Innovative Technologies Change the TV Landscape: Drivers of DVR diffusion in Ad-TV

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Abstract

This paper focuses on the diffusion of Digital Video Recorders (DVRs) from a program choice perspective. After presenting theoretical foundations of program choice models and demonstrating the main features of DVRs, a new DVR-converted program choice model is developed.

Based on that model, we show that program providers in Ad-TV have the incentive and the opportunity to act as drivers of DVR diffusion by offering cost-effective programs and thus attracting viewers from competitors.

Slide 1

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Slide 2

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Program Choice Models

- Audience-based models
  (Steiner 1952, Rothenberg 1962a & 1962b, Beebe 1977)
  - Satisfaction criterion: No. of satisfied choices
  - Goal: Maximize no. of viewers per channel

- WTP-based models
  (Spence/Owen 1977, Wildman/Owen 1985)
  - WTP to measure preference intensities (Ad-TV and Pay-TV)
  - Goal: Maximize revenue per channel

- Models in marketing and advertising research
  - Observational data $\Rightarrow$ Forecasting ratings
  - Goal: Optimizing program scheduling

Slide 3

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Main DVR Features

Recording Functionality
- Shifting away from linear TV watching
- Watching simultaneously broadcasted programs
- Library building

Ad-Skipping Functionality
- Setting price for watching Ad-TV programs to zero
- Increasing viewer satisfaction

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Model Assumptions

A1: Viewer groups highly unequal in size and homogenous preferences per group
A2: Viewers watching programs of 1st choice or common 2nd choice ('common denominator')
A3: Program duplication: Audiences shared equally
A4: Viewer groups differing in value to advertisers
A5: Program types differing in cost
A6: Competition within single program period
A7: Program providers maximizing single program profits
A8: Ad-skipping: No revenue for program providers
A9: Recording: Simultaneously broadcasted programs in succession
A10: Penetration of DVR: same equal over all viewer groups
A11: Program providers able to add mark-ups on advertising prices

Slide 5

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Slide 6

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A9: **Recording: Simultaneously broadcasted programs in succession**

A10: Penetration of DVR was equal over all viewer groups

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Slide 2: Selected Model Measurements

Selected Model Measurements

Company and Industry Characteristics
➤ Revenue (Company Level)
➤ Total Revenue (Industry Level)

Welfare
➤ Consumer Surplus
➤ Total TV Viewing

Diversity
➤ Market Concentration

$$HHI_{MC} = \sum_{n=1}^{N}\left[\frac{\text{Revenue per Program Provider } n}{\text{Total Revenue}}\right]^2$$

➤ Diversity of Content

$$HHI_{DC} = \sum_{i=1}^{I}\left[\frac{\text{Total TV Viewing per Program } i}{\text{Total TV Viewing}}\right]^2$$

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Slide 3: Selected Scenario Results

Selected Scenario Results

DVR Roll-Out	0%	10%	33%	75%
Revenue (Common Denom. Provider, in Ths. €)	24.3	21.9	49.0	42.7
Total Revenue (in Ths. €)	204.3	183.9	132.7	42.7
Consumer Surplus (in Ths. €)	87.5	89.3	96.5	70.6
Total TV Viewing (# viewers)	8,750	9,500	10,400	8,750
Market Concentration (HHI)	0.46	0.46	0.53	1.00
Content Diversity (HHI)	0.43	0.39	0.50	1.00

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Slide 4: Selected Scenario Results

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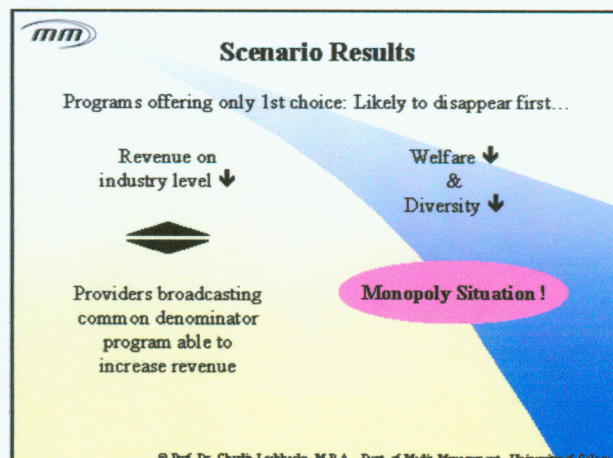© Prof. Dr. Claudia Loebbecke, M.B.A. - Dept. of Media Management - University of Cologne

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Scenario Results

Programs offering only 1st choice: Likely to disappear first...

Revenue on industry level ↓

Welfare ↓ & Diversity ↓

Providers broadcasting common denominator program able to increase revenue

Monopoly Situation !

Recommendation to Ad-TV Program Providers

- Provide common denominator program to stay in business
- Create interest for relatively cheaply produced program
- Push DVR diffusion

Helpful ONLY for common denominator providers, & in the extreme case, only for THE MONOPOLIST ?!

... Questions, Comments, Complaints ?

Thanks for your attention !

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Selected Program Choice References Back-Up

Beebe, J. (1977) Institutional Structure and Program Choices in Television Markets, *Quarterly Journal of Economics*, 91(1), 15-37.

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Scenario Example

Group	1	2	3
Size	5,000	2,500	1,250
Advertisers' WTP per Viewer (in €)	30	25	20
Preferences			
1st choice	P1	P2	P3
2nd choice	P3	P3	-
3rd choice	-	-	-

	Program Cost (in €)	Advertising Price per Viewer (in €)	Viewer's WTP (in €)	With Ad	Without Ad
			1st choice	10	12
P1	80,000	25.00	2nd choice	6	8
P2	44,000	22.00			
P3	24,000	19.50			

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