THE ECONOMICS OF TWO-SIDED MARKETS DOCTORAL COURSE UNIVERSITY OF PORTO, APRIL 10-13, 2012

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1. Overview of basic concepts (2 hours)

This part aims at introducing the basic features of two-sided (more generally, multi-sided) markets. Two-sided markets share four common features:

- (1) Various groups of participants interact via a platform. Several examples of two-sided platforms are given to illustrate what is meant by 'groups of participants' and how these groups take value from the interaction they can achieve via the services of the platform.
- (2) Cross-side (or inter-group) effects are present. These effects refer to the fact that the value of the platform for participants in one group depends on decisions taken by participants of the other group. Various types of cross-side effects are presented through a set of examples.
- (3) Platforms are often actively managed. Cross-side effects pose important challenges for the working of two-sided markets. To start with, inducing participation is problematic as participants on each side are likely to wait for the other side to make a move. This is why intermediary firms manage platforms and develop strategies aimed at 'internalizing' the cross-side effects. While various strategies are described, the focus is put here on basic pricing principles for a monopoly platform.
- (4) Few platforms are active in a single market. Cross-side effects also pose important challenges for competition in two-sided markets. These effects create self-reinforcing mechanisms that often lead to market dominance by a single platform or very few of them. To understand this, one must first correctly define the market itself and market power in two-sided markets.

References

- Armstrong, M. 2006. Competition in Two-Sided Markets. RAND Journal of Economics 37, 668–91.
- [2] Belleflamme, P. and Peitz, M. 2010. Industrial Organization: Markets and Strategies (Chapter 22). Cambridge: Cambridge University Press.
- [3] Evans, D. 2003. Some Empirical Aspects of Multi-Sided Platform Industries, Review of Network Economics 2, 191-209.
- [4] Rochet, J.-Ch., and Tirole, J. 2003. Platform Competition in Two-Sided Markets. Journal of the European Economic Association 1, 990–1029.
- [5] Rochet, J.-Ch., and Tirole, J. 2006. Two-Sided Markets: A Progress Report. RAND Journal of Economics 37, 645–67.

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PAUL BELLEFLAMME

- [6] Spulber, D. 2010. Solving the Circular Conundrum: Communication and Coordination in Two-Sided Markets. Northwestern University Law Review 104, 537-591.
- [7] Weyl, E.G. 2010. A Price Theory of Multi-Sided Platforms. American Economic Review 100, 1642-1672.

2. Platform competition (3 hours)

This part aims at extending the study of platform competition (sketched at the end of Part 1) in several directions, which will later inform the analysis of competition policy in two-sided markets. The focus is deliberately put here on recent contributions.

- (1) Viability of competition in two-sided markets. Several determinants of the number and relative size of competing platforms are discussed: on the one hand, cross-side effects, single-homing and scale economies lead to concentration; on the other hand, within-side effects, multi-homing, congestion and platform differentiation lead to the coexistence of platforms.
- (2) Effects of competition in two-sided markets. It is not clear whether an increase in competition in two-sided markets always leads to a more efficient or balanced price structure; competition may sometimes lead to higher prices. The plausibility of such situation is examined.
- (3) Competition in two-part tariffs. The analysis of platform competition is usually simplified by assuming that platforms focus either on membership or on usage fees. In practice, platforms often combine the two types of fees. It is thus important to examine the implications of two-part tariffs in terms of profits and welfare.
- (4) Dynamic issues. Another common simplification in the analysis of platform competition is to assume that agents (platform operators and participants on both sides) make one-time decisions. After discussing the conditions under which the static model is a reasonable approximation of more complex dynamic models, two types of dynamic settings are considered. In the first, participants make usage decisions more regularly than membership decisions. In the second framework, the usual static setting is preceded by sellers' investment decisions.

References

[1] Belleflamme, P. and Peitz, M. 2010. Platform Competition and Seller Investment Incentives. European Economic Review 50, 1059-1076.

[2] Belleflamme, P. and Toulemonde, E. 2009. Negative Intra-Group Externalities in Two-Sided Markets. International Economic Review 50, 245-272.

[3] Böhme, E. and Müller, C. 2010. Price-Increasing Competition on Two-Sided Markets with Homogeneous Platforms. Mimeo.

[4] Cabral, L. 2011. A Dynamic Theory of Two-Sided Markets. Mimeo.

[5] Reisinger, M. 2011. Unique Equilibrium in Two-Part Tariff Competition between Two-Sided Platforms. Mimeo.

[6] White, A., and Weyl, E.G. 2011. Insulated Platform Competition. Mimeo.

3. Application to specific industries (3 hours)

While a general analysis is useful to derive a set of principles that commonly apply to the majority of two-sided markets, various industries pose a number of specific issues that are better addressed separately.

 $\mathbf{2}$

- (1) Payment cards. The simple settings usually used in the two-sided market literature may not adequately account for the complex structure of payment cards networks. Payment card transactions involve indeed a set of interrelated bilateral transactions between consumers and their banks (so-called issuers), merchants and their banks (so-called acquirers), and among banks via some network operators. These transactions generate a set of distinct monetary transfers. Examining the implications of this complex fee structure and of other rules imposed by network operators is crucial to assess the welfare impact of regulatory interventions in this industry.
- (2) Media markets. A common feature of media markets is the presence of advertisers on one side of the market. While readers or viewers exert positive cross-side effects on advertisers, the reverse is not necessarily true: advertisers may exert positive cross-side effects on some users (identified as 'ad-lovers') but negative effects on other users (identified as 'ad-haters'). This feature sets media markets apart from other two-sided markets where it is generally reasonable to assume that cross-side effects have the same sign for all participants on a given side. It is important to examine how this feature affects media platforms when they make their decisions about advertising prices and content provision.
- (3) Software platforms. Software platforms link software developers to endusers. A major issue is the degree of compatibility between competing platforms: to what extent can a software developed for one platform be 'ported' to another platform. Platform operators affect the degree of compatibility through the design of platforms (by keeping them proprietary, or by making them open) and through exclusive contracts. It is therefore important to understand the impact of these compatibility decisions on competition between software platforms.
- (4) *E-commerce*, *B2B* and matching platforms. In matching environments, it is often more the expected quality of the pool of participants than its expected size that affects an agent's decision to join a particular platform. How does the presence of such composition effects affect platform competition?
- (5) *Mobile telephony.* Fixed-to-mobile telecommunications networks can be represented as two-sided platforms with a single-homing side (mobile subscribers wish to join at most one mobile operator) and a multihoming side (callers on the fixed telephone networks wish to call mobile subscribers of all operators). This representation is useful to shed light on the way mobile operators set fixed-to-mobile termination rates and on the potential effects of regulation on such rates.

References

 Anderson, S., and Coate, S. 2005. Market Provision of Broadcasting: A Welfare Analysis. Review of Economic Studies 72, 947–972.

[2] Armstrong, M., and Wright, J. 2007. Two-sided Markets, Competitive Bottlenecks and Exclusive Contracts. Economic Theory 32, 353-380.

[3] Caillaud, B. and Jullien, B. 2003. Chicken & Egg: Competition among Intermediation Service Providers. Rand Journal of Economics 34, 309–328.

[4] Clements, M. and Ohashi, H. 2005. Indirect Network Effects and the Product Cycle: Video Games in the U.S., 1994–2002. Journal of Industrial Economics 53, 515–542.

[5] Chakravorti, S. 2010. Externalities in Payment Card Networks: Theory and Evidence. Review of Network Economics 9, Iss. 2, Article 3.

PAUL BELLEFLAMME

[6] Damiano, E. and Li, H. 2008. Competing Matchmaking. Journal of the European Economic Association 6, 789–818.

[7] Gabszewicz, J., Garela, P., and Sonnac, N. 2007. Newspapers' Market Shares and the Theory of the Circulation Spiral. Information Economics and Policy 19, 405-41.

 [9] Genakos, C. and Vanetci, T. (2007). Testing the waterbed Enlect in Mobile Felephon. Minuco.
[9] Lee, R. S. 2010. Vertical Integration and Exclusivity in Platform and Two-Sided Markets. Mimeo.

[10] Rochet, J.-Ch., and Tirole, J. 2002. Cooperation among Competitors: Some Economics of Payment Card Associations. Rand Journal of Economics 33, 549-570.

[11] Tirole, J. 2011. Payment Card Regulation and the Use of Economic Analysis in Antitrust. TSE Notes $n^{\circ}4$.

4. Competition policy and regulation in two-sided markets (2 hours)

The insights gathered from the previous three parts are now combined to derive implications for competition policy and regulation in two-sided markets. The main challenge is to move from a conventional 'one-sided' logic to a suitable 'multi-sided' logic when dealing with cases involving platforms. As revealed by the previous analyses, this exercise is fraught with difficulty. On the one hand, strong crossside effects increase the risks of dominance and are likely to lead to skewed price structures; this naturally places platforms under competition authorities' scrutiny. On the other hand, agents may be better off if they can all interact on the same platform, meaning that less concentration may decrease welfare. It must also be noted that many platforms operate in sectors that are already subject to specific modes of regulation. It is with this general trade-off in mind that unilateral and coordinated conduct are analyzed. Recent cases are used to illustrate the analysis.

- (1) Exercise of unilateral market power. Market power and its potential anticompetitive effects may easily be over-estimated if the following characteristics of two-sided markets are not well understood: (i) the efficient price structure must not reflect the cost structure; (ii) prices above marginal cost do not necessarily indicate market power, nor do prices below marginal cost necessarily indicate predation or cross-subsidization; (iii) exclusive contracts or tying arrangements that platforms use on one side of the market may have new efficiency justifications but they may also lead to tipping.
- (2) Mergers. Two-sided markets generate a new form of efficiency defenses for clearing mergers between platforms. For instance, it has been shown, both theoretically and empirically, that mergers in two-sided markets may not necessarily lead to higher prices for either side of the market. Moreover, when the intensity of cross-side effects increases as a result of the merger, all participants may see an increase in surplus even when prices do rise for both sides of the market. As for vertical mergers, they may be needed to solve the chicken-and-egg problem that arises when launching two-sided platforms.
- (3) Coordinated Practices. A priori, collusion seems harder to sustain in twosided than in one-sided markets. If competing platforms agree to fix prices on one side, they will tend to compete the supracompetitive profits away on the other side. This means that more agreements and additional monitoring are required to sustain collusion. Also, as hinted for mergers, it cannot be excluded that collusion may be welfare-enhancing.

^[8] Genakos, C. and Valletti, T. (2007). Testing the Waterbed Effect in Mobile Telephony. Mimeo.

(4) Regulation. What needs to be understood regarding regulation in two-sided markets is that regulating prices on a platform may not be competitively neutral. Also, it is not clear whether regulating platform prices eventually benefits end-users. So-called 'waterbed effects' may be observed, whereby a price reduction imposed on one side of the market eventually leads to a price increase on the other side of the market.

References

[1] Belleflamme, P. and Peitz, M. 2010. Industrial Organization: Markets and Strategies (Chapter 22). Cambridge: Cambridge University Press.

[2] Chandra, A. and Collard-Wexler, A. 2009. Mergers in Two-Sided Markets: An Application to the Canadian Newspaper Industry. Mimeo.

[3] Chang, H., Evans, D. and Garcia-Swartz, D. 2005. The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia. Review of Network Economics 4, 328–358.

[4] Chao, Y., and Derdenger, T. 2011. Mixed Bundling in Two-Sided Markets: Theory and Evidence. Mimeo.

[5] Choi, J.P. 2010. Tying in Two-Sided Markets with Multi-Homing. The Journal of Industrial Economics 58, 607-626.

[6] Dewenter, R., Haucap, J., and Wenzel, T. 2011. Semi-Collusion in Media Markets. International Review of Law and Economics 31, 92–98.

[7] Evans, D. and Schmalensee, R. 2008. Markets with Two-Sided Platforms. Issues in Competition Law and Policy (ABA Section of Antitrust Law) 1, 667–693.

[8] Filistrucchi, L. 2008. A SSNIP Test for Two-Sided Markets: The Case of Media. Mimeo.

[9] Hagiu, A. and Lee, R.S. 2011. Exclusivity and Control. Journal of Economics and Management Strategy 20, 679-708.

[10] Lee, R. S. 2010. Vertical Integration and Exclusivity in Platform and Two-Sided Markets. Mimeo.

[11] Ruhmer, I. 2011. Platform Collusion in Two-Sided Markets. Mimeo.

[12] Wright, J. (2004). One-sided Logic in Two-sided Markets. Review of Network Economics 3, 44–64.