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# Value Explosion

Exploring Barriers to Entry for Internet Companies

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- There are *meaningful* barriers to entry for a handful of Internet companies. We believe that these barriers have not been accorded full weight by investors.
- We define four barriers to entry that may serve as the source of sustainable competitive advantage: network effect, switching costs, business models, and pricing.
- Investors that size up the competitive advantage of Internet companies solely by using traditional income statement measures will inevitably miss the power of the economic model.
- These advantages should allow a select group of companies to generate outsized earnings power.

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## Executive Summary

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- *Lack of traditional barriers to entry.* Some investors have asserted that since anyone can put up a web page, no barriers to entry exist on the Internet. Indeed, it seems that traditional entry barriers based on tangibles—like superior products or volume production—are of lesser importance in the on-line world.
- *New categories of entry barriers are emerging.* Our analysis concludes that although the *source* of competitive advantage for Internet companies differs dramatically from those of its off-line counterparts, select Internet companies have nonetheless established competitive advantages based on the network effect, switching costs, and the superior business models.
- *Networks rule.* The value of a network grows exponentially as the number of members grows arithmetically. This plays into the hands of companies like AOL, whose e-mail and chat features become more valuable to consumers as their customer base grows. Indeed, AOL recently acquired 1 *million* customers in less than 6 weeks—a process that took 19 weeks last spring. In fact, *any* community of users can benefit from the network effect. A prime example is eBay, whose user base reached 2 million in the December quarter, up 65% from September. Incremental users choose eBay because that's where everyone is, and that's where over 1.6 *million* items are up for auction. Over time, this positive feedback loop should ensure mass-market dominance for eBay.
- *Switching costs are underappreciated but vital.* Switching costs are the costs that users bear when they switch from one product to another. Many websites have nonobvious switching costs, such as the time to reinput tickers into a personal finance website to track a stock portfolio or the loss of customized book recommendations that Amazon makes based on a customer's past purchases. At a minimum, a new supplier must compensate new users for this inconvenience in order to convince them to switch to its product. Since the Internet is all about mass customization, many websites have locked in their customers—perhaps to the extent that other companies may find that stealing customers is a value-destructive proposition. Finally, since customers that stay put tend to spend more money and cost less to support, Internet companies that establish switching costs should have higher returns.
- *Channel conflict benefits Internet pure plays.* Since most traditional businesses have set channels of distribution, the emergence of the Internet as a new direct-to-the-consumer distribution channel generally makes dealers fearful that they will be sliced out of the value chain. This concern has hindered many companies from competing in the on-line space. Compaq's recent decision to stop its on-line sales effort owing to fears of cannibalizing dealer sales serves as a perfect example.

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## Introduction

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Despite a recent price correction, many Internet companies still enjoy multibillion-dollar market capitalizations that appear incongruous with their scant revenues and earnings. Investors would bid a company up only if they believe it has a competitive advantage—that it can invest in its business at returns greater than its opportunity cost of capital.<sup>1</sup> However, even those pundits that acknowledge that Internet companies offer attractive new business models question the *sustainability* of their competitive advantages. The issue basically boils down to whether the barriers to entry exist to justify current valuations.

We believe that a handful of Internet companies have established *meaningful* barriers to entry, and that investors have not accorded them full weight. These barriers are not appreciated for a couple of reasons. First, most investors associate barriers to entry with tangible elements—such as a superior product or scale economics from volume production.<sup>2</sup> Barriers based on more intangible elements—like the value of a user network—are much more difficult to visualize and to quantify.

Second, the use of the income statement to judge value has become increasingly misleading because of the way in which “investments” are accounted for. Traditional “Old Economy” companies earn money by investing in physical capital or resources. These investments—changes in working capital and capital outlays—are capitalized. Thus, their reported earnings meaningfully *overstate* the overall cash generated by the business.

Things are different for the next generation of “New Economy” knowledge-based companies. Investments like R&D, training, and marketing are *expensed*, and physical capital needs are modest. In fact, some Internet companies generate cash from their balance sheets even as they produce income statement losses. As a result, reported earnings either fairly represent cash flow or, in some cases, *understate* cash generation. Investors that size up the competitive advantage of Internet companies solely using traditional income statement measures inevitably miss the power of the economic model.<sup>3</sup>

We define four barriers to entry that may serve as the source of sustainable competitive advantage in the New Economy. These advantages will not accrue to all companies, but will allow a select group to generate outsized earnings power.

## Barriers to Entry in the Internet

### Network Effect

The network effect<sup>4</sup> is the basic idea that the value of a network grows exponentially as the number of members grows arithmetically. It is driven by positive feedback, which means that the strong get stronger and weak get weaker. Lise

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<sup>1</sup> See *Frontiers of Strategy, Volume 1: Why Strategy Matters*, by Michael Mauboussin and Bob Hiler, Credit Suisse First Boston Equity Research, September 30, 1998.

<sup>2</sup> The classic work on barriers to entry is *Barriers to New Competition*, by Joe S. Bain, originally published in 1956. Bain outlined four specific entry barriers: scale economy, product differentiation, absolute cost, and capital requirement.

<sup>3</sup> See *Frontiers of Finance, Volume 9: Cash Flow.com*, by Michael Mauboussin and Bob Hiler, Credit Suisse First Boston Equity Research, March 2, 1999.

<sup>4</sup> The economic term is “network externality.” Economists refer to any factors that are not captured in their formulas as “externalities.”

Buyer, CSFB's Internet/New Media analyst, has consistently highlighted this point in her work.<sup>5</sup> A number of elements are worth noting:

- *Supply-side versus demand-side drivers.* Old Economy companies have their own version of positive feedback—economies of scale—driven by supply-side features like manufacturing efficiencies and procurement discounts. Larger size translates into lower costs, up to a point. However, this kind of positive feedback typically wanes before a business reaches market dominance as a result of too much bureaucracy, too many assets, or too many products. In contrast, positive feedback for many Internet companies is demand-side driven: the more people that use a service, the more valuable that service becomes to others. Accordingly, the positive feedback *strengthens* as a company reaches market dominance.
- *Tipping points.* This term refers to the level of market share at which future market share gains become cheaper and cheaper to acquire. Accordingly, the company that reaches the tipping point first wins the bulk of incremental customers. Tipping often occurs either when de facto technological standards are set (Microsoft operating systems) or when customer interaction occurs (America Online e-mail and chat). Tipping points have always existed, but the threshold of significance is lower today than ever. This means that market shares, innovation, and growth rates must be taken seriously earlier than in the past.<sup>6</sup>
- *Winner-take-all outcomes.* Positive feedback assures that for a given network or standard, one company often ends up dominating. Importantly, it is not always clear early on which company will be the winner. But once the tipping point is reached, radically different financial results for the haves and the have-nots become clear. Given the network effect's demand-side-driven nature, some companies can not only achieve market dominance, but their strength actually *increases* over time.
- *Critical mass.* A useful metaphor for thinking about how companies launch into a successful positive feedback loop is the idea of critical mass. Critical mass is the key to atom bomb detonation. When the unstable nucleus of uranium breaks up, energy is released. Neutrons emanating from the break-up of one nucleus may hit another and cause it to break up, but most neutrons miss other nuclei and are projected harmlessly into space. On the other hand, if the quantity of uranium is appropriately condensed—critical mass—the typical neutron leaving one nucleus will hit another nucleus and so on, causing a chain reaction. So, too, with a network of users. A critical mass of early adopters is required to harness the power of the network effect, and is the essence of first-to-scale advantage. Scattered users of a product or service are unlikely to capture the appropriate critical mass to produce a value explosion.

Three examples illustrate the power of the network effect. The first is on-line auction leader eBay. The company's registered user base has been growing rapidly, reaching 2 million in the December quarter—up over 65% from its user count in the September period. Why does an incremental user choose eBay? Because that's where everyone else is. It is interesting to note that Yahoo!, the leading

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<sup>5</sup> See *Reeling in the Big Ones*, by Lise Buyer and Tracey Ford, Credit Suisse First Boston Equity Research, February 18, 1999.

<sup>6</sup> *New Rules for the New Economy*, by Kevin Kelly (Viking, New York, 1998).

Internet portal, also offers an on-line auction service. But eBay has 11 times as many items for sale (roughly 1.6 million versus 150,000) than Yahoo! eBay's first-to-scale advantage has been greeted by the stock market with a \$10 billion market capitalization.

A second illustration is Amazon, the leader in retail e-commerce. Amazon taps the network effect a number of ways. Customers find Amazon's site more valuable than others because of the book and music reviews written by other customers: the more reviews, the more valuable the site. Further, the tracking of book purchases allows Amazon to provide well-grounded recommendations of other books of interest. The quality of those recommendations is enhanced with a large customer base.

Word of mouth is also important for Amazon.<sup>7</sup> All of the company's proactive marketing initiatives—banner ads on other Internet sites, print and media advertising, and an associates program—are estimated to bring in a *minority* of its new customers. Most new Amazon users come by way of recommendation of others. It is the benefit of critical mass in action.

A final case is America Online. The value of AOL—now approaching \$100 billion—is not in its informational content or its consumer Internet service provider business, in our view. The value of AOL lies in *interactivity*: it allows lots of users to efficiently communicate with one another. E-mail, chat rooms, instant messaging, buddy lists, and ICQ ("I Seek You," an Internet-based chatting and networking tool) enable this communication. ICQ alone—with over 30 million users—recently registered over 1 million simultaneous users.

Here again the more members, the more valuable AOL's network. AOL has passed the tipping point, and recently added 1 million customers—6-7% of the base—in less than 6 weeks. Replicating AOL's network of users at this point is not effectively, or economically, feasible. The network effect has done its work.

**Table 1**  
**The Network Effect in Action**  
**AOL's Membership Count after Acquisition of CompuServe**

Number of Members	Date Announced	Days to Add 1 Million Members	Weeks to Add 1 Million Members
12 million	April 16, 1998		
13 million	August 27, 1998	133	19.0
14 million	November 12, 1998	77	11.0
15 million	December 30, 1998	48	6.9
16 million	February 9, 1999	41	5.9

Source: Company website.

<sup>7</sup> See *Amazon.com*, by Lise Buyer and Tracey Ford, Credit Suisse First Boston Equity Research, January 11, 1999.

## Switching Costs

Switching costs—the cost users bear when they switch from one system to another—are an important variable in understanding entry barriers. We consider three aspects of switching costs. The first is the degree to which customers get locked in. Greater lock-in means higher switching costs. The second is the cost borne by a new supplier to draw a customer away. The more a new supplier has to pay to lure a customer away, the higher the entry barrier for that business. Finally, we look at how small increases in customer loyalty translate into dramatically higher value for the company that has those customers.

Switching costs tend to get underappreciated. Often it is difficult to determine the *degree* to which customers are locked in to an information system, especially when the system is relatively new. Also, when evaluating a network of users, one has to consider the switching costs on a per customer basis and aggregate those costs. Small switching costs for a huge user base are equivalent to a large switching cost for a single user, even though the latter is easier to appreciate.

Many Internet companies are focused on increasing the switching costs of their customers—the buzzword is making a website “sticky.” By what means do customers get locked in to a site? There are many ways, including a learned interface, product customization, an e-mail address, chat rooms, buddy lists, access to a large user base, and broad services that provide one-stop shopping. Switching costs are often linked to *communication*—no one wants to leave a great virtual community. We believe that the accumulation of many little costs represent fairly meaningful total switching costs.

One way of measuring the magnitude of switching costs is to consider customer acquisition costs for a new supplier. If a new supplier offers a product that is a close substitute, then switching costs tend to be relatively low. Long distance phone service is an example. On the other hand, if a customer is locked in, customer acquisition costs rise sharply, creating a significant barrier to entry.

The new supplier faces two additional hurdles. The first is that once a dominant company reaches the tipping point, new consumers *want* to join the leader. And they are often encouraged to do so by the general buzz.<sup>8</sup> This means that even as switching costs go *up* for established customers, customer acquisition costs go *down* for the incumbent.

The second is the constraint of net present value. The value of a new customer is the expected present value of the cash flows derived from the customer minus the customer acquisition cost. If acquisition costs rise without a commensurate increase in expected cash flows, pursuing new customers becomes less and less attractive to the point of being nonviable.

Switching costs are clearly a significant barrier to entry. The value of this barrier can be highlighted by analyzing the *extraordinary* value that accrues to companies that successfully retain customers. For example, a 500-basis-point increase in customer retention leads to a near doubling of customer net present value in many industries. (See Table 2.) This force is explained in detail in Fred Reichheld’s *The Loyalty Effect*.<sup>9</sup>

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<sup>8</sup> An anecdotal example: during the course of her popular daytime show, Rosie O’Donnell routinely plugs AOL—keyword “Rosie”—and eBay, where she coordinates charity auctions. The value of this free advertising is significant.

<sup>9</sup> *The Loyalty Effect*, by Frederick F. Reichheld (Harvard Business School Press, Cambridge, Massachusetts, 1996).

**Table 2**  
**Impact of Retention Rate Increases on Customer NPVs**

assumes a 5% increase in retention rate

Industry	Increase in Customer Net Present Value
Advertising agency	95%
Auto/home insurance	84
Branch bank deposits	85
Life insurance	90
Credit card	75
Average	86%

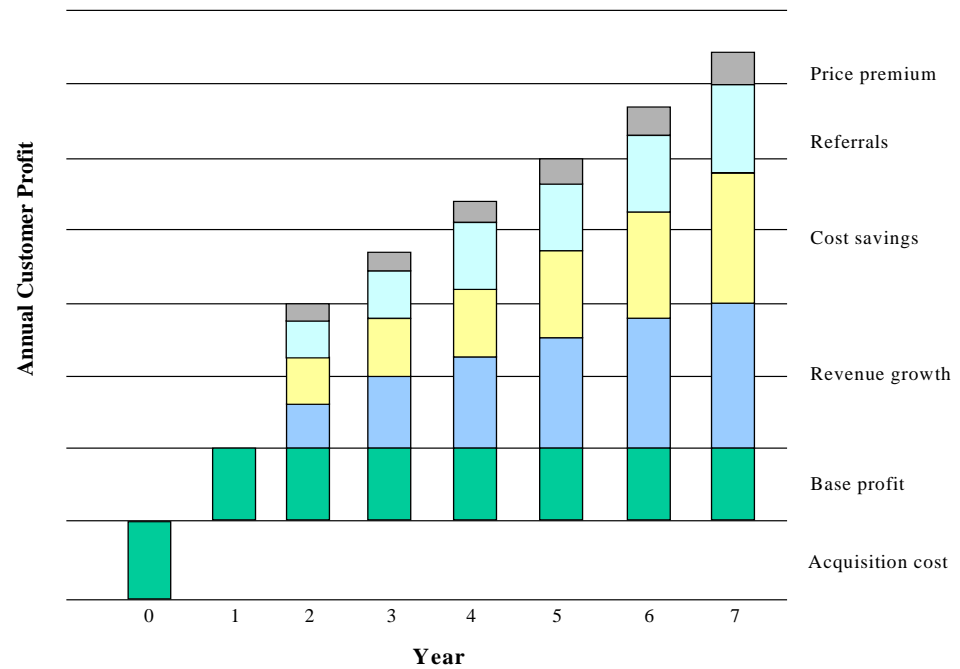
Source: *The Loyalty Effect*, by Frederick F. Reichheld.

More specifically, Reichheld defines six key drivers to the value derived from loyalty. Figure 1 shows a generic model of how these factors come into play over time. They are summarized as follows:

- **Acquisition costs.** As part of any net present value calculation, a company has to understand new customer acquisition costs. Generally, the total costs of new customer acquisition, including hidden costs, are underestimated. Acquisition costs do tend to be helped by the network effect: new customers are drawn to the market leader.
- **Base profit.** The basic earnings from a customer—excluding the benefit of time, loyalty, or efficiency—can be viewed as an annuity with a fixed life. Simply stated, the longer a customer is retained, the greater the value of this annuity.
- **Per-customer revenue growth.** In most businesses, customer spending tends to increase over time. This reflects a few factors, including a greater appreciation of the product line, increased customer buying power, and comfort with the purchase format.
- **Cost savings.** As customers learn about a business, they require less and less help. This is particularly true for companies that rely on technology to deliver their services. Once customers understand how the technology works, what products are offered, and how to efficiently access the information they need, the company's operating expenses per customer decline. Constant churning of the customer base—even with net user additions—creates higher expense than a matured customer base.
- **Referrals.** Satisfied customers recommend a business to others. Further, customers that are gained through referral tend to be better than those that respond to promotions, pricing tactics, or advertising.
- **Price premium.** Loyal customers often pay higher prices for goods or service. This can be the result of new customers gained through price promotions or because established customers greatly value the service and are thus willing to pay a higher price.

So switching costs have a double-barreled effect for the dominant company. First, higher switching costs make it less attractive for competitors to lure customers away, increasing entry barriers. Second, customers that stay put become considerably more valuable.

**Figure 1**  
**Why Loyal Customers Are More Profitable**



Source: *The Loyalty Effect*, by Frederick F. Reichheld.

### Business Models

Internet-based businesses often have two significant advantages over their traditional competitors. The first is that incumbent companies often face channel conflict as new business channels clash with their established model. Second, Internet companies tend to use limited amounts of invested capital. As a result, they can post much lower operating margins and still generate satisfactory—that is, above-cost-of-capital—returns. Both channel conflict and return on invested capital (ROIC) constraints represent meaningful barriers to entry—at least for established businesses.

Most traditional businesses have set channels of distribution and significant investments in assets. The new channels of distribution exploited by later-entry challengers create a conundrum. Either the incumbent pursues new opportunities—at the risk of alienating established channel partners and/or siphoning revenues away from the capital-intensive core business—or it continues with business as usual and loses out on a major growth opportunity. We believe that few traditional companies will successfully transition into new business models.

One example of channel conflict is in the personal computer business. PC vendors that sell direct to the customer, most notably Dell Computer, have gained market share in recent years as they simultaneously offered attractive prices and better managed their invested capital. Major competitors Compaq, Hewlett-Packard, and IBM have had a hard time mimicking Dell's high-return model because they can only do so by circumventing their traditional—and important—distributors. Barnes & Noble faces the same hurdle in the book business. Competing toe-to-toe with Amazon takes resources, and success on-line likely means diminished results on land.

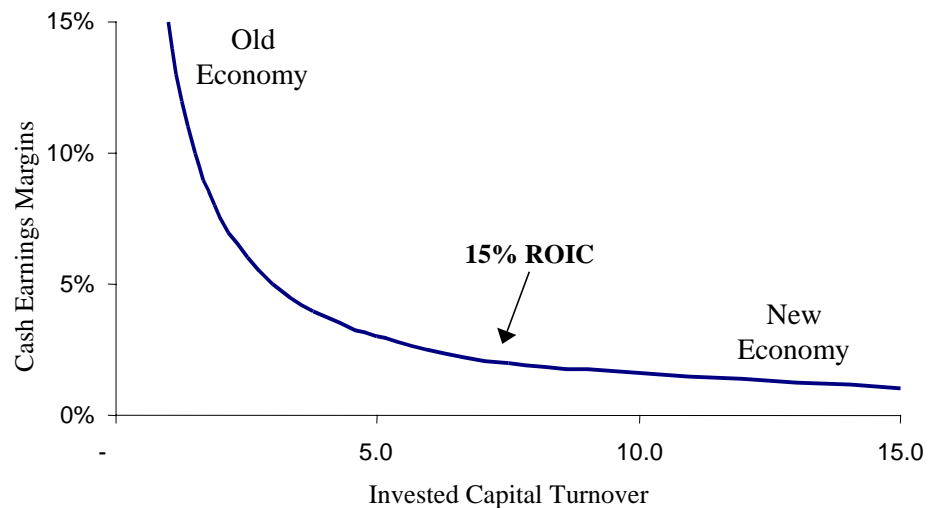
The prime objective of management is to allocate capital to businesses that earn satisfactory returns over time. In this regard, Internet companies have a decided,

if not obvious, advantage because they are inherently more capital-efficient. The formula for ROIC can be expressed as follows:

$$\text{ROIC} = \text{cash earnings margin} * \text{invested capital turnover}$$

As Internet-based businesses tend to use invested capital sparingly, they can afford to post relatively low margins and still generate attractive economic returns. Figure 2 shows the cash earnings margin to invested capital turnover tradeoff for a 15% ROIC. Old Economy businesses tend to be in the upper left-hand part of the curve. High margins are required to support a large capital base. New Economy companies tend to be in the bottom right hand corner, where low margins and high capital turnover intersect. The key point is that *Old Economy companies cannot simultaneously compete on price—jeopardizing margin—and sustain satisfactory returns.*

**Figure 2**  
**The Margin and Capital Turnover Tradeoff**  
assumes a 15% return on invested capital



Source: CSFB analysis.

Many traditional businesses are boxed in by old ways of doing business and large historical capital bases. The threat of entry, then, is more realistic coming from other cyber competitors. However, advantages like network effects and first-to-scale status make it hard to dislodge the franchise of leading Internet companies.

### Pricing

Investors often assume that doing business on the Internet—especially in e-commerce—is mostly about cheap prices. While price is a component of the value proposition, we believe it is just part of the story.

Credit Suisse First Boston and @PCData recently conducted a joint survey of on-line shoppers for the 1998 holiday season.<sup>10</sup> A full 63% of the respondents listed convenience as the most important reason they shopped on-line, while price was

<sup>10</sup> See *Surveying the Shoppers*, by Lise Buyer and Tracey Ford, Credit Suisse First Boston Equity Research, February 23, 1999.

mentioned by only 25% of those surveyed. We believe there are four essential elements to the consumer experience on the Internet:

- *Quality/breadth of product.* One of the attractive features of many e-commerce businesses is that the product offering can be materially larger than held inventory. Consumers want access to a wide array of quality products.
- *Interface.* Customers want a site that is straightforward, intuitive, and helpful. Finding products, in particular, must be easy.
- *Price.* Attractive prices are important. Because Internet business models accommodate lower prices without sacrificing economic returns, they are well positioned to offer competitive prices.
- *Execution.* We believe that execution is probably the most important element of the consumer experience at this point. When a product is purchased, the consumer expects to receive the correct product on a timely basis. We believe that a company is far more likely to lose repeat business because of poor execution than because of unattractive prices.

Two additional points support our position that price is unlikely to undermine the sustainability of competitive advantage for some companies. First, the largest companies receive some benefit of scale in their purchases from suppliers. In other words, the largest companies have a structural cost advantage.

The second is that the unprecedented information companies gather on their customers allows them to price differentially. For example, if a customer demonstrates a pattern of price-sensitivity, the vendor can offer a lower price. Price-insensitive customers, on the other hand, can be shown higher prices. This allows for maximization of revenue and profit for a given customer base.

On balance, price is a barrier to entry in a couple of important ways. On the one hand, traditional companies cannot match e-commerce prices because of their less attractive business models. On the other hand, on-line competitors must not only overcome the market leader's scale but must also execute. For these reasons we are unconvinced that price, and price alone, will dictate the rise and fall of Internet retailers.

### Conclusion

Our analysis suggests that select companies will benefit from significant barriers to entry in the Internet space. This is in contrast to the popular view that many Internet businesses have no sustainable competitive advantage. We believe that understanding the network effect best helps identify such barriers.

The main implication of this analysis is that a handful of companies will enjoy extraordinary financial returns. These returns are driven by two factors. First, dominant companies will enjoy the fastest growth rates. Second, the leaders enjoy the most enduring franchises—the longest competitive advantage periods. As Lise Buyer has emphasized, bigger is better.

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