

The New Economy and old economics: What 19th century railroads can tell us about the future of ecommerce

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Two puzzles:

- Wide erosion of privacy in spite of extensive public opposition and little visible gain
- Priceline.com disappointment (and, more generally, slow spread of auctions, shopping bots, B2B exchanges, . . .)

Main theses:

- Erosion of privacy and disappointingly slow development of *The New Economy* both caused largely by incentives to price discriminate
- Price discrimination offers far greater gains in social and economic welfare than auctions and shopping bots
- Intense public opposition will force price discrimination to be practiced in hidden forms
- Price discrimination will be a major and contentious public policy issue

Underlying trends:

- incentives to price discriminate are increasing
- technology to price discriminate is improving
- privacy will be victim, since it inhibits price discrimination

Price discrimination likely to be most notable feature of
The New Economy

Will upset conventional wisdom:

- first degree price discrimination is possible
- monopoly is not required for price discrimination

Railroads and The New Economy

- Railroads: high fixed and low marginal costs
——→ incentives to price discriminate
- Airlines and railroads: same incentives
- Price discrimination tools: crude for railroads, sophisticated for airlines
- Public reaction to modern price discrimination: likely to be similar to 19th century railroad pricing

“Frictionless capitalism” vs. reality:

Dell Latitude L400 ultra light laptop listed at \$2,072.04, \$2,228, and \$2,307 on Dell Web pages (designed for state and local governments, small businesses, and health-care companies, respectively).

Wall Street Journal
June 8, 2001

*Ecommerce is not about “frictionless capitalism,”
but about exploiting market power, creating
barriers, . . .*

See:

AO, “The bumpy road of electronic commerce,” *Proc. WebNet 96*, available at:

[<http://www.dtc.umn.edu/~odlyzko>](http://www.dtc.umn.edu/~odlyzko)

Shapiro and Varian, *Information Rules*, Harvard Business School Press, 1998,

or any of numerous papers on spectrum auctions.

Standard economic argument for price discrimination

Charlie: willing to prepare a report on digital cash for \$1,500

Alice: willing to pay \$700

Bob: willing to pay \$1,000

Uniform pricing makes transaction impossible

Charging Alice \$650 and Bob \$950 makes everybody better off (in conventional economic model)

Modern economy is moving towards higher fixed costs and lower marginal costs, which increases the incentives to price discriminate

Information goods (software, music): prototypical example

Also other high-tech products:

Pharmaceuticals

Microprocessors

Pentium prices: \$100 – 500

Marginal cost ~ \$30

Communication satellites

Cars: design and tooling costs of \$2-3B for each new model

Price discrimination is ubiquitous

World Business

With Stock Market Tables

The New York Times

THURSDAY, OCTOBER 31, 2002

Europe Fines Nintendo \$147 Million for Price Fixing

By PAUL MELLER

BRUSSELS, Oct. 30 — The European Commission fined Nintendo, the Japanese video game maker, \$147 million today for colluding with seven European distributors to fix prices on its products.

In a statement, the commission said that Nintendo had organized a cartel that lasted from 1991 to 1998 and allowed the company to keep prices for its games and game consoles artificially high in some countries. The distributors agreed not to sell the products to buyers from other European countries.

As a result, the commission found, differences in prices from country to

The cost of games varied greatly from country to country.

country were extraordinarily large. By 1996, it said, Nintendo game consoles cost about three times as much in Spain as they did in Britain, Germany or the Netherlands.

"European families have the right to buy the games and consoles at the lowest price the market can possibly offer, and we will not tolerate collusive behavior intended to keep prices artificially high," Mario Monti, the

European commissioner for competition, said today.

Nintendo, which was founded by the company's president, would appeal the fine.

One of the cases involved the company's distribution in the United Kingdom.

In the case of Nintendo, which was founded by the company's president, officials laid out the strategy and methods of maintaining the huge price differences for Britain, the most competitive market, and other national markets on the Continent.

"We can, by working closely together, find a much better way of isolating our products and our prices to within the shores of the U.K., thus reducing the impact that this differ-

ential pricing has upon mainland Europe," the Menzies' memorandum said.

By 1996, it said, Nintendo game consoles cost about three times as much in Spain as they did in Britain, Germany or the Netherlands.

other six distributors combined, because it worked the most closely with Nintendo, the commission said. Menzies also "tried to mislead the commission with regard to the real scope of the infringement" in the early stages of the inquiry in mid-1997, the commission said today.

The chief executive of Menzies, David J. Mackay, said the fine was

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Price discrimination is ubiquitous, often concealed and often disputed:

- Student and senior citizen discounts
- Medical fees
- Gasoline wholesalers' "zone pricing"
- Undergraduate financial aid
- Sales, coupons, price-matching
- Roaming charges for cell phones

Less certain:

- Movie ticket and popcorn pricing

Questions of whether price discrimination is being practiced is often muddled by issue of "joint costs"

Clear example of dominant influence of price discrimination: Fares offered at www.continental.com on February 27, 2002:

Minneapolis to Newark, NJ on Wednesday, March 20,
returning Friday, March 22: \$772.50

Minneapolis to Newark, NJ on March 20,
returning March 27: \$226.50

Newark, NJ to Minneapolis on March 22,
returning March 27: \$246.50

Regulatory price discrimination usually rooted in corporate practices from an early era:

The terms for leasing two telephones for social purposes, connecting a dwelling house with any other building, will be \$20 a year; for business purposes \$40 a year, payable semi-annually in advance.

Bell Telephone Association, 1877

Absurdities of government regulation often rooted in corporate practices:

Cats is ‘dogs’ and rabbits is ‘dogs’ and so’s Parrats, but this ‘ere ‘Tortis’ is a insect, and there ain’t no charge for it.

Punch, 1869

Politics makes for strange bedfellows, but so does economics:

On average, for each dollar American consumers pay for prescription drugs, the Germans are paying 71 cents; the Swedes, 68 cents; the British, 65 cents; the French, 57 cents, and the Italians, 51 cents. Unfortunately, U.S. policy allows pharmaceutical industry to maintain that disparity. . . . It's a moral outrage that Congress continues to allow millions of elderly and chronically ill Americans to suffer and die because they cannot afford the inflated prices charged for pharmaceuticals.

Congressman Bernie Sanders
letter to *Barron's*

Versioning is motivated by incentives to price discriminate:

It is not because of the few thousand francs which have to be spent to put a roof over the third-class carriages or to upholster the third-class seats that some company or other has open carriages with wooden benches. What the company is trying to do is to prevent the passengers who pay the second class fare from traveling third class; it hits the poor, not because it wants to hurt them, but to frighten the rich.

And it is again for the same reason that the companies, having proven almost cruel to the third-class passengers and mean to the second-class ones, become lavish in dealing with first-class passengers. Having refused the poor what is necessary, they give the rich what is superfluous.

Jules Dupuit, 1849

Versioning is increasingly leading to “damaged goods”: higher costs for lower functionality

IBM, 1990:

Laser Printer: 10 pages/min.

Laser Printer E: 5 pages/min.

FedEx: afternoon delivery only in the afternoon.

Effective price discrimination conflicts with “first sale” principle, arbitrage, anonymity, and privacy

Moves that facilitate price discrimination:

- positive passenger identification
- service contracts instead of goods sales
- UCITA
- DRM (Digital Rights Management)
- . . .

Limitations on price discrimination:

Intense negative popular reaction, rooted in behavioral economics factors, especially concerns about fairness

Do people really care about privacy, given their use of frequent shopper cards, etc., as well as once common use of telephone party lines:

Henry Winston, a prosperous young farmer living near Fairfax, Missouri, did not reckon with the rural party line, to which his telephone was connected, when he called up Miss Lorena Simpson and asked her to share his joys and sorrows of life, and for that reason is in quite a predicament. Before Miss Lorena could answer the question, eleven fair damsels, who had heard, at their respective homes, the ring for the Simpson home, quickly stepped to the telephone. Each, knowing full well that “something would be doing,” had quickly answered “Yes,” adding, “You set the date and I’ll be on hand.”

Although Henry knows he is engaged, and that it is not Miss Simpson who accepted, he is a little in doubt as to which one of the eleven answered his question first.

Telephony, 1909

Airline yield management is spreading, but not without opposition:

But perhaps the most baffling aspect of British rail travel is the price. . . . Fare structures have become a tangle of elusive discounts and incentives for early booking that have widened the gap between standard and first class passengers – but probably united them in complaining about poor service.

New York Times
28 May 2000

Railroads in the 19th century: extremely important, widely hated

The drama was over. The fight of Ranch and Railroad had been wrought out to its dreadful close. . . . Yes, the Railroad had prevailed. The ranchers had been seized in the tentacles of the octopus; the iniquitous burden of extortionate freight rates had been imposed like a yoke of iron.

Frank Norris, *The Octopus*

Origins of government intrusion in U.S. business:

The demands that brought the first permanent regulatory commission to the United States resulted directly from the railroads' discriminatory pricing policies.

Alfred Chandler, Jr. *The Railroads:
The Nation's First Big Business*, 1965

Behavioral economics: serious constraints on price discrimination, “dynamic pricing,” auctions, . . . , because of negative public reactions:

Ultimatum game:

1. \$10 to be divided by Alice and Barbara
2. Alice proposes a split (for example, \$7 for Alice, \$3 for Barbara)
3. (a) Barbara accepts: each gets specified amount
(b) Barbara rejects: neither gets anything

Business opposition to price discrimination:

But the fact that the charges are so low does not make *differences* in charge bear any less severely upon business. A difference of five cents per bushel in the charge for transporting wheat a thousand miles is a small matter, taken by itself. It would be weeks before it would make a difference of one cent to the individual consumer of bread. But if a railroad makes this reduction for one miller, and not another, it will be enough to drive the latter out of business.

Arthur T. Hadley,
Railroad Transportation, 1885

Business demands for fairness:

When the rate went down to ten cents a hundred from Chicago to New York, or fifteen cents from St. Louis to New York, the rate was to some few fifteen, to some few others ten, but the main body of the commercial community were compelled to pay twenty-five and thirty cents a hundred, and the standard rate was forty and forty-five; thus inaugurating a wide-spread system of uncertainty, chicanery, fraud and personal favoritism, demoralizing trade and commerce even worse than the demoralizations due to an uncertain currency, because the freight charge fluctuated more frequently, even from hour to hour and day to day. Consequently, the combination which brought the rate to seventy cents a hundred, and maintains it there, is considered a God-send and a blessing, compared with the fifteen or ten cent fluctuating rates before, simply because the seventy cents is an equally distributed and calculable element.

Simon Sterne
New York Board of Trade and
Transportation, 1879

Interstate Commerce Act of 1887: first serious federal regulation

Provisions:

- Rates to be “just and reasonable”
- Personal discrimination forbidden
- “Undue or unreasonable preference” forbidden
- Charging more for short than long haul on same line forbidden
- Pooling forbidden
- Rates to be published
- . . .

Regulation and the “Robber Barons”

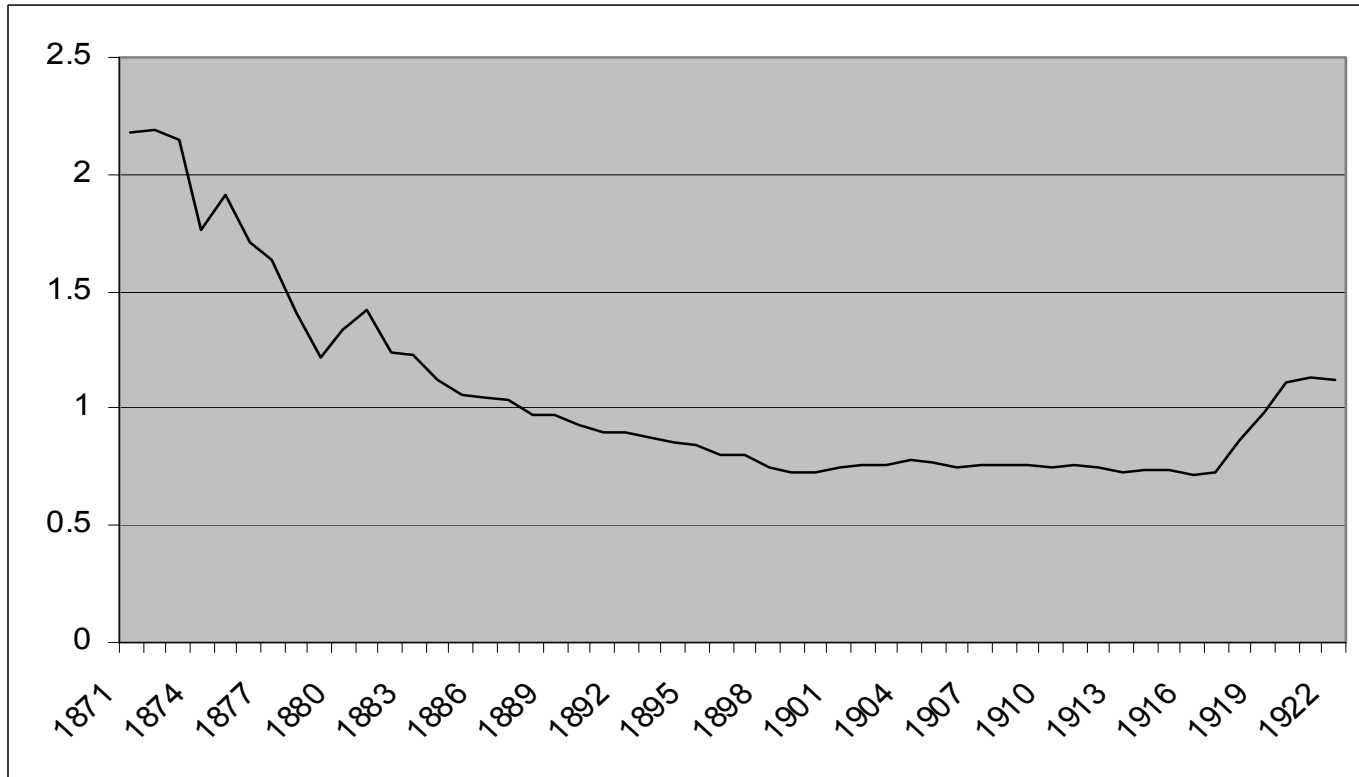
By 1903, it had become apparent that the law relating to personal discrimination and rebating needed strengthening. The carriers themselves sponsored legislation of this sort because they were losing revenue as a result of the widespread discrimination and departure from published rates. Yet they were unable to stop the practice without the aid of the government.

Locklin, *Economics of Transportation*

Government regulation of railroads:

- traditional view: curtailing of Robber Barons' obscene profits
- revisionist view: regulatory capture by industry
- more accurate view: stability for industry and prices perceived to be fair for customers at the expense of efficiency

Technology, competition, and regulation: average freight rates (in cents per ton-mile) on U.S. railroads, 1871-1922:



Fundamental problems:

How to reconcile incentives to price discriminate with public loathing of such practices

Warning: better data collection and analysis tools are becoming available to customers

Other ways to skin the cat (other than explicit price discrimination:

Microsoft Office (for Windows 3.11)

components:

| | |
|--------------------|--------------|
| Access | \$225 |
| Excel | \$225 |
| PowerPoint | \$225 |
| Word | <u>\$175</u> |
| Total: | \$850 |
| Office Pro bundle: | \$389 |

Bundling is an alternative to price discrimination in reducing consumer surplus:

Willingness to pay:

| | word processor | spreadsheet |
|-------|-------------------|-------------|
| Alice | \$100 | \$300 |
| Bob | \$300 | \$100 |

Pricing and revenue:

| | | |
|------------------------|-------|-------|
| \$100 for each program | ————→ | \$400 |
| \$300 for each program | ————→ | \$600 |
| \$400 for bundle | ————→ | \$800 |

Site licensing:

| # employees | value |
|-------------|-------|
| 900 | \$ 0 |
| 10 | \$ 10 |
| 10 | \$ 20 |
| 10 | \$ 30 |
| 10 | \$ 40 |
| 10 | \$ 50 |
| 10 | \$ 60 |
| 10 | \$ 70 |
| 10 | \$ 80 |
| 10 | \$ 90 |
| 10 | \$100 |

1000 employees

Sales to individuals: optimal price either \$50 or \$60

revenue = \$3,000

Site licensing: revenue = \$5,500

Consumers' willingness to pay more for simple pricing:

What was the biggest complaint of AOL users? Not the widely mocked and irritating blue bar that appeared when members downloaded information. Not the frequent unsolicited junk e-mail. Not dropped connections.

Their overwhelming gripe: the ticking clock. Users didn't want to pay by the hour anymore.

Case had heard from one AOL member who insisted that she was being cheated by AOL's hourly rate pricing. When he checked her average monthly usage he found that she would be paying AOL more under the flat-rate price of \$19.95. When Case informed the user of that fact, her reaction was immediate.

'I don't care,' she told an incredulous Case. 'I am being cheated by you.'

from aol.com: How Steve Case Beat Bill Gates, Nailed the Netheads, and Made Millions in the War for the Web, Kara Swisher, 1998.

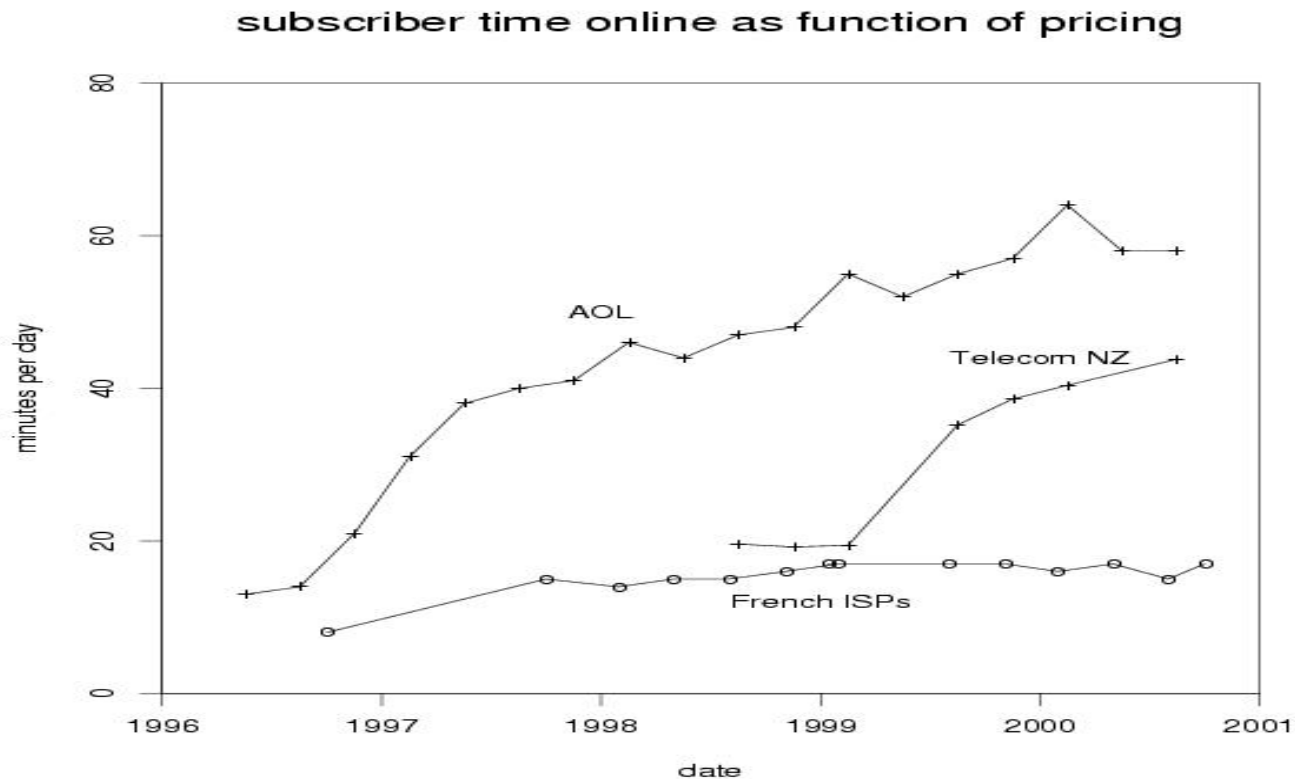
Increasing usage as key imperative:

AO, “Tragic loss of good riddance: The impending demise of traditional scholarly journals,” 1994: predicted that pay-per-view in scholarly communication doomed to fail because of the deterrents of usage charges

[Elsevier’s] goal is to give people access to as much information as possible on a flat fee, unlimited use basis. [Elsevier’s] experience has been that as soon as the usage is metered on a per-article basis, there is an inhibition on use or a concern about exceeding some budget allocation.

K. Hunter of Elsevier, 2000

Flat rates as a way to stimulate usage:



Network effects:

Although about three million computers get sold every year in China, people don't pay for the software. Someday they will, though. And as long as they're going to steal it, we want them to steal ours. They'll get sort of addicted, and then we'll somehow figure out how to collect sometime in the next decade.

Bill Gates, 1998

Constraints on auctions, dynamic pricing, micropayments, DRM, . . . :

- Political action
- Preference for simple pricing, expressed in willingness to pay more
- Advantages of bundling
- Lower usage with constraints
- . . .

Constraints on auctions, dynamic pricing, micropayments, DRM, . . .:

- Continuing tension between incentives to price discriminate and constraints on overt price discrimination
- Likely to be resolved through attempts at bundling, loyalty programs, . . ., which help conceal price discrimination

Implications for technologies:

- Data mining to flourish, privacy to suffer
- Government role likely to be substantial but ambiguous, since price discrimination is often socially desirable
- DRM, auctions, micropayments to play minor role