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**Lecture 22: Planned Obsolescence**

1. The case of the ever-lasting bulb
   1. Why do light bulbs burn out? Why is there no ever-lasting bulb?
      1. After all, the Centennial Light is a bulb that’s been lit continuously for over 100 years. It’s maintained by the Livermore-Pleasanton Fire Department.
      2. Some (including my mother) argue light bulbs burn out because they are built that way. That way you buy more bulbs. This is sometimes referred to an example of *planned obsolescence*—when a firm engineers its product to expire artificially soon.
   2. This example is incorrect—physics explains why light bulbs burn out and why the Centennial one doesn’t—but it’s a good starting point. Why would having a quickly-dying light bulb be a poor business model?
2. Basics of P.O.
   1. Bernard London coined the phrase in 1932, arguing it was needed to stimulate demand during the Great Depression.
   2. A better treatment of planned obsolescence comes from Jeremy Bulow (1986).
   3. Since planned obsolescence is really just a form of increasing prices (you pay more because you have to buy the same good multiple times), it requires some market power.
      1. This makes sense: if GE sold me a weak light bulb, how could they be sure I wouldn’t just buy from a competitor when the light bulb went out?
   4. P.O. takes two different forms: function and fashion
      1. Functional obsolescence means the good stops working after a period of time. Example: Apple glues the battery in the new iPad so when the battery wears out, you can’t just swap batteries. You have to get a new iPad.
      2. Fashionable obsolescence means the good continues to work but it’s not the “newest” thing so it’s not as good. Example: There is little difference between the new iPad and the old one but the new one is fashionable (especially if you had to wait in line to get it). By having the newest iPad, you can signal how hip and trendy you are.
      3. As of February 2013 there is a class-action lawsuit in Brazil claiming the 4th generation iPad is planned obsolescence due to the law of technological improvement. The thrust behind this lawsuit, however, is apparently the new iPad isn’t cool enough.[[1]](#footnote-1)
3. Planned Obsolescence model
   1. Given how much we’ve covered in this unit so far and how involved Bulow’s paper is, I think it’s more appropriate to conceptually go over Bulow’s paper rather than work through it in all its mathematical glory.[[2]](#footnote-2)
   2. Basic monopoly model with obsolescence
      1. We start with two time periods, 1 and 2. We also assume there is a robust secondary market.
      2. The firm has the ability to choose the durability of its product.
      3. The higher the durability in period one, the more there is in period two. But if durability is so low, 100% wears out immediately and a lot will not bother to buy at all.
      4. The firm can also make new output in the second period…since there are only two periods, we don’t care about the durability of this next batch.
      5. There is also a demand function which determines price based not just on how much of the good there is, but how long it’ll last.
      6. Thus the firm maximizes profits by setting three values: the durability, the quantity produced in period one, and the quantity produced in period two.
      7. That means there’s three partial derivatives…this is why we are doing this (extra) simple version.
4. Conclusions
   1. When a firm creates high durability, it effectively competes against itself thanks to the secondary market.
      1. An excellent example is the market for used cars, which directly competes with the market for new cars.
      2. So Ford and Honda make cars with expiration dates? Nope! In fact, cars last longer than they did decades ago. It’s because the market for cars is competitive. People want to be able to sell their car and in a competitive market, the firm will swallow the additional competition it will get from itself and increase durability. If they don’t someone else will.
      3. Thus trade restrictions on goods with a robust secondary market (like cars) mean less competition and thus *crappier cars*.
   2. Because the monopoly can capture the resale value in the initial price, monopolies don’t inherently lead to planned obsolescence.
      1. If marginal cost—when it’s downward sloping (which is rare)—is steeper than demand, we won’t get planned obsolescence.
      2. Not only is each additional unit getting really cheap as you increase output, and you’re not suffering very much demand-wise. The price people are willing to pay isn’t falling nearly as fast as your costs are.
      3. So you might as well produce a lot now and keep it really durable (that way you don’t have to incur the cost to produce twice). You can always not produce that much in the second period and keep total quantity low. Remember, you get to charge more thanks to the secondary market!
   3. But most of the time, this relationship doesn’t hold. Planned obsolescence is the expectation.
      1. When demand steeper than marginal cost, or if marginal cost is increasing (which is usually is), we have planned obsolescence.
      2. Your costs aren’t falling fast enough (they may even be increasing) as you increase output to adjust for the lower price you’ll get. So you shouldn’t produce that much and it should be pretty short-lived (or you’ll effectively produce a lot in the next period).
      3. In other words, a low durability has two things going for it: it reduces long-run output and they are (generally) cheaper to produce.
      4. Note that because there are two things going for it, if reducing the output is valuable enough, a firm might even ***pay more*** to reduce durability.
5. Implications and examples
   1. A fixed tax will increase durability
      1. If cars cost $1,000 more, then spreading that additional cost across many periods will make consumers more likely to buy it.
   2. A percent tax (ad valorum) will decrease durability
      1. Low durability goods will be cheaper so the percent tax will have a lower impact on the final price.
   3. To deter entry, increase durability and sell—rather than rent—your product. This locks consumers into your product and reduces potential competition in future periods since a larger share of the available output will be yours (which you, of course, charged people for when they bought it).
      1. IBM and Xerox focused on sales rather than rentals when they started seeing greater competition.
   4. Other planned obsolescence examples:
      1. Ink cartridges won’t use all the ink inside of them. The amount claimed to be in them isn’t as high as you think.
      2. Textbooks will create a new edition with barely any changes. The only changes make it annoying to stick with the old textbook: different end-of-chapter questions, different organization, very little new content.
   5. Things that are not planned obsolescence
      1. It’s easy to call something planned obsolescence when it breaks before you’re ready. But lots of things look like it but are not.
      2. For example, some argue[[3]](#footnote-3) a lack of support for software is planned obsolescence. But it is costly to provide support and as people adopt newer software (whether the firm’s or a competitors’), the average cost increases. Firms are reacting to consumers, not making them act. (Sometimes, though, it is P.O…it depends on—drum roll please—monopoly power!)
      3. On a similar vein, “fast fashion” seems the result of consumers wanting to be hip, rather than the very competitive industry forcing them to get the latest thing. Black is still the new black.
      4. Video games consoles are rarely backward compatible. Is it because of planned obsolescence or is it just that backwards compatibility is expensive with little benefit? Most gamers buy new consoles to play new games, not old games. If they want to play old games, they still have their old console.
      5. And the idea of a light bulb conspiracy is, as mentioned, dumb.
      6. Sometimes, we are just not willing to pay for durability.

1. [http://www.macrumors.com/2013/02/21/apple-hit-with-planned-obsolescencence-lawsuit-in-brazil-over-fourth-generation-ipad/](http://www.macrumors.com/2013/02/21/apple-hit-with-planned-obsolescence-lawsuit-in-brazil-over-fourth-generation-ipad/) [↑](#footnote-ref-1)
2. The paper’s available here if you want to check it out: [https://faculty-gsb.stanford.edu/bulow/articles/an%20economic%20theory%20of%20planned%20obsolescencence.pdf](https://faculty-gsb.stanford.edu/bulow/articles/an%20economic%20theory%20of%20planned%20obsolescence.pdf) [↑](#footnote-ref-2)
3. <http://www.thedailygreen.com/environmental-news/latest/planned-obsolescence-460210#slide-6> [↑](#footnote-ref-3)