

Pricing & revenue architecture

What is a two-sided market?

In a two-sided market, a platform serves two linked groups, and the split of the price between them changes trade volume. Its theory is mostly models.

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Management summary A two-sided market is one in which a platform serves two distinct groups, at least one of which gains when the other is on board, and in which the split of the total price between them changes how much is traded. This concept guide defines the two-sided market and the network effects behind it (Rochet and Tirole; Parker and Van Alstyne), explains why such a platform sets a price structure and not only a price level, sets out what the models predict about which side to subsidize and how multihoming changes that, reports a study in which more complementors produced no overall network effect (Boudreau and Jeppesen), and gives a one-page record for a two-sided pricing decision. The sources are two formal models and one empirical study.

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What is a two-sided market?

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A two-sided market is a market in which a platform serves two distinct groups, at least one of which gains when the other group is on the platform, and in which it matters how the platform splits its charges between them. Rochet and Tirole (2003)³, writing when “two-sided markets have received scant attention”, observed that “many if not most markets with network externalities are characterized by the presence of two distinct sides whose ultimate benefit stems from interacting through a common platform”. Their examples are game consoles and the developers who write for them, and payment cards and the merchants who accept them.

³ Rochet, J.-C., & Tirole, J. (2003). Platform competition in two-sided markets. *Journal of the European Economic Association*, 1(4), 990-1029.

Their test is about charges, not about how many groups a firm can name. A market with network externalities is two-sided, on their definition, when the platform can shift charges from one group to the other and the shift changes the result: “That is, the volume of transactions on and the profit of a platform depend not only on the total price charged to the parties to the transaction, but also on its decomposition.” Where the shift changes nothing, the market behaves as an ordinary one. That happens when “Both sides of the market coordinate their purchases.”, as when a platform deals with a single party, such as a company that buys an intranet for its own use, or when charges pass straight through from one side to the other: “If such neutrality holds, then the markets discussed above should be treated as one-sided markets”. They then argue that “There are three broad reasons why neutrality does not hold in practice”: transaction costs, costs that the platform influences and that do not vary with the number of transactions, and rules a platform sets to limit pass-through.

In this guide, a market is two-sided when a platform serves two distinct groups, at least one group values the platform more as the other grows, and the split of the total price between them changes how much is traded. The other group need not gain in return: in Parker and Van Alstyne’s² advertising case, “for many forms of advertising, consumers may experience clutter costs”. If one party buys for both sides, or if a charge on one side passes through in full to the other, treat the market as one-sided.

² Parker, G. G., & Van Alstyne, M. W. (2005). Two-sided network effects: A theory of information product design. *Management Science*, 51(10), 1494-1504.

What are network effects, and which kind makes a market two-sided?

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In the classic case, a product becomes more valuable to each user as more users join: Parker and Van Alstyne² (2005) describe demand economies of scale that “cause growth in an existing stock of consumer value as new consumers join the network”. They separate two kinds of network effect: “We distinguish between intramarket and intermarket network externalities.” The first operates within one group, as when more users of a format make it more useful to each user; this guide calls it a same-side network effect. The second, a cross-side network effect, runs across groups: “Producers want consumers and consumers want producers before either prefers a new format.” A two-sided market rests on the second kind.

What separates this from complementary product pricing, as with razors and blades, is who decides. In a razor-and-blade case, “the same consumer buys the razor and the razor blade”, so one buyer weighs both prices. In a two-sided market, Rochet and Tirole³ write, “our end-users do not internalize the impact of their purchase on the other side of the market”. Parker and Van Alstyne² make a similar distinction: “Unlike razors and blades, the products are standalone goods”, and “consumers need never purchase both goods”. This is also why platforms face what Rochet and Tirole call the celebrated chicken-and-egg problem: each group waits for the other, and a platform has to find a price structure that will “get both sides on board”.

Why does a two-sided platform set a price structure and not just a price?

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Because the split of the price between the sides changes how much trade the platform carries. Rochet and Tirole³ put it plainly: “Under multisidedness, platforms must choose a price structure and not only a price level for their service.” In their examples, “platforms often treat one side as a profit center and the other as a loss leader, or, at best, as financially neutral”. They also caution against taking such labels at face value: “Such conventional wisdom about business models found in the trade press and summarized in Table 1 is of course subject to criticism.”, because in profit-centre reasoning costs are often allocated to one side intuitively but, in their word, arbitrarily. Yet they hold that the conventional wisdom “points at some more fundamental logic related to prices and surpluses on both sides of the market”, which their model sets out to unveil.

Figure 1 Who is subsidized and who pays: examples from Rochet and Tirole

In each example one side is treated as a loss leader or break-even segment and the other as the profit-making segment. On the author's reading, the profit-making side pays for access to the other.

Platform	Subsidized or break-even side	Profit-making side	What the paying side gains
Video games	Consumers (consoles)	Software developers	Access to the players who own the console
Operating systems	Application developers	Clients	Software written for the system they use
Newspapers	Readers	Advertisers	The attention of the readers
Credit and deferred debit cards	Cardholders	Merchants	Customers who carry and use the card
Online debit cards	Merchants	Cardholders	Shops that accept the card
Shopping malls	Consumers (free parking, cheap gas)	Shops	Shoppers drawn to the mall
Real estate	Buyers	Sellers	Buyers who visit the property

The authors present these business models as conventional wisdom, which they say is open to criticism; similar platforms can sit in opposite rows.

Source Rochet and Tirole (2003), Table 1, p. 992, condensed: seven of the table's examples. The labels are the industry's conventional wisdom as the authors report it, not estimates; the fourth column is the author's paraphrase of what the paying side gains.

Credit cards and online debit cards sit in opposite rows. For the online debit market in the United States, Rochet and Tirole³ explain the difference by which side needs courting: “consumers indeed do not need to be courted”, because they already carry the card they would use for online debit, while merchants have to install costly equipment.

Operating systems reverse the video game model: in the authors' words they "have adopted the opposite business model and aim at making money on consumers".

How the split is set is a matter of the two sides' responses to price. In Rochet and Tirole's³ basic model of a single platform, the total price follows the familiar Lerner rule for a monopolist, applied to the sum of the two sides' elasticities, and its split between the sides follows a rule of its own: "The price structure is given by the ratio of elasticities (and not inverse elasticities)". The [price elasticity guide](#) explains the measure. Parker and Van Alstyne² add that "Network effects on one side of the market render the matched side more inelastic.", but that the optimal prices "also depend on cross-price elasticities and the ratio of surplus created on both sides".

Which side gets the free product follows from the same logic in Parker and Van Alstyne's² model: "Deciding which market to subsidize depends on the relative network externality benefits." Their rule: "At a high level of externality benefit, the market that contributes more to demand for its complement is the market to provide with a free good." And "At lower levels, firms may charge positive prices in both markets but keep one price artificially low." Their model also shows that "a firm can rationally invest in a product it intends to give away into perpetuity even in the absence of competition".

The two papers also use the same words for different groups. Rochet and Tirole's³ game platforms are console makers such as Sony, Sega and Nintendo, which charge the studios that write games through royalties and fees for development kits, and treat players as the loss leader. Parker and Van Alstyne's² are games makers such as Ubisoft, id, Valve and Electronic Arts, which "charge consumers but give developers free toolkits": the subsidized product in their table is the level editor, so their developers build content for a game the consumer has already bought. Even within one market the instrument varies: Rochet and Tirole report that Microsoft courted developers "by not charging for the Xbox Prototype kit" while planning to earn on royalties. On this guide's reading, which side looks subsidized depends on which group is called the developer and which charge is counted, the console, the games or the kit, so a pricing decision should name the group and the instrument, not just the side.

How does competition between platforms change the price structure?

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Through multihoming, the term Rochet and Tirole³ borrow for users who connect to more than one platform, such as merchants who accept both American Express and Visa. Their argument is that “multihoming on one side intensifies price competition on the other side as platforms use low prices in an attempt to” steer users on that other side toward an exclusive relationship. They state four implications for business models, numbered 3 to 6 in their summary: “Monopoly and competitive platforms design their price structure so as to get both sides on board.”; “An increase in multihoming on the buyer side facilitates steering on the seller side and results in a price structure more favorable to sellers.”; “The presence of marquee buyers (buyers generating a high surplus on the seller side) raises the seller price and (in the absence of price discrimination on the buyer side) lowers the buyer price.”; and “Captive buyers tilt the price structure to the benefit of sellers.” In their model, three of them hold for a single platform as well; the multihoming one is about competition.

These are predictions, not findings. The authors write that “A rigorous validation of testable implications 3) through 6) lies beyond the scope of this paper”, and offer case illustrations instead, saying “this preliminary evidence seems quite encouraging of the theory”. Their payment card case fits the multihoming prediction: as more American Express customers also carried a Visa card or MasterCard, this multihoming “made it less costly for merchants to turn down Amex cards”. A platform that also competes with the sellers it hosts faces a further conflict, which the [marketplace essay](#) treats.

Do network effects always appear?

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Not always. The usual reasoning, as Boudreau and Jeppesen (2015)¹ describe it, assumes that “users prefer platforms with many complementors” and that complementors build more for a platform with many users. They tested this where complementors are unpaid, with data from 85 online multiplayer game platforms whose complementors, the developers of game modifications, are unpaid. Both cross-side responses appeared: users responded positively to more complementors, and “we find a positive causal response of development rates to growing platform usage and a negative response to growing numbers of complementors”. The negative response, from complementors competing for limited attention, cancelled the positive one, “producing no overall network effect”.

¹ Boudreau, K. J., & Jeppesen, L. B. (2015). Unpaid crowd complementors: The platform network effect mirage. *Strategic Management Journal*, 36(12), 1761-1777.

Their warning is about what network effects look like from outside: “The breakdown of network effects with unpaid complementors may be difficult to observe and easy to mistake.” Positive correlations between usage, the number of complementors and development rates “are each consistent with network effects, but can be spurious correlations with platform attributes”, and “Although complementors remain attractive to have, large numbers of complementors no longer produce a self-reinforcing process whereby growth begets growth”. The authors expect “precise magnitudes of countervailing effects” to vary from context to context, but argue that network effects should tend “to similarly break down in a range of similar contexts with competing unpaid complementors”, and that their mechanisms differ “from cases of both paid competing complementors working in multi-sided markets and collaborative platforms”. On this guide’s reading, a platform whose partners or developers contribute without being paid at all, by the platform or by the users they serve, should not assume that each new one adds to the others’ incentive to build; partners who sell their work, even outside the platform, are the paid case the authors set apart. The [ecosystem essay](#) treats how such partners are aligned.

How do you write a two-sided pricing decision down?

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This guide’s answer is one record per platform: the two sides, the cross-side effect claimed and its evidence, whether the market is two-sided at all, the price structure and its instruments, the multihoming on each side, and what would show the network effect is real. The fields follow Rochet and Tirole’s³ definition and predictions, Parker and Van Alstyne’s² subsidy rule, and Boudreau and Jeppesen’s¹ warning.

Figure 2 A two-sided pricing record

Write down both sides, the cross-side effect and its evidence, the neutrality test, the price structure, multihoming and the test of the network effect in separate fields.

Sides	Cross-side effect	Neutrality	Price structure	Multihoming	Evidence test
Which two groups meet here, and who decides for each?	Which side gains more from the other, on what evidence?	Does one party buy for both, or does a charge pass through in full?	Which side pays, which is subsidized, with which charge?	What share of each side also uses a rival platform?	What result would show the effect is not real?

If one party buys for both sides or charges pass through in full, price it as a one-sided market.

One row per platform. An empty evidence field means the network effect is an assumption.

Source Author's decision worksheet. The sides and neutrality fields follow Rochet and Tirole (2003), pp. 990, 1007, 1017-1020; the cross-side effect field follows Parker and Van Alstyne (2005), pp. 1495-1496, 1503; the price structure and multihoming fields follow Rochet and Tirole (2003), pp. 993, 1013, and Parker and Van Alstyne (2005), pp. 1499, 1503; the evidence field follows Boudreau and Jeppesen (2015), EarlyView pp. 2, 14. The fields are reader inputs; no company data is supplied.

An illustration, with no company data: a firm runs an invoicing network that connects suppliers with the business customers they bill. The record names the two sides and asks who decides for each. If a large customer tells its suppliers which network to use, those suppliers resemble what Rochet and Tirole³ call captive buyers, who are “loyal to their platform, independently of prices”; in their model, captive users let the platform raise the price on their side. The mandate alone does not make the market one-sided, because each supplier still pays its own charge. The record then asks whether a fee charged to suppliers would be passed in full onto their invoices, which would make the market behave as one-sided. It records which side is charged, by subscription or per invoice, how many suppliers also send invoices through a rival network, and what result would show that more suppliers actually draw more customers. These are the author's examples and have not been tested.

Where does the evidence on two-sided markets stop? § 7 of 7

For this guide, at two formal models and one test; the wider empirical record is larger. Rochet and Tirole (2003) and Parker and Van Alstyne (2005)² are formal models: their results hold under the models' assumptions, and Rochet and Tirole³ leave the rigorous test of their business-model predictions to future research. Boudreau and Jeppesen (2015)¹ is one empirical study, of game platforms whose complementors are unpaid, and its authors expect the size of the effects to vary with context. The same papers point to empirical work that, by their account, found two-sided network effects: Boudreau and Jeppesen cite studies of publishing and advertising, media, mobile computing and video game consoles, and Parker and Van Alstyne cite a test that found "significant positive externalities between the Web browser and Web server markets". This guide has not read those studies and rests no claim on them. None of the three papers studies B2B software platforms, invoicing networks or business marketplaces directly, and none gives a number for how strong a network effect must be before a side should be subsidized. The B2B illustrations in this guide are the author's reasoning.

 End of essay

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