

# Electronic Commerce

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Economics

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## Abstract

Today we review performance concepts and consider some basic measures of performance for firms in e-commerce.

# Performance

**Performance** refers to whether an institution achieves the goals that society sets for it. Common types of goals include

- **Consumer satisfaction**
- **Resource balance** (non-bankruptcy)
  - Non-negative profits
- **Productive efficiency** (non-wastefulness)
- **Allocative efficiency** (no gains from trade)
  - Equalize profit rates to allocate investments
- **Distributive equity** *e.g.*, fair income distribution
- Others

# Firm performance: measuring profitability

- Conceptually, profit is simple: revenue less cost
- Costs usually occur at different times than revenues
  - Simple case: inventory LIFO *vs.* FIFO
  - Capital amortization
- Theoretically as well as practically we want to distinguish **sunk**, **fixed**, and **variable** costs.
  - **Generally accepted accounting principles** (GAAP) give comparability, by having all companies use the same accounting principles
  - **Pro forma** profits allow companies to estimate profits based on special circumstances
- Special-purpose rules: tax accounting

# Profit reporting issues

- We postpone opportunity cost and other “economic accounting” issues
- **GAAP** is most conservative; eventually all costs must be paid
  - Makes sense for growth or mature industries
  - Best standard for conservative investors
- **Pro forma** accounting actually covers anything not GAAP; if it is more conservative than EBITDA or cash flow, it may be a better indicator of the future (because of mistakes in the past)
  - No defined standard; you need to read the small print!
  - Listed firms must reconcile to GAAP

- **Cash flow** measures the short-term survivability of a business (includes cash expenses like interest and taxes but not non-cash expenses like depreciation)
- **Earnings before interest and taxes (EBIT)**
- **Earnings before interest, taxes, depreciation, and amortization (EBITDA)** reflects the current health of the underlying business. This is what a raider aims at for an undervalued business, especially in bankruptcy
  - May also be of interest to VCs and other active investors

# Why does profitability matter?

- The obvious answer is that it provides income to stockholders
  - Economists don't care; stockholders are non-productive and if profits were lower, some other group's income would be higher
  - As **contractual return** to past investment, the system needs to keep its promises
- **Entrepreneurs** persuade investors, and siphon off a share of profit if successful; they seek the highest **expected profit**
- **Retained earnings** provide funds for successful entrepreneurs to reinvest
- **Economic profit** (above-normal profit) provides a signal to attract new investment, both “internally” (to the profitable firm) and “externally” (new entry)

## Where's the beef?

- Commerce Dept. estimates that in 2006 92.5% of e-commerce activity is B2B, accounting for about 25.5% of manufacturing and wholesale revenues, and only 7.5% is B2C, accounting for 2.1% of retail and service revenues.
- B2C share of activity is increasing rapidly at least in the retail sectors, from 2.9% of all retail in Q4 of 2006 to 3.3% in Q4 of 2007. Another way to look at it is total retail activity grew by 3.8% over that year, while B2C in retail grew by 19.9%.
- Manufacturers and services require much more detailed data because so much of their cost and value-added is not explained by e-commerce. Wholesale data not available.

## e-Retailing indicators

Retailer type	catalog	store	web
Average EBIT (2001)	+6%	-5%	-13%
Proportion of positive EBIT (2001)	73%	51%	55%
Year	1999	2000	2001
Online spending ( $\times 10^9$ )	\$25.5	\$42.4	\$51.3
Marketing cost per order	\$26	\$20	\$12
Fulfillment cost per order	\$12	\$11	\$14
Acquisition cost per new customer	\$38	\$29	\$14
Percentage of revenue from repeat buyers	31%	40%	53%
Order conversion rate	1.8%	2.2%	3.3%

# Who profits and why?

shop.org estimates are substantially (50%) higher than those of the Commerce Department, but trends are similar.

- Figures not reliable as they are self-selected respondents
- Web-based companies do *worst* (-13% average margin, 55% claim positive margin), while catalog-based companies do best (+6% average margin, 73% claim positive margin)
  - Web-based companies try to exploit web skills of uncertain applicability
  - Catalog (and more generally *multi-channel*) companies leverage experience in similar operation

# Trends in e-Tailing

- Marketing cost (per order) and acquisition cost (per new customer) both fall dramatically
  - Could reflect **learning curve** for online operations
- Fulfillment (S&H) costs per order constant
- Percent of revenue from repeaters rises
- Above trends seem to continue until 2006 (but more gently), however the increase in conversion rate reverses after 2003

# Resources, not money

- Money can't buy happiness, they say
  - And it doesn't even taste good
- But it can buy sushi
  - And that makes my daughter happy ... until it's gone
- *General equilibrium theory* takes the money out of the economy and looks at how to allocate sushi *etc.* “for the greatest good of the greatest number”
  - With appropriate definitions of “good” and “number”
  - Fundamentally values individual happiness
  - But doesn't know how to measure it!

# So why does accounting in money work?

- Market economy
  - Allows individuals to express value as choice
  - Equates money to *personal* marginal value of resources
- Capitalism forces managers to try to increase profit
- Actual economy is more accurate approximation of perfect competition than managers can accurately estimate economic costs

# Economic cost

- **Opportunity cost** of resource is **value in best other use**
  - Relates value of **input** to value of **output**, thus applies to **production**
  - Allows measurement of **value in production** in physical (not financial or “utility”) terms
- Unlike (linear) market, opportunity cost changes with scale (diminishing returns, *etc.*)
- Adjusting quantities leads to equation of opportunity cost “at the margin” so all actual usage is “best” in opportunity cost sense
  - Optimization for individual decision makers (**rationality**)
  - Equilibrium for society (**market**)