'Lowest' tariffs (€/month)[10]



A full review of the tariffs available from MVNOs is beyond the scope of this report. However, it is clear than in choosing to omit them, Rewheel is significantly overstating the tariffs in a number of countries (certainly including some of the key 'protected' markets).

[10] MVNO operator websites (including both tied and independent MVNOs)

3. Rewheel's categorisation of countries

The companies in scope

Rewheel's analysis covered 91 MNOs in the EU27, operating in the 800, 900, 1800, or 2100 MHz frequency bands. (MNOs with only 2600 MHz, CDMA or WiMAX license were excluded). Orange Austria, which was acquired by H3G Austria in January 2013, was specifically excluded. Rewheel also excluded MVNOs, as we have discussed.

Rewheel then categorised these MNOs into 'E4 group members', 'Incumbents' and 'Independent challengers'. By Rewheel's definition, E4 group members are Vodafone, Telefonica, France Telecom and Deutsche Telecom. According to Rewheel any other company:

> "Fulfilling any of the below listed criteria has been classified as 'Incumbent':
>
> - It is the no.1 MNO in terms of subscription market share in any of the EU27 member states
> - If it is part of a group then there is at least one MNO in the group that holds a no.1 position in terms of subscription market share in any member state
> - If the owner of the MNO is an incumbent fixed operator or a minority shareholder in an incumbent group
> - If during the year that preceded the tracking period (calendar year 2013) merger talks had been held with an incumbent MNO (e.g. WIND Hellas merger talks with Vodafone GR)"[11]

All other operators (that are neither 'E4' nor 'Incumbent') are deemed to be 'challengers'. Based on these categorisations, Rewheel then categorises markets as 'progressive' or 'protected'. 'Progressive' markets are those with at least one challenger operator.

This categorisation is critical to Rewheel's conclusions. Obviously if some high price markets are allocated to the 'progressive' category rather than 'protected', then the pattern Rewheel presents of higher prices in 'protected' markets falls away. It is immediately obvious that Rewheel's categorisation is rather complex. Further inspection suggests that it has been constructed in this way to ensure that particular operators fall in particular categories (so to ensure that particular markets are categorised in a way that fits Rewheel's theory i.e. that high price markets are found to be 'protected').

[11] Rewheel report, p17

Simple errors

For four countries, there appear to be categorizations of MNOs that look to be simple errors (Malta and Cyprus) or simply indefensible (Greece and Portugal).

Miscategorisation of Greece

Rewheel treat WIND Hellas as an incumbent. WIND is the third operator in Greece with 24% share (behind Vodafone and incumbent OTE).[12] WIND is controlled by a group of financial investors, following a financial restructuring in 2010.[13] Neither WIND nor (as far as we can tell) its controlling shareholder (Largo Ltd) nor any of Largo's shareholders have any material interest in other telcos. Thus WIND Hellas would appear to be a classic 'challenger' MNO. It certainly does not fit Rewheel's description of incumbents as being entities with "substantial interests in European fixed broadband assets".[14]

Rewheel says it has placed WIND in the incumbent category because WIND held merger talks with Vodafone Greece. These talks became public in August 2011,[15] but were abandoned in February 2012.[16] In placing WIND in the incumbent category, Rewheel is presuming that somehow WIND's prices have been materially influenced by these talks.

To claim that a target would adjust its prices as a result of merger talks underway is an odd claim, and one for which Rewheel provides no evidence. To suggest that WIND would maintain increased prices more than a year after merger talks collapsed is simply bizarre.[17]

If Rewheel were right and merger talks influenced pricing conduct then they should apply this theory consistently. Hutchison has been in discussions with Telecom Italia about a merger of their mobile operations in Italy. This first became (officially) public on 5 April 2013,[18] and talks continued beyond the publication of the Rewheel report.[19] On this basis Hutchison should also be considered an incumbent operator.

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[12] Wireless Intelligence
[13] WIND Hellas, *SSN Ad-Hoc Committee completes acquisition of Weather Finance III's WIND Hellas assets*, [Press release], 16 December 2010
[14] Rewheel report, p29
[15] BloombergBusinessweek, *Vodafone May Merge Greek Mobile-Phone Unit With Wind Hellas*, 30 August 2011
[16] Vodafone, *Vodafone and Wind Hellas Terminate Discussions Relating to a Potential Business Combination*, 6 February 2012
[17] Rewheel gathered its prices in Q2 2013
[18] Bloomberg, *Telecom Italia Considers Combination With Hutchison Unit*, 5 April 2013
[19] Bloomberg, *Telecom Italia Board to Review Hutchison Linkup at Next Meeting*, 31 May 2013

Thus WIND is far more appropriately placed in the 'challenger' category, which changes Greece's categorisation to 'progressive'.

Miscategorisation of Malta

Malta has three MNOs: Vodafone (the market leader), Go and Melita. Go is the incumbent telecoms operator. Melita is cable TV operator launched in 1992 which now offers a range of fixed and mobile services. It is owned by a consortium of investors: Gasan, a Maltese conglomerate, and three financial investors (Blackrock Communications, MC Venture Partners and GMT Communications Partners). None of these declare ownership in market leading fixed or mobile operators anywhere in the world.

Rewheel has categorised Melita as an 'incumbent'. The basis for this is mysterious. It is not part of a group that has leading mobile market share in Malta or elsewhere. Its owner is not an incumbent fixed operator, nor do any of its owners have a stake in any incumbent large enough for them to declare.[20] It has also not been subject to any merger talks.[21]

Melita should be categorised as a 'challenger', and this changes Malta's categorisation to 'progressive'.

Miscategorisation of Cyprus

Rewheel lists two MNOs in Cyprus, Cyprus Telecom - generally known as CYTA - and MTN. (These are the operators serving southern Cyprus). CYTA is the local incumbent. MTN Cyprus is 100% owned by the MTN Group,[22] a pan-African mobile operator headquartered in South Africa. MTN has no other operations in Europe besides Cyprus, and while their holdings elsewhere are extensive,[23] we are unable to detect any holdings in incumbent telcos anywhere in the world. There seems no basis to categorise MTN Cyprus as an 'incumbent'.

MTN should be categorised as a 'challenger', and this changes Cyprus' categorisation to 'progressive'.

[20] It is possible one of them has a minor holding in an incumbent somewhere. However, firstly it is not clear how Rewheel would be aware of this. Secondly, if having a minority shareholder who is also a minority shareholder in an incumbent is enough for Rewheel to label a company an 'incumbent', then every public company in the world would pass this test

[21] It is conceivable that Rewheel has caetgorised Melita as an 'incumbent' on the basis that it is a CATV operator (though it has made no such indication in its report). However, they have they not done the same for RCS-RDS in Romania, the leading CATV operator there, and (according to Rewheel) the only 'challenger' in that low price market. Nor have they done the same for DNA in Finland, the leading CATV operator in that market

[22] Until February 2013, Amaracos Holdings, a local partner, held a 50% stake in MTN Cyprus

[23] See page 212 of MTN, MTN *Group Limited Integrated Report for the year ended 31 December 2012*, March 2013

Miscategorisation of Portugal

Rewheel lists three MNOs in Portugal – Portugal Telecom, Vodafone and France Telecom. The last is presumably Optimus, which is wholly owned by Sonaecom. Sonaecom is 54% owned by Portuguese conglomerate Sonae, 25% by the public and 20% by France Telecom.[24] Rewheel has classified Optimus as being 'E4', presumably regarding it as a France Telecom group member.

This is inappropriate – clearly with a minority stake, with another entity holding an absolute majority and with all board members obliged to consider the interests of public shareholders, it seems *extremely* unlikely that France Telecom could meaningfully influence Optimus' pricing in pursuit of some wider FT agenda. (Certainly for competition or accounting purposes, it seems highly unlikely FT would be deemed to have control of Optimus.)

Moreover, in February 2013 FT agreed to dispose of its holding in Sonaecom entirely.[25] This is likely as part of a wider transaction that will see Portugese cable operator Zon merge with Optimus and take a 60% share in the combined entity.[26]

Finally, we note that in the converse situation of T-Mobile Czech Republic, where DT holds a 61% stake and Mid Europa holds a 39% stake, Rewheel (reasonably) gives credit for control to the larger entity.

Sonaecom should be categorised as 'challenger', and this changes Portugal's categorisation to 'progressive'.

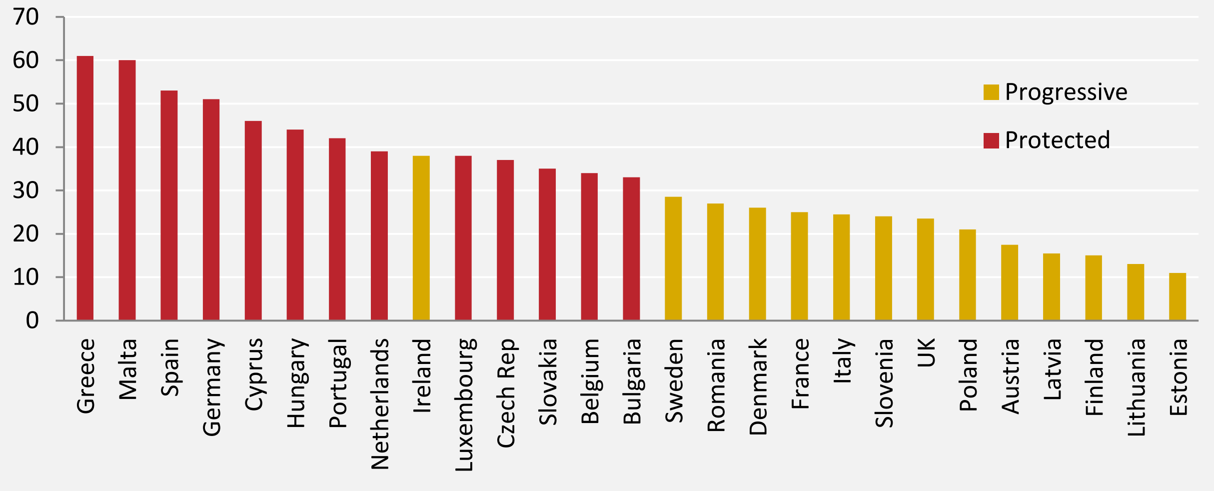
Combined impact of these miscategorisations

Correcting the four miscategorisations set out above has a significant impact, since they apply to four out of the top seven most expensive markets in Rewheel's analysis.

Before correction, Rewheel's graph of tariffs across its six usage baskets appears as follows:

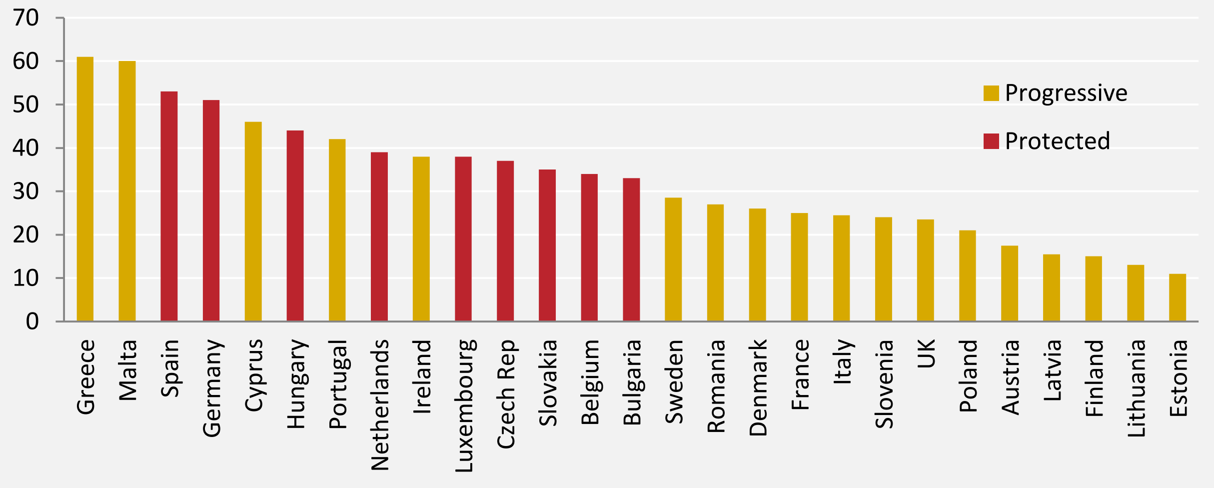
[24] Sonaecom, *Shareholder Structure* [accessed 6 June 2013]
[25] France Telecom, *France Telecom-Orange disposes its shareholding in Sonaecom, a Portuguese telecommunications operator, to Sonae* [Press release], 15 February 2013
[26] Reuters, *Zon, Optimus agree to merge, to take on Portugal Telecom*, 21 January 2013

Figure 3: Rewheel average smartphone tariffs across six baskets (€/month)[27]



After correction, the picture is rather different (Figure 4). Rewheel's thesis that progressive markets result in low prices looks considerably weaker. By themselves, these four corrections eliminate fully 47% of the gap in average pricing that Rewheel claims to have found between progressive and protected markets.

Figure 4: Rewheel avg smartphone tariffs across six baskets, miscategorisations corrected (€/month)



Other categorisation issues

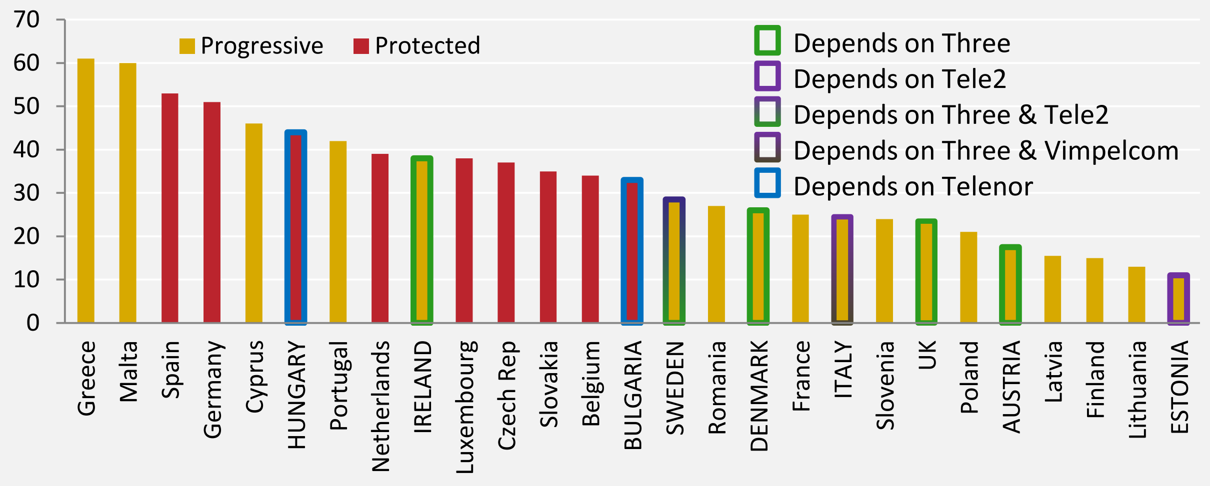
While the above examples are particularly stark, they are not the only issues with Rewheel's categorisation methodology, which often appears arbitrary (or engineered to fit a theory). For instance, the 'E4' group was, in previous Rewheel reports, the 'E5' group, with

[27] Rewheel report, p23

Telecom Italia also included.[28] TI has now been dropped, and no explanation has been provided for this switch.

There are also significant problems with their definition of ‘incumbent’. The definition matters, because a large number of country categorisations depend on the treatment of a small number of companies. (See Figure 5). Four countries’ categorisations depend on the treatment of Three, since it is the sole ‘challenger’ player in each of Ireland, UK, Denmark and Austria.

Figure 5: Rewheel avg smartphone tariffs across six baskets, categorisation senstitivities (€/month)



As we saw above, Rewheel defines a company as an incumbent if:

A. It is the leading MNO in any of the EU27 member states
B. If it is part of a group, then another member of that group is a leading MNO in any member state
C. If the owner of the MNO is an incumbent fixed operator or a minority shareholder in an incumbent group

It is puzzling is that Rewheel has given the first two of these criteria an EU scope, whereas the third has a global scope.

If Rewheel’s claim is that ownership by or indirect association with an fixed incumbent *anywhere in the world* ‘taints’ a MNO in a given European country, why is it that the ‘taint’ associated with being a leading mobile operator is unable to extend from beyond the EU27? No reason is given.

This has important consequences since several companies that Rewheel categorises as ‘challengers’ are part of groups that own a leading MNO outside the EU27:

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[28] Rewheel, *Telcogroups' protective pricing widens digital divide between poor and wealthy EU member states*, February 2013

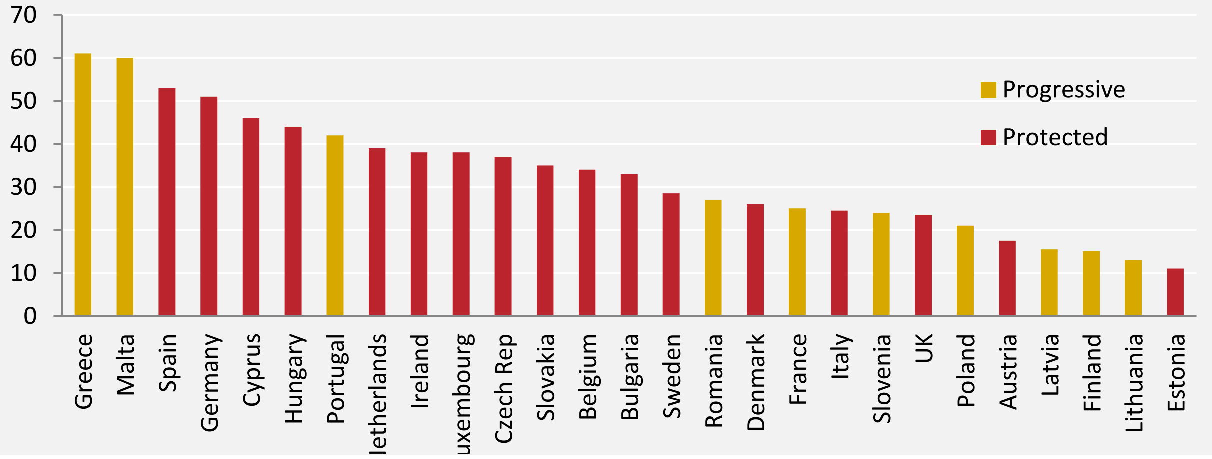
Figure 6: 'Challenger' MNOs with Leading MNO operations elsewhere

'Challenger'	Ultimate controlling shareholder	Leading MNO operations controlled by that shareholder
Three	Hutchison Whampoa	Macau
Tele2	Kinnevik[29]	El Salvador, Guatemala, Honduras, Paraguay[30]
WIND (Italy)	Vimpelcom	Ukraine, Uzbekistan

If Rewheel's criteria were made consistent by making all global in scope, then Three, WIND and Tele2 would be recategorised as 'incumbents'.

However, as we saw above, these companies are the only 'challenger' entities in each of Austria, Denmark, Estonia, Ireland, Italy, Sweden and the UK. Thus this small change in definition turns all seven of these markets from being 'progressive' to being 'protected', as shown below:

Figure 7: Rewheel avg smartphone tariffs across six baskets, miscategorisations corrected and 'global' consistency (€/month)[31]



Note that we are not suggesting that the ex-Europe corporate siblings of these three companies *actually* have material impact on these companies' pricing in Europe. It is Rewheel's contention that such cross border influence on pricing is important, not ours. We return to this issue later.

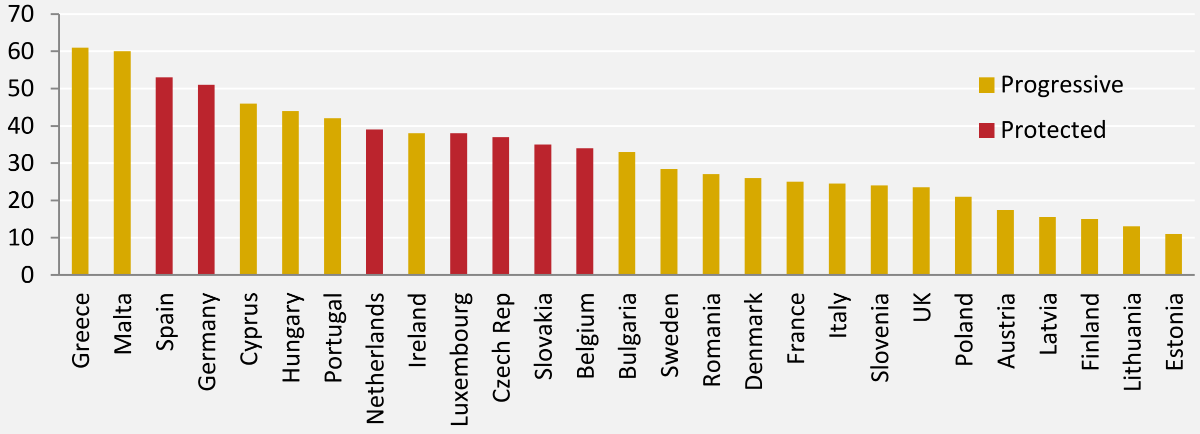
Nor are we suggesting that Tele2 and Three do not take an aggressive approach to pricing. However, if companies are to be categorised as

[29] Kinnevik has 47.9% voting control of Tele2
[30] These operations controlled through Millicom, in which Kinnevik had a 38% stake
[31] Note that Cyprus has flipped back to being 'protected' in this case, since MTN has leading market share in various markets in Africa

'challengers' based on the fact that they have low pricing, then of course markets that have 'challenger' operators will have low prices – Rewheel's argument would be purely circular.

Conversely, Rewheel's definitions could be made consistent by narrowing their scope – that is, by limiting all three criteria to the EU27, rather than making an operator in a given country 'incumbent' if it is owned by an incumbent fixed operator outside the EU27. This too changes country categorisations, since two – Bulgaria[32] and Hungary - depend on the categorisation of Telenor's MNO operations as 'incumbent' (and Telenor is not an incumbent operator within the EU27):

Figure 8: Rewheel avg smartphone tariffs across six baskets miscategorisations corrected and 'EU27' consistency (€/month)



Again, making the criteria more consistent weakens Rewheel's case, since one of the high price markets, Hungary, becomes 'competitive'. The only 'protected' markets that purportedly remain at the top of the price range are Spain, Germany and the Netherlands. As we have already seen, Rewheel has substantially overstated the prices in these markets by excluding MVNOs.

An unstable analytical approach

We do not suggest that it is inherently better to move to a wider or narrower set of criteria. Our point is that Rewheel's approach is arbitrary and artificial, and that no justification is provided for these inconsistencies. Small changes to bring greater consistency have dramatic consequences to the results and to the credibility of Rewheel's analysis.

[32] Rewheel shows Globul of Bulgaria as being a Deutsche Telekom entity. This is on the basis of DT's 40% stake in OTE, which in turn owned Globul. However, Telenor acquired Globul in April 2013

As a further example, note that Tele2 is within a percentage point of becoming the leading MNO in Latvia. If it does so, Tele2 will - by Rewheel's definitions - become an Incumbent. That in turn will make Estonia, the cheapest market on Rewheel's figures, 'protected'.

In general such unstable approaches have two problems. Firstly, minor variations in inputs - due to limits of available data, minor changes over time and so on - can lead to substantial changes in outputs. Secondly, such unstable approaches are open to abuse, in that quite minor (potentially imperceptible) changes to inputs or assumptions can be used to deliver results to support a particular theory

A standard approach when working with such unstable analytical frameworks is to provide a 'sensitivity analysis', to enable the reader to see the consequences of alternative inputs and assumptions (such as variations to the categorisation methodology). Rewheel has not provided such an analysis.

4. Testing Rewheel's specific allegations

One way to test the robustness of Rewheel's approach is to step back from individual company categorisations, and instead use quantifiable metrics that go directly to the 'non-competitive' behaviour Rewheel alleges.

High mobile prices to protect fixed broadband

Rewheel contends that incumbents are keeping mobile prices artificially high in order to protect their fixed broadband revenue:

> "E4 group (Vodafone, Deutsche Telekom, France Telecom, Telefonica) members and other incumbents with vested interest in protecting and further strengthening their dominance in fixed broadband networks have cultivated the belief that mobile data is expensive and can only be offered to complement fixed offerings."[33]

This is an odd assertion. Firstly, it is clearly wrong to say that Vodafone is dominant in fixed broadband. Secondly, even if it were true that incumbents were seeking to suppress mobile broadband in their home markets, there would be no reason for them to do so in other markets where they did not have fixed broadband interests of any significance.

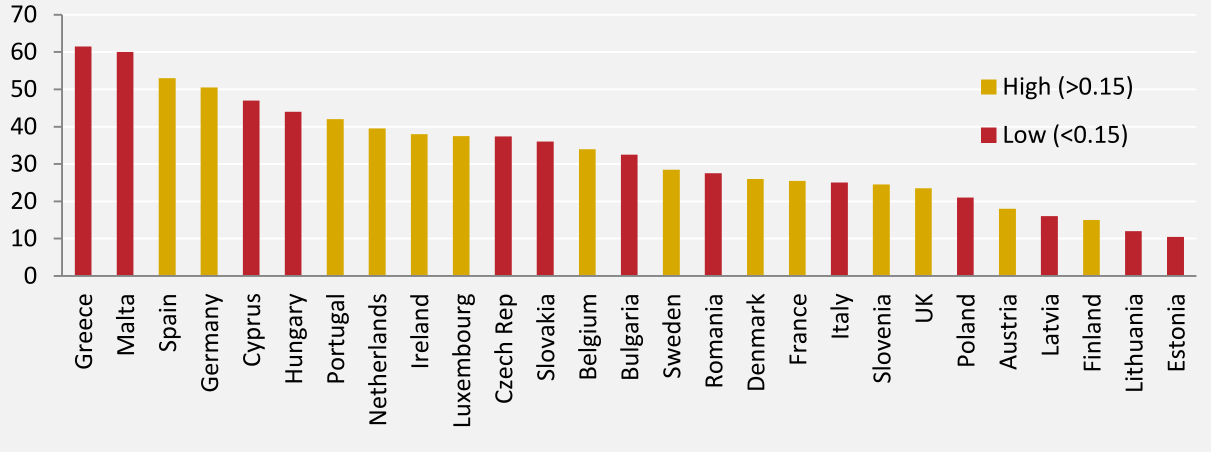
Consider KPN in Belgium. In that market it competes with Belgacom and France Telecom, and has smaller market share than either of them. It has no historic fixed broadband business to defend in that market. (Moreover, it competes with Belgacom and FT in no other market, so there is no conceivable issue of cross-border coordination, which is Rewheel's other implication).

But Rewheel labels KPN's operations in Belgium as 'incumbent', and Belgium becomes 'protected', even though KPN's clear financial interest is to behave in this market exactly as any independent new entrant would.

We can test Rewheel's theory objectively and directly. If it were true we would expect to see a lower ratio of mobile to fixed usage in markets with high mobile prices (since those prices would encourage consumers to prefer fixed broadband). We term this ratio of mobile to fixed usage 'mobile intensity', and calculate it by dividing the percentage of adults using the internet on their phone by the percentage of households with fixed broadband.

[33] Rewheel report, p18

Figure 9: Rewheel avg smartphone tariffs across six baskets, split by high and low mobile intensity[34]



There is no pattern here. While some of the markets with the highest mobile prices (Greece, Malta) have low mobile intensity, so do some of those with the lowest prices (the Baltic States). If in markets such as Spain, the Netherlands and Luxembourg high mobile prices are being used in an attempt to encourage consumers to stay with fixed broadband, it isn't working, since each of these markets has relatively high mobile intensity.

The data simply does not support Rewheel's claim that high mobile prices are being used to protect fixed broadband demand.

Cross border coordination

Rewheel also implies that some operators keep prices high even in markets where they do not have significant fixed broadband because they are coordinating across borders with their competitors.[35]

If this were the case, then we might expect prices to be higher in markets where the participants also faced each other in other markets. (Obviously the hypothetical cross-border coordination can only happen if a given pair of operators compete in two or more markets).

Again, we can test this directly. For each market, we have quantified the number of *other* markets where two operators from the original market also compete, which we term 'overlaps'. For instance, if Country 1 has operators A, B and C, Country 2 has operators A, B and

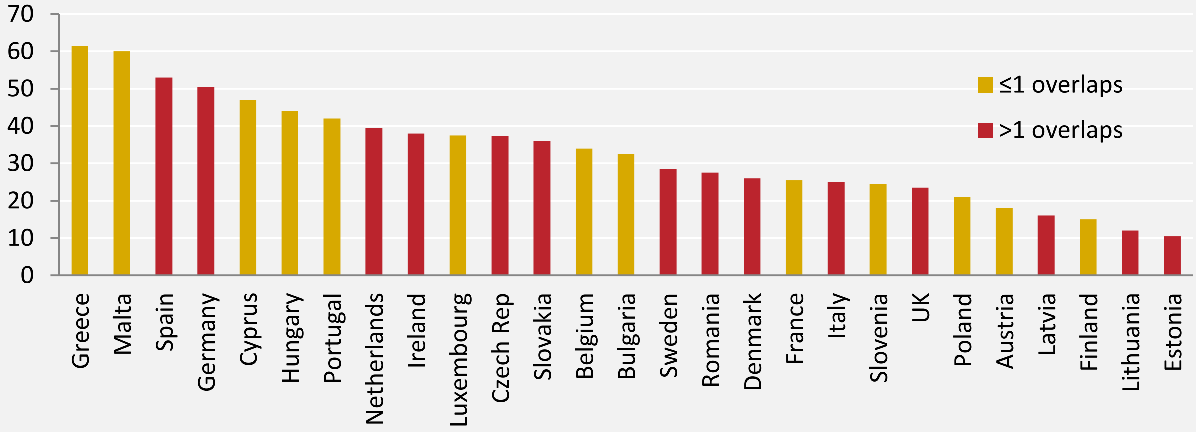
[34] Communications Chambers analysis of Digital Agenda Scoreboard, 2012. Countries have been split 'High' or 'Low' by comparison to the EU median of (approximately) 0.15. There is near zero correlation between price and mobile intensity (R^2=0.01)

[35] Rewheel report p8. Similar implications are in Rewheel, *Telcogroups' protective pricing widens digital divide between poor and wealthy EU member states*, February 2013

D, and country 3 has operators B, C and D, then for Country 1 there are two 'overlaps' (since A and B also compete in country 2, and B and C compete in country 3). The number of overlaps is a proxy for the benefits of any purported coordination, since the participants can expect to reap the benefits of that coordination across all the overlaps.

Figure 10 shows Rewheel's average price basket, this time coloured according to whether the country in question has high or low numbers of international overlaps. If cross border coordination was taking place, we might expect to see higher prices in the markets with more overlaps (shown in red). There is no such pattern – indeed, tariffs are on average €5 *lower* in the high overlap markets.

Figure 10: Rewheel avg smartphone tariffs across six baskets, split by high and low 'overlaps'[36]



Again, the theory of cross-border co-ordination does not stand up to scrutiny.

[36] Communications Chambers analysis. Note that we have included overlaps anywhere in Europe not just the EU27, since any purported coordination benefits would not stop at the borders of the Community. We have split the countries into high and low overlap categories based on those with 1 or fewer overlaps outside the market in question, and those with 2 or more, since this dividing line roughly evenly splits the EU27. However, more generally there is essentially zero correlation between price and number of overlaps (R^2=0.01)

5. Conclusions

As we have seen, there is a wide range of concerns regarding both Rewheel's data integrity and methodology. These affect all of the top eight markets that Rewheel perceives to be most expensive (Figure 11), and fatally undermine the results Rewheel claims to have found in its data. Small adjustments to their methodology result in major changes to the results.

In these circumstances, it is advisable to test Rewheel's theories (such as high mobile prices being used to protect fixed broadband, or cross-border coordination of prices) directly. When we do this we find no empirical evidence to support them.

Understanding why prices differ between European markets in the way they do is a worthwhile and important exercise, but it is one for which Rewheel's theories do not assist.

Figure 11: Issues with 8 most expensive markets[37]

Market	Concern
Greece	Miscategorised
Malta	Miscategorised
Spain	Much cheaper MVNO offers excluded
Germany	Much cheaper MVNO offers excluded
Cyprus	Miscategorised
Hungary	Becomes 'competitive' if incumbent criteria made consistent with EU27 scope
Portugal	Miscategorised
Netherlands	Much cheaper MVNO offers excluded

[37] Per Rewheel's average of six baskets

6. Appendix – Other errors in the report

Significant overstatement of typical usage

Rewheel attaches great significance to the very high volume packages (up to 100 GB) available in some markets. However, offering such volume levels is more about marketing than about actual likely levels of usage. 100 GB represents almost 4 hours of SD video per day, clearly an *extremely* heavy use of a smartphone. While Rewheel excluded 100 GB packages when calculating per-GB prices,[38] it did include 50 GB packages, which in practice are very unlikely to be fully used.

Rewheel also greatly overestimates typical usage. In justifying their use of 2GB packages as a central benchmark, Rewheel cite an Informa report[39]:

> ”The global average monthly cellular data usage was 1.5GB and 2.1GB respectively for smartphone users that were on >1GB and unlimited data allowance packages. In the UK the figures were 2.1GB and 1.9GB respectively for smartphone users that were on >1GB and unlimited data allowance packages.”[40]

However, if the issue is the usage of a typical smartphone user, it is obviously wrong to take the usage of the subset of users on high usage tariffs. This group will clearly be self-selected to be high usage.

Though Rewheel doesn’t mention it, Informa provide average usage (for Android and iOS devices) for each of Spain, Germany and the UK. In each case they are in the range 0.3-0.6 GB.

Ericsson estimate that average traffic for ‘High Traffic Smartphones’ – Android, iOS and Windows devices – was 500 MB per month in 2011, though with higher levels for tablets and PCs.[41] (Even by 2017 Ericsson only expect the typical smartphone to be generating 1GB). Cisco believes that average smartphone usage globally in 2012 was 342 MB.[42] Sandvine reports 311 MB in Europe.[43]

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[38] Such as those shown on the front page of the report
[39] Informa, *Understanding today’s smartphone user*, August 2012
[40] Rewheel report p11
[41] Ericsson, *Traffic and Market Report*, June 2012
[42] Cisco, *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2012–2017*, 6 February 2013
[43] Sandvine, *Global Internet Phenomena Report 1H 2013*, 14 May 2013

Looking at individual countries, Rewheel highlights Austria as a high use country. According to regulator RTR, per-user usage is 460 MB per month.[44] In Sweden it is 500 MB (895 MB for those on 1 GB plans and above).[45] Notably, these are both 'progressive' according to Rewheel, so it cannot be claimed that incumbents have artificially suppressed demand in these markets.

This all suggests that Rewheel's 'normal' usage of 2 GB is a significant overstatement.

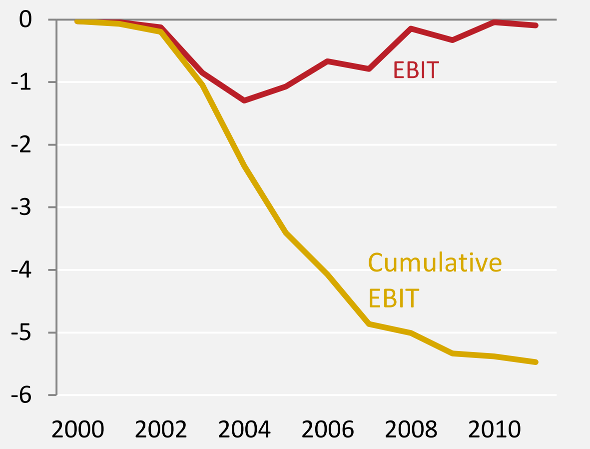
Inaccurate assertion of challenger profitability

Rewheel simply asserts that independent challengers are profitable.[46] This is an important issue, since if the aggressive pricing of certain new entrants leads them into sustained loss (or to returns below their cost of capital), then it is hardly reasonable to expect other MNOs to follow in their footsteps.

Consider the UK. Rewheel refers to the UK market favourably several times. It is Three that leads this market to be categorised as 'progressive', and in reality it has certainly contributed to downward movement in UK prices.

Founded in 2000, Three launched services in 2003. It is clearly long out of its start-up phase, but up to 2011 - the latest available accounts - it has had cumulative losses before interest and tax of £5.5bn, and continues to be loss making.[48] This is obviously not a particularly attractive investment profile.

Figure 12: Three UK Profitability (£bn)[47]



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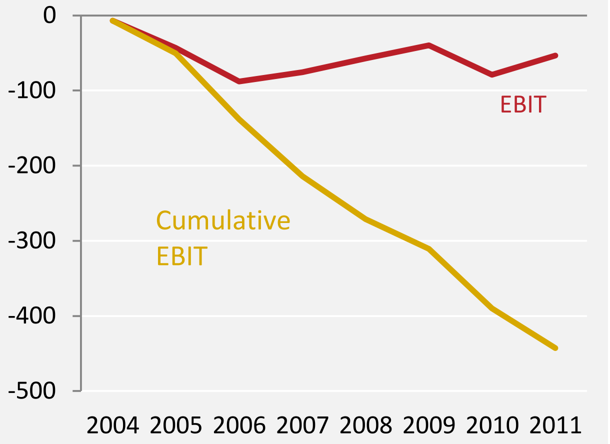
[44] RTR, *Telekom Monitor 1/2013*, 6th March 2013
[45] PTS, *The Swedish Telecommunications Market first half-year 2012*, 16 November 2012
[46] Rewheel report p29
[47] Hutchison 3G UK Ltd company accounts
[48] At the operating profit line in 2011, it did make a £15m profit, but this was offset by £108m of asset write-offs

Ireland, another market where Three's accounts are available, tells a similar story. Three launched services there in 2005, but has seen ongoing losses (despite benefiting from government subsidies via the National Broadband Scheme). For 2011 it made an operating loss of €53m on revenues of €118m.

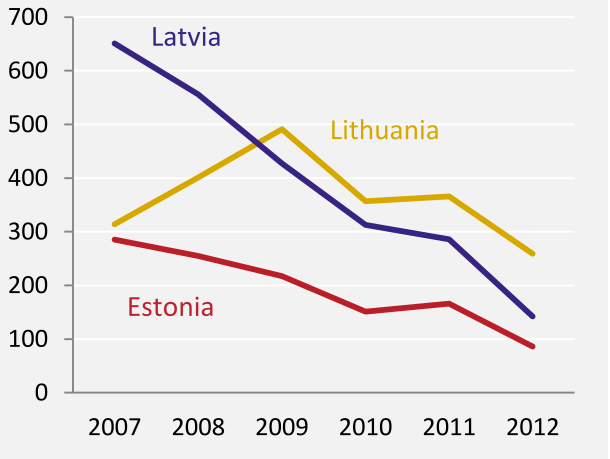
Figure 13: Three Ireland Profitability (€m)[49]



Three plays an important role in Rewhweel's categorisation of countries – it is the player that makes each of Austria, Ireland, Denmark and the UK progressive. However, its financial performance is not an encouraging precedent, and it is obviously not a safe assumption that there will always be rich parents to fund substantial losses like Three's in the UK and Ireland (and perhaps elsewhere).

Another player with an aggressive pricing strategy is Tele2. Tele2 is currently profitable, but the trends for some of its operations are not encouraging. Consider its Baltic operations. These have each been on a steep downward trend in recent years, a trend that if it continues will render then all unprofitable (Figure 14).

Figure 14: Tele2 Baltic ops Profitability (SEKm)[50]



[49] Hutchison 3G Ireland Ltd company accounts
[50] Tele2 annual reports