

Upward Pricing Pressure Analysis: Critical Issues in Recent Applications

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I. Introduction

Upward pricing pressure (UPP) analysis uses proxies of the closeness of competition between the merging parties in order to assess the price effect of a merger. It was introduced as a screening device to identify mergers that required in-depth analysis. In so doing, UPP accounts for different degrees of competition, whereas screening based on market shares would require binary presumptions of whether or not to include certain goods and firms into the relevant market.¹

In recent years, UPP analysis has also become an integral part of the European Commission's quantitative merger assessment. This development can be traced in three decisions on mergers of mobile telecoms, first in Austria (2012) and then in Ireland and Germany (both 2014). In the latter cases, UPP analysis has been applied alongside a second quantitative means of merger assessment: merger simulation based on demand estimation.

Quantitative merger assessment is arguably useful as it condenses various competitive effects into few indicators. In so doing, quantitative methodologies rely on a coherent theoretical framework which captures competitive concerns due to a significant impediment of effective competition (SIEC). According to the latter, a merger may not only create concerns due to the creation or strengthening of a dominant position but also in cases not involving market leaders. Such concerns have indeed become more prominent since the formal implementation of SIEC standards in various jurisdictions and in the light of mergers of recent high-profile mobile telecoms. Quantitative indicators also compare easily across different cases and over time.

This article describes how the application of UPP analysis has evolved and, against that background, what appear to be the most relevant levers in practice.² In particular, Section II explains the main intuition behind the Commission's enhancements to UPP analysis, and Section III

Key Points

- Upward Pricing Pressure (UPP) analysis has become an integral part of the assessment carried out on mergers by the European Commission.
- Yet, it appears unsettled as the standards used for its implementation have changed substantially in recent cases.
- Among others, a difficulty is to calibrate the inputs and another, to interpret the results given the limited framework of the analysis.

discusses the relationship between UPP-based and demand estimation-based merger simulation techniques. Section VI discusses assumptions underlying UPP analysis. Section V concludes.

II. UPP approaches

After the merger of Hutchison 3G Austria and Orange in 2012 (M.6497), the European Commission published decisions on further concentrations in markets of mobile telecoms: *Hutchison 3G UK/Telefónica Ireland* (M.6992) and *Telefónica Deutschland/E-Plus* (M.7018). These three decisions mark the first use of UPP analysis as part of the Commission's quantitative merger assessment.

UPP analysis relies on presumed profit margins and diversion ratios. The main idea of this approach is that the merger will remove the competitive constraints that the parties exert on each other before the merger. One simple way to illustrate the intuition of the unilateral effects at work is as follows: if a firm increases prices unilaterally, it will lose sales to its rivals. Before the merger the part of these lost sales that are captured by the merging counterpart are truly 'lost'. This limits the incentive to raise prices. After the merger, this part is

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1 Joseph Farrell and Carl Shapiro, 'Antitrust Evaluation of Horizontal Mergers: an Economic Alternative to Market Definition' (2010), *The B.E. Journal of Theoretical Economics*, 1–39.

2 Alison Oldale and Jorge Padilla provide an introductory overview on different UPP approaches: 'EU Merger Assessment of Upward Pricing Pressure: Making sense of UPP, GUPPI, and the Like' (2013), *Journal of Competition Law & Practice*, 4, 375–381.

re-captured as the firm is now under common ownership. Compared to the situation before the merger, there is an incentive to increase prices.

The relevance of the competitive constraint that is removed depends on the closeness of competition between the merging parties and the relevant margins that had been lost to the rival. The European Commission uses switching data in order to calibrate the diversion ratio to the merging counterpart (and vice versa) and accounting data to calibrate the relevant margins. The exact measures to use are often subject to intensive discussion; we will get back to this below.

Multiplying the first party's diversion ratio with the second party's profit margin determines the second party's gain due to the first one's price increase (and vice versa). This gain can also be interpreted as an opportunity cost for the first party *not* to increase its prices after the merger.

Consider, for example, a four-to-three merger. Let the diversion ratios among the merging parties be 25%. Suppose further that the merger concerns a capital intensive industry, such that short-run margins are relatively high at about 80%. Then, the gross-upward pricing pressure index (GUPPI) for each party is $25\% \times 80\% = 20\%$, whereby 'gross' refers to each party's perceived *cost* increase due to the merger, creating the UPP. It is important to note that the GUPPI is only a perceived cost increase, whilst the potential *price* increase depends on the extent to which cost increases are passed-through. Accounting for additional effects may then lead to an 'extended' UPP analysis. The various steps can be summarised as follows:

- **GUPPI:** As explained earlier, GUPPI is the perceived increase of the parties' marginal costs. It can simply be calculated by multiplying a party's diversion ratio (eg 25%) with the margin earned at the other party (eg 80%): eg 20%. In many practical applications, the GUPPI will mark an upper bound of the predicted price increases.
- **Predicted price increase (without competitors' reactions):** The predicted price increase (without competitors' reactions) depends on the cost pass-through and hence competitiveness of the industry. In the unlikely case of perfect competition, the pass-through rate would be 100% such that the GUPPI would equate the predicted price increase. In most practical

applications, involving more concentrated industries, the pass-through rate will usually still be at least 50%, such that the predicted price increase will lie between the GUPPI and half of it, ie between 10 and 20% in our example.³

- **Predicted price increase accounting for competitors' reactions:** In determining the loss of competition between the merging parties, the UPP framework relies on economic models of price competition (Bertrand price competition). These models predict that competitors react to strategic moves by moving in a similar direction: if the merging parties increase their prices, then the non-merging parties have an incentive to increase their prices as well (strategic complementarity).⁴ Accordingly, accounting for these strategic interactions leads to additional price increases of non-merging firms and, as a reaction to that, of the merging parties themselves. In modelling a new price equilibrium, this type of UPP analysis can be considered as a merger simulation.

III. Demand-based modelling: complement or substitute?

In *Hutchison 3G UK/Telefónica Ireland* and *Telefónica Deutschland/E-Plus*, the Commission did not only conduct UPP analysis but also merger simulation based on an econometric estimation of consumer demand using tariff level data ('merger simulation based on demand estimation' or 'demand-based modelling').

Whilst both approaches, UPP analysis and demand estimation-based merger simulation, rely on the same theoretical framework, they differ in terms of inputs and their ways of computing price changes. As such, intermediate and final results may differ, subject to inconsistent inputs or assumptions.

Recall that all UPP approaches are primarily driven by measures of the parties' diversion ratios and presumed profit margins. As we shall point out later, these inputs are hard to obtain and approximations may be controversial.

Merger simulation based on demand estimation, in contrast, relies on data revealing consumers' actual choices. Econometric techniques can then estimate consumer demand. Estimated consumer demand and prevailing price levels imply firms' profit margins. Based on these parameters, merger simulation techniques predict the post-merger price equilibrium; that is price increases

likely strategic substitutes: if a firm reduces capacities, other firms have an incentive to increase their capacities. Indeed, if the competitive concern of a merger involves capacity contractions of the merging parties, then capacity expansions of competitors would likely counteract such a concern.

³ Pass through rates can also be out of the 50–100% range as they depend on the curvature of the demand function—the presentation here is for illustrative purposes.

⁴ Notice that not all strategic variables are complements. If firms compete primarily in capacities, for example, then their strategic variables are more

of both the merging and non-merging parties. Demand estimation involves significant data work, and its reliability depends on careful implementation.

Given the differences discussed earlier, one might expect UPP analyses to be employed as an initial screening device, for example during Phase I proceedings, whereas a full merger simulation based on demand estimation would take over during Phase II. Indeed, since merger simulation based on demand estimation essentially replaces approximations and judgements by actual data, once available, it may be considered more accurate.

The recent decisions point in a different direction. After a Phase II investigation, the final quantitative assessment in *H3G Austria/Orange Austria* solely relied on UPP analyses, although it is understood that the European Commission gathered data allowing for merger simulation based on demand estimation. In *H3G UK/Telefónica Ireland* and *Telefónica Deutschland/E-Plus*, the Commission applied both UPP analysis and merger simulation based on demand estimation. Indeed, the Commission clarified that it considered the two approaches complementary, without any statements in regard to one approach being superior or more reliable than the other.

This may appear surprising at first glance: given the tremendous additional information and computational effort involved in the second approach (demand estimation based on merger simulation), one would expect demand estimation-based merger simulation to substitute UPP analysis.⁵ Since both approaches rely on the same theoretical models, they should lead to consistent results though. In that regard, the Commission seems to satisfy itself that the *final results* in terms of price increases can be reconciled.⁶

In our view, usage of *consistent inputs/intermediary results* would be desirable, too, though. As explained earlier, merger simulation derives diversion ratios and profit margins from retail level data and consumers' choices. Final price predictions rely on these intermediary results. If UPP analysis used (substantially) different diversion ratios and profit margins, then it would latently lead to different price predictions. Such departures can be reconciled through additional assumptions and adjustments. In our view, however, the predictions of

two complementary approaches would appear more reliable if they were based on consistent inputs/intermediary results throughout.

IV. Critical UPP determinants

A. Profit margins

As stated earlier, profit margins are an important and controversial input to UPP analyses. Recalling the most basic formula for gross-upward pricing pressure (diversion ratio \times profit margin), it is easy to see why: the assumed profit margin essentially scales the UPP from 0 to 100%, with a zero-profit margin leading to zero predicted price increases and a 100%-profit margin determining the upper bound of predicted prices increases.

The non-controversial part about profit margins is that they should involve those costs that are relevant for firms' pricing decisions. However, when determining these costs in a particular context, there appears to be only little black and white, leaving a substantial grey area:

- **Clearly not relevant** (sunk costs): It is not controversial that all costs that cannot be avoided in the relevant timeframe should not be included when computing margins for UPP analyses. This concerns, in particular, the amortisation of goodwill (eg non-tradable spectrum) or long-term rental or other commitments.
- **Clearly relevant** (short-term marginal costs): Costs that vary on per unit of output basis should clearly be taken into account. Per unit production or material costs, as well as merchandise, are examples.
- **Grey area:** For many industries, there remain substantial costs not covered above. Consider (i) regular marketing and advertising expenditures, (ii) rental and other agreements that can be terminated, (iii) investments (depreciation) concerning eg (network) quality and scope, (iv) personal/staff costs, and (v) generally any assets bearing opportunity costs.⁷

The decisional practice appears unsettled with regard to this crucial element of practical UPP analyses. In the decision on *H3G Austria/Orange Austria*, the Commission employed two types of margins, direct margins and contribution margins, without any qualification as to

5 For example, Oldale and Padilla (2013) report that in *Unilever/Sara Lee* UPP analyses featured the 6.1(c) decision, whilst the final decision was based on merger simulation based on demand estimation; Alison Oldale and Jorge Padilla, 'EU Merger Assessment of Upward Pricing Pressure: Making sense of UPP, GUPPI, and the Like' (2013), *Journal of Competition Law & Practice*, 4, 375–381.

6 M.7018 – *Telefónica Deutschland/E-Plus* paras 718–720.

7 To illustrate the latter point, consider a spectrum licence, enabling higher quality mobile communication. Suppose such a licence were granted for

five years and suppose it were tradable (restrictions are not uncommon though). Suppose that such a licence would lose a fifth of its economic value per year for it could be sold at a value reflecting the remaining duration of the licence. In such a context, the spectrum licence would bear substantial opportunity costs on a yearly basis and hence on a relatively short-term basis. Conversely, if such a licence is not tradable (for regulatory reasons), then its costs would appear largely sunk.

which margin is given more credibility.⁸ Direct margins measure the difference between price and short-term marginal costs (ie including no element from the 'grey' list). In mobile telecommunications, this means subtracting interconnections costs and outbound roaming costs, leading to a margin at about 80%.⁹ Contribution margins additionally deduct customer acquisition and retention costs and bed debt (ie some parts of the above specified grey areas). In mobile telecommunications, this may lead to margins at a level of 50 to 60%.¹⁰

However, in the *H3G UK/Telefónica Ireland* and *Telefónica Deutschland/E-Plus* decisions, the Commission dropped scenarios involving direct margins entirely but assessed the cases based on scenarios involving contribution margins and, as a sensitivity check, incremental margins. The latter also deduct longer-term avoidable costs, for example (avoidable) investments into the telecoms and distribution networks (ie an even larger part of the above-indicated grey area). Again, in capital intensive industries, such as telecoms, these costs can be substantial, lowering the relevant margin figure by another 10–20 percentage points.

At least two points are noteworthy in this context.

- First, the potential range of relevant margins has varied quite significantly within the recent decisions, which has relevant effects on the predicted price increases. For example, if the merging parties' diversion ratio were 25%, then a 80% direct margin would lead to gross-upward pricing pressure of about 20% (ie $25\% \times 80\%$). A contribution margin of about 60% would lead to a gross-upward pricing pressure of 15%, and an incremental margin of about 40% to a GUPPI of 10%.
- Second, the degree of vertical integration prevailing in an industry may have a substantial impact on predicted price increases. For example, whilst operators of vertically integrated mobile telecoms may face low short-term variable costs, leading to direct margins at the order of magnitude 80%, grocery retailers' costs of goods sold may amount to about 90% of revenues, leading to direct margins in the order of magnitude 10%.¹¹ In other words, what might lead to a GUPPI of 20% in mobile telecommunications could lead to a GUPPI of 2.5% in an equally concentrated retail market (eg $25\% \times 10\%$).

Against the above-mentioned background, it should be clear that profit margins have a crucial impact on UPP analyses. At the same time, certain margin definitions (such as direct, contribution, and incremental margins), derived from accounting data, may not in all circumstances reveal the full picture of what types of costs are (or are not) taken into account in firms' pricing decisions.

In cases where the Commission conducts demand estimation (for a merger simulation based on demand estimation), this will yield demand elasticities for all firms in the relevant market. These figures can be used to calculate the profit margins relevant for pricing. Indeed, these figures and their underlying relationships determine the results of the merger simulation, subject to the same principles as they would determine results for UPP analyses.

However, the *Telefónica Deutschland/E-Plus* decision states that the Commission did not have to regard the margins implied by its demand estimation for the purpose of its UPP analyses. Rather, it would suffice that final results could be reconciled.¹²

B. Diversion ratios

Reverting to the basic (G)UPP(I) formula, *diversion ratio* \times *profit margin*, it is clear that diversion ratios play an equally important role as the profit margin discussed earlier. It makes intuitive sense that a merger creates higher UPP the closer the competition among the parties, that is the higher the share of party 1's customers lost due to a price increase would opt for party 2 (as their next best alternative).

Market shares may serve as a crude approximation of diversion ratios if operators are equally close competitors. However, diversion ratios based on market shares do not detect particularly close competition among certain operators. Switching data, on the other hand, may reveal how customers lost by one operator distribute across other operators. In that regard, the mobile telecoms sector offers rich information because number portability data and surveys are readily available to trace the origination and destination of customer losses and gains, respectively.

Yet, neither market shares nor switching ratios necessarily reflect customer migration caused by *price* changes. For example, in *Telefónica Deutschland/E-Plus*, the parties' had

8 The same holds for the 6(1)(c) decision in M.7018 – *Telefónica Deutschland/E-Plus*.

9 According to Yankee data, for example, Germany operators' revenues net of cost of service led to average profit margins of 78% in 2012.

10 According to Yankee data, for example, Germany operators' revenues net of cost of service, cost of equipment sales, marketing, and selling led to average contribution margins of 53% in 2012.

11 For example, for the year 2013, British retailer Tesco reported revenues of 63,406 million British Pounds and costs of goods sold (COGS) of 58,596 million British Pounds. Bloomberg Businessweek: <http://investing.businessweek.com/research/stocks/financials/financials.asp?ticker=TSCO:LN>, last accessed 11 November 2014.

12 M.7018 – *Telefónica Deutschland/E-Plus*, para 719.

substantial switching ratios from their prepaid to their post-paid tariffs. These would have inflated UPP estimates whilst the Commission recognised that switching across segments may less likely be price-driven and therefore considered UPP analyses excluding cross-segment switching. Indeed, migration from prepaid to post-paid may largely take place without any price changes, and within operator, simply as a matter of quality upgrading, eg if the income of users increases. More generally, past customer migration (ratios) may be caused by many things but prices. To the extent that they were caused by other things, they may give a distorted view of what would happen due to price increases.

Finally, the concept and measurement of diversion ratios usually concerns unilateral price increases, whilst all else would remain unchanged. As such it applies to the incentive for one of the parties to increase its price, whilst the other party kept its price constant but not to a situation in which the receiving party increases its price as well. Intuitively, customers may consider their second best choices quite differently depending on whether the price of a certain choice remains unchanged or is presumed to increase—an effect not captured by UPP analyses.

In sum, using diversion ratios observed in response to price changes (if available) appears more reliable than using switching data.

C. Reduced consumption and outside goods

As discussed in the previous section, standard UPP analyses often presume inelastic market demand: if the merging parties (and other operators) increase their prices, this will trigger customer re-allocations, but it will not reduce usage at all.

This is a strong assumption as price increases, whilst inducing switching, usually also lead to reduced consumption. The threat of reduced consumption would discipline price increases. Conversely, if ignored, predicted price increases will likely be inflated.

Departing from previous UPP applications, in *Telefónica Deutschland/E-Plus*, the Commission accounted for competitive pressure through reduced consumption and/or outside goods. Technically, the Commission assumed a 'diversion ratio to an outside option' and thereby reduced the presumed diversion ratios among the parties. This reduced UPP estimates.

However, values for a diversion ratio to an outside good are again not readily available. In *Telefónica Deutschland/E-Plus*, the Commission applied the market share of

mobile resellers without own networks.¹³ The latter is relatively high in Germany, whilst resellers had been ignored in the UPP analysis in the statement of objections. This approach might suggest that the 'diversion ratio to an outside option' were to capture the competitive constraint through an actual alternative. At the same time, the Commission employed the 'diversion ratio to an outside option' referring to reduced mobile usage in terms of shorter calls or less data consumption.¹⁴ In that respect, there remains some ambiguity how to derive the 'diversion ratio to an outside option' in future cases.

D. Product re-positioning

As explained earlier, UPP analyses yield firms' incentives to increase prices, presuming unchanged non-price competition. However, mergers may not only alter firms' pricing incentives but also their product and/or brand positioning.

Indeed, UPP analyses rely on theoretical models of differentiated price (Bertrand) competition. In such models, the market outcome is largely explained by two effects. On the one hand, all competitors have an incentive to position themselves at the centre of demand in order to attract as many as possible customers. However, such a strategy would remove any product differentiation, such that competitors would have to compete fiercely on price, diminishing profit margins. Therefore, competitors have an incentive to position themselves somewhat away from each other, thereby relaxing price competition. One may assume that pre-merger firms have optimised both their positioning and pricing. In well-specified UPP analyses, these decisions would be reflected in the diversion ratios and profit margins.

Now, for the post-merger situation, UPP analyses predict higher prices. That is where its analytical framework ends. Presuming higher prices, however, as well as optimised positioning and prices before the merger, implies that firms would have an incentive to re-position themselves after the merger. In *Telefónica Deutschland/E-Plus*, the Notifying Party argued, had the merging parties optimally positioned themselves to all competitors, then the removal of competition among them would create an incentive to move closer to the remaining competitors Deutsche Telekom and Vodafone. Similarly, had the non-merging firms optimally positioned themselves, the predicted price increase of the merging parties would create an incentive for their competitors to move closer to the merged entity. Both effects would counteract the predicted price increases.

13 In that context, the *Telefónica Deutschland/E-Plus* decision refers (more precisely) to non-MNOs which cover mobile virtual network operators (MVNOs), service providers, and resellers.

14 M.7018 – *Telefónica Deutschland/E-Plus*, paras 714, 715.

In *Telefónica Deutschland/E-Plus*, the 'Commission also considers that it is not always profitable to adjust two instruments (prices and position) due to repositioning costs. [...] The Commission considers that repositioning can be time consuming and therefore product repositioning may have no effects in the near future'.¹⁵ As such it appears as if the arguments of the Notifying Party had been accepted substantially whereas the Commission considered the burden of proof that such effects materialised as a matter of costs and duration lied upon the Notifying Party.¹⁶

E. Investments, innovation, and efficiencies

Initially, UPP analysis was developed to generate an intuition for the efficiencies required to compensate the UPP (as this is more reliable than predicting expected price increases which depend on the shape of the demand function).¹⁷ Meanwhile, the ways in which presumed diversion ratios ratios and profit margins can be transformed into predicted price increases by merging and non-merging firms have been refined tremendously. Little practical progress has been made in terms of balancing UPP against efficiencies. It should be noted, however, that extended UPP frameworks can incorporate quantified cost efficiencies and quality improvements in order to balance upward and downward pricing pressure, yielding the net effects of anti- and pro-competitive effects.¹⁸

V. Summary and conclusions

Recent decisions suggest that UPP analyses have become an integral part of the European Commission's quantitative merger assessment when it comes to differentiated goods markets. It has become clear that the Commission would not only use UPP analysis as a screening device, but as a tool as valid as merger simulation based on demand estimation ('complementary approaches').

UPP analysis is appealing for its apparent simplicity and seemingly limited information requirements. At the same time, it should be emphasised, in our view, that if margins and diversion ratios become the predominant ingredients to a merger analysis then the outcomes can never be any more revealing than what margins and diversion ratios can say about the nature of competition in a market (provided, in any event, that reliable estimates of margins and diversion ratios are available to begin

with). Predicted price increases ignore effects resulting from strategic re-positioning and price-differentiation, as well as competitive dynamics based on investments, innovation, and efficiencies (if not proven under an efficiency defence).

In *H3G Austria/Orange Austria*, the Commission relied on simple single segment approaches without the reaction of non-merging parties, whilst the analyses in *H3G UK/Telefónica Ireland* and *Telefónica Deutschland/E-Plus* considered cross-segment optimisations and the reaction of non-merging parties. In *H3G Austria/Orange Austria*, the Commission considered direct margins and contribution margins as inputs, whereas in the more recent cases, it considered contribution margins and incremental margins. In *Telefónica Deutschland/E-Plus*, the Commission further qualified diversion ratios (in terms of switching ratios) as being partly non-price driven. The introduction of a 'diversion ratio to an outside option' further lowered predicted price increases. Counteracting effects through product re-positioning had been acknowledged substantially in *Telefónica Deutschland/E-Plus*, whereas the burden of showing and quantifying such effects had been assumed with the Notifying Party.

For all its conceptual simplicity, the devil of UPP analyses is in the details, and it appears yet unclear as to how some of these details will be tackled and interpreted in future cases. This may also raise questions as how to compare UPP figures (and cases for that matter) over time. To illustrate this consider the question of consistent remedies across decisions in a relevant market. Assume that an authority's UPP analysis predicted a price increase of 20% in a past case and that the authority accepted remedies accordingly. Assume further that in a subsequent case, the authority applies an advanced UPP (or any quantitative) approach and that it predicts a price increase of 10% whereas the application of the older and inferior technique would again predict a price increase of 20%: should the authority consider remedies s.t. to the previous and inferior prediction of a 20% price increase, or s.t. to the new and superior prediction of a 10% price increase? The decision in *Telefónica Deutschland/E-Plus* suggests that the Commission might opt for the former option of 'a like-to-like comparison'.¹⁹

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15 M.7018 – *Telefónica Deutschland/E-Plus*, Annex A, para 130.

16 The decision further stated that in 'the Commission's view, the effect of product repositioning is not sufficiently established in the economic literature to draw robust conclusions on an abstract level.' M.7018 – *Telefónica Deutschland/E-Plus*, para 726.

17 Joseph Farrell and Carl Shapiro, 'Antitrust Evaluation of Horizontal Mergers: an Economic Alternative to Market Definition' (2010), *The B.E. Journal of Theoretical Economics*, 1–39.

18 Robert Willig, 'Unilateral Competitive Effects of Mergers: Upward Pricing Pressure, Product Quality, and Other Extensions' (2011), *Review of Industrial Organization*, 39, 19–38.

19 M.7018 – *Telefónica Deutschland/E-Plus*, para 734.