

**Versioning when customers can buy
both versions: an application to
intertemporal movie distribution**

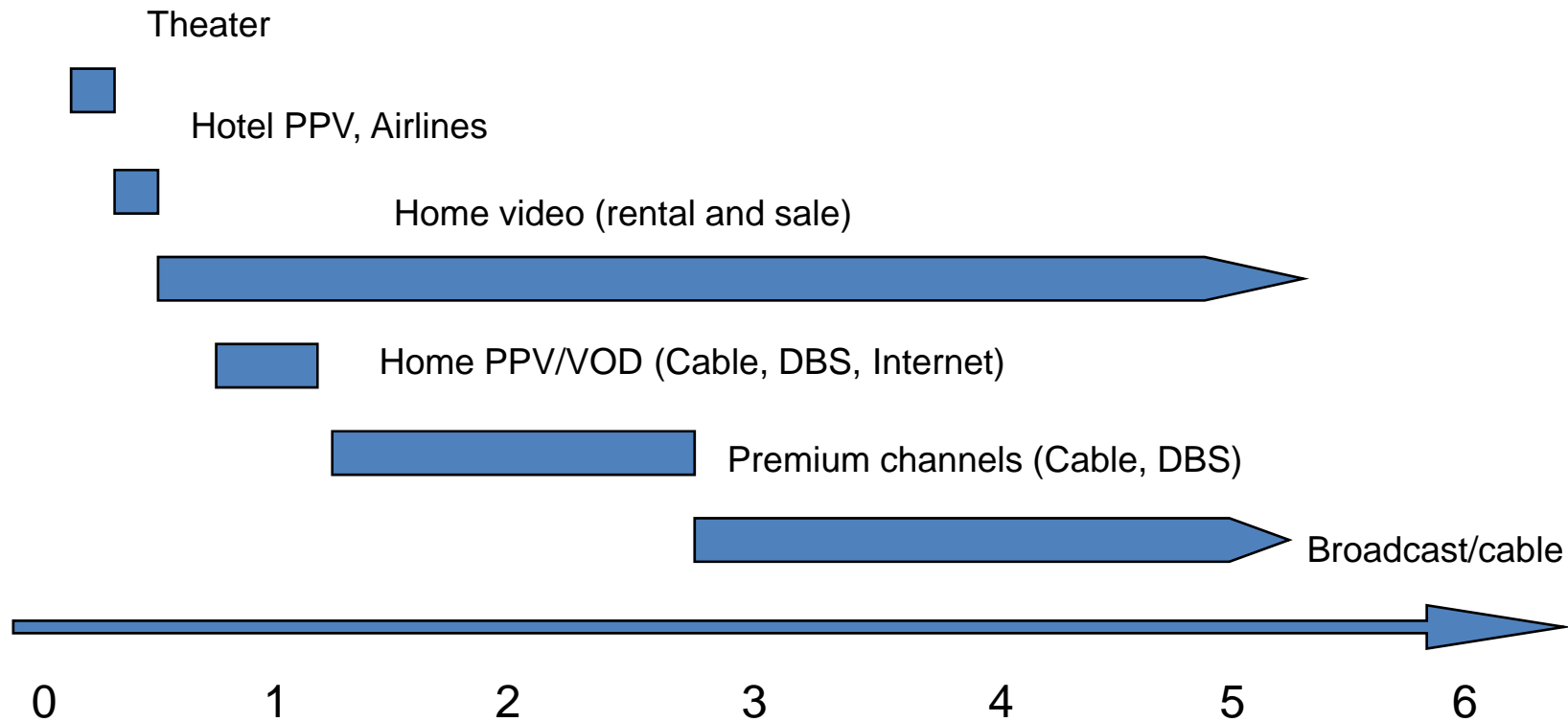
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Motivation

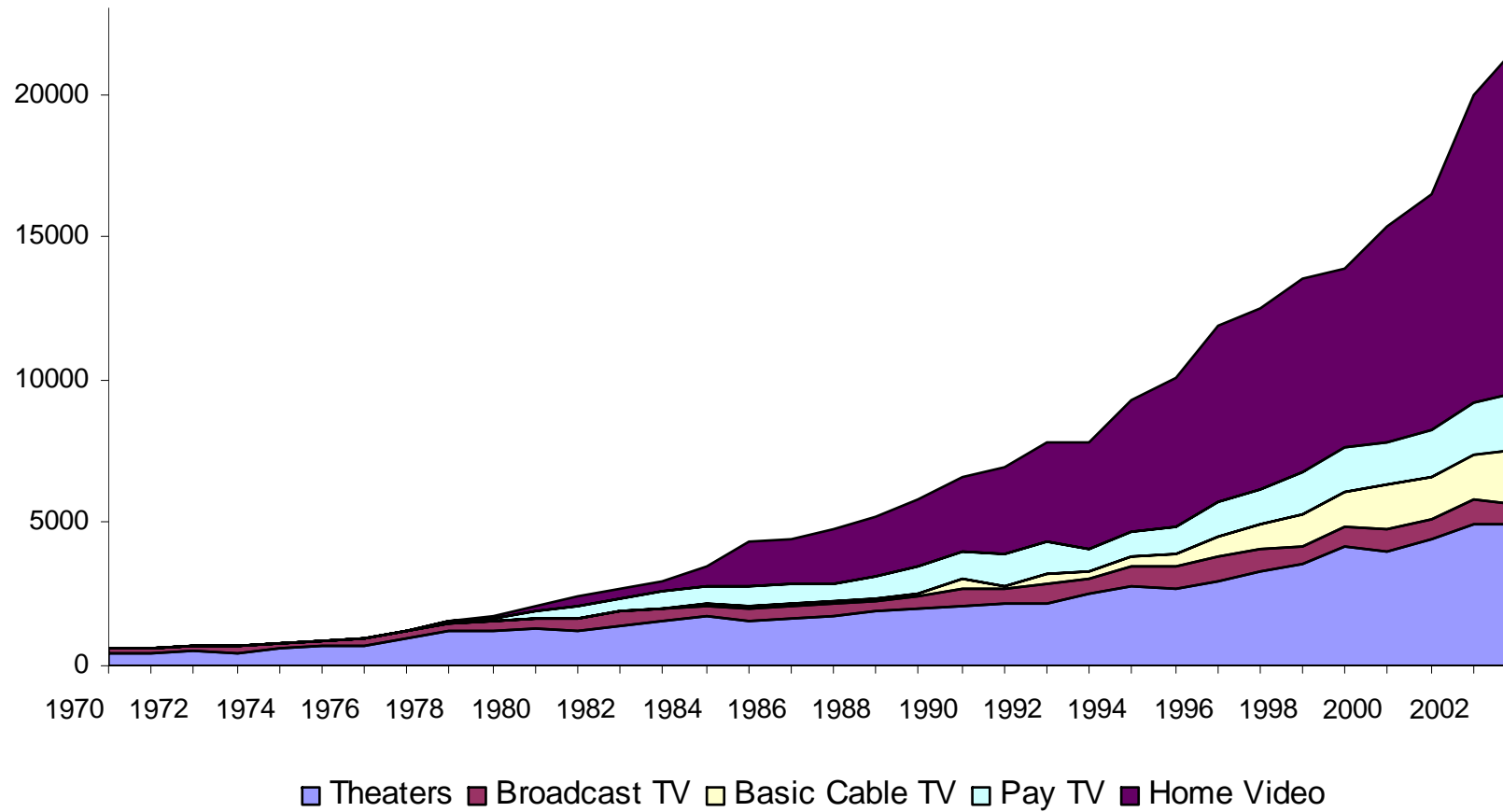
- Movies typically first released in theatre, then pay TV, home video, network television, local television - > “Versioning”.
- “Video window”: sequential introduction. Constant at 180 days, but now falling. Now also examples of simultaneous introduction.
- Hollywood majors cannot own theatre chains (US): antitrust decision in 1948 (Paramount).

Typical domestic theatrical release sequence



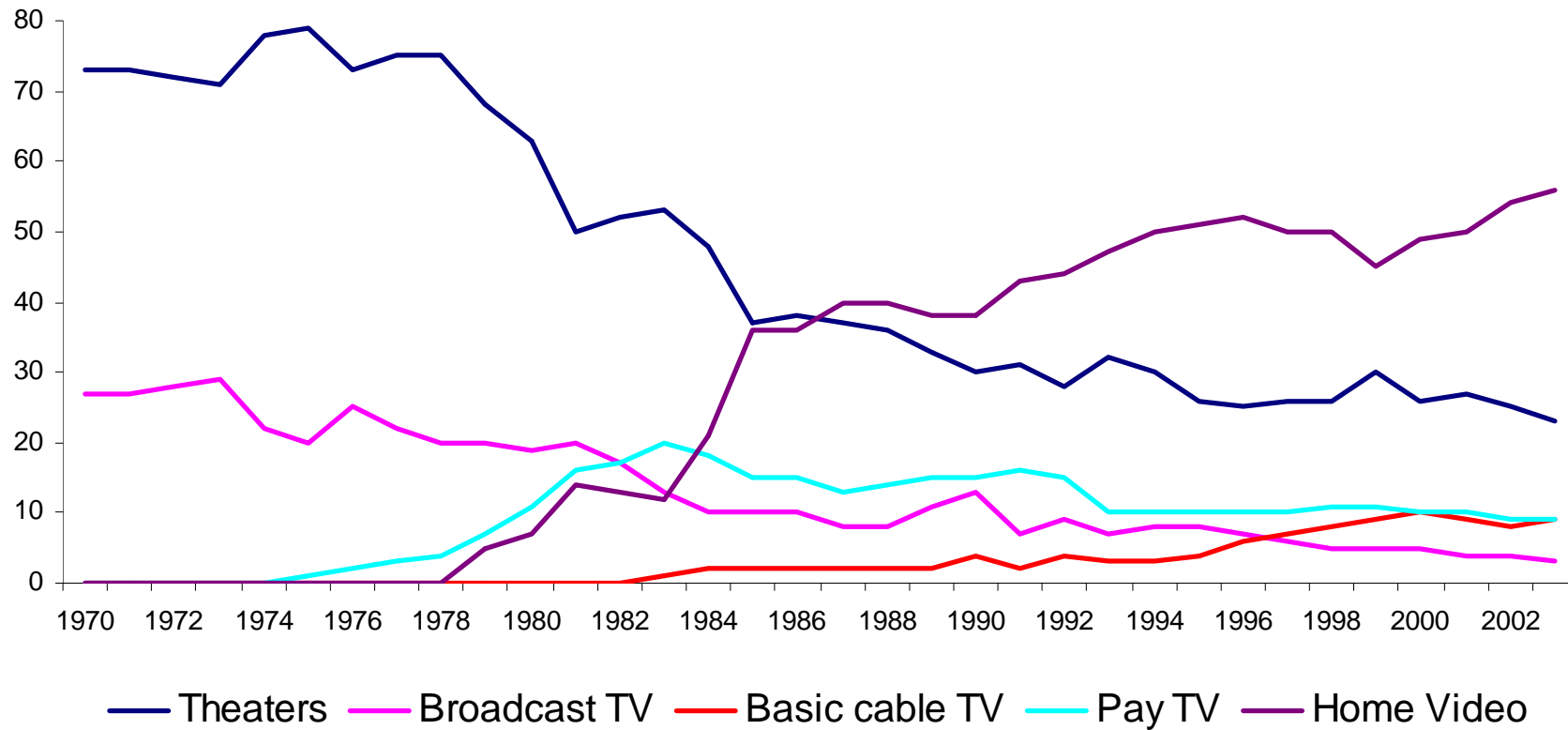
Source: Waterman, 2005

U.S. theatrical distributor revenue domestic sources, constant 2003 dollars (millions)



Source: Waterman, 2005

U.S. distributor revenue from distribution of theatrical films: Domestic market (%)



Source: Waterman, 2005

Existing literature

- “Versioning” by a monopolist. Back to Mussa and Rosen (1978), Stokey (1979). Single purchase.
- Mussa Rosen: offer multiple products of differing qualities (marginal cost increasing in quality). Not in Stokey.
- Anderson and Dana (forthcoming)
 - $V(u, \theta) - c(u)$ must be log supermodular to sell multiple variants
 - $\theta u - cu$ is *not*, thus offer only 1 version
 - Indeed the case for pure information goods ($c = 0$)
- Difficult to have sequencing with only 1 good... alternatives:
 - Signalling
 - Word of mouth
 - Difference in discount factors of customers and monopolist

This paper

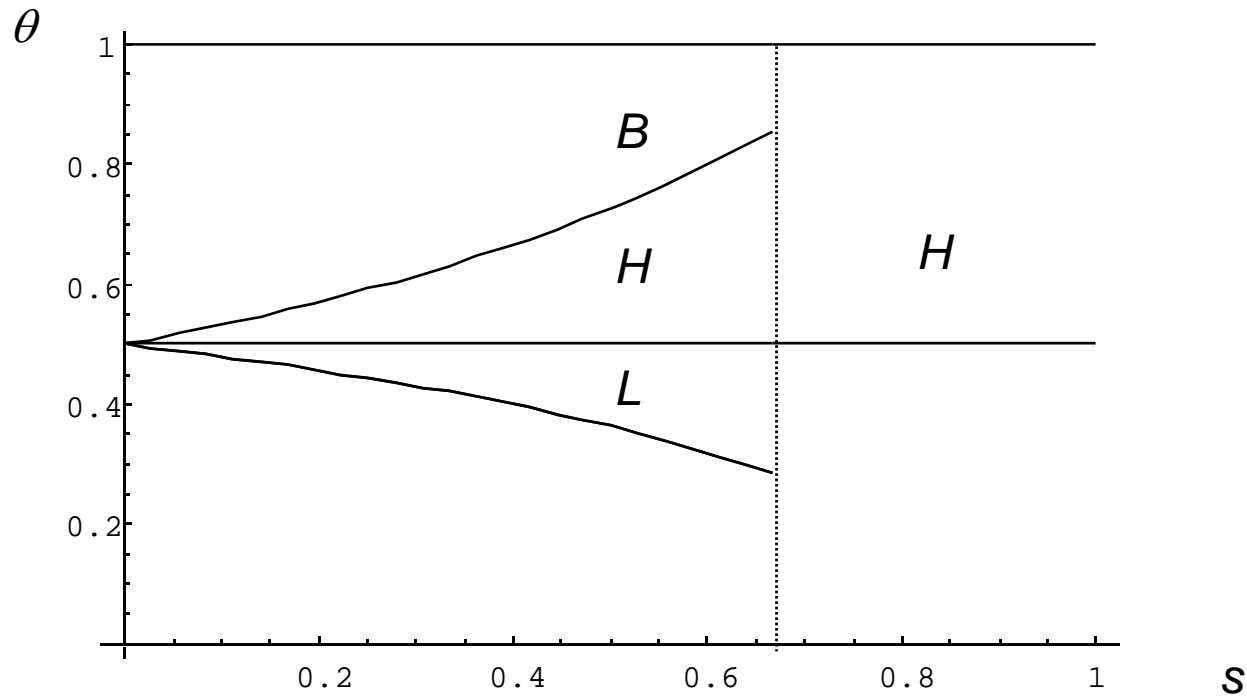
- Reassess versioning and sequencing.
- Introduce 2 new ingredients:
 - Consumers can buy both versions
 - Introduce a vertical structure

The model

- Basic model with single monopolist
- 2 versions, H and L
- Types θ uniformly distributed over $[0, 1]$
- Utility $V(u, \theta) = \theta u$
- Consumers can buy H, L or B
 - $u_B = u_H + u_L(1 - s)$
 - Where s is degree of substitutability (can be < 0)
 - Notice: $s = 1$ is the standard model
- Marginal cost of each version is c (can be 0 for info goods)
- H may be sold with delay (sequencing): discount factor

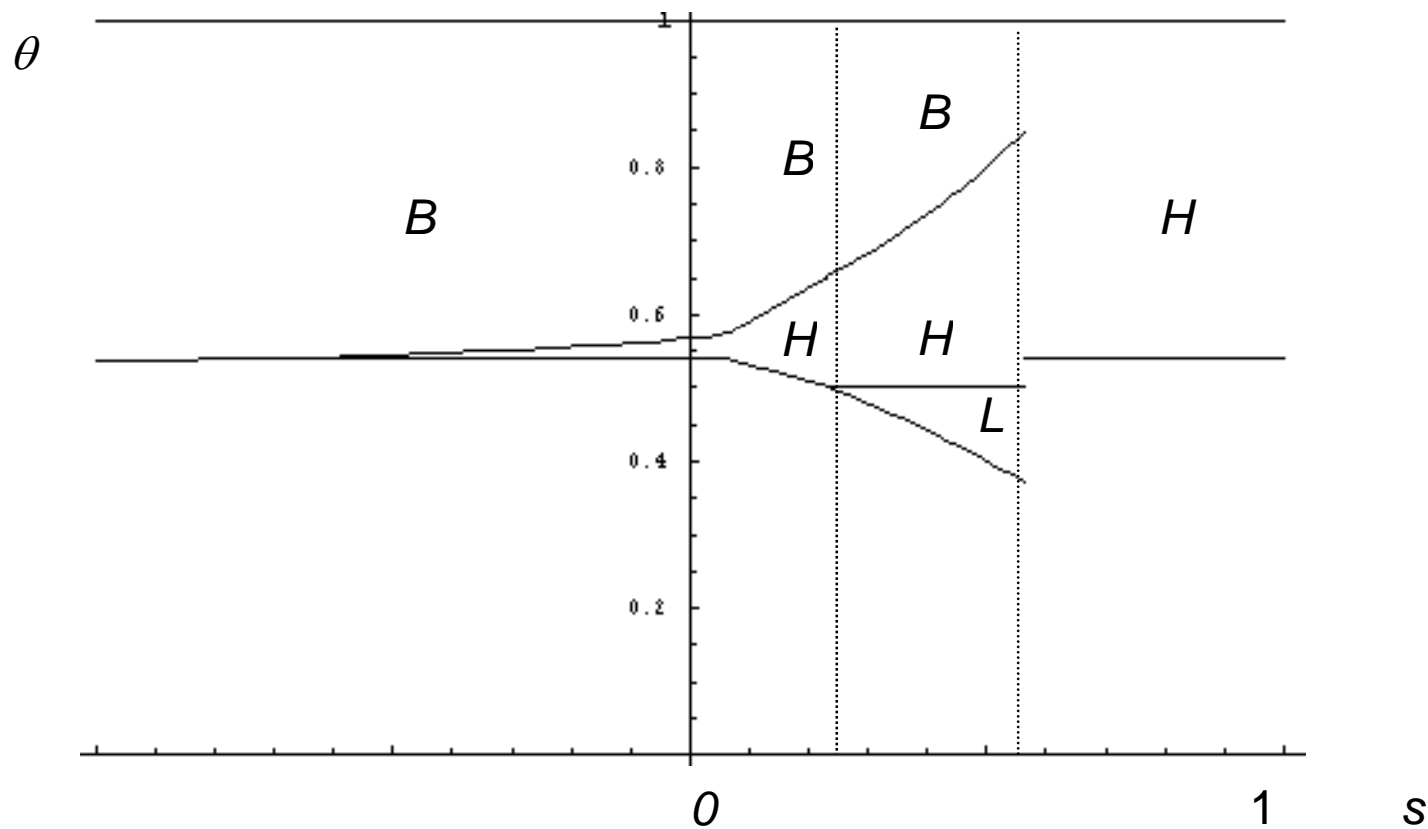
Results (1) : $c = 0$

- Versioning when $s < 2/3$.
- But *never* sequencing (same discount factor)



Results (2) : $c > 0$

- Versioning when $s < s^1$.
- But *never* sequencing.



Vertical structure

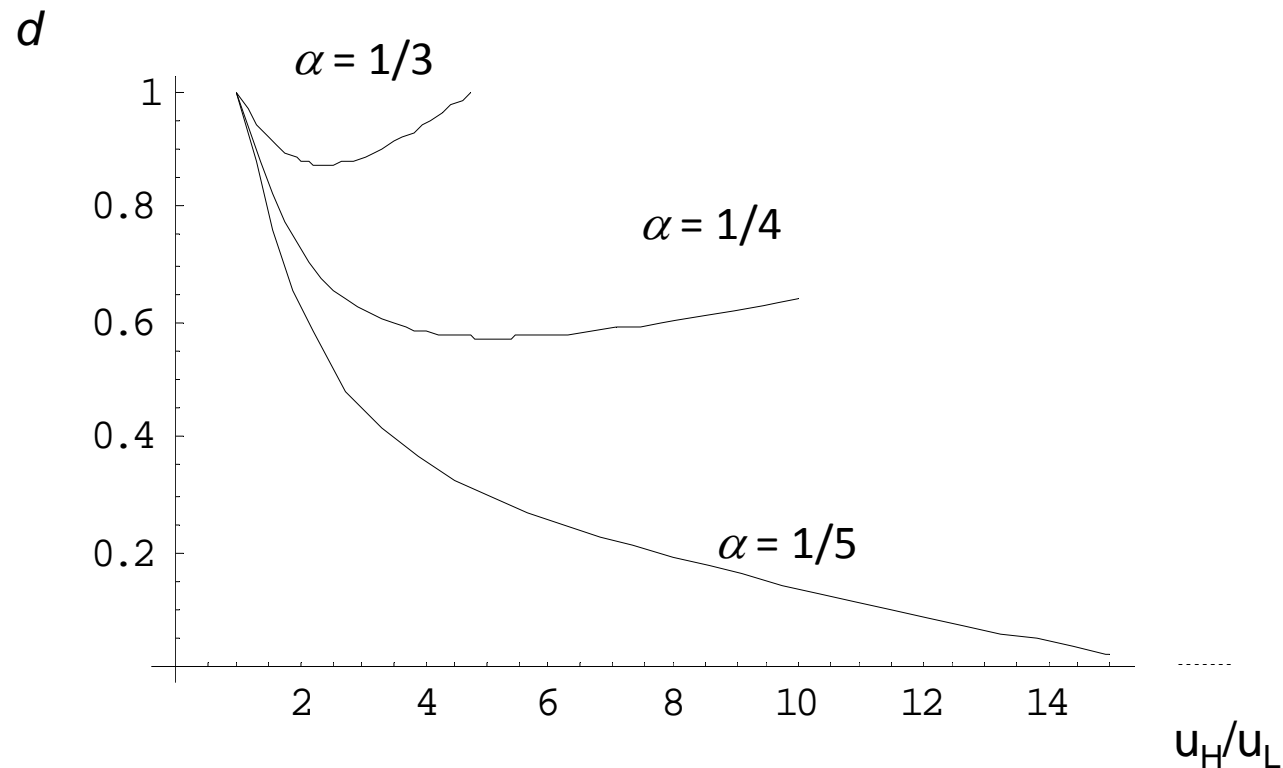
- L sold directly by distributor D
- H must be shown via exhibitor E
- Timing:
 - D decides whether to show both H and L, or L alone
 - If shown, 'video window' (sequencing) decided jointly by D and E
 - E pays a linear wholesale price to D (imperfect rent extraction and double mark ups)

Vertical structure - results (1)

- When $s = 0$, pattern is L/B
- When $s = 1$
 - If u_L low enough, pattern is L/H
 - If u_L is high enough, pattern is L
- There is 'more' versioning than with monopolist.
- But versioning does not imply sequencing.
- When $s = 0$, both D and E have an interest to introduce versions simultaneously
- Only when $s = 1$ and u_L low enough, interests diverge over introduction
 - E prefers sequential intro
 - D prefers simultaneous intro
- (Can generalise results to s sufficiently high)

Vertical structure - results (2)

- Bargaining over the length of the window (α is bargaining power of distributor, must be low enough to have window)



Conclusions

- When customers are allowed to buy both versions of a product, versioning becomes optimal (the pattern is L/H/B). This result appears when the two versions are not too substitute for each other. Novel result in the literature.
- Application to the movie industry (vertical separation). Even when two versions are perfect substitutes distributors may accept to supply the two versions if the quality differential between versions is sufficiently high.