Ramsey Prices

If there are increasing returns to scale, then MC< AC. Efficient pricing usually requires that price equal MC. If this rule is used, the firm will have negative profits. What are the efficient prices that will ensure that the firm survives, has zero profits? The answer is Ramsey prices.

Suppose there are two services and the demand elasticities are \( \eta_1 \) and \( \eta_2 \). The Ramsey prices satisfy:

\[
\left( \frac{P_1 - MC_1}{P_1} \right) \eta_1 = \left( \frac{P_2 - MC_2}{P_2} \right) \eta_2
\]

or

\[
\left( \frac{P_1 - MC_1}{P_1} \right) = \frac{\theta}{\eta_1} \quad \left( \frac{P_2 - MC_2}{P_2} \right) = \frac{\theta}{\eta_2}
\]

These equations can be derived from the constrained optimization problem: max social welfare (sum of consumer and producer surplus) such that the firms have zero profits.

Example: (due to K Train)

Suppose a firm produces two goods with demand functions

\[
P_1 = 50 - .0075Q_1 \quad \text{and} \quad P_2 = 40 - .004Q_2
\]

and total cost,

\[
TC = 19,200 + 20Q_1 + 20Q_2
\]

If prices are set at MC then the firm will lose 19,200. Prices have to be raised to eliminate the losses which requires an extra $19,200. There are an infinite number of ways of doing this. Three examples are P_1 = 20, P_2 = 25.44, and P_1 = 26.25, P_2 = 20, and P_1 = 23, P_2 = 22. In each case profits are zero.

We want to raise prices to cover the initial losses while maximizing welfare. Since profits are zero, welfare is simply total consumer surplus. With linear demand curves, consumer surplus in each market is simple to calculate as the area of the triangle under the demand curve and above the price line. In our three cases, total consumer surplus is 86,499, 87,605 and 89,100. The last case is clearly better because consumer surplus is highest.

Our last case (P_1 = 23, P_2 = 22) is the Ramsey price case. We can see this by checking if equation one is satisfied. At these prices, \( \eta_1 = -0.85 \) and \( \eta_2 = -1.2 \). Note that the price is higher in the market with the lower elasticity even though MC is the same.

In market one, price exceeds marginal cost by 3 which is a 13% markup. Multiply this by the elasticity to get -0.11. In market two, the price markup is 9% which if multiplied by the elasticity gives -0.11. Equation one is satisfied.
THE TELECOMMUNICATIONS ACT OF 1996

1. Comprehensive—telecom, cable, satellite, etc.

2. Administered by the FCC

3. In telecom
   A. Change the 1983 AT&T breakup
   B. RBOC/ILECs can enter long dist when local open to comp.
   C. Require interconnection between networks
      - reciprocal rates but left to negotiation
   D. Change Universal service obligation

4. In cable
   A. Remove regulation and promote entry/competition
ACCESS TO BOTTLENECKS

1. There are some local monopoly bottlenecks
   • The Local Loop, for example

2. Current policy (adopted in TA96)
   • Incumbents must provide access to bottlenecks
     - at "just" & non-discriminatory prices (else arbitrate)
   • Access, Unbundled Network Elements (UNE), resale
   • Local carriers can enter long-distance if they open local

3. How to set the prices?
Access to Bottlenecks

Say that at $14, sales total 20.

MC=7, MC=4 sell at price=14, profit=20 x 3 = 60
Access to Bottlenecks

Now suppose a competitor comes along, more efficient on the non-bottleneck part. What will monopolist do?
Access to Bottlenecks

Will they just use the new technology themselves?

Bottleneck owner values the new technology.

If he sold 20 units before at profit $3 ea.
He can now sell 20 units at profit $4 ea.
Net: $20 thanks to the innovation.

(Possibly more if they lower P to sell more Q)
Access to Bottlenecks

Evaluating the situation:

Will the efficient technology be used?
Yes.

Is there an incentive to innovate?
For incumbent: $20
For rival: some fraction of $20
Access to Bottlenecks

So why regulate at all?

Worried about the output price (b/c still a monopoly)?

Worried that incentives for competitor are weak?

Worried that bottleneck will exclude competitor?
Access to Bottlenecks

Efficient Component Pricing Rule (ECPR):

Bottleneck price set at market price minus avoided costs.

\[ P_b = 14 - 4 = 10 \]

Logic:

Bottleneck owner indifferent (opp cost)
Only efficient competitors enter
Access to Bottlenecks

Under ECPR, competitor values the new technology.

If B sold 20 units before at price $14 ea.
C can now sell 20 units at price $13.99 ea.
Cost to C is 10+3 thanks to ECPR
B still makes his profits of $3 ea.
10-7 is the same as 14-11
But C now makes a profit of about $1 ea.

Net incentive to C to innovate: 20 times $1.
PROBLEMS WITH ECPR

1. Doesn't eliminate monopoly—inefficient entry good?

2. What if monopolist can lie about costs?

3. It's not Ramsey Pricing: allow price discrimination?
TELRIC PRICING (For UNEs)

1. Total Element Long Run Incremental Cost
   • MC + a share of fixed costs + some profit rate
   • Basically like an AC measure

2. BUT, the FCC says it should be forward looking
   • Interprets this as on the "Hypothetical" network
   • Take AC from best practice today & that's TELRIC
   • Even if paid a lot last year, must sell at today's price
   • Should we care about past costs?
   • Turn over to states for TELRIC determination
   • What counts as a UNE?

3. Dampens Incentives to innovate for both CLEC and ILEC.
HOW COULD AN INCUMBENT FIGHT ACCESS RULES?

1. Cross-Subsidization
   • Pac Bell and the free local service if $50 of long distance

2. Vertical Price Squeeze
   • Raise \( p \) for both self and competitor, observable costs?

3. Reduce Quality/Raise Switching Costs
   • Number portability, repairs, underinvest in training

4. Bundle Services to get the potential Switchers
   • long contracts, special terms, etc.
   • What if people like that better?
UNIVERSAL SERVICE

1. Changing/inconsistent definitions
   • Interconnection between carriers
   • Complete coverage at low price
   • Access to the latest technology everywhere

2. Conventional Usage: Push for 100% subscription
   • 95% of the U.S. has service
   • Are 5% w/o phones b/c income, choice, credit, etc?

3. Where does the money come from/where does it go?
   • Traditionally long-distance prices inflated while Access price artificially low
   • IMPLICIT subsidies, typically not explicit
   • Rural (high-cost) users and low-income users subsidized
UNIVERSAL SERVICE

1. Services included under 1996 Act
   • Voice access and touch-tone service
   • Operator, 411 & emergency services
   • Access to a Long-Distance carrier (of your choice)

2. Services not included
   • Voice mail, toll-blocking, caller ID
   • Wireless, payphones (frequently)
   • New services (DSL, for example)

3. Must agree on quality level, prices and financing
   • Pricing and financing mainly political decisions
UNIVERSAL SERVICE CHANGES: Telecom Act of 1996

1. There should be entry

2. Universal Service should be
   • Competitively neutral (not just to ILECs)
   • Explicit not implicit

3. Similar in Europe after 1998

4. New Universal Service Obligation for Internet in Schools
   • $2.25 billion paid for by another charge on L-D
THE PROBLEM OF TA96 UNIVERSAL SERVICE

1. Proxy model (a voucher to use anywhere) for high cost area (i.e., c > p)

To induce universal service, they need to give a subsidy

\[ s = AC - p \]

(where AC is forward looking AC) for each customer.

2. Assume two types of customers
   \( f\% \) of people are high cost to serve \( c_H \) and
   \( 1-f\% \) of people are low cost to serve \( c_L \)

\[ c_L < p < c_H \]

Average costs \( c = f(c_H) + (1-f)(c_L) \)

3. Cream-Skimming by entrants.
UNIVERSAL SERVICE: CHARGES

1. Charges (look at a phone bill)
   • Subscriber Line Charge (SLC) for access
   • Interconnection fees on long-distance (inter-LATA)
     - access charges about $.06 per minute
     - actual MC of connections about $.01 per minute
     - + about $6.50 per line (only part to direct subsidies)
   • 25% of the local costs must be paid by L-D (regulation)

2. 1998 Data
   • Total L-D minutes (residential): 250b  AVG P: $.162
   • Total access charges (over mc): $12.5b ($110/line/yr)
UNIVERSAL SERVICE: DIRECT SUBSIDIES

   • About $550/yr per additional subscriber

   **Life-line**:
   - $7 off the access fee (2X the SLC) per month
   - Cost: $422m or $2.43 per local carrier line/yr

   **Link-Up**:
   - up to $30 off connection fee (50% subsidy)
   - Cost: $42m per year or $.24 per line/yr

2. High-Cost area subsidies—paid for by the USF
   • subsidize LEC costs in high-cost areas
     - 0% for <1.15 x AVG, up to 75% >1.50 x AVG
     - Cost: $827m or $5/line/yr
   • subsidize LECs with <50,000 lines
     - Cost: $472m or $3/line/yr
ARGUMENTS FOR UNIVERSAL SERVICE

1. Redistribution (across income, across geography)

2. Network Externalities
   • Coordination problems—all or nothing
   • Example: Native American phone rates vs others
     • If value of network to one person is $\beta*(N-1)$
     • Value of whole network is $\beta*N*(N-1)$
     • One person a small increase but sum over 100m is big

3. Economies of Scale: spread the FC over more people

4. Political issues: joining the nation, etc.
ARGUMENTS AGAINST UNIVERSAL SERVICE

1. Why force buying phones rather than just giving $?

2. Should there be universal service for refrigerators?

3. Phones compared to other goods: income & penetration?

4. Costs of the programs in efficiency losses.