From Market Definition to Unilateral Effects Running without moving?

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Why do we define markets?

- Market definition is an indirect way to assess market power:

  "to identify in a systematic way the competitive constraints that the undertakings involved face"

    Commission's Notice on Market Definition

- This involves first defining the relevant antitrust market(s) where the undertaking's products compete

What is a market and how do we define it?

- An economic definition of a market is
  "something worth monopolising"

- Virtually all competition authorities define a
  "market" for antitrust purposes in a very specific
  way using the SSNIP or hypothetical monopolist test

The hypothetical monopolist test in Europe

"The question to be answered is whether:

the parties' customers *would switch to readily available substitutes or to suppliers located elsewhere*

in response to a hypothetical small (in the range 5% to 10%) but permanent relative price increase in the products and areas being considered.

If substitution were enough to make the price increase unprofitable because of the resulting loss of sales, additional substitutes and areas are included in the relevant market.

This would be done until the set of products and geographical areas is such that small, permanent increases in relative prices would be profitable."

Commission notice on definition of the relevant market, paragraph 17

The SSNIP test in practice

- The SSNIP test asks: how would consumers and rivals response to a 5%-10% increase in the price of products in the candidate market?

- Start with the smallest number of products, and then add substitutes until the test is met

- Key question: are the reactions big enough to make the price increase unprofitable?

- Can only be answered empirically

  - Various possible empirical techniques, some high-tech (e.g. estimation of market demand elasticities) and some low tech (e.g. shock/natural experiments)

  - Choice of empirical techniques depends upon various factors including the products, the availability of data, time constraints, etc.

Customers
Demand side response

Candidate market

Neighbouring products

Rival sellers
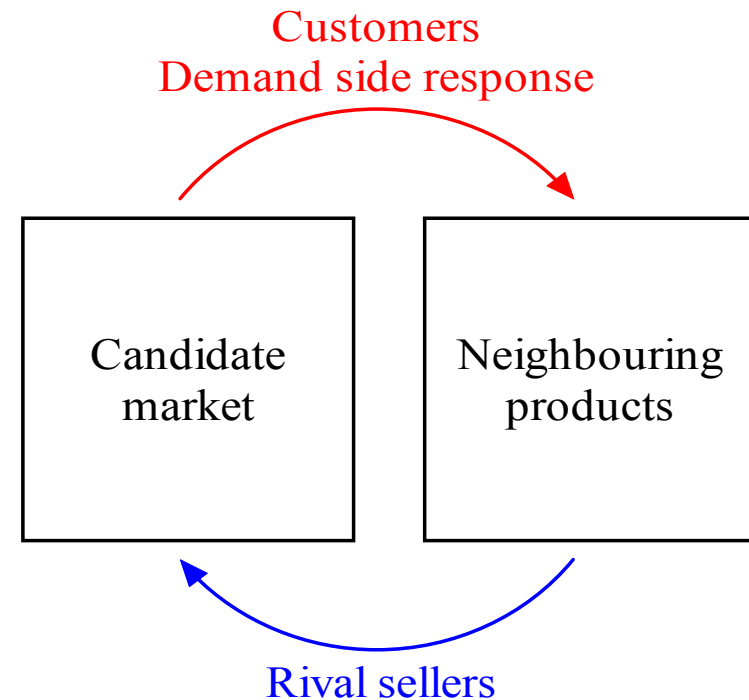
Will the SSNIP be profitable?
Demand side issues

How responsive are consumers' choices to (relative) price?

- ▪ **Depends on consumers' preferences …**

- ▪ **… as well as the availability of alternatives**

Are there any barriers to switching?

Can producers charge different prices to different customers?

If so, can they identify customers for whom switching is difficult?

All this is complex!...

…And there is supply side substitution

Can producers easily switch between making products. Would a 5-10% price increase be sufficient to cause them do so?

- Examples might include: different diameters of steel tubes, or thicknesses of paper; different size suits;

Supply side substitution is explicitly acknowledged as a potential constraint on market power in the Commission's Notice on Market Definition (paragraph 20):

- "when its effects are equivalent to those of demand substitution in terms of *effectiveness* and *immediacy*"
- Suppliers must be able to "switch production to the relevant products and market them in the short term *without incurring significant additional costs or risks*" in response to SSNIP
- Near-universality principle

But, often difficult to meet these strict requirements in practice

Obtaining empirical evidence is demanding

- **Direct application of SSNIP test requires information on margins and quantification of demand elasticity and/or supply responses**

  1. Econometric estimation of demand elasticity or supply response

  2. Evidence of <u>price-induced</u> switching

  3. Well designed customer or producer surveys

- **Indirect evidence regarding market definition**

  4. Price correlation analysis
  (including cointegration / stationarity analysis)

  5. Evidence of non-price induced switching

  6. Comparison of price levels or product characteristics

Fallacies in market definition

- Market definition frequently does not assess the SSNIP question in practice

- Common mistakes/problems include:

  - an over-reliance on characteristics

  - absolute versus relative price levels (e.g. Branded and private label milk)

  - mistaken emphasis on whether *everyone* can switch (e.g. Bananas)

  - Defining markets that are already monopolised (e.g. Cellophane)

Does market definition due the job of identifying competitive constraints?

Market definition can appear very binary (1,0), placing an artificial cut-off between what is in the market, and what is out.

Implicit assumption that all players <u>within</u> the market are equally close substitutes. Can be misleading, especially for differentiated products:

- Substitutability can vary even between products within the market

- Products outside the market can still impose competitive constraints

Why focus on whether an "hypothetical monopoly" (or cartel) can profitably raise prices when the key issue is whether the "merging parties" can raise prices?

From Market definition to Unilateral Effects

The fundamental question: Horizontal mergers give rise to unilateral anticompetitive effects if:

- they cause the merged firm to compete less intensely than the merging firms had done,

- while non-merging rivals respond in accord with their unchanged self-interests.

In competing less intensely, the specific actions of the merged firm would be to raise price, reduce promotions, restrict output, contract capacity, and the like.

Unilateral effects contrast with coordinated effects arising when non-merging rivals cooperate with the merged firm on the choice of competitive actions

"Diagnostic tests"

A decade ago, Daniel O'Brien and Steven Salop put forward the idea of a Pricing Pressure Index to predict unilateral effects in differentiated products mergers.

More recently, Joseph Farrell and Carl Shapiro proposed the similar Upward Pricing Pressure Index (UPPI) for use as;

- *"a simple diagnostic test to flag horizontal mergers that are most likely to lead to unilateral anti-competitive effects in markets for differentiated products*."

They argued that the use of their UPPI "*is often simpler and more disciplined than flagging mergers based on market definition*" and market shares.

In a later paper, Farrell and Shapiro similarly described their UPPI as a *"practical" tool "for initial screening purposes*" but insisted that they "*are not suggesting that antitrust enforcement . . . drop market definition.*"

This position has largely been adopted in the new US HMG

2010 US Merger Guidelines

"Adverse unilateral price effects can arise when the merger gives the merged entity an incentive to raise the price of a product previously sold by one merging firm and thereby divert sales to products previously sold by the other merging firm, boosting the profits on the latter products.

Taking as given other prices and product offerings, that boost to profits is equal **to the value to the merged firm of the sales diverted to those products**

The value of sales diverted to a product is equal to the number of units diverted to that product multiplied by the margin between price and incremental cost on that product"

The basic idea
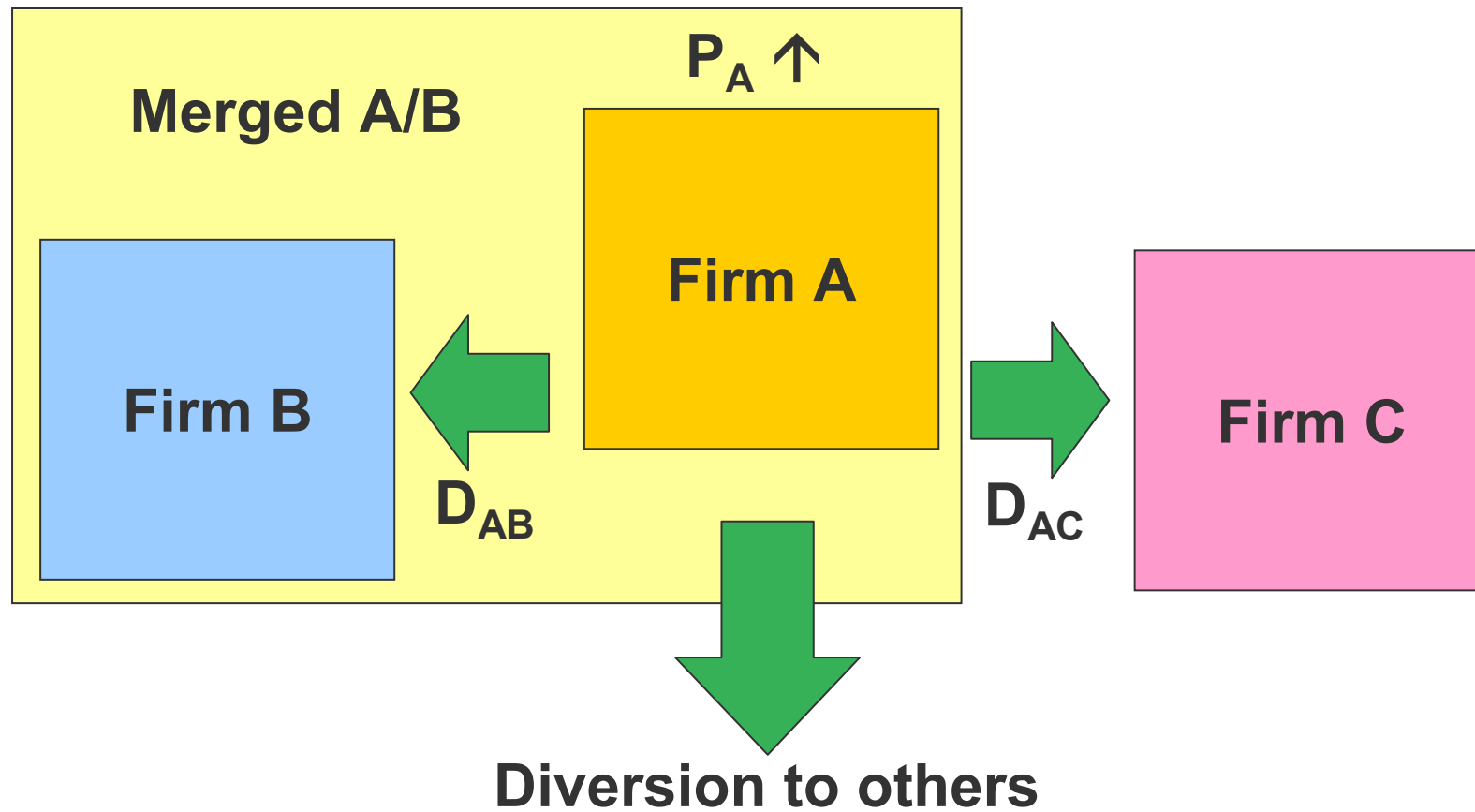
The (gross) UPPI is motivated by the following thought experiment:

- Assume firms 1 and 2 had set pre-merger prices to maximize their separate profits.

- After merger, they are operated as separate divisions by a central manager who realizes that a tiny increase in the price charged by division 1 does not affect profits from division 1's sales (because of the mathematics of profit maximization)

- but it does affect the profits from division 2's sales, with the magnitude of that effect given by the diversion ratio from division 1 to division 2, multiplied by the difference between division 2's price and its marginal cost.

- This is the value of diverted sales: $D_{12} \cdot (p_2 - c_2)$.

A Brief Technical Analysis of the *GUPPI*

The GUPPI measures the merged firm's incentive to raise price unilaterally post-merger

- (in the absence of merger-induced efficiencies, entry, and repositioning).

There is a GUPPI for each product sold by the merging firms.

- For example, consider a merger of Firm A and Firm B, and suppose that Firm A sells Product 1 and Firm B sells Product 2.

- In this example, the merging firms are selling two products and therefore there are two GUPPIs (one for each product).

- The GUPPI for Product 1 measures the merged firm's incentive to raise the price of Product 1, holding the price of Product 2 constant. The GUPPI for Product 2 is similar.

There is also a Uniform GUPPI that measures the incentive to raise the prices of Product 1 and Product 2 together and by the same percentage price increase.

The GUPPI for a product sold by one of the merging firms (say, Product 1) can be defined as:

The value of sales diverted to the products sold by the other merging firms (i.e., Product 2 in our example) expressed as a percentage of the revenues on volume lost by Product 1 as a result of the price increase:

$$GUPPI \ for \ Product \ 1 = \frac{value \ of \ sales \ diverted \ to \ Product \ 2}{revenues \ on \ volume \ lost \ by \ Product \ 1}$$

Section 6.1 of the 2010 Merger Guidelines explains how to calculate both the numerator and the denominator. That is:

$value\ of\ sales\ diverted\ to\ Product\ 2\ =$

$\qquad number\ of\ units\ diverted\ to\ Product\ 2\ \times\ unit\ margin\ of\ Product\ 2$

and

$revenues\ on\ volume\ lost\ by\ Product\ 1\ =$

$\qquad number\ of\ units\ lost\ by\ Product\ 1\ \times\ unit\ price\ of\ Product\ 1$

$$GUPPI \text{ for Product } 1 =$$

$$\frac{number\ of\ units\ diverted\ to\ Product\ 2}{number\ of\ units\ lost\ by\ Product\ 1} \times \frac{unit\ margin\ of\ Product\ 2}{unit\ price\ of\ Product\ 1}$$

Note that the first ratio (that is, the number of units diverted to Product 2 divided by the number of units lost by Product 1) is the "diversion ratio" from Product 1 to Product 2.

Note also that the second ratio (that is, the unit margin of Product 2 divided by the unit price of Product 1) is equal to the percentage margin of Product 2 multiplied by the price ratio of Product 2 to Product 1.

$GUPPI\ for\ Product\ 1\ =\ diversion\ ratio\ from\ Product\ 1\ to\ Product\ 2$
$\times\ percentage\ margin\ of\ Product\ 2$
$\times\ price\ ratio\ of\ Product\ 2\ to\ Product\ 1$

In symbols, this can be written as follows:

$$GUPPI_1\ =\ DR_{12}\ \times\ m_2\ \times\ P_2/P_1$$

An alternative intuition
"The opportunity cost of lowering price"

Hold fixed the price of Product 2.

How common ownership of Product 2 changes the pricing incentives for Product 1, starting at pre-merger prices?

Think in terms of the incentives to sell more units of Product 1 (the reverse of raising the price of Product 1).

Owning Product 2 creates a <u>disincentive</u> to sell more units of Product 1.

- Suppose the DR is 25%: for every 4 extra units sold of Product 1 *by lowering its price*, 1 fewer unit of Product 2 is sold.
    - [The higher the diversion ratio, the greater the disincentive to sell units of Product 1]

- The per-unit opportunity cost of selling Product 1 that is borne (internalized) by the merged firm but not Firm 1 is equal to:
    - The product of the diversion ratio to Product 2 and the margin on Product 2. This is the <u>value of diverted sales.</u>

- If the value of diverted sales is proportionately small (relative to the price of Product 1), significant unilateral price effects are unlikely. The merged firm will continue to have an incentive to lower price.

Example (Shapiro 2010)

Products 1 and 2 each sell for 100 €

MC of each is 60 €,

Each unit sold contributes 40 € towards covering fixed costs and earning profits.

DR=25%.

- For every four extra units sold of Product 1, one unit of Product 2 is cannibalized, leading to a lost contribution of 40€.

- Thus, every extra unit sold of Product 1 reduces Product 2's contribution by 10€.

- 25% x 40 = 10

Combining the ownership of Products 1 and 2 thus creates a 10€ per-unit disincentive to sell units of Product 1.

In economic terms, the merged entity bears a 10€ per-unit opportunity cost not borne by Firm 1.

This is akin to an increase in costs. An increase in costs will lead to higher prices

Treatment in US HMG Guidelines

The value of diverted sales, taken alone, does not quantify the magnitude of any post-merger price increase. Rather, as the US HMG state, it:

- "can serve as an indicator of the upward pricing pressure on the first product resulting from the merger."

- "In some cases, where sufficient information is available, the Agencies assess the value of diverted sales, which can serve as an indicator of the <u>upward pricing pressure</u> on the first product resulting from the merger"

- Diagnosing unilateral price effects based on the value of diverted sales <u>need not rely on market definition</u> or the calculation of market shares and concentration.

- The Agencies rely much more on the value of diverted sales than on the level of the HHI for diagnosing unilateral price effects in markets with differentiated products. If the value of diverted sales *is proportionately* small, significant unilateral price effects are unlikely."

A good screen for phase I?

The Guidelines do not specify a standard such as GUPPI=10% for establishing a presumption of significant competitive concerns.

Moreover, because the *GUPPI does not take into account several relevant* factors—such as merger synergies (e.g., reductions in variable costs, increases in product quality, and faster innovation), competitor responses (e.g., entry and product repositioning), and other factors:

- *a high GUPPI by itself would not prove that a merger would be anticompetitive.*

In other words, any type of presumption of anticompetitive effects flowing from a high GUPPI score would be rebuttable.

- *But a high GUPPI would suggest that the transaction creates a greater risk of anticompetitive effects than a low GUPPI and thus invites closer scrutiny.*

Connection between GUPP, price increases and MD

The *GUPPI is a useful metric because it is a rough measure of post-merger pricing incentives.*

- *In particular, under the assumption of linear demand and constant marginal costs, one can show that the post-merger profit-maximizing single-product price increase of Product 1 is equal to one-half of GUPPI1*
  - *(ignoring price changes for other products in the market—including Product 2 of the merger partner—merger synergies, competitor responses and other factors).*

The fact that the *GUPPI is equal to twice the profit-maximizing SSNIP (assuming linear demand and constant marginal costs) implies a relationship between the GUPPI and the hypothetical monopolist test for market definition.*

- *If any one of the GUPPIs (e.g., GUPPI1, GUPPI2, or the Uniform GUPPI) is larger than 10%, then the merging products by themselves would constitute a relevant antitrust market under the hypothetical monopolist test with a 5% SSNIP*

Intrinsic limitation of GUPPI (and variants)

Before considering some specific unilateral effects scenarios that could emerge in the full investigation of a merger we note that:

One substantial limitation on the application of GUPPI and other variants as diagnostic tools is that they are designed to assess unilateral effects.

Coordinated effects do not arise from the internalization of the competition between the merging firms: No UPPI-type formula reflecting the magnitude of internalized competition can be useful in gauging coordinated effects.

- Economic models can be employed in a quantitative assessment of coordinated effects, but only limited progress has been made in doing so.

Scenario 1: Price competition in differentiated goods (e.g. branded consumer goods)

In the full investigation of a merger involving differentiated products, the logic of the GUPPI is correct:

- Diversion ratios are crucial, so an agency should devote substantial resources to estimating them.

With *reliable* diversion ratios and margins, GUPPI or related analytic tools can be applied

- but none should be without first examining prevailing patterns of competitive interaction (e.g. habit formation or stocking behavior in fast moving consumer good industries can lead to serious biases)

Even in this scenario there are complexities

Feedback effects

Repositioning by rivals

New entry

Countervailing buyer power (e.g. retailers)

Dynamic strategies to foreclose markets (e.g. through product proliferation or controlling access to shelf space)

Competition on dimensions such as advertising and R&D etc.

…But note: Ignoring complexities at the start is not necessarily problematic:

- The pricing story told by UPP/merger simulation or other diagnostic tools is never the whole story of any real-world competitive process...

- …but it often is the part of the story that really matters in determining the relatively near-term effects of a merger.

Ignoring complexities is highly problematic, however, if they make the pricing story is mostly wrong.

- it is appropriate to focus **on marginal price adjustments** as the unilateral effect of concern while **holding constant all other dimensions of competition** (at least for the purpose of determining the relatively short-term impact of the merger).

- E.g. Oracle / Sun: are prices the dimension of interest?

Other unilateral effects scenarios where UPP and variants may not be useful

We turn now to unilateral effects scenarios illustrating that the economic forces critical with differentiated consumer products often are not the forces that really matter.

- In one scenario, the anticompetitive effect of the merger **does not manifest itself in a short-run marginal decision on price or output.**

- In the other scenario, the anticompetitive effect of the merger does manifest itself in a short-run marginal pricing decision, but **the particularities of the competitive process greatly affect the nature and extent of the anticompetitive effects**

Reduction of capacity (and associated fixed cost reductions)

With standardized products and no brands of significance, one should focus on the supply side (not demand)

A merger can produce a unilateral anticompetitive effect if the merged firm can materially reduce the available supply and thereby drive up the market price if capacity is fairly tight and demand is not especially elastic.

- by a simple reduction in output or

- by shutting down productive facilities.

But the strategy of shutting down capacity often dominates that of just reducing production because it can avoid substantial costs that otherwise would be incurred.

Reduction of capacity (and associated fixed cost reductions)

With some mergers, therefore, the most plausible unilateral anticompetitive effect would be manifest in the post-merger decision to dismantle a manufacturing facility.

- The plant-closing decision implicates benefits and costs to the merging firm different and often dwarfing those arising from a marginal reduction in production.

- The analysis of the effects of a merger on the plant-closing incentive must focus largely on those particular benefits and costs, which are not reflected in conventional margins or diversion ratios.

- Important factors with plant decommissioning could be: (i) the value of land or production assets in alternative uses, (ii) the amount of required severance payments to workers, (iii) sunkness of exit costs, etc

Note: Identification of the competitive landscape, and in particular the identity of the suppliers that would exert a competitive constraint on the merging parties post merger remain important.

Traditional market definition tools (e.g. SSNIP tests or critical loss analysis) are often useful even if accurate delineation of market boundaries should not be a goal in itself

"Bidding-like" markets

A second scenario involves competition that occurs essentially through a procurement auction.

- Each procurement entails an entirely separate price determination
- Customers are differently "situated" in a way that affects potential suppliers' costs of serving them.
    - For example, suppliers and customers could be differentiated by location with transportation sufficiently costly to make the differentiation meaningful.
    - Customers may value product characteristics differently

Competition under these circumstances can be modeled as a second-price (or Vickrey) auction, in which the contract is awarded to the low bidder at the second-lowest bid.

- The outcome of a second-price auction is exactly the same as that of an oral auction where bidders pull out as lower prices are announced until only one bidder is left.

"bidding-like" markets

In a second-price procurement auction, the optimal strategy for each participant is to bid its cost:

(e.g. A:100 – B:120 – C:140 etc...)

Consequently, the winning bidder is the lowest- cost supplier and its profit is its cost advantage over the second-lowest-cost supplier. Above A wins and charges 120 to the buyer.

If two suppliers merge with no synergies, they submit the lower of the two bids the two merging firms would have submitted.

If A and B merge they submit the two lowest bids (100) , the next-lowest-cost supplier C now sets the price (140)

- and the increase in the amount the customer pays is the difference between the costs of the second- and third-lowest-cost suppliers (140-120).

A merger in this auction setting has no marginal effect on the level of bids that could be gauged with a UPPI-type formula :margins do not matter, or diversion ratios

Indeed, *there is no actual diversion* in this context:

- the lowest-cost supplier is awarded every contract,
- and absent synergies, a merger does not alter the identity of the lowest-cost supplier.

More importantly: the effect of the merger on the amount customers pay *is determined by characteristics (e.g cost efficiency) of non-merging suppliers*.

If the merger generates synergies and thus reduces the cost of either merging firm (e.g. 100 -> 80), the impact of the cost reduction is quite different from that with a merger involving branded consumer products:

- When the merged firm is awarded the contract, the customer pays the cost of the next-lowest-cost supplier (still 140), so the reduction in the merged firm's marginal cost has no effect

But suppose the merger is between B and C and there are efficiencies:

- 120->80. This causes the merged firm to become the lowest-cost supplier so the customer also benefits by paying 100)

But the reduction in marginal cost from the merger does affect what the customer pays EVEN when the merged firm is not awarded the contract but sets the price as the second-lowest bidder.

- 120-> 110 : This does not alter the identity of the winner. Still A (the non-merging firm). Customer pays 110

Conclusion: There are different tools to evaluate unilateral effects

The foregoing scenarios are illustrative of the fact that many specialized tools are required to assess unilateral effects.

- The analytic tools used in merger assessment, including the SSNIP test to delineate markets can be, and always should be, specialized tools designed for particular applications.

Absent from the recent debate over tools for evaluating unilateral effects has been clear recognition that one "size does not fit all".

The debate has focused on unilateral effects from differentiated products mergers without acknowledging that is merely one of many scenarios encountered in merger assessment.

A competition agency can go badly astray if it chooses an analytical tool for merger assessment without first identifying the dimension(s) of competition most likely to be affected significantly, the nature of the likely effects, and the mechanism through which each could be produced.

Market definition remains 'a useful tool'

It enables you to identify area(s) of overlaps and therefore focus for any theories of harm (where might the merger effects arise?)

It is a necessary precondition for discussion about issues, e.g. entry into "the market". Be clear that this does not preclude analysing constraints from outside the market or between different segments within the market. This is part of why courts like it.

Some specific circumstances may exist where the boundaries of the market matter:

- Where market shares convey useful information about likely price effect of the merger (but note difficulty of accurately defining SSNIP market) or about diversion ratios

- If want to delineate the products that are affected by any SLC?

- In bidding markets (knowing who are potential bidders)

Lawyers v Economists?

The courts like a clear analytic framework

Market definition gives them a language to discuss/understand issues in a case – it is the optic they will see the SLC and the remedies decisions through. (It is also what they are trained to expect in competition cases).

They will not require undue or pointless analysis, but will want clarity of reasoning, with supporting evidence, to underpin the analysis:

See the CAT recently: **"impressed by the evident determination of the CC not to be enslaved by any particular market definition**, but rather to assess the competition problems arising in the sale of PPI on an empirical rather than overly theoretical basis which, while no doubt influenced by market definition, was by no means controlled or dominated by it"**.**

Conclusion on UPP

All the caveats above do not mean that it is not worth collecting data on margins and diversion ratios

- Margins are a good indicator of pre-merger competition

- Diversion ratios are a good indicator of the competitive constraint lost through merger

- The GUPPI is a good measure of the value of the sales internalised as a result of the merger

All of this is definitely valuable!

It is like good wine, superb in the right circumstances, a waste in others

US experience in 2011

The DOJ challenged 18 mergers in 2011 and caused two others to be abandoned once the agency threatened to block the deal -- more than double the number of transactions the agency contested in 2010.

The DOJ's most noteworthy successes were in court:

- Successful challenge to H&R Block Inc.'s / 2nd Story Software Inc., the developer of TaxAct digital tax preparation products. It was the DOJ's first merger trial since its 2004 defeat in Oracle / PeopleSoft Inc. and its first merger litigation victory since 2003.

- AT&T's / T-Mobile abandoned.

The FTC also has stepped up its merger enforcement activity. The FTC was in court on five mergers in 2011, a substantial increase over 2010. All five cases involved the healthcare industry.

DOJ

Despite the agencies' de-emphasis of market definition in their revised Merger Guidelines, market definition played a critical role in the agencies' victories (and losses) last year.

As acting Assistant Attorney General Sharis Pozen noted: "Market definition retains the key role it has always played in division investigations."

AT&T-T-Mobile:

- while local markets are appropriate geographic markets from the perspective of individual consumers, the four largest wireless carriers make their competitive decisions, such as marketing, pricing and technology deployment, on a national level, without accounting for competition from regional carriers.

- Therefore, the DOJ brought the case on the theory that the transaction will have "nationwide competitive effects across local markets."

- This approach virtually eliminated the possibility of settling the case through a city-by-city-based structural fix.

FTC

Two major losses by the FTC also turned on market definition:

In Lundbeck, the FTC argued that the only two drugs approved to treat a certain heart condition were in the same product market because they were functionally interchangeable.

- The court, however, rejected the FTC's market definition, relying on the testimony of physicians who stated the price of the drugs was not a factor in their treatment decisions and

- on economic evidence that the cross-elasticity of demand between the two drugs was low.

In LabCorp, the FTC alleged that capitated services were a separate market from fee-forservice laboratory services. The court disagreed and noted

- that the FTC had previously relied upon a broader market definition (all clinical laboratory testing services) in a 2003 Quest Diagnostics Inc.-Unilab Corp. transaction and

- that Commissioner Thomas Rosch had dissented

Example: Thomas Cook/Co-op/Midland – Product market for holidays

- Parties' view – national market for all holidays, however sold

- Overlap → Most immediate and significant effects in sale of overseas package holidays via high street travel agents (Candidate Market)

- Sensible choice for three reasons (JV businesses weighted towards the area; specific features which differentiated these products and channels; majority of package holidays still sold on high street)

- Considered constraints from outside the market (Internet) and possibility of segmentation within it (different types of package holiday, destinations etc)

- Competitive assessment could identify other constraints (eg price perception gained from other non-JV travel agents)

- Following competitive assessment, no firm view on which subset of constraints identified would satisfy HMT. Satisfied (with reasons) that no choice of market definition that was defensible based on analysis would have led to different result on the substantive effect of the JV

Example: Zipcar/Streetcar – Car Clubs

- Parties' view – broad transport market (including car rental, taxis and public transport)

- But internal documents and marketing materials and views of other car clubs indicated a strategic focus on competition between car clubs

- Products that may have been most directly affected by merger were car club services, so this was our candidate market, but acknowledged constraints from outside the market and considered these in assessment of competitive effects.

- CC quantitative analysis (as part of competitive effects analysis) confirmed narrow market (which satisfied the HMT)

- **Ultimately, it didn't matter whether talking about merger in a narrow market or between close competitors on a wider market. Our assessment of the effect of the merger on competition would have been the same.**