Competition Policy in Two-Sided Markets

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December 9, 2014
Symposium in honor of Jean Tirole

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Two-sided markets

- Two-sided market: A firm sells two products or services to two groups of customers and demands are interrelated through indirect network effects.
- When choosing, customers do not take network effects into account (do not internalize, hence externalities, different from complements).
- When setting prices or quantities, firms take network effects into account (internalize).
- Example here: daily newspapers:
  - newspaper publishers sell content to readers, and advertising slots to advertisers
  - knowing that advertisers value a higher number of readers and readers may be affected by the number of advertisements.
- Reasoning also applies to other contexts, such as: TV, credit and debit cards, search engines, online intermediaries such as eBay, social networks such as Facebook.

Merger assessment

- Recent surge in merger cases in two-sided markets (Google-DoubleClick, Dutch flower auction houses, Dutch yellow page directories, Deutsche Börse-NYSE Euronext). Running example here: proposed merger between newspaper publishers—like recently in Belgium.
- Yet, two-sided nature of the market has played only a minor role in the decision:
  - size of the indirect network effects has not been assessed
  - decision only based on the effects on one market side
  - or separately for each market side.
- For instance, in the 2006 decision concerning Springer and Pro Sieben/Sat.1 the Bundeskartellamt did not take into account that TV viewers might dislike advertising.

This talk

- In general, conclusions depend on the sign and size of the indirect network effects.
- Difficult to judge whether conclusions would have been different had the two-sided nature of the market been fully taken into account.
- But natural to wonder to what extent competition authorities should dedicate more resources to
  - the assessment of the two-sided nature of a market and thus to the quantification of the relevant network effects
  - using adjusted methods that take the two-sidedness of the market into account.
- Outline what can be done. Focus on the assessment of a merger with respect to unilateral effects.
- Methods: concentration analysis, SSNIP test, UPP, merger simulation.

Own work on merger assessment in two-sided markets

- Filistrucchi, L., D. Geradin, E. van Damme, S. Keunen, T.J. Klein, T. Michielsen, and J. Wileur (2010): "Mergers in Two-Sided Markets—A Report to the NMa," Nederlandse Mededingingsautoriteit, The Hague, Netherlands, 183 pp.
- Filistrucchi, L., T.J. Klein, and T.O. Michielsen (2012): Assessing Unilateral Merger Effects in a Two-Sided Market: An Application to the Dutch Daily Newspaper Market, *Journal of Competition Law and Economics*, 8(1), pp. 1-33. Reprinted in: *Advances in the Analysis of Competition Policy and Regulation*.
- Affeldt, P., L. Filistrucchi, and T.J. Klein (forthcoming): "Upward Pricing Pressure in Two-Sided Markets" *The Economic Journal*.
- van Dalen, R. and Klein, T. J. (2014): "Mededingingsbeleid voor internetmarkten met netwerkeffecten," Economisch Statistische Berichten, pp. 44-49.

Background: theoretical literature on oligopoly in two-sided markets

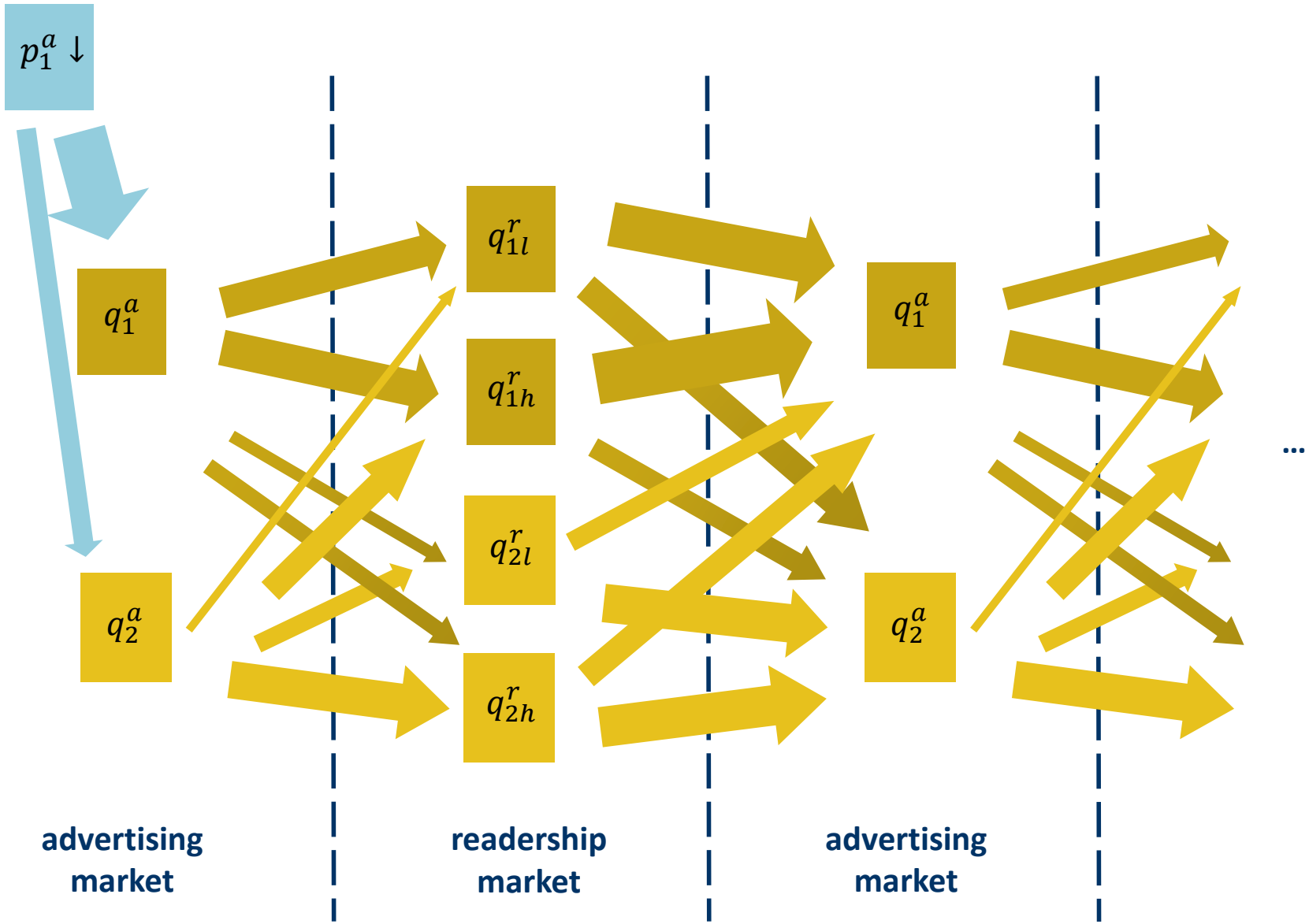
- Gabszewicz J.J., Laussel, D. and N. Sonnac (EER, 2001): Hotelling duopoly, no effect of advertising on readers.
- Anderson and Coate (RevStud, 2005): price to viewers, advertising quantity.
- Armstrong (Rand, 2006): Hotelling duopoly.
- Chandra and Collard-Wexler (JEMS, 2009): Hotelling duopoly.

Background: structural empirical literature on oligopoly in two-sided markets

- Rysman (RevStud, 2004): phone directories in the US, no price for users.
- Kaiser and Wright (IJIO, 2006): magazines in Germany, Hotelling duopoly.
- Argentesi and Filistrucchi (JAE, 2007): newspapers in Italy, no effect of advertising on readers.
- Jeziorski (under review, 2012): radio in the US, no price for listeners.
- Fan (AER, 2013): newspapers in the US, no effect of advertising on readers.

Technical difficulty: feedback loops in two-sided markets

- Two-sidedness of markets has often not been fully taken into account because tools that are used have mainly been developed for one-sided markets.
- Wright (2004): analyzing a two-sided market as if it were a single-sided market may lead to mistakes and unintended consequences in the application of competition policy.
- Two indirect network effects lead to a loop and may lead to multiple equilibria in both,
  - the consumers' coordination game: for instance, given the prices set by firms, it might be the case that everybody chooses one platform, or another one
  - the firms' pricing game; here, results from one-sided markets do not directly carry over.


$p_1^a \downarrow$
q_1^a
q_2^a
q_{1l}^r
q_{1h}^r
q_{2l}^r
q_{2h}^r
q_1^a
q_2^a
...
advertising market
readership market
advertising market

Intuition

Consider for instance a merger between newspaper publishers. Will it lead to higher cover prices?

- Usual two-sided market story:
  - as the cover price increases, not only some readers stop buying (as in a one-sided market) but also advertising demand will decline
  - therefore, advertising prices may increase more than subscription prices.
- Additional effects with heterogeneity:
  - as the cover price increases, some readers are more likely to stop buying (those with low incomes)
  - these readers may be of different value to the advertisers than those who keep on buying
  - therefore, effects of the merger ultimately depend also on the relationship between price sensitivity and value to advertisers.

Concentration analysis

- Initial screening traditionally based on analysis of market shares of the merging parties and the Herfindahl-Hirschman index (HHI).
- Market definition always an issue.
- Does not take the two-sidedness of the market into account.
- Case is similar to
  - Weisman (2005) and Tardiff and Weisman (2009): traditional market power measures are biased under multi-market participation and demand interdependence
  - presence of direct network effects: more concentration may be better for consumers.

SSNIP test

- Stands for "small but significant non-transitory increase in price". The SSNIP test has originally been designed for market definition.
- Ask the question whether increasing one price on one market side by 5% or 10% is profitable for the merged firm.
- Do this for each price and each market side.
- Possible to take feedback loops into account.

UPP

- Stands for "upward pricing pressure".
- After the merger, firms will internalize the effects of their price setting on previously competing firm.
- UPP measures whether increasing the price is profitable.
- One for each product and each market side.
- Non-trivial: need to take feedback loops into account. Affeldt, Filistrucchi and Klein (forthcoming) show how this can be done.

Table 4

Two-sided Upward Pricing Pressure (UPP) Measures

	GUPP	*EC*	*UPP*	*UPP**	*GUPPI*$^{+}$	*GUPPI*$^{*+}$	*NEC*
Advertising: first firm with newspapers …							
AD1	0.38	−0.31	0.07	0.12	0.02	0.02	0.41
NRC	0.24	−0.20	0.04	0.07	0.03	0.04	0.58
NRN	0.12	−0.03	0.09	0.10	0.03	0.03	0.64
PAR	0.04	−0.05	−0.01	−0.01	0.01	0.02	0.24
TRO	0.08	−0.08	0.01	0.02	0.02	0.03	0.41
VOL	0.32	−0.16	0.16	0.19	0.04	0.05	0.66
… merging with the second firm with newspapers …							
GOO	0.00	−0.01	−0.01	−0.01	0.01	0.01	0.07
HAR	0.01	−0.03	−0.02	−0.02	0.00	0.00	0.07
LEI	0.01	−0.04	−0.04	−0.04	0.00	0.00	0.07
NOR	0.02	−0.04	−0.02	−0.02	0.01	0.01	0.08
TEL	0.40	−0.24	0.17	0.20	0.03	0.03	0.37
Subscriptions: first firm with newspapers …							
AD1	4.27	−8.40	−4.12	−3.65	0.02	0.02	0.03
NRC	6.64	−11.63	−4.98	−4.33	0.02	0.02	0.03
NRN	5.59	−3.89	1.71	2.28	0.03	0.03	0.07
PAR	10.07	−7.66	2.41	3.23	0.04	0.04	0.07
TRO	6.61	−8.99	−2.38	−1.75	0.02	0.02	0.04
VOL	7.08	−8.87	−1.79	−1.12	0.03	0.03	0.04
… merging with the second firm with newspapers …							
GOO	13.33	−6.84	6.49	7.69	0.05	0.06	0.10
HAR	11.70	−8.86	2.84	3.88	0.05	0.05	0.07
LEI	11.32	−10.20	1.12	2.11	0.05	0.05	0.06
NOR	6.86	−6.43	0.43	1.02	0.03	0.03	0.05
TEL	10.36	−8.45	1.90	2.79	0.04	0.05	0.06

Notes. See notes to previous Table. All measures are adjusted for indirect network effects as described in the main text.

Merger simulation

- Can formulate a complete economic model of a two-sided market.
- Estimate demand parameters and marginal costs.
- Then simulate effects of a merger.

Filistrucchi and Klein (2013)

- Develop a structural empirical model of a two-sided market with heterogeneous consumers and network effects...
  - ...that allows for the existence of indirect network effects in both directions and for firms setting prices on each side of the market
  - ...and allows to predict counterfactual equilibria (e.g. after a merger).
- Provide testable conditions for
  - demand to be unique given prices on the two-sides; "solves" issue of multiple equilibria in the consumers' coordination game
  - equilibrium existence and uniqueness.

General conclusions

- Can still use most of the "usual tools" that we know from one-sided markets.
- Possible (and in general necessary) to take the two-sidedness into account.
- Our finding in the context of newspapers: advertising prices more likely to increase because advertisers care about readers.

New markets and direct network effects

- So far have only incorporated indirect network effects: advertisers care about readers and readers care about advertising.
- But direct network effects may also play an important role: users on Facebook care about the number of users on the same market side.
- Leads to additional tendency towards concentration and additional challenges for competition policy.
- Important: may be benefitial for consumers if effect of resulting increase in prices (or nuisance) is lower than increase in utility due to direct network effect.

New markets and the advertising market

- Empirical studies typically assume single-homing and then use a simple model for the advertising market without cross-price effects (conditional on quantities on the other market side).
- May not be accurate description of reality:
  - targeting by advertisers
  - increasing opportunity costs of funds or advertising budgets
  - multi-homing by consumers.
- Additional layer of complexity. Risk: wrong conclusions.

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Summary and conclusions

- Theory of two-sided markets helpful for competition policy in new markets.
- Using conventional tools without accounting for two-sidedness may yield wrong conclusions.
- Conventional tools can be used in two-sided markets
  - if properly adjusted
  - and if the right data are available.