Why did most of the dot-coms fail?

A no-brainer, you say? With hindsight, it does seem bizarre that otherwise-sane investors threw billions of dollars at a bunch of 20-somethings who knew more about grunge bands than broadband and regarded the concept of profit with the contempt once reserved for their fathers’ Oldsmobiles. But the bubble aspects of dot-com mania have obscured what are arguably more profound economic changes that added to the woes of both Internet start-ups and more traditional businesses facing radical changes in the structure of markets.

Success in commerce often demands insight into markets in which the value of the product to one group depends on the value of another product to another group. To take a trivial example, a dating service can’t make money from males aged 35-44 seeking females aged 25-34 who love Italian art and extreme sports unless their female counterparts have also signed up for their service. And, of course, vice versa.

Such “two sided” markets are not unique to the Internet, or even to what used to be called the New Economy. Magazines for skiers (or coin collectors or sports car nuts) must price the distinct services provided to readers and to advertisers in ways that keep both on board. Real estate brokers face a similar problem in making their services

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Everything you wanted to know about Two Sided Markets*

*...but never knew to ask.
TWO-SIDED MARKETS

attractive both to house buyers and sellers. Likewise, payment card companies must distribute lots of plastic and induce consumers to use it — which is possible only if lots of merchants are willing to accept the cards.

But a variety of factors are pushing two-sided markets to the fore. For one thing, information technology is increasingly important to the economy. And in many IT businesses, success turns on satisfying multiple constituencies whose demand for multiple products is interdependent. Thus, key players such as Sony, IBM and Sun are relying on “platform” marketing strategies that turn on the success of attracting both developers and users of applications software.

Yet, while business school gurus have certainly analyzed individual two-sided markets and many of the concepts have spilled into common business parlance — these days, for example, magazines are more apt to brag about the demographics of their readership than total circulation or the quality of the editorial content — there has been little effort to generalize about their workings.

The complexity of operating in two-sided markets creates challenges for investors and managers, who face unfamiliar problems in identifying winning strategies. More important from the perspective of public policy, it challenges regulators to rethink the way they judge the health of competition. Indeed, it may force the most basic rethinking of antitrust policy since economists succeeded in shifting the focus of analysis from questions of fairness to questions of efficiency.

THE NOT-SO-OBVIOUS ECONOMICS OF TWO-SIDED MARKETS

It’s easier to find examples of two-sided markets than to generalize about them. But three characteristics do seem common to all.

There must be distinct classes of consumers demanding complementary goods. General Motors has very good reasons to be in both the truck and the car business — it’s cheaper to make and market one if you make the other. But GM could exist, and perhaps even thrive, by making just cars or just trucks. Contrast GM with Morgan Stanley’s Discover Financial Services. To persuade merchants to accept the Discover card (and pay fees with each transaction), Morgan Stanley must persuade consumers to carry and to use the Discover card.

The value of the service to consumers on one side of the market depends on the number and qualities of consumers on the other side. Nasdaq’s services are more valuable to owners of Intel because the large number of potential buyers linked through Nasdaq’s computer network increases the liquidity of the stock. Note that the proportions of buyers needed to achieve balance between sides may vary enormously with the market. Thus, in 1999, American Express introduced the Centurian “black card,” whose appeal to its 4,000 holders turned on its utter exclusiveness.

The “network economies” associated with having more participants on both sides of the

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Market could not be realized without an intermediary. Singles in search of mates can (and do) wander around public parks on sunny afternoons looking for that perfect someone. But putting an ad in Yahoo! Personals is surely a more efficient way to meet a like-minded member of the opposite sex.

Profit Maximization

While we’re all aware that the behavior of modern corporations doesn’t always follow the gospel according to Adam Smith, profit maximization figures in there somewhere. And economists long ago worked out the simple conditions – simple in concept, anyway – that lead to maximum profit.

Sellers maximize the difference between revenues and costs by setting prices where the cost of marketing one more unit equals the net gain in revenue from its sale. For competitive firms, that net gain will equal the price. Hence, the hoary marginal-cost-equals-marginal-revenue condition for profit maximization implies that price will equal cost. For monopolists, selling more units means selling each unit at a bit lower price, and thus profit maximization implies price above cost. Hence, the classic result that monopoly breeds inefficiency by restricting output.

But the price that maximizes profits in a two-sided market isn’t so easily derived since demand for the complementary products must be balanced. Changing the entry price for women at a singles club will change the number of women who show up, and thus the price that men are willing to pay to join the fun. Changing the subscription price of a magazine will change the number of readers (and perhaps their demographics), and will thus affect the demand for advertising space. Indeed, looking at demand and cost on one side of a two-sided market alone can’t tell you what you need to know to maximize profit.

Entry Costs and Balancing Demand

For a lucky few businesses, the right products and the right marketing strategy yield profits from Day 1. But for most, start-up losses are to be expected. In fact, it is widely understood that most small businesses fail for lack of “working capital” before they get a chance to find out whether the business is viable.

Likewise, one could imagine a business in a two-sided market that became profitable very quickly. But, other things equal, there are reasons to expect that the start-up costs will be exceptionally high. Indeed, about the best face you can put on the dot-com’s apparent indifference to profitability was the implicit assumption that, in a two-sided market enterprise, the start-up period would be exceptionally long and thus profits would be a poor benchmark of success early on. Hey, if that reasoning is good enough for Condé-Nast’s Teen Vogue, why not use it to rationalize the burn rate for Loadabull.com?

In a one-sided market, establishing the viability of a product is relatively simple: will sufficient numbers of consumers buy the product at a price above cost? In a two-sided
market, the question must be answered on both sides – and simultaneously. Moreover, more experimentation in pricing may be needed to arrive at the answer because the experience of others may not serve as a benchmark. In magazines, for example, the range of successful periodicals runs the gamut from an all-subscription revenue model (Consumer Reports) to an all-advertising revenue model (Harte-Hanks’s local PennySaver shoppers) to everything in between.

It may even make sense to charge what amounts to a negative price to one side of the market. Microsoft spends hundreds of millions of dollars each year providing free or cut-rate services to software developers to encourage them to create applications for Windows. The software giant is compensated indirectly, through the sales of Windows to users who value access to diverse applications software as well as through sales of its own software applications (like Microsoft Office) to consumers lured to the Windows platform by the software cornucopia.

By the same token, it is likely that American Express spends more to provide ancillary services, like frequent flier miles and collision-damage waivers on car rentals, than it earns in annual fees from cardholders. But these net outlays are probably more than offset by the fees that merchants pay when the cards are used. All told, four-fifths of the revenue from Amex cards comes from merchant fees.

One factor driving the way costs are apportioned is the degree to which users are locked into a single intermediary. With computer operating systems and video games, users are reluctant to change platforms, but software developers often write applications for more than one platform. With payment cards, by contrast, many people carry both American Express and one or more of the bank association cards.

Just how such “multihoming” affects prices can be quite complicated. For example, manufacturers of video game platforms heavily subsidize sales of the console in an effort to lock in players – the hardware in a PlayStation2 or an Xbox rivals that in full-blown PCs costing several times as much. The profit from sales of the platform makers’ own games, as well as royalties from licensing other gamemakers, presumably depends on both the installed base of consoles and the popularity of the individual games.

Note, too, that the pricing problems of companies in two-sided markets may be compounded by network economies within each side. Thus, new magazines often “buy circulation” – offer subscriptions for little or nothing – in order to create interest among readers as well as to make the publication more attractive to advertisers. And they may offer space for little or nothing to high-profile advertisers in order to make the publication appear to be a safe bet for other advertisers.

THE CHALLENGE FOR REGULATION

For a host of reasons, companies operating in two-sided markets are likely to attract the attention of competition authorities. Start with the reality that two-sided markets are likely to be more concentrated than one-sided markets. Two-sided markets invariably exhibit network effects that increase the size at which a company will be most efficient. The more people who buy and sell on eBay, the more it is valued by buyers and sellers. Hence, it should not be terribly surprising that roughly 85 percent of all Web-based auction revenues go to eBay.

For reasons noted earlier, it is also typically quite expensive to establish a viable company in a two-sided market. As a practical matter, that daunting capital requirement makes
challenges to incumbent firms less likely. Microsoft has fought battles with Apple, IBM and now Linux for king of the mountain in operating systems over the last decade. But compared with, say, the automobile industry, hard-fought skirmishes for market share in operating systems are relatively rare.

Moreover, the higher cost of establishing a foothold in a two-sided market and the higher risk that the enterprise will fail implies that a firm must expect to earn high profits if it does succeed. *Sports Illustrated*, for example, lost money for many years before it became a cash cow for what is now AOL Time Warner. So it should not be surprising that the operating profits of the enterprises that do prosper in two-sided markets are relatively high.

Last but hardly least, no matter how competitive, costs and prices aren’t likely to track the separate sides of a two-sided market. And since it is common for one side of the market to bear much of the cost, it is also likely that the price charged one side of the market will be far higher than the costs directly attributable to services to that side of the market. Thus, the fees that American Express demands from merchants exceed the costs of processing transactions, carrying the float and bearing the burden of card fraud.

This creates a considerable challenge for antitrust regulators to distinguish between actions that would undermine competition in one-sided markets, yet serve the long-term interests of consumers in two-sided markets.

For example, concentration in markets is widely viewed as a warning that competition isn’t working. Indeed, the Justice Department’s merger guidelines include a calculation of a merger’s potential impact on a standard index of industrial concentration. While opposition to mergers that would raise the index above a threshold is not automatic, it certainly can change the burden of proof.

By the same token, the guidelines discourage mergers in which the merged firm could raise prices significantly – 10 percent is the rule of thumb. Yet one could certainly imagine a merger in a two-sided market in which the combined firms found it profitable to raise prices substantially on one side and lower them on the other. What ought to count, then, is whether the sum of the prices charged by the merged firm to the two sides of the market could be substantially higher.

Note, too, that the trustbusters use industrial concentration as evidence of monopoly power. While it is not illegal to possess a monopoly, the tactics a firm with monopoly power may use in countering the efforts of rivals are far more constrained than that of a non-monopolist.

The Microsoft case illustrates the pitfalls in applying tests devised to weigh the health of one-sided markets to a two-sided market. The Justice Department argued that Microsoft’s PC operating system monopoly was protected by an “applications barrier to entry.” Other operating systems could not hope to compete, the government said, because they could not hope to match the quality and diversity of

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software applications that ran on Windows.

Seen from the perspective of two-sided markets, however, the applications barrier to entry was the benign consequence of Microsoft’s strategy of charging less to one side of the market – in this case, actually subsidizing production of applications software – in order to add value to the other side. In itself, this barrier to entry seems no more artificial or threatening to society’s interests than the fact that GE’s multibillion dollar investment in jet engine technology would make it very expensive and very risky to start another aircraft engine company.

The government also charged Microsoft with predatory behavior against Netscape’s Navigator Web browser. To drive Navigator out of business and monopolize browsers, the government said, Microsoft gave away valuable software tools that made it possible for Internet service providers and corporate information technology departments to customize the Internet Explorer browser. But what looks damning in the context of a one-sided market has an innocent interpretation in a two-sided market: encouraging Internet service providers to use Internet Explorer on one side of the market made Windows more valuable to users on the other side.

The issue of how companies in two-sided markets get and keep both sides on board has touched competition policy in other ways, too. Some two-sided markets have room for dozens or even hundreds of efficient-size competitors; they solve the problem of achieving network efficiencies by creating cooperatives that deliver the network service. Thus, relatively small competing real estate brokers collectively maintain the Multiple Listing Service, which allows members to exploit the efficiencies of a larger inventory on the seller side and increases the number of potential buyers for each. And banks, which are too small to achieve network economies by issuing their own payment cards and signing up merchants to accept the cards, have formed the MasterCard and Visa associations. The payment card cooperatives operate the electronic transactions networks and exploit other marketing activities – advertising, branding, creation of new services – that can reduce costs per transaction.

The payment card associations also, in effect, set a floor on the fees that all banks charge to merchants accepting the cards – a practice that has, not surprisingly, caught the eye of competition enforcers in many countries. Visa’s collectively set “interchange fee” – a fee paid to card-issuing banks by the banks that processed the transaction – was challenged in a private antitrust suit in 1979. The federal courts ruled in Visa’s favor, deferring to Visa’s argument that the revenue from the interchange fee was needed to offset the costs of issuing enough cards to balance the market.

Australia’s central bank, which regulates the Australian card payments system, recently reached the opposite conclusion. The Royal Bank of Australia implicitly accepted the idea that charges on each side of a two-sided market need not match the narrowly defined costs of servicing that side. And it did not allege that the revenues were generating excessive profit for the banks, which, like their American counterparts, competed away much of the revenue bonanza by offering extra goodies (like frequent flier miles) to cardholders. But it did decide that the charges were too high in the sense that they encouraged overuse of cards compared with cash and checks.

In justifying their decision, the Australian regulators alluded to a plausible economic model showing the interchange fee that balanced the two sides of the card market could
exceed the fee that equalized costs among various methods of payment. But the same economic model also suggested it was possible that, in the process of balancing the two sides of the card market, the payment card associations would set the interchange fee below the optimal level.

In other words, regulators could show that the private market outcome was not necessarily efficient, but they couldn’t show that government could necessarily do better. Just why the Royal Bank of Australia decided to tilt in one direction instead of the other is unknown. But it is known that the issue was initially raised by the retailers’ trade association, which chafed at the fees charged by the card payment companies. And there is a vast body of literature in economics suggesting that, eventually, regulators are captured by one competing constituency or another – a reality of democratic pluralism, perhaps, but hardly a comforting reality.

Efforts to regulate collusive behavior in two-sided markets highlight another irony. The bank card associations’ collective pricing on one side of the market was bound to attract the attention of regulators. But American Express, which operates a payments system of the same order of magnitude, is far less subject to scrutiny.

The card-issuing side of the payments market is fiercely competitive, with dozens of huge players and thousands of smaller ones competing with a half-dozen card brands. Would competition be healthier if, say, only five integrated payment card companies, like American Express, controlled both sides of the market?

More generally, two-sided markets are likely to encourage novel partnership arrangements among competitors – collective behavior that might reduce competition or, as in the case of the card associations, increase competition on one side of the market while arguably reducing it on the other. Computer operating system designers collaborate with microprocessor designers, affecting competition in the computing platform market. Real estate brokers collectively devise the rules for the Multiple Listing Service, affecting competition in a variety of ways.

The question for the regulator of a two-sided market is thus twofold. Is the restraint of competition in portions of a multisided market justified on grounds of efficiency? And if the answer is problematic – as the Australians might have concluded – is regulation in the context of interest group pressure work better than no regulation?

Stylized models of markets are just that – models that are no better than the underlying assumptions. And while the standard one-sided market model has offered powerful insights into capitalist economies, its weaknesses in analyzing contemporary markets are increasingly apparent. That, of course, is ominous news for managers who understand the world is changing, yet lack a rudder to negotiate the treacherous waters. It is equally problematic for regulators, who are likely to find that healthy competition in a world of markets riddled with interdependencies is increasingly difficult to define.