Industrial Organization
Case Studies
Lent Term

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1 Week 1: 14 Jan - 18 Jan

1.1 Raleigh Case: Intoduction

- We introduce the notion of vertical restraints in this case and the next. The underlying general issue: is this an anti-competitive devise or is it a harmless way of dealing with an externality (via "Matthew - Winterson").

- Consider the case of the UK Monopolies Commission (UKMC) and their investigation of the Raleigh Company (RC). In the 60's and 70's, RC was the number one UK producer. It was the strongest firm in the UK market. Imports at the time were small but growing.

- RC sold their bikes to many small independent bike shops to distribute them. The bike shops were specialists. The bike specialists would act as approved RC bicycle dealers so if there were any problems with the bikes, customers could return to these specialists in Raleigh bikes.

- Then superstores came along and went to RC and wanted to stock their bikes. RC refused and the superstores had to rely on the relatively small inflow of imports.

- So two questions: 1) The Commercial Rational of the Raleigh decision: was this a good strategy for Raleigh.

- 2) Public Policy issue: should the UKMC require Releigh to supply to the superstores?

1.2 Raleigh Case: Group Discussion

1.2.1 Commercial Rational

- Commercially, it appears that the Raleigh Company (RC), could have done much better for itself if it would have released its product to the discount stores. The market share of RC fell from 67% of the UK market in 1972 to 40% in 1980. This seems mostly accounted for by the rise in the discount stores selling the cheaper imported bikes which grew from 6% in 1972 to 26% of the market in 1980.

- We felt that the RC numbers on the predicted effects of selling through discount stores (losing 200,000 units through the specialist stores while only gaining 40,000 units through discount stores) are way out of line. While, we could see where they were getting the number from, we figured that if RC started competing at the discount store level, they would gain significant market share in that segment of the market: namely those customers who are just looking for a decent bike, not some state of the art vehicle that requires technical advice and maintainance. [Note: in 1980, UK bike sales = 1,563 * RC market share = 0.4 = 625. 625 * Volume of bikes sold through discount stores = 0.07 = 40. So this is where they are getting the 40,000 number. However, the 7 percent volume number for discount stores would of course increase once RC (40 percent of the whole market!) starting distributing through them.]

- In terms of brand image, the UKMC's suggestion of selling the RC bicycles through the discount stores under one of their other names seems like a reasonable solution to this problem.

- Finally, examining the RC company balance sheet, (appendix 2, page 47), it seems that under the current distribution plan for RC, they are actually making losses. This is due mostly to a large increase in net interest payable in 1979 and very low "trading profit" starting in the same year. It appears in table 2.1 on page 4, that the bicycle market had a bad year in 1977, but we could find no reason in the article to justify those losses experienced in 1979 onwards.

1.2.2 Public Policy Issues

- The Public policy issue seemed to be fairly clear to us. The RC argues about things like bike maintainance and safety issues as reasons why it is so selective in its distribution process. The UKMC stated that there are complicated technical items such as cars which clearly should be sold from authorized dealers who clearly know what they are doing. On the other end of spectrum are products that require almost no specialized knowledge to own or operate. The RC company put modern day bicycles somewhere closer to cars and the UKMC, which we agreed with, placed them closer to the other end. While the technologies have advanced and there are clearly dangers associated with operating a bicycle, we couldn't convince ourselves that the local discount store personnel wouldn't be able to provide the same level of service as a bike specialist. [The RC argument also falls apart once you consider that they already are selling bikes in the mail order market: a market which provides no specific expertise or safety screenings of their bikes.]

- The servicing options are still available no matter where the bike was purchased so we didn't feel that this argument was very good. Bikes are not all that specialized in that the brake system on a RC bike versus a Huffy or something are most likely the same or very close to identical. As long as bikes are on the road and they break down or need repair, there will exist a bike repair market which should be sufficient. If anything, having specialized bicycle repair shops that ONLY deal with RC bikes would be more of a disservice to the public as they MUST own a particular brand of bike to have it repaired at that shop.

- So overall, requiring the RC to supply through the discount stores would surely increase consumer welfare. Prices would fall as the RC bikes would compete with cheaper imports. Though statistics were not available, the safety argument seemed to lack any substance. And the idea that all these specialist bike shops will go out of business doesn't seem reasonable when they could surely either a) offer their bikes at a lower price without the service guarantees, or b) supply high priced (more service oriented) bikes to the segment of the market that really wants it. (though we believe that this segment of the market is very small.)

2 Week 2: 21 Jan - 25 Jan

2.1 Raleigh Case: Class Discussion

- The key question to ask is how does the entry of the new retailers affect the price and sales of old and new retailers.
- The real conflict comes from within the company as the 2 divisions (high and low quality) are effectively competing with each other and stealing one and other's sales.
- Note the discount stores cannot buy high quality bikes from abroad because even though they will be high quality, people won't recognize the names, so they won't be able to compete with Raleigh.
- A solution for the bike shops once the discount stores steal their business is to sell bundles: bikes and service agreement. However, this creates a bad externality: free riders. Customers will go to bike stores for service and advice and then buy cheaply at discount stores.
- Viability of strategy for Raleigh. The RC strategy is coherent but rests on 2 premises: 1) they can maintain structure of retail markets, and 2) people attach benefit to service. The inflow of imports is changing the structure of the market but RC is NOT changing with it.
- In the end the UKMC ruled the RC strategy of pricing and distribution was just poor and it was not in their area to criticize or adjust for bad strategies. It is not the job of UKMC to enforce a change of strategy on RC. Intervention can only be justified under abuse of market dominance which RC clearly did not have. RC is missing the boat on the changing market conditions. RC experienced large losses of market share but thanks to the introduction of the Chopper and other inovations, the company was saved.

2.2 Sealy Case: Introduction

- Weak Matthewson-Winter (MW) ties.
- Can we rationalize by reference to a typical M-W argument or is there something else going on here.
- Evaluate critically : what are the basic arguments.
- Sealy - biggest brand in US.
- Can we rationalize the restrictions using MW?
- What kind of structure does Mueller have in mind? What is the right analytical model for what is happening? Consider Mueller's model. Consider evidence as to what model is appropriate.

3 Week 3: 28 Jan - 1 Feb

3.1 Sealy Case: Group Discussion

- We did not feel that Sealy's distribution restrictions could be rationalised under any of the M-W arguments. M-W argues that sometimes a vertical restraint is beneficial for an economy because it eliminates an externality and increases consumer welfare. We could not justify an argument of this form for Sealy.

- **Free Rider Problem:** The free rider problem which Sealy is supposedly trying to get around by using these required selling areas and then the APRs (Areas of Primary Responsibility); we determined there really were no significant free-rider problems in the case of Sealy mattresses. Consider their advertising strategy. Over half of the money spent on advertising was done at a national level and the purpose was to enhance Sealy's nation-wide brand image. The locally licensed distributers also advertised but they did so by entering into an agreement with a department store or other retail outlet and they shared the cost of advertising. Thus, if an "invader" came into another's APR, they would also have to spend some amount of money on advertising themselves to develop a relationship with the retailer. There would surely be some degree of local spillover, but surely this would not justify such an extreme solution as APRs.

- **APRs:** We believe that the reason Sealy kept the territorial boundries for their distributors was to raise the price of their products in what became many, almost monopolistic, geographically divided markets. Each APR could be thought of as a seperate market because there is absolutely no incentive for anyone else to sell Sealy products in an area outside their own.

- **FHPD:** For these reasons, we constructed something of a Forced Horizontal Product Differentiation (FHPD) type model where Sealy created geographical boundries for their markets that would not have naturally occured (except in the West).

- **Anti-cartel:** The other argument brought forward in favor of Sealy was that the APRs "were adopted to eliminate competition among potentially competing licensees to decrease output and to increase prices." This is like an anti-cartel type argument? Clearly it is flawed because once the Sealy restraints were removed (price and territorial), prices fell and output rose. Clearly welfare increasing.

- **Restraints:** Sealy's restraints themselves also really don't make economic sense. The "Passover Payment Provision" is to get around the problem of free riding which we have shown did not exist for the most part. The "Warranty Repair Charge," a fee paid by the invader to the invaded to cover the invaded's cost of repairing the invader's shitty mattresses. This is completely crazy and even the president of Sealy wanted to remove it.

- **Easter:** Finally, the Easter-Head Filters (pg 1311): clearly any of those qualifiers alone should NOT dismiss a firm from unreasonably restricting output or behaving in

an anticompetitive manner (particularly number 4 which is complete bs). Sealy would have qualified for all but one of the filters thereby completely dismissing their case.

- Need to still address the "Right of First Refusal" (pg 1284) and it's relation to Western APR's (pg 1300).

3.2 Sealy Case: Class Discussion

- National advertising created no spillovers at the local level so a M-W argument based on the advertising idea doesn't jive.

- What about the other M-W argument, Double Marginalization? If we had a situation where both the manufacturer was pricing at a margin and the retailer was pricing at a margin, we would have a problem (which might be solved using vertical restraints). But here, we have the licensees themselves manufacturing the product and they are just paying a fixed license fee to put the Sealy tag on the mattresses. So there is no Double-Marginalization either because the license fee is a fixed cost. If it was some sort of royalty per mattress sold, we might have a case, but otherwise, M-W doesn't apply to this case at all.

- Ohio Sealy - the most efficient of all the licensees. They were the ones that were upset because the restraints (APRs) were effectively preventing Ohio Sealy from profit maximizing. So under a monopolist's first best, Ohio Sealy would produce all the mattresses at their low cost and distribute them. High transport costs stop this from happening completely, but Ohio-Sealy definitely could have expanded a little and increased profits.

- Natural Experiment. The restraints have effectively created a cartel of individual licensees. The Hotelling umbrellas go verticle at the edges of the APRs. (ie, no one can come into any one else's APR, so each licensee has a monopoly over that area. When the restraints are removed in 81, the prices movements are rather large because even though the mattress market is highly homogenous, Sealy has a large market share due to their higher preceived quality. So prices fall a lot which is welfare improving.

- But more importantly than the welfare effects, is that ruling against Sealy creates a president for other firms who might consider setting up a similar arrangment with APRs. The courts had to make an example out of Sealy so other firms wouldn't try the same thing even though the welfare effects were probably rather small in this case.

- Suppose that one licensee purchased the whole of Sealy Inc. and all the other licensees. Sealy would effectively become a monopolist and prices would begin to rise. Profits would rise and firms (HIGH QUALITY FIRMS THAT IS) would enter the market and Sealy would lose market share. Thus, having the current setup with a lot of small licensees allows an entrant to just start selling the Sealy brand instead of trying to compete with the product line itself. The monopoly solution is in effect, not as profitable as the more fragmented structure.

3.3 IBM Case: Introduction

- In the mid 1960's to late 1970's, IBM was the number one firm in the computer mainframe market with about a 70 percent market share.
- Concentration in this type of industry is inevitable because it is so $R\&D$ intensive.
- The next 7 firms below IBM had a smaller combined market share than IBM had alone.
- So an antitrust case was brought against IBM by its competitors because they couldn't compete with the giant.
- Issues in IBM: Preliminary Question: What was the source of IBM's dominance in the mid 1970's. The Key to this is the 360 series.
- Issues in the Antitrust Case: Market Share. Around this time, the focus of investigations had been to look for price coordination or price fixing (ie, look for bad behavior among firms). But now, the focus turned to observable effects such as market share. ATT and IBM were like two test cases. The question is therefore: Is market share alone grounds for intervention?
- Another issue: Bundling. IBM sells all hardware and software as a bundle. Is this Anticompetitive? (Ref: Adams Yellen QJE)
- Final issue: Early announcements. When another firm comes out saying that they are working on some new product or a faster processor, IBM makes a public announcement well in advance saying that they will have a superior product in the matter of X months. Is this anticompetitive?

4 Week 4: 4 Feb - 8 Feb

4.1 IBM Case: Group Discussion

- Source of IBM's dominance in the 1970's. We reasoned that the source of IBM's dominant (almost 80 percent) market share was mostly a result of their reputation effects and the high switching costs to competitor's products. IBM had developed its product and had penetrated a large segment of the market. By staying up with the latest technologies and offering new but compliant hardware and software, they maintained their customer base. It was also a result of the way the computer hardware market is structured. A new firm will choose to use IBM's product because they are fairly confident they will still be around in a year when something needs to be upgraded or a machine breaks down. A firm with a small market share (especially in an industry with a dominant firm like IBM) might not be around in a year. So IBM was in a way selling a service agreement along with its product even if it wasn't explicit in the contracts. It's name and reputation depended on providing a good quality product both now and in the future.

- The 360 series. This series guaranteed them continued market share in an ever more competitive market place. The way they announced the product is something of controversy and will be discussed in a bit. But securing these contracts and by making the 360 incompatible with competitor's old hard/software kept them in the market even though the 360's had yet to hit the showroom floor.

- Is Market Share alone enough for intervention? We reasoned that it was not. Anti-competitive practices are not always associated with high market share though market power clearly enables firms to engage in anticompetitive behavior and thus market share might be used as a flag for further intervention. For example, new industries are sometimes dominated by one firm and then as they make profits, other firms come and an dilute the power of the larger firm. Market definition is obviously a tricky issue which might make using market share very misleading. Particularly in the computer industry, issues of consumer welfare must also be considered when determining if IBM's practices are anticompetitive. One might argue that it is in the consumer's favor to have one firm dominate (at least initially) and set the standard for future competitors. IBM was playing that role in this market.

- Bundling: Anticompetitive? We cannot see how IBM is really bundling their hardware and software because it does not say that consumers are forced to buy both from IBM. We figured that by bundling, he means that the software or hardware released only works on old IBM machines. But again, IBM was setting a standard and why would they make software or hardware that worked in other's machines? We're still not clear on what this question is really asking.

- And finally: Early Announcements. It is perfectly normal for a firm to announce the release of its product possibly before that product is completely finished. But we reasoned that IBM's announcement was particularly unreasonable. We made reference

to the Lucas/AC Delco case where Lucas underprices AC Delco who had a superior product just to stay in the market while Lucas updated their products. The issue there is that AC Delco could have stolen the entire market from Lucas while they were updating their technologies and because of high switching costs, Lucas wouldn't be able to reenter the market. So Lucas's initial response of making loses to maintain market share, was a competitive response.
Here, we have IBM, this huge firm with an 80 percent market share, and a competitor like Honeywell with only 1 percent. Honeywell has a superior product and IBM tries to prevent their current clients from switching by telling them that they will have an even better product in some short period of time. All this to maintain market share. But IBM isn't like Lucas. While AC Delco had large capacity possibilities due to a backing by GM, Honeywell would not be able to steal much of the market because they simply wouldn't be able to supply it. True, IBM would lose some market share but not a significant part. The announcement that IBM made is ridiculous. Clearly, this was NOT a competitive response because in a high technology industry where service and reputation plays a large part, they weren't treating their clients very well by selling them a shitty product. The only point of releasing the announcement was to cause their competitors to be unable to secure contracts on a clearly superior product to anything IBM had to offer.

- Source: Adams and Yellen, QJE, P9418A, Commodity bundling and the burden of monopoly, W. Adams and Janet L. Yellen. Adams, William James, 1947-, SOURCE: Quarterly Journal of Economics. Vol.90, No.3, pp475-498, Aug.1976. SHELVED AT: HB1

- Source: Folded, spindled, and mutilated : economic analysis and U.S. v. IBM, Franklin M. Fisher, John J. McGowan, and Joen E. Greenwood.

4.2 IBM Case: Class Discussion

- IBM's market dominance: First mover advantage, brand loyalty, reputation and switching costs, Large investments in $R\&D$.

- Prior to the 360's: IBM's 1401 was a good computer but was too expensive and their customers started to look for something better and cheaper. Source of entry for competing firms was software ... needed to develop a new system that would be compatible with the existing firm's software because that was a huge investment for the firm and was very particular to individual firms. It would be very costly to have to rewrite their programs for a new OS.

- The Honeywell H200 came in at a higher quality and they made it compatible with existing software. This undermined IBM's entire position. So, although their market share was looking good, they were looking very vulnerable at this point.

- The 360's: Key ideas was that big and small machines have the same architecture (OS). You could carry software throughout the range of the 360's. Great improvement.

However, the uniform construction came at a premium: they sacrificed speed. It was a trade off, but IBM figured that compatibility was more important than speed at this point. They made huge investments (over 100 million) in the 360s, way beyond what any of their competitors could do. (ie, betting the company on it's success.) It was more of a commerial judgement than a technical one: moving towards compatibility over speed. IBM was a smart company. They didn't just provide a machine to their clients, but rather made the machine work for the client. They taylored each box to work for each individual client. (hence the range of 360s).

- Post 360 series: The switching costs have now effectively risen for each customer of IBM. Good for IBM. Also, the reputation story was strongly in IBM's favor ... it was widely known that a safe commerical decision for a firm was to get their computers through IBM. You couldn't go wrong there.

- So what was the strategy of the small competitor? They could either make their systems compatible with IBM or focus on speed instead of compatibility. The Cray company went for speed and hence the "Cray Supercomputer." However, they were catering to a very small portion of the market that was interested in pure speed. There was also Burroughs who built computers that were very efficient but very user UNfriendly. Therefore, only the computer geeks bought these. IBM was going for the middle of the market. Honeywell was one of the only firms to try to compete with them on compatibility.

- COMPETITION POLICY. Market share. Should it be used as a signal for intervention? No, because the market is dynamic and a market share measure is just a snap shot at one moment in time. There are also other (non-competitive) reasons for why some firms market share might be large: first mover advantage, quality premium, reputation effects, and more efficient. But also, we could just claim that the demand curve that IBM was facing was very elastic. Thus, as seen in the notes, the DWL from a monopoly price decision is very small. The reasons mentioned above would cause the DD curve to be more elastic, though they aren't anticompetitive characteristics. **[G-4.3]**

- Early Announcments. It is hard to justify intervention based on this alone. The practice of early announcments by a firm that doesn't produce (repeatedly) is self-defeating. Firms will lose reputation and market share if they engage in such practices. There are also always reasons that someone could come up with that might delay a product. Chief engineer run over by a train, etc.

- More on strategies of competitors: small firms started to make compatible components to the IBM system but not the entire range of products (too expensive), but rather just a substitute for say one of the 360 models, or one of the components like a printer. This undermined IBM's strategy because in each model of the 360, you had one or two specialist small firms competing down price to MC. To defeat this, IBM engaged in a business strategy: bundling. Offering the bundle at a lower price than you could buy from all these small competitors combined. And they also pursued a technological

strategy of not releasing the programming source for their software/hardware so it was difficult to engineer "Plug Compatible" components.

- In court, IBM was losing the case on the bundling argument because they were excluding firms that could have been producing software (a relatively low cost business). Thus IBM unbundled. They lost market share not only because of this, but also because the Honeywells of the world were somehow successfully making "Plug Compatible" components and driving down the prices of the individual components which were now being sold individually by IBM. Reagan administration came in and threw out this case. Later on, the industry was moving from being hardware intensive to being software intensive, and thus the entry of Microsoft. IBM missed this boat completely and concentrated on hardware.

4.3 McCaw Case: Introduction

- McCaw is a small maker of cell phones. They are growing fast and are going to build a new network to sell phones. They are faced with a commerical challenge of adopting the new digital network that is replacing the analogue network.

- Question 1: Should they move immediately to a quickly available but inferior technology? Or wait for a better technology that will be around in some period of time?

- Question 2: Analyze their commercial position at this time. What will happen to McCaw and the market over the next few years?

5 Week 5: 11 Feb - 15 Feb

5.1 McCaw Case: Class Discussion

- McCaw is in a good strategic position initially in that they control a large segment of the market and all firms profit from compatibility. Thus, most likely if McCaw goes for TDMA immediately, others would surely follow.
- The waiting strategy (CDMA) makes McCaw lose their first mover advantage. When McCaw commits to waiting, the adjacent areas might initially say they will wait too, but it might not be credible, as if other adjacent areas want to develop earlier, McCaw's adjacent areas might be provoked into also going for TDMA and McCaw's strategy is undermined.
- While waiting, there also might be new innovations and technologies that could come along that would further undermine the waiting strategy. There seems to be a lot of uncertainty in the model.
- However, if McCaw could be sure that their adjacent areas (cities that are close to their areas but are owned by other firms) will for sure wait for the new technology, then this lower cost technology might be the optimal strategy. Thus, the question of which strategy to follow is just about equally supported on either side.
- In terms of the future structure of the industry, McCaw has been successful because they have built up a "web" of areas, even though McCaw is spread out, the web it creates is something that customers value. Thus, since McCaw owns several spread out adjacent areas, when a new adjacent area comes up for auction, McCaw will have a higher reservation price for that area than a new entrant. Thus they were bidding very high for these adjacent areas banking on the idea that compatibility is KEY ... therefore owning adjacent areas will have huge positive externalities in the long term. Sort of like the value of the web increases exponentially with the addition of adjacent markets, not merely the sum of the parts.
- The long term structure of this industry is then for one firm to own all adjacent areas because they are willing to pay a higher price than someone say, who only only owns one area in a broader area. However, this only persists if the externalities are large from owning adjacent markets.
- However, the externalities began to fall because with the new technologies, compatibility became less and less of an issue and owning adjacent areas did not provide as much benefit as it used to. Thus, McCaw's future profitability is hard to measure. Even though the market is growing quickly, McCaw is very much in debt because of the high prices they were paying for new areas. If the externalities fall off enough, McCaw might quickly lose market share.
- The shortness of liquid assets is one of the major problems facing McCaw. Therefore, within a year, ATT bought out McCaw. The choice of technologies also changed so the decision between T/CDMA was a non-issue.

5.2 Big 6 Case: Introduction

- Two chapers of a book entitled the Big 8/6 for the largest accounting firms.
- These firms have two branches of business: 1) Auditing and 2) Consulting.
- Question 1) What is the model? Why has it become concentrated?
- Question 2) What are the sources of Consumer's Willingness to pay for audit or consulting services?
- Question 3) Submarkets. Is the structure different in each submarket?
- Question 4) What is a good strategy for the Big 8/6 companies?

6 Week 6: 18 Feb - 22 Feb

- No case discussion this week. Essay proposals.

7 Week 7: 25 Feb - 1 Mar

7.1 Big 6 Case: Class Discussion

- There are several things we would like to address in this class: Sources of, and investment in, capability building, the causes of the concentration, and finally the strategies of the firms.

- In terms of the model from lectures we have $\alpha(\beta, \sigma)$ where α is high as there are large returns to investment or research (in the form of human capital), β is therefore low, and σ is argued to be relatively large on the supply side in terms of scope economies.

- Costs (F) on the firm side include things like human capital expenditure, office space, overhead, and learning specialist skills. The payoff comes in the form of a firm's level of u. u involves things like reputation, quality of service and firm size.

- But just hiring more workers and increasing the size of the firm is a variable cost that any firm can take on. You don't get concentrated industries from these types of costs. We seek a fixed cost to get at the reasons for the concentration of this industry. For instance graduates who go to work for Andersen are just the same as those going to work for a small boutique type of firm. The investment in an individual person is the same.

- The key difference between the big 8 firms and the small firms, is the "Accumulation of Knowledge." The Big 8 firms could go out to many many sectors of industry and have expertise somewhere in the firm because they have experience with a wide range of firms in the past. Thus the total jigsaw of expertise is greater than the sum of its parts.

- The key example of how the accumulation is more of a fixed cost is the New York City audit that one of the firms took on. This was clearly an unprofitable project to take on, but what it did was establish a credible reputation for the firm which would benefit them in other contracts. The investment in expertise is considered a fixed outlay.

- So we get the emergence of high concentration in the industy not because of price or cost superiority, but rather because of reputation and capability effects.

- In terms of the strategic decision facing the firms: they did start to compete in prices, but more importantly they looked to two other areas to increase their profit margins.

- 1) Small business. They tried to expand their client base to include small businesses as well. This is difficult because of the higher fixed costs that the big 8 had, small businesses could not afford to pay the rates that the big 8 firms charged. Thus the big 8 firms decided to spin off a small business division of their firms which would work with the small firms on a lower payment schedule. However, this causes problem of taking productive workers from the big sector and transferring them to the smaller sector where they might not be as productive (even though they had to pay them the

same salary). What happened in the end was that the big and small business were really completely different so there were not the scope economies that existed in the bigger firms. It just didn't make economic sense to service the small businesses.

- 2) Range of services. Advantages of providing two services for the same company, but this is a conflict of interest (Enron). Eliminating this conflict also eliminates the scope economies for the firm.

7.2 Microsoft Case: Introduction

- The issue: network externality model. The idea is that the more users that use a certain software, the more attractive the package becomes in the eyes of the next generation of users.
- We see a rise in concentration of this industry.
- We extend the model to many periods and we introduce an initial accident which favors one product, then this small initial advantage expands over time. The argument of the paper is that microsoft had a technically better product.
- Literature reference: Paul David: QWERTY story.
- Question 1) Can we use the time series pattern of sales or market shares to distinguish the 2 hypotheses (Network Externalities or Superior product?)
- Question 2) What is/are the key feature(s) of the "winning" software packages?

8 Week 8: 4 Mar - 8 Mar

8.1 Microsoft Case: Class Discussion

- The idea was to distinguish between two alternative hypotheses to explain Microsoft's (Msft) quick rise to dominance. Networking externalities and Superior Products.

- When looking at the market share data, to tell a networking effects story, we first need something that shocks the market to allow one firm to get ahead of the others. And then we need the networking effects to kick in so a sort of snowballing occurs as the software gains exposure.

- [**G-8.2**] Thus, in terms of sales data over time, we expect to see an "S-Curve." This means there is a point of inflection in the sales curve over time when $f'' > 0$ and not only is the sales curve sloping up, but at an accelerating rate. This inflection point is basically the shock that we just mentioned. At some point after sales grows high enough, the sales curve should level off when the market reaches saturation. This is referred to in the literature as "Tipping."

- You can see tipping by looking at the time profile of the curve. The article argues that there is no point of inflection so a tipping story cannot be told. Thus they conclude that the networking effects story is not the right story to be telling.

- So what about the story that Msft had a superior product? Well, we also know that this market is growing as a whole so the shape of the sale curve for the entire application market will also look very much like an S curve. Thus, under a superior product story, we could basically have any sales curve shape we want so an S curve might result just because of the underlying demand for applications and not necessarily due to a superior product story.

- Thus the shape of these curves will NOT help us distinguish between the two hypotheses.

- Now we turn to quality measures. Basically there are a lot of problems with measuring quality in this industry because just what makes a good software application is very subjective. The idea in the article was to identify the high quality packages and then see if they eventually became and industry "winners." The authors found a nice positive correlation and thus concluded that the Msft products were superior in quality and this is what gave them their dominant position. Also, saying that consumers read the magazines and base their purchasing decision on their ratings is not the argument that the authors want to put forward. We need the opposite causation. A software is highly rated because the consumer actually thinks it's superior.

- There are also problems of weighting technical characteristics more than non technical ones and there is a fashion in the computer industry to be Msft haters. Thus, clearly the accuracy of the quality rankings comes into question. However, it's probably the best we can do.

- Since the winners and the high quality packages were so highly correlated, the author's argument is supported.

- So back to the network externality effects argument ... is it so easily dismissed? Under this argument, one observation that we might see is a low quality product gaining superior market share due to snowballing. The argument in the paper is that in each of the markets analyzed, Spreadsheets, word processors, etc, we don't see this happening and in the market in which the Msft product was NOT the superior product (financial software), the Msft product also didn't have the high market share. All this is in support of the author's argument. Afterall, statistically, if we are looking at a reasonable sample, we should see at least SOME inferior products gaining from the networking effects.

- BUT, there is more to the story. Msft sells all these applications as part of the office suite. So when considering all these different markets, we're really looking at 10 different pictures of the same thing. So basically the authors only have 2 data points ... 1 for office and 1 for the financial software. 2 observations is clearly not enough to get statistical significance. What we would see is that the Office package sales data experienced the S shaped curve characteristic of the networking effects story. Thus the author's argument falls apart when looked at from this perspective.

8.2 Internet Connectivity Case: Introduction

- In this case we consider the competition among backbone providers on the internet. The model involves many many internet service providers (ISPs) and very few backbones. The backbones route the information from one ISP to another.

- The quality and speed of the connections is very important.

- The larger backbones are more attractive because they have direct links to other ISPs. So is there a tendency towards natural monopolisation and is there reason enough for regulation in this market?

- The distinguishing characteristic about this market is that backbones can swap traffic between one and other. However, for the quality to remain good, BOTH backbones must have a good quality connection. The chain is only as strong as its weakest link. So the strategic variable for the backbone firms is the quality measure, u. A large backbone can make it hard for a smaller backbone to gain market share by keeping the the larger backbone's quality LOW. An ISP prefers to go with the larger backbone to begin with and knowing that if it went with the smaller backbone (even at a lower price) since most other ISPs go through the large backbone, a small backbone cannot gain market share by increasing his quality.

- 3 Questions: 1) Page 12: The market definition issue. What are the strengths and weaknesses of this definition and how does it relate to other definitions? How else would you define the market?

- 2) Is there a tendency towards monopolisation of backbones under free competition? Should we regulate? Can you find other IO models that give a valid analogy? (VPD, Quality choice models, network externality models?)
- 3) Why is it NOT an equilibrium outcome (or is it?) for the ISP's to swap traffic directly, ie form their own backbone?

9 Week 9: 11 Mar - 15 Mar

9.1 Internet Connectivity Case: Class Discussion

- Measure of market definition. What it says is that if we take what we think is a bounded market and take a hypothetical monopoly made up of all those firms within the bounds, then we would expect that the monopoly should be able to raise its price and gain positive profits from doing so. If consumers substitute away, then we have not bounded our market broadly enough. It is quantitatively good, but for instance, if we don't see the hypothetical profits rising, is it because of substitutability issues or because or because firms are ALREADY charging the monopoly price. Normally we just seek a break in the chain of substitutes by looking at cross price elasticities, but in the paper, they try to estimate the demand system which is fairly difficult to do in practice.

- In terms of a good IO model for this case, to tell a Network externality story, we would need a situation where the number of customers held by a firm in period 1 determines the demand for the firm's product in period 2. Absent of network externalities, an ISP would just simply go with the firm with the highest quality/price ratio.

- Consider the Lucas case however: There it was switching costs which was driving the analysis. So do ISP's stay with a backbone due to network externalities or high switching costs?

- Consider the microsoft case: There it really was network externalities that was determining the demand for the software.

- So Which is It? Well, with switching costs alone, we wouldn't necessarily get high concentration which we are seeing in this industry. So it can't be just switching costs. With network externalities, we do get concentration, but what about quality competition?

- A Quality Choice Model: In each period, everyone chooses the highest quality BB. To keep quality / customer ratios about constant, a firm will have to continually invest in its product.

- A firm who has a lot of customers this period, will invest a lot to keep the quality/customer ratios constant or rising. Does this quality choice model lead to high concentration? Not necessarily because some ISP's might prefer to pay a lower price for a lower quality. But in general, most firms would be looking to get the best connection for their customers. Thus we would see high concentration but NOT monopolisation. This seems to be the best model overall.

- Now question 3: Should ISPs merge and form their own backbone. [**G-9.3**] Problems immediately arise regarding coordination, and the quality of the alternative BB. The Quality of their new BB will be compromised by multiple connections that would have to occur. There is a lot of learning by doing presumably in this industry and

the existing BB's surely have that advantage and there are also huge Fixed Costs of setting up such a BB.

- Also, if a new BB is formed, the old BB surely has a dominant strategy to compete via Targeted Degredation. So a NE involves the new BB NOT being build. The threat of this new "plant" makes the original BB scared and it must lower his price so it is not cost effective to build the new BB.

- BUT!! Does the old BB have to cut its price to ALL its customers? Probably not. Say giving priviledged connections to AOL, an ISP who would surely be involved in forming and supporting the new BB, might be enough to make the remaining ISPs unwilling to get together without the cooperation of AOL. Thus the old BB will just target just enough of its customers to make the forming of a new BB unprofitable.

- One final point on Arbitrage. If there is this targeted degredation going on, what is to stop AOL, for example, from selling some of its high speed connections to the ISPs that are not getting the fast connections with the BB? Well, Sutton's argument is that since the ISP's connection will have to pass through AOL and then to the BB, the quality of the connection will be impaired enough so that arbitrage is not possible (However, it would be very difficult to monitor this type of action among ISPs).

10 Week 10: 18 Mar - 22 Mar

- No Case this week.