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# SI 646: Week 5

## DRM

### Today's Agenda:

1. Basic DRM Concepts
2. Modeling DRM (Bergemann, et. al., etc.)
3. Case: File Sharing
4. Next Time: the Long Tail

Note: these slides are based partly on Jeff Mackie-Mason's 646 slides from Winter term 2008.

Content owners have a variety of rights to control...

1. Duplication
2. Performance
3. Creation of Derivative Works
4. Distribution
5. Public Display

Challenge:

How Should “Copy” Rights be Managed?

What implications does digital technology have  
for rights management?

What are some management options?

1.Sell

2.License

3.Retain Exclusively

4.Give Away

**duplication**

**performance**

**creation of derivative  
works**

**distribution**

**public display**

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duplication

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duplication

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public display

Search Amazon.com

"star wars"

Narrow Your Results

**Narrow by Category**

Books (24016)  
Toys & Games (2378)  
**Home & Garden** (1369)  
Apparel (297)  
Video Games (244)  
Music (185)  
Everything Else (125)  
Sports & Outdoors (111)  
Kitchen & Housewares (103)  
VHS (96)  
DVD (82)  
Office Products (79)  
Electronics (73)  
Software (63)  
Classical Music (60)  
Tools & Hardware (29)  
Outdoor Living (28)  
Computers & Add-Ons (14)  
Unbox Video Downloads (13)  
Automotive (12)  
Baby (7)  
Musical Instruments (6)  
Jewelry & Watches (5)  
Health & Personal Care (4)  
Gourmet Food (3)  
Cell Phones (2)

Source: <http://www.amazon.com/>

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duplication

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# How Much Value has been generated by the Star Wars franchise?

- Performance: \$4-7 billion (source [Wikipedia](#), Forbes)
- Merchandising Revenue (derivative works):  
~\$15-18 billion (source: [Forbes, May 24, '07](#))
- Duplication/Public Display: ????

# How do digitization and the internet affect rights management?

- Reduced reproduction costs
- Reduced distribution costs
- Information Goods are “experience goods”
- Implication: [give some content away](#)

## Giveaways?

- Sampling “repeated use” goods (barney...)
- Similar but not identical goods (lower resolution photos)
- “versioning” (a few pages of a book...)
- As inducements for complements (iTunes/ iPod, etc.)



## **Less restrictive control...**

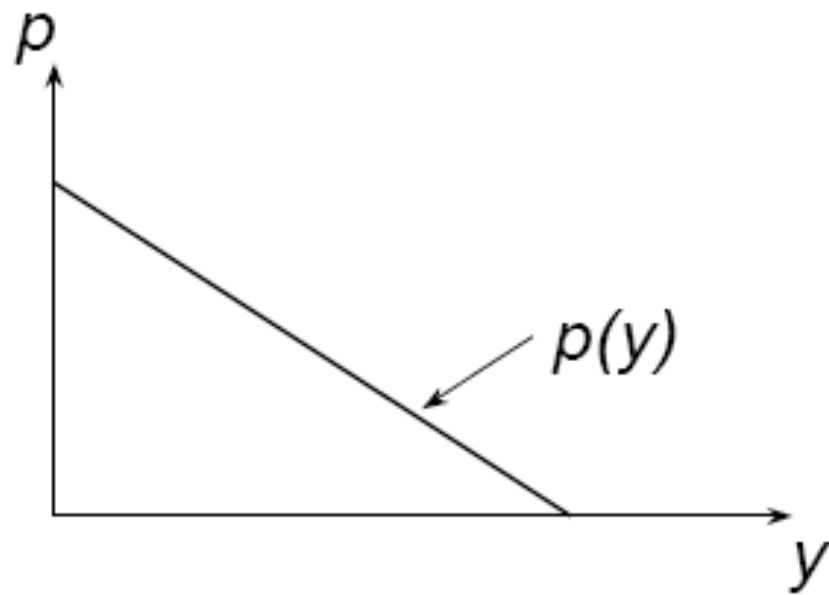
- Increases value...why?
- But may also decrease value...why?

## DRM flexibility

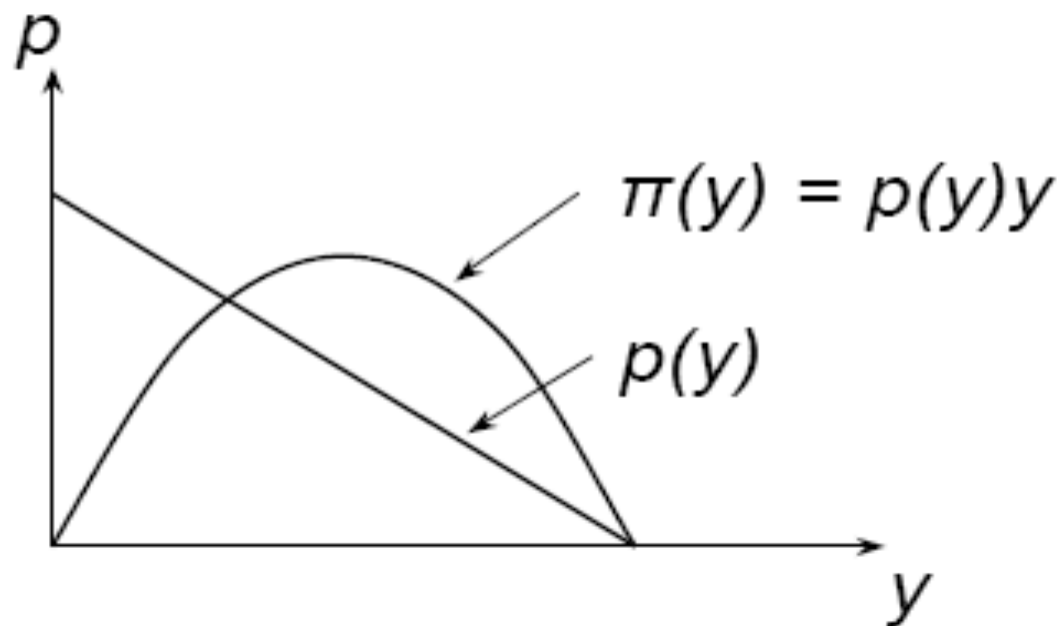
- Suppose production costs negligible
- Market demand is  $p(y)$
- The firm wishes to

$$\max_y p(y)y$$

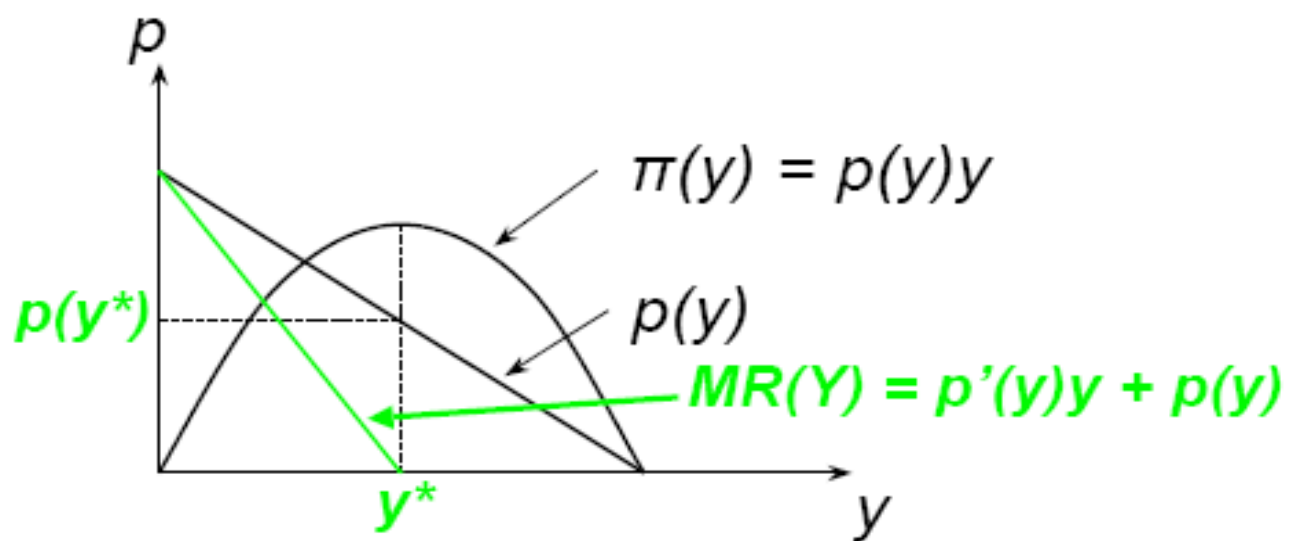
# Demand



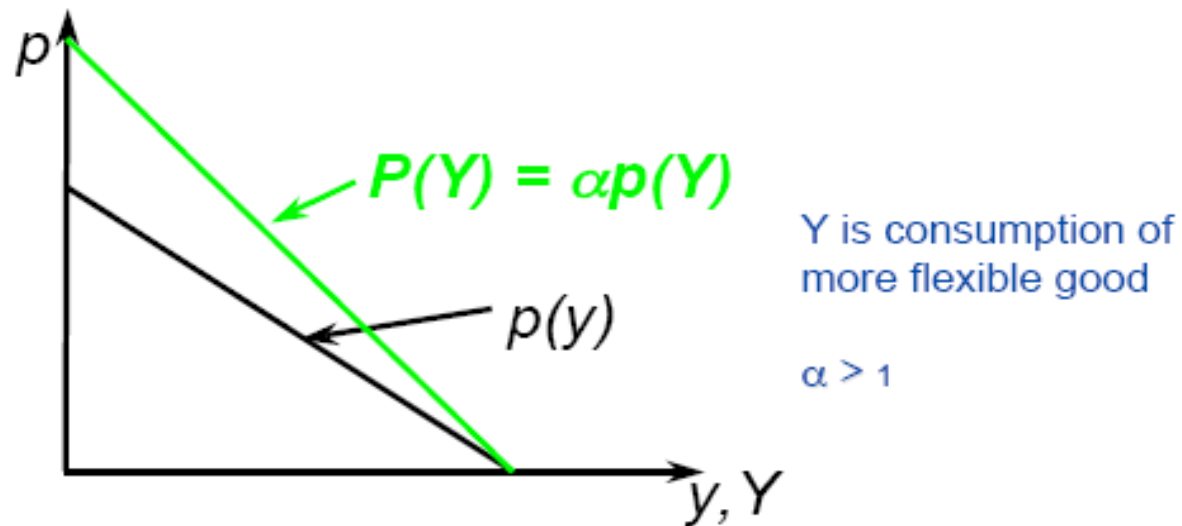
# Profitability



# Profit-maximization

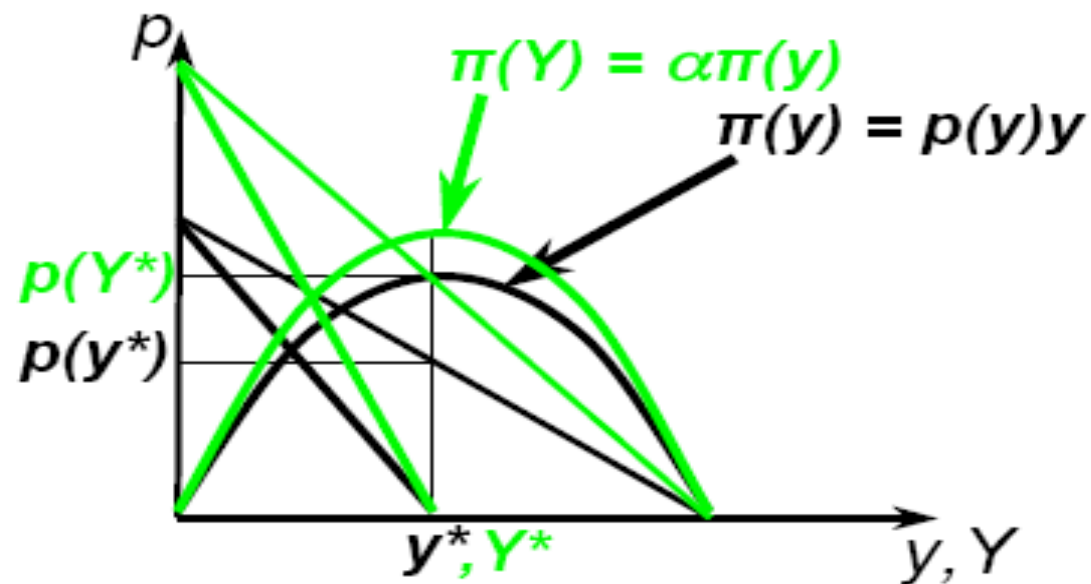


Suppose rights owner  
increases flexibility:  
Increases value (wtp) to users

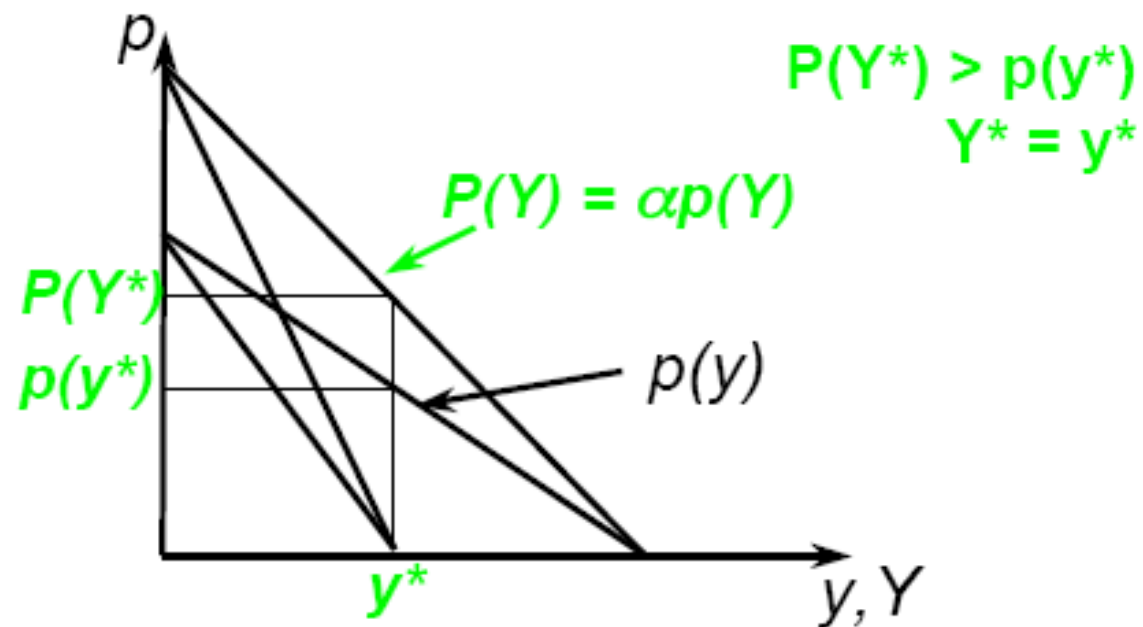


Note:  $\alpha$  here has a different meaning than in the Bergemann paper

# Profit maximization with "flexibility effect"

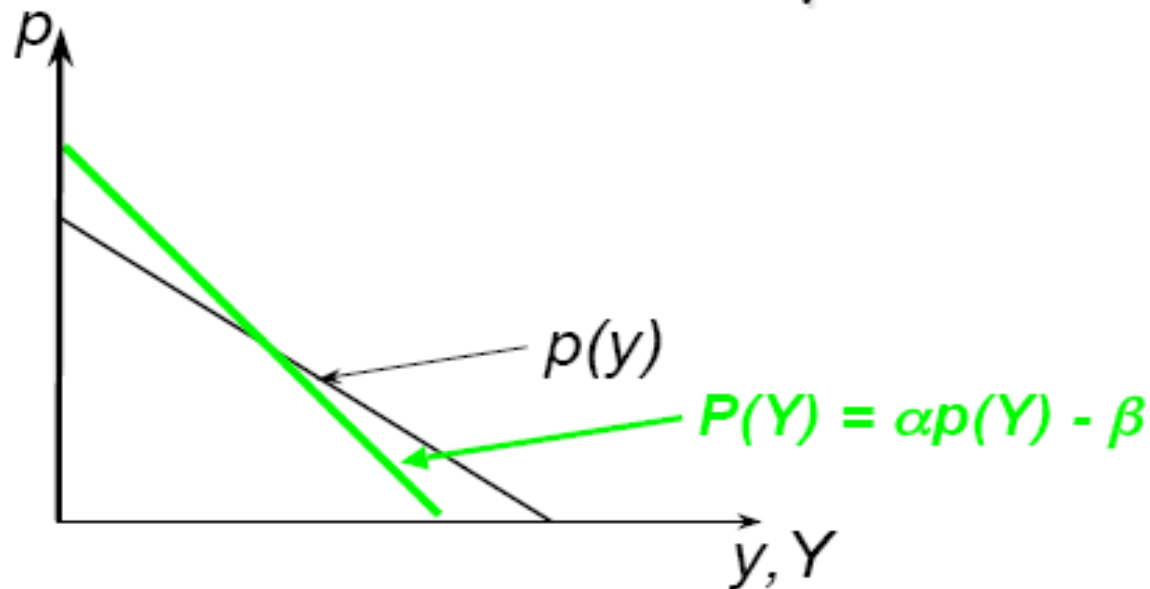


# Profit maximization with "flexibility effect"



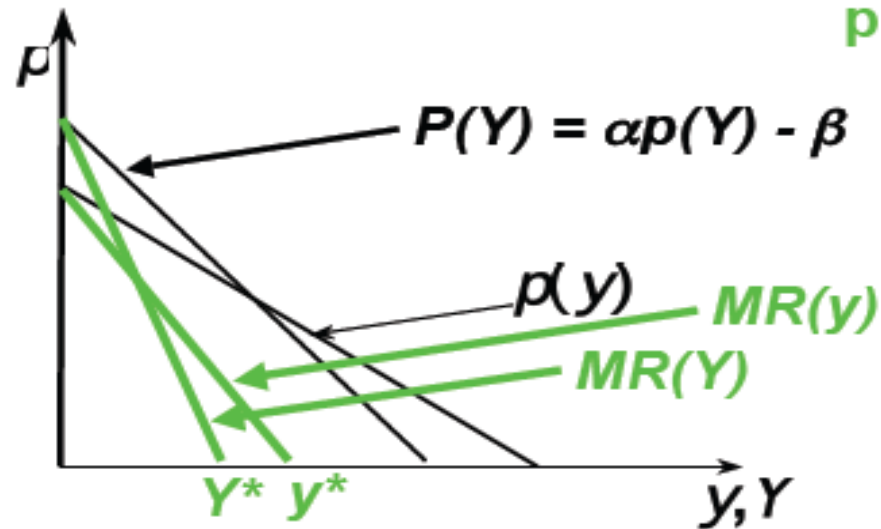


2. Increased flexibility  
increases outside options, fewer  
consumers want to purchase



# Profit maximization with both "flexibility" and "piracy" effects

$Y^* < y^*$   
price?



Price Effect is ambiguous: it depends on the size of  $\beta$ ,  
i.e. where the  $y, Y$ -axis crossing occurs

## Bergemann, et. al.

- This paper explicitly models the tradeoff between “flexibility” (i.e. the number of copies a consumer is allowed to make) and # of unlicensed copies.
- If  $\alpha$  is not “too large” then consumers only consume licensed copies ( $\alpha$  measures the “permeability” of the content distribution environment)
- However, for large enough values of  $\alpha$ , unlicensed copies will be consumed; prices and profits for the licensed copies are lower

## Bergemann, et. al., cont'd

- They also consider the case of complementary goods: the information goods + a platform (Itunes/ Ipod)
- In the integrated case, flexibility and profits are higher
- In the non-integrated case, flexibility and profits are lower, due to the tradeoff between flexibility and consumption of unlicensed copies.

## Applications...

- Shapiro and Varian provide historical examples of lower reproduction and distribution costs leading to higher content revenues
- e.g. circulating book libraries, video tapes
- How likely is this for, say, file-sharing of audio and video?

- “[Book] publishers and movie producers understood their own industries, but they didn’t understand their complementors’ industries.” SV p. 97
- What does this mean?

## **Should music publishers abandon DRM?**

- Apple's Perspective?
- RIAA's Perspective?

## How do you avoid losing most revenue to “sharing” and piracy?

- Sell complement that is hard to copy (customer support, updates, etc.)
- Reduce price, makes illegal activity less desirable, increases number of consumers