Using System Dynamics to Understand Disruption:

Part 1: Sports over IP – a practical case

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Outline

Two uses of System Dynamics as a tool to capture the dynamic complexity of the environment:

1. **Sports over IP – a practical case** (Emmanuel Blain)
 - Rationale for use of System Dynamics in the SpoIP framework
 - Model: Block representation and Design choices
 - Results and prospective

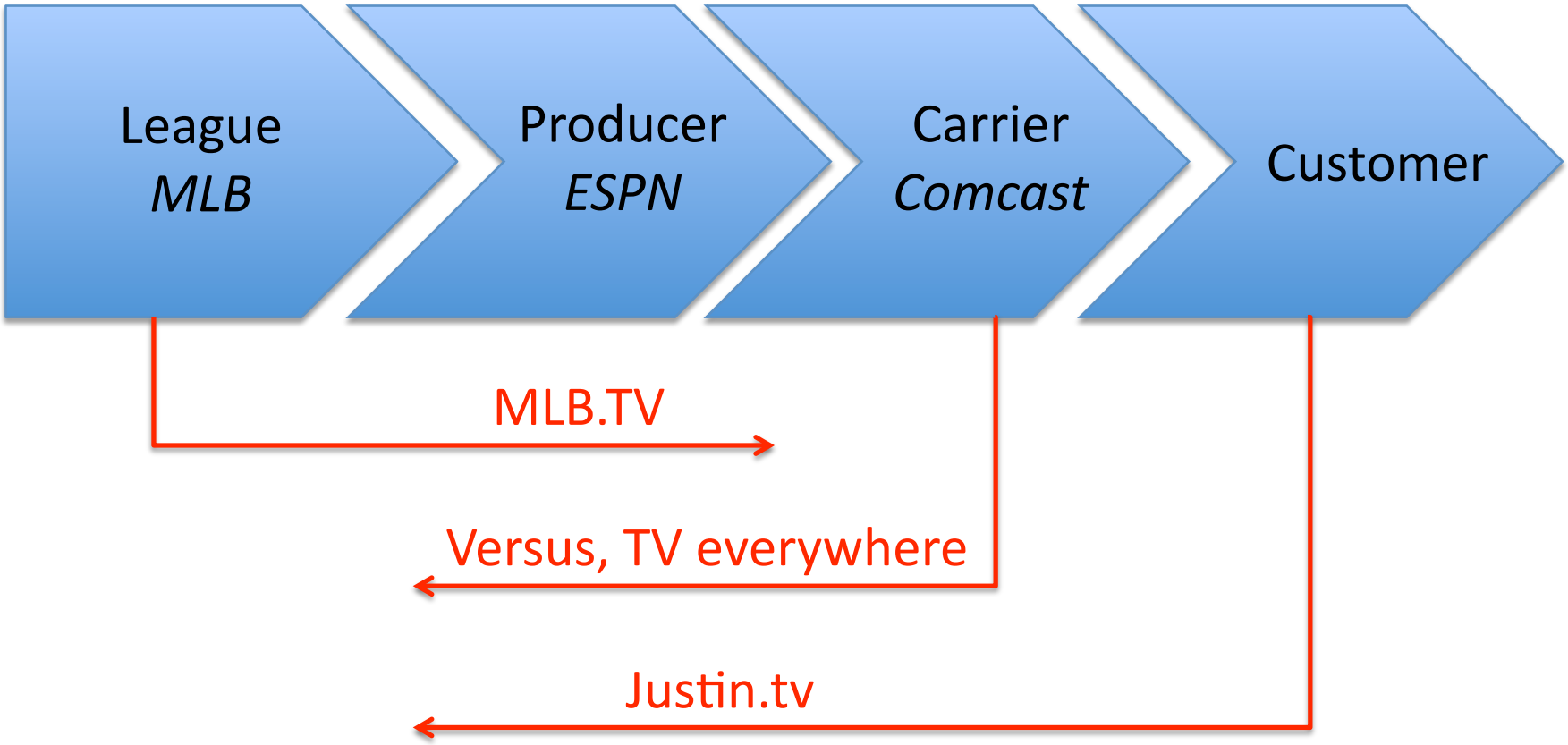
2. **A general model for Technology and Industry Disruption** (Chintan Vaishnav)

The SD standard method

1. Problem articulation
2. Reference modes ("triggers" in the toolkit)
3. Formulation of Dynamic Hypotheses and Causal loop diagrams
4. Formulation of the stock & flow model
5. Testing
6. Policy design and evaluation

From Sternman (2000)

Quick recap of the SpoIP issue



And a lot more complexity added by regulation, historical bonds, etc…

A trans-disciplinary problem

Dealing with the question requires to look more closely at:

- The historical roots of the existing business models
- The existing mechanics in the Sports broadcasting industry
- The technical requirements for “Sports over IP”
- The regulation in vigor (and the trends for the future)

Methodology: System Dynamics

System Dynamics is a tool of choice:

- Multi-disciplinary problem
- Dynamic problem, lots of "What if?" questions
- Behavioral factors are inherently part of the problem
- We do not try to forecast, but study interplays between stakeholders

Aim: study the technological and regulatory conditions under which the market will tip toward a predominance of broadcasters or content owners

SD model for SpoIP

Dynamics of supply and demand in the sports broadcasting market

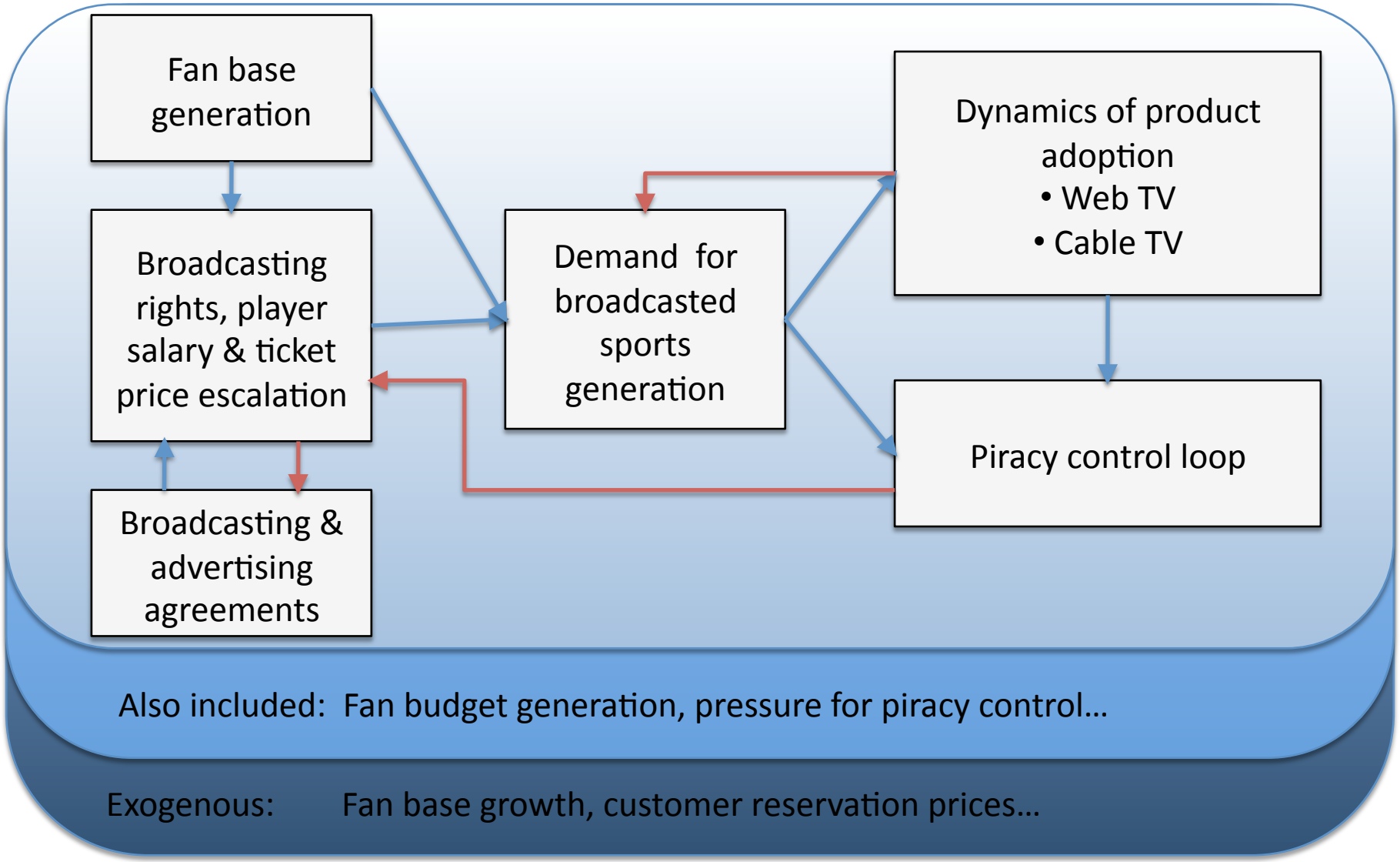
AND

Competitive model between:

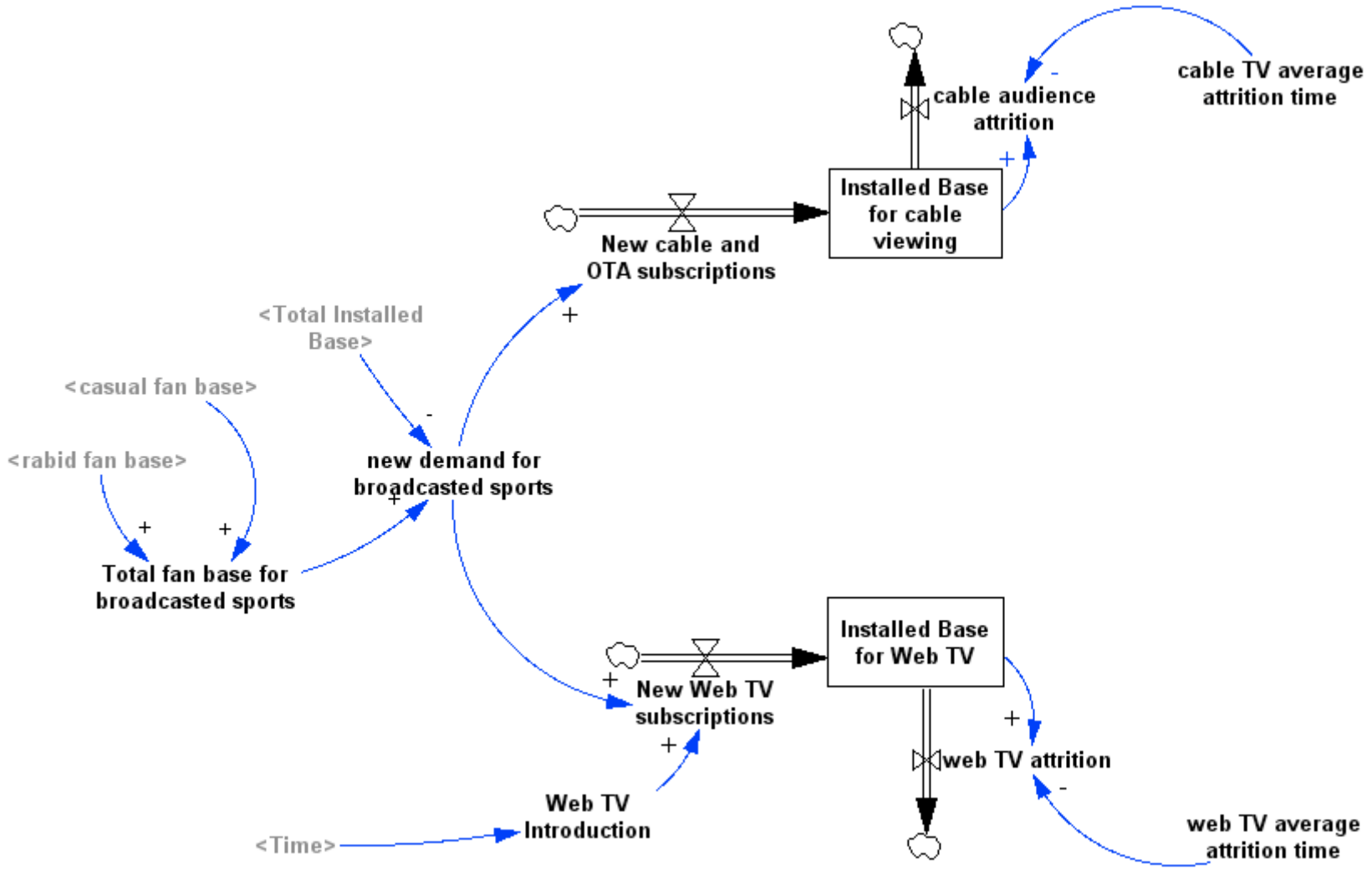
Cable TV
- Operated by legacy carriers.
- Revenues depend on # of viewers, from subscription and ads.
- Incumbent – customer base is large, price is low, quality is high

MLB.TV
- Operated by league itself.
- Revenues come from a flat subscription fee
- Entrant – customer base is small, price is rather high, but potential for quality and variety is higher than for cable.

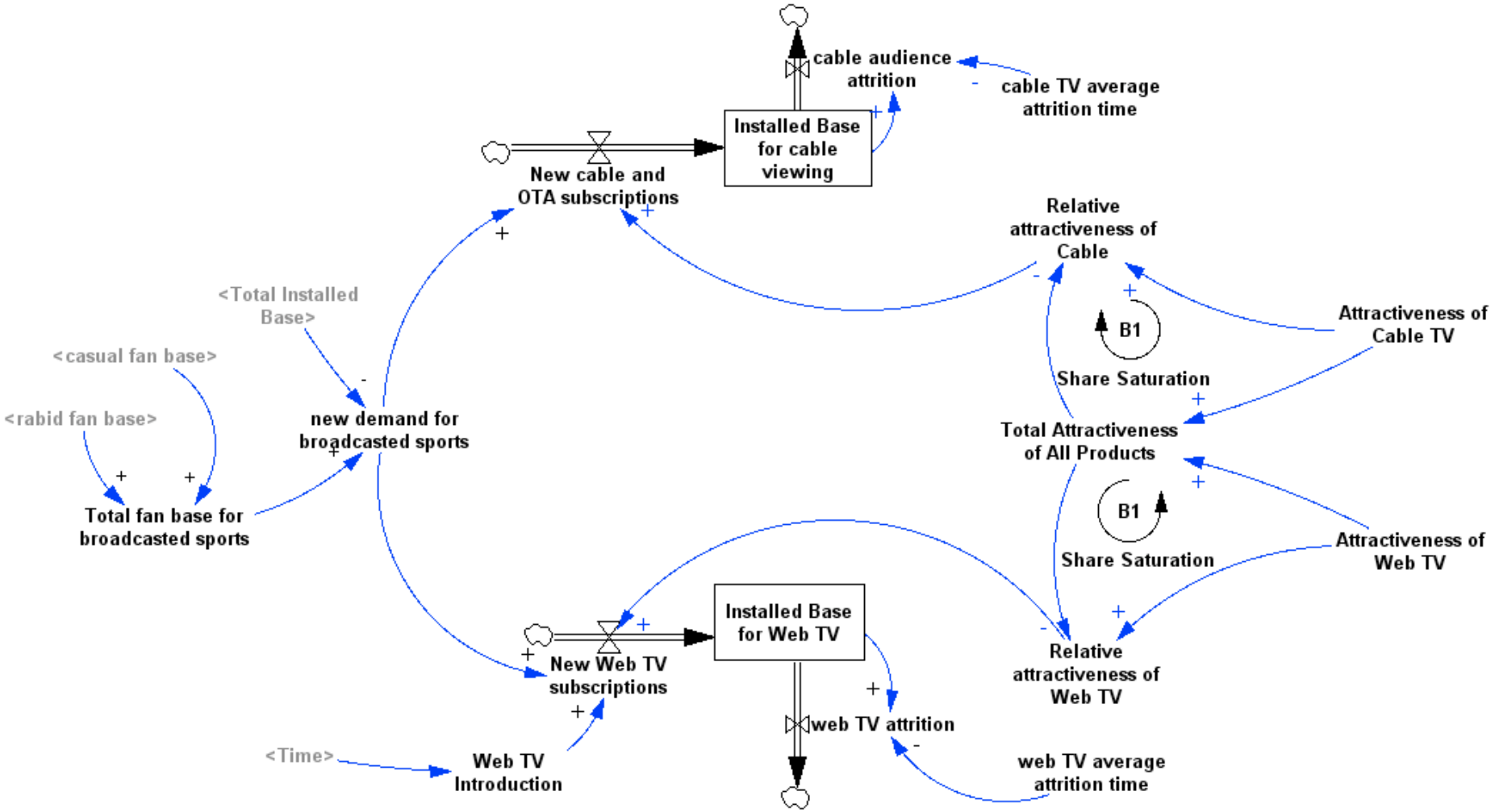
Block view of the model



Example: Dynamics of product adoption



Dynamics of product adoption



Dynamics of product adoption

What makes a sports viewing package attractive ?

Already implemented:
- Price
- Quality of content
- Variety of content

All the implemented factors have the same weight on attractiveness, and are normalized on a scale from 0 to 1.

Not implemented :
- Service uptime (may be an issue for Web TV)
- Blackouts
- Ease of use
- Network effects

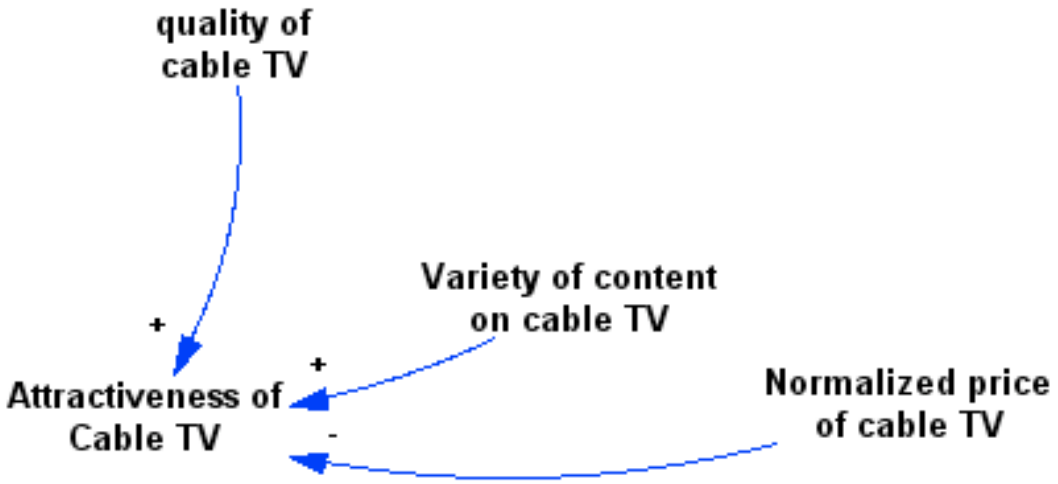
Dynamics of product adoption

Hypotheses for Cable TV:

• Cable is a MATURE technology
  Quality is fixed at 0.5 (quality for Web TV varies from 0 to 1)

• Variety of content only slowly varies as long as the market share is above a threshold (incumbent "rigidity")

• Price depends on the installed base – to a certain extent



Attractiveness = Quality * Variety * Normalized price

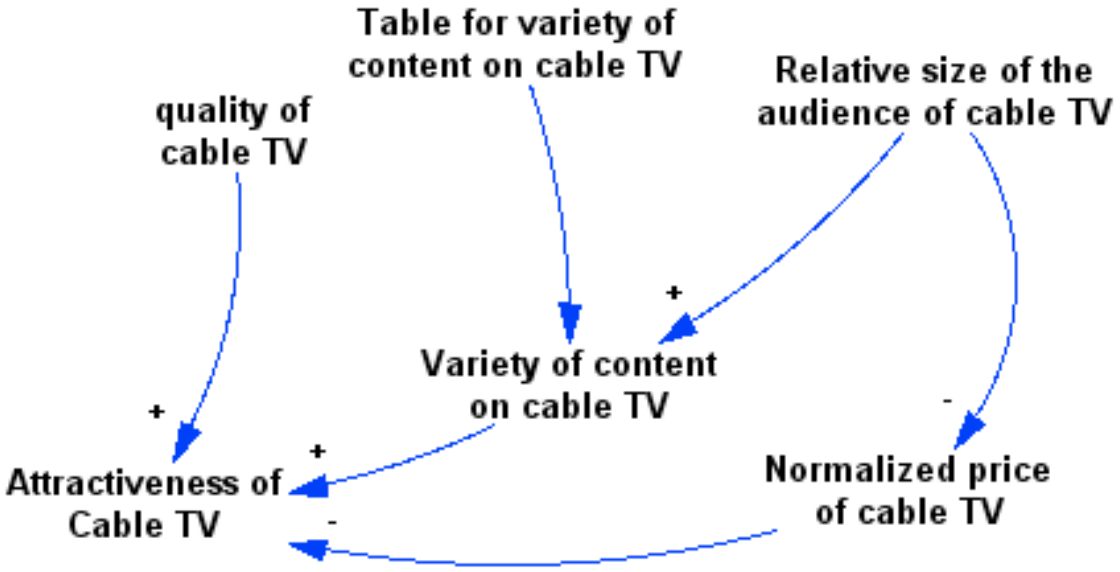


Table for variety of content on cable TV
Relative size of the audience of cable TV
quality of cable TV
+
+
Variety of content on cable TV
-
+
Attractiveness of Cable TV
Normalized price of cable TV
-

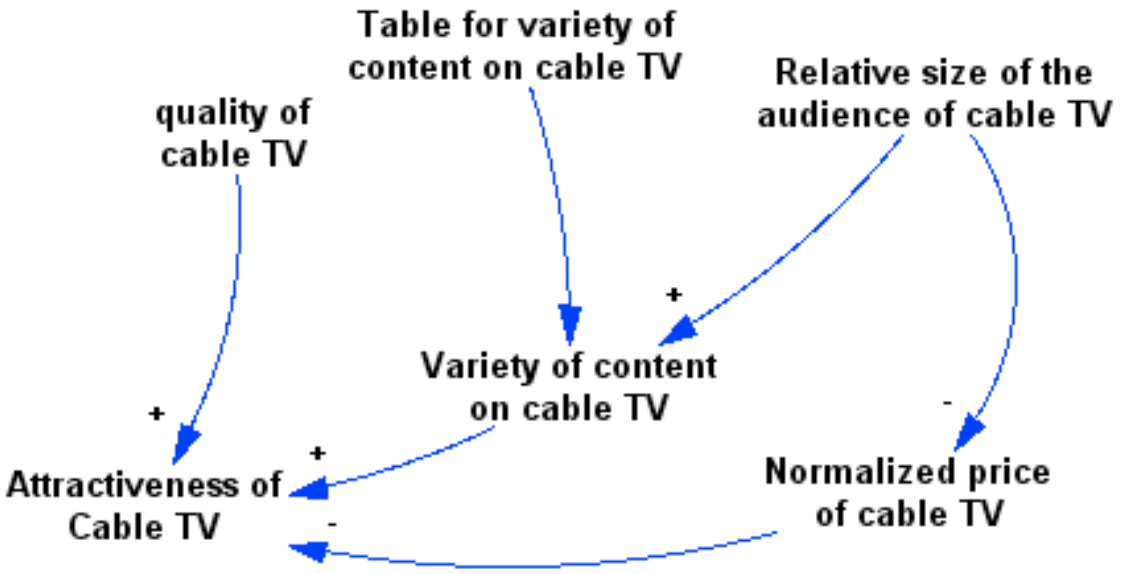
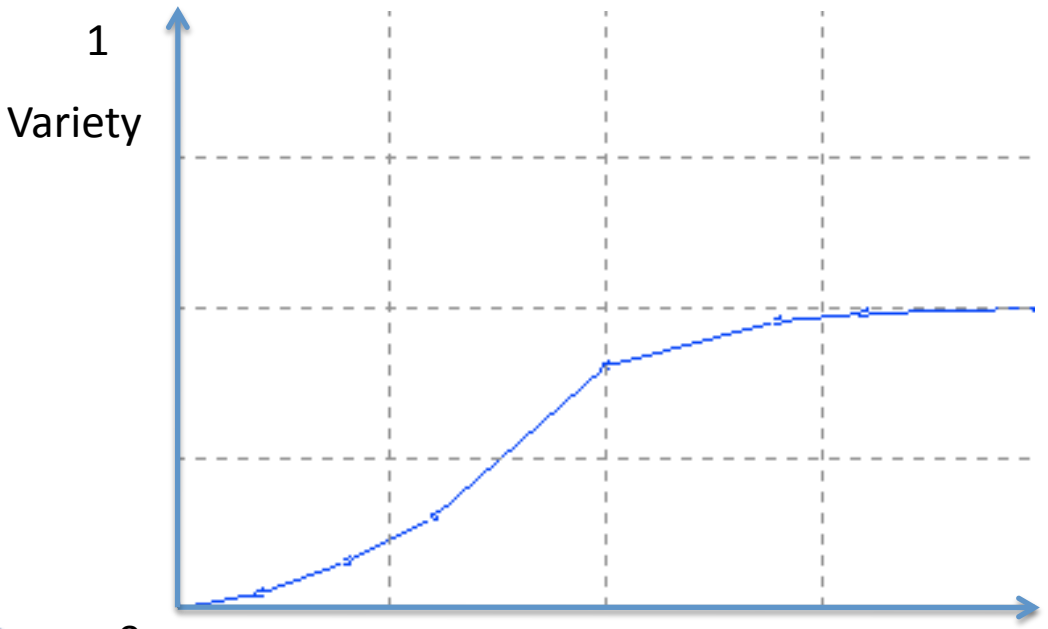
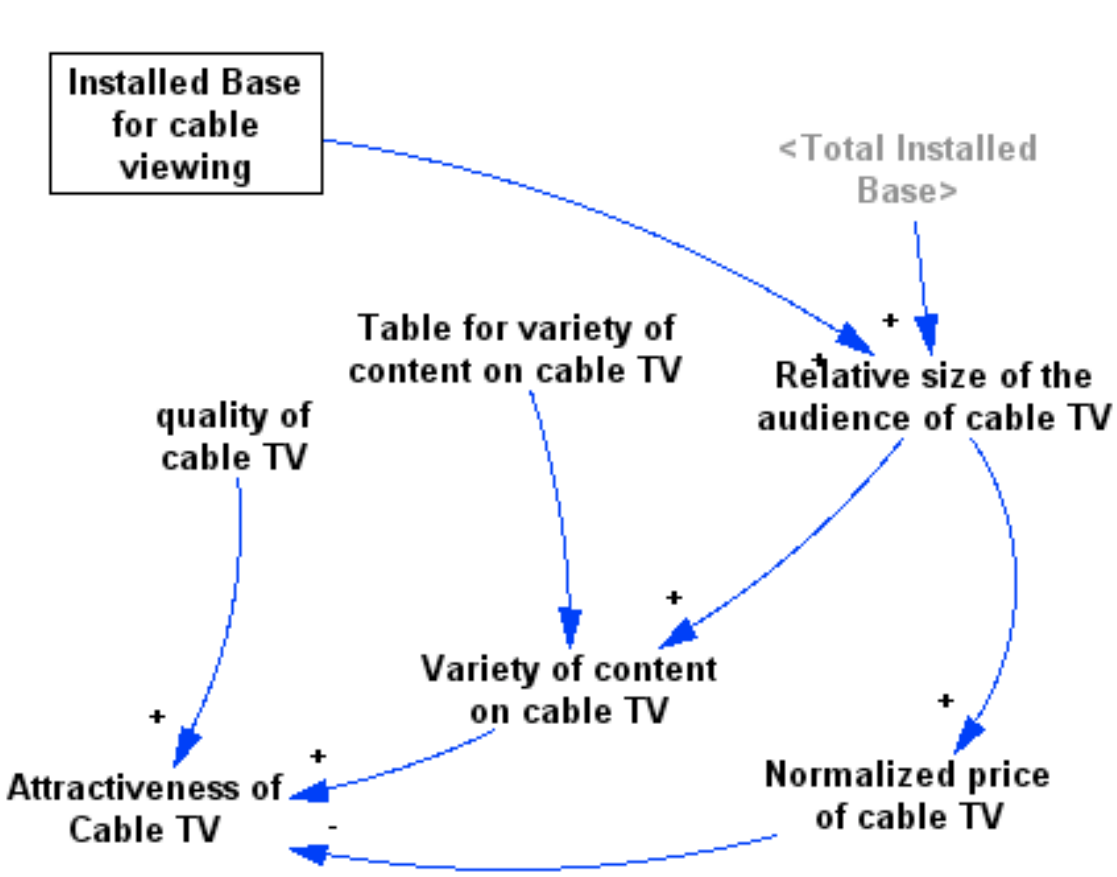


Table function for variety:




Installed Base for cable viewing
<Total Installed Base>
Table for variety of content on cable TV
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Attractiveness of Cable TV
Normalized price of cable TV
+
+
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+
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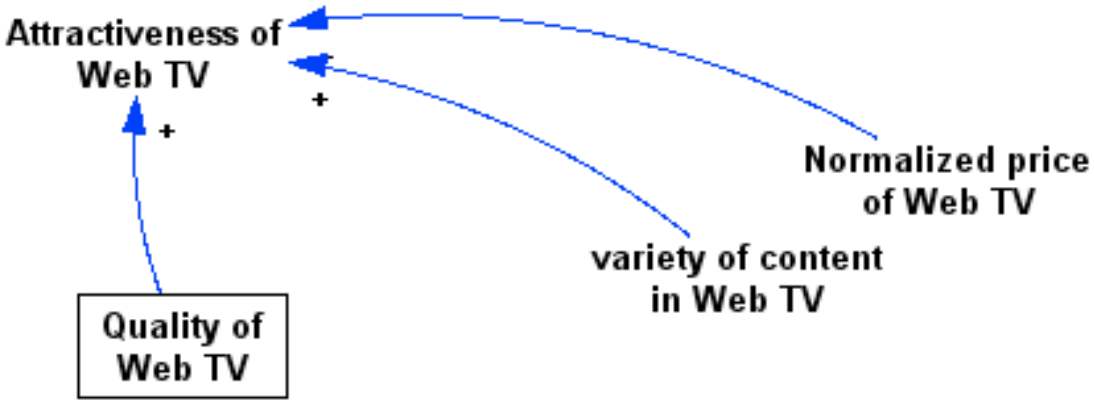
Dynamics of product adoption

Hypotheses for Web TV:

- Cable is a fast growing technology
  Quality driven by "Internet-based innovation"

- Variety of content varies quickly as capacity allows it

- Price for now is fixed, and above the current price of cable TV


Attractiveness of
Web TV
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Normalized price
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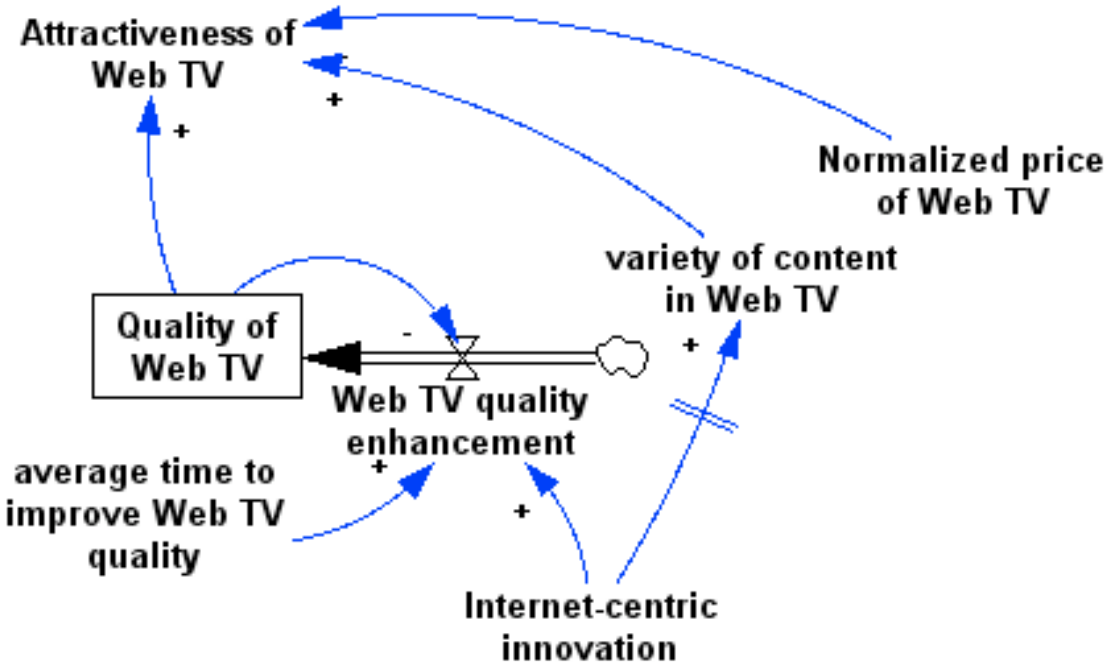
variety of content
in Web TV
Quality of
Web TV


Attractiveness of Web TV
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Normalized price of Web TV
variety of content in Web TV
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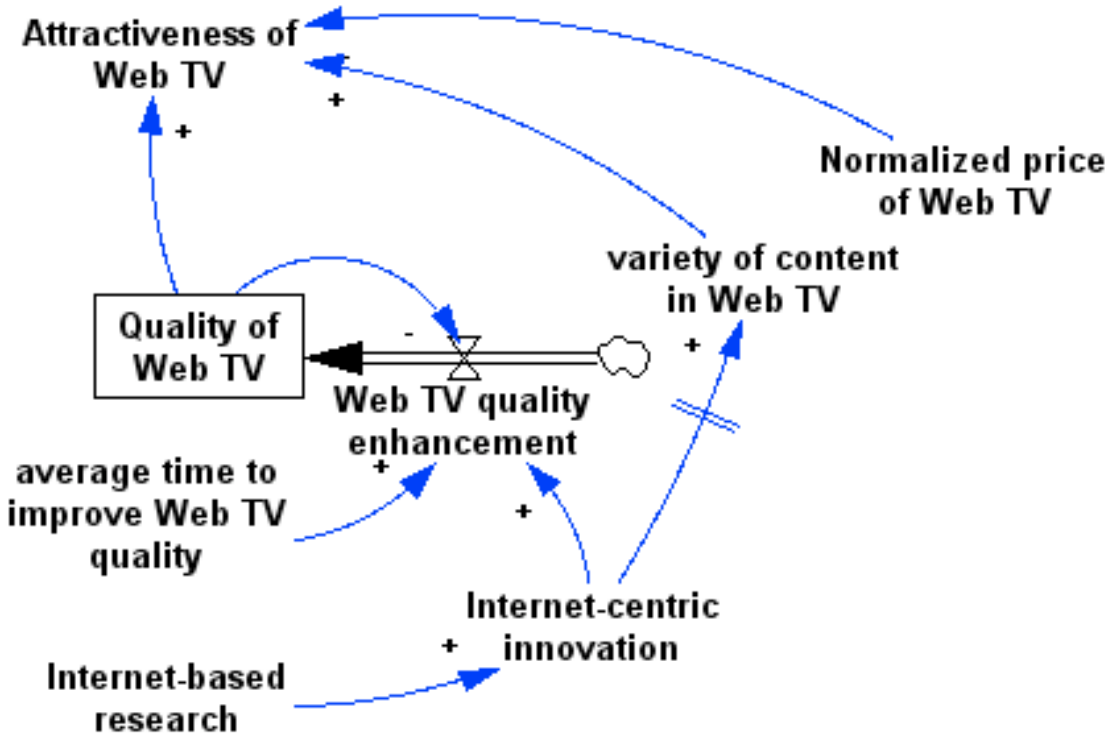
Quality of Web TV
-
Web TV quality enhancement
+
average time to improve Web TV quality
+
Internet-centric innovation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Internet-based research

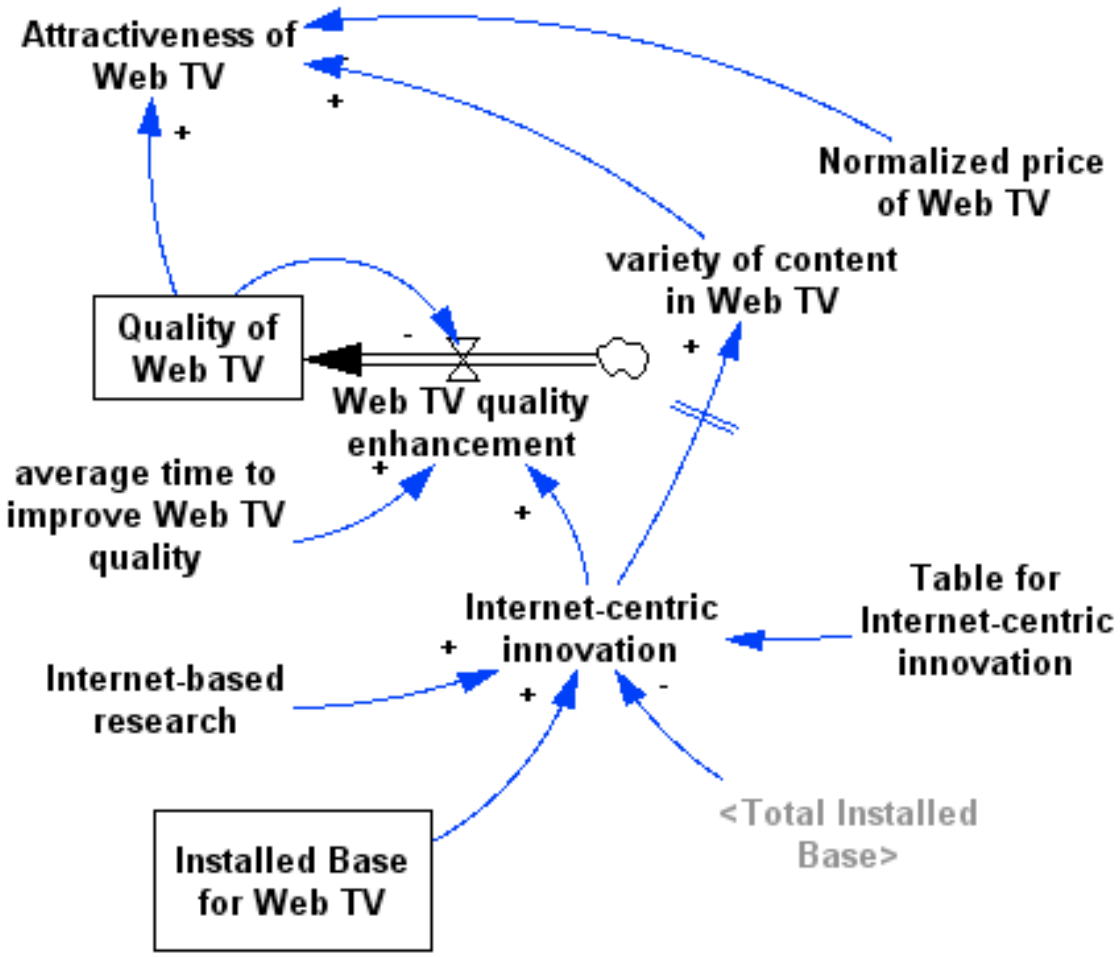
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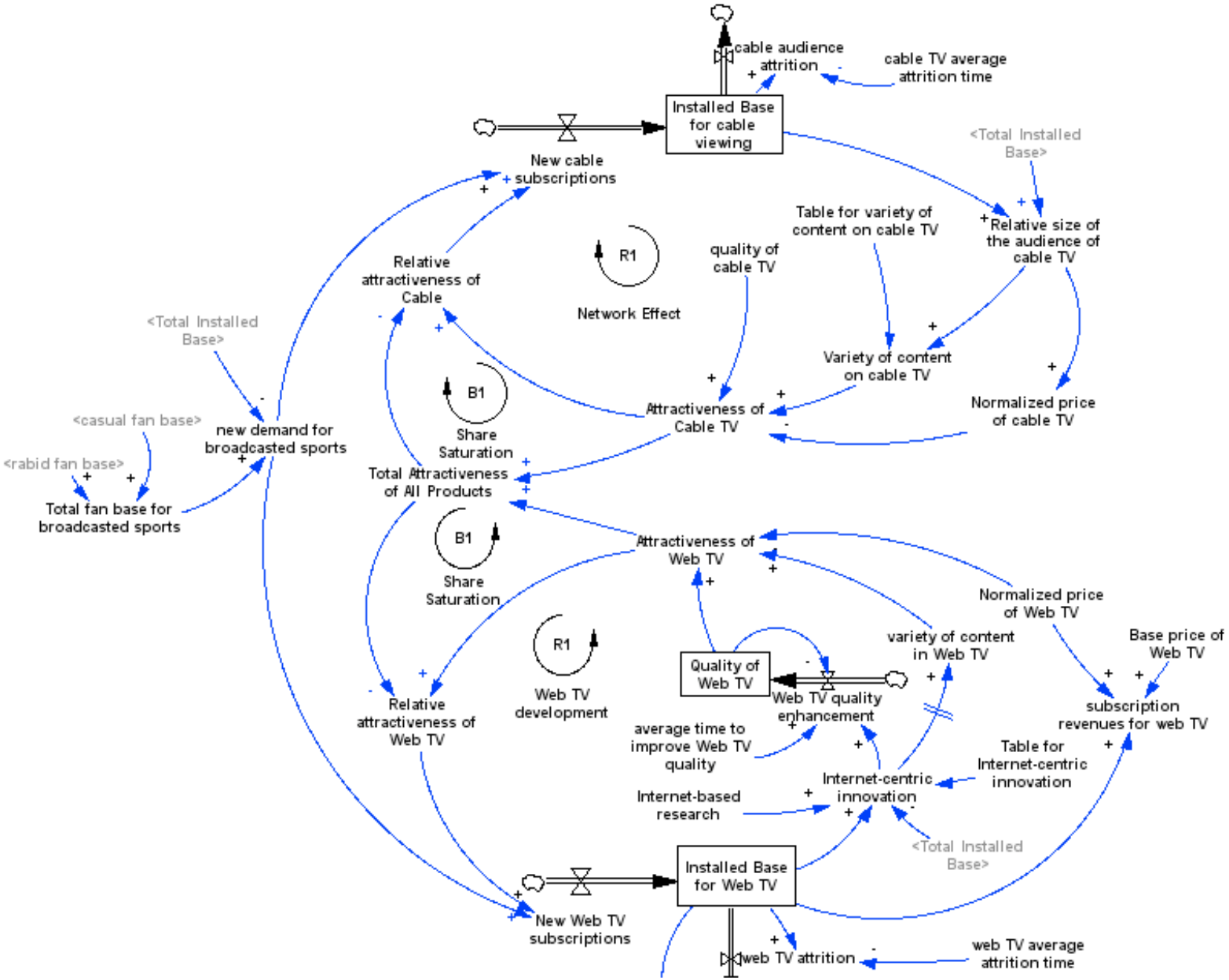
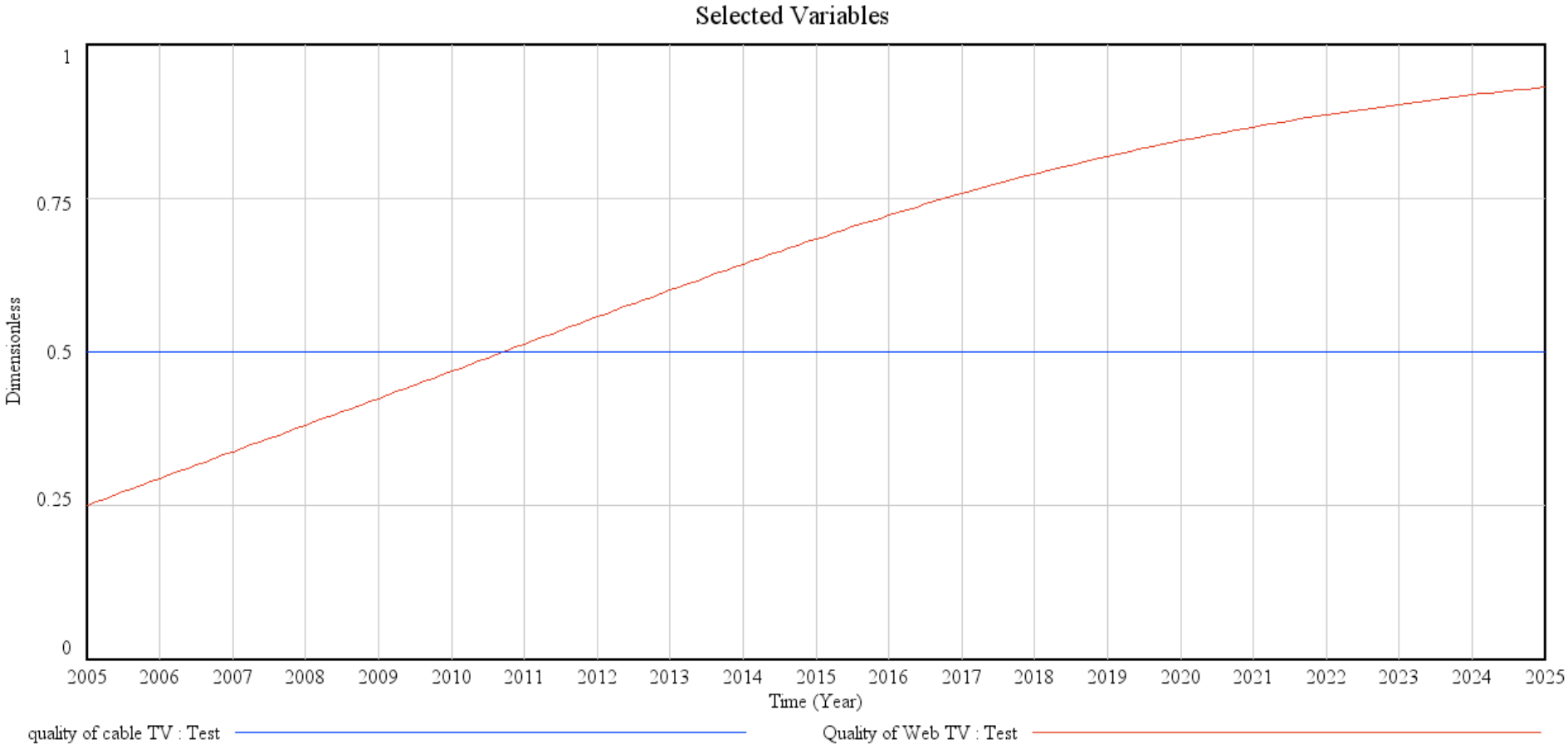
Table for Internet-centric innovation
Internet-based research
<Total Installed Base>
Installed Base for Web TV

Dynamics of product adoption



Results as of today: compared qualities



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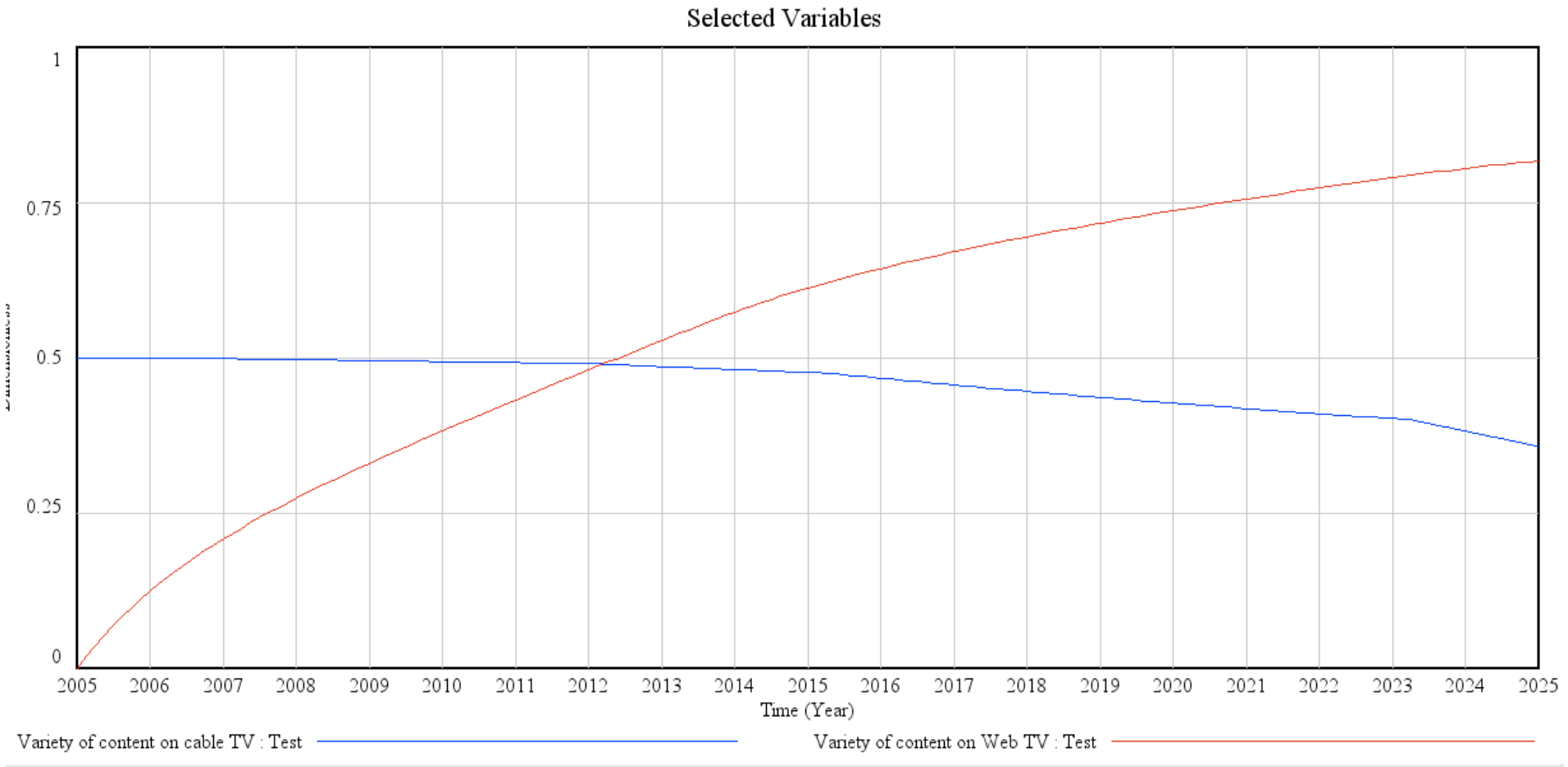
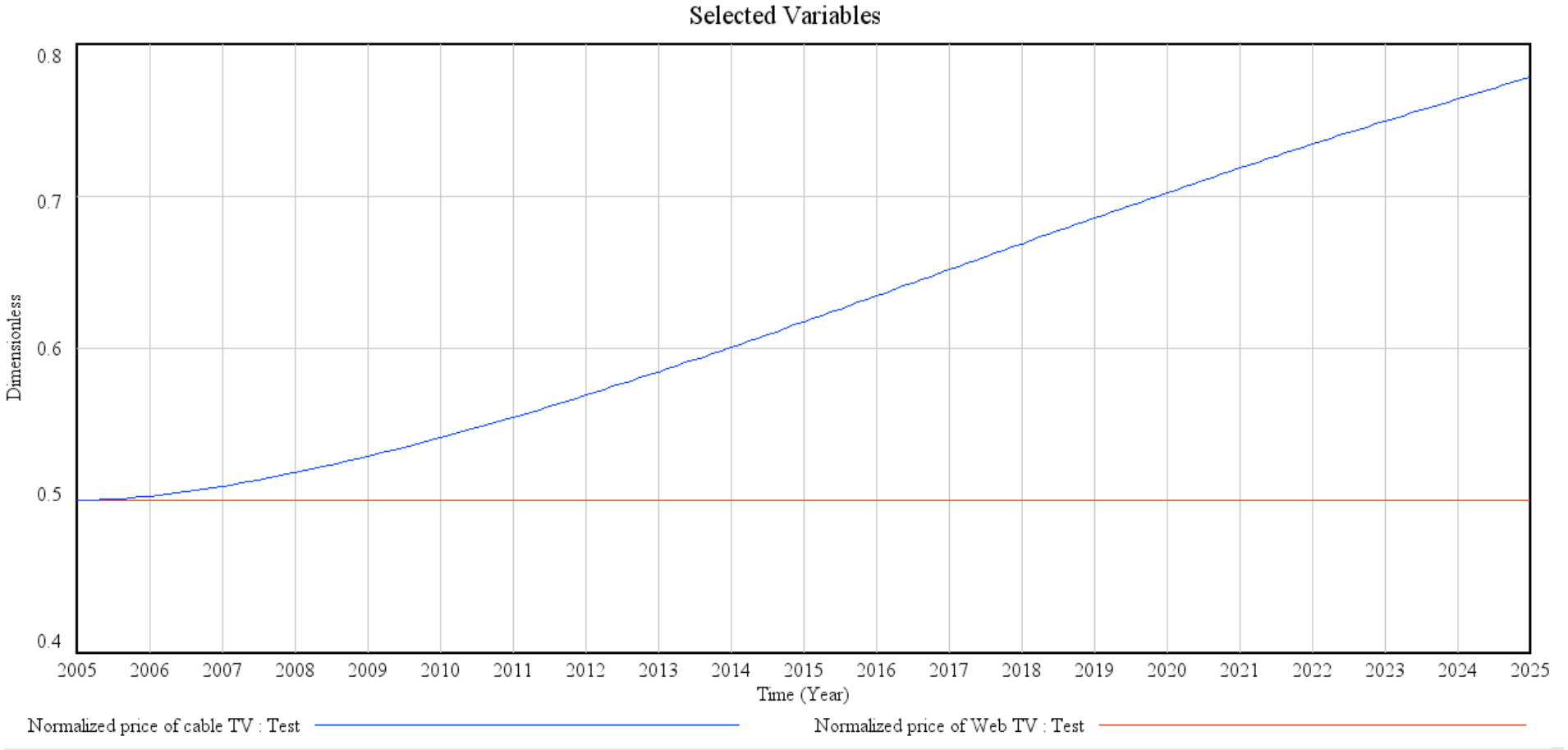
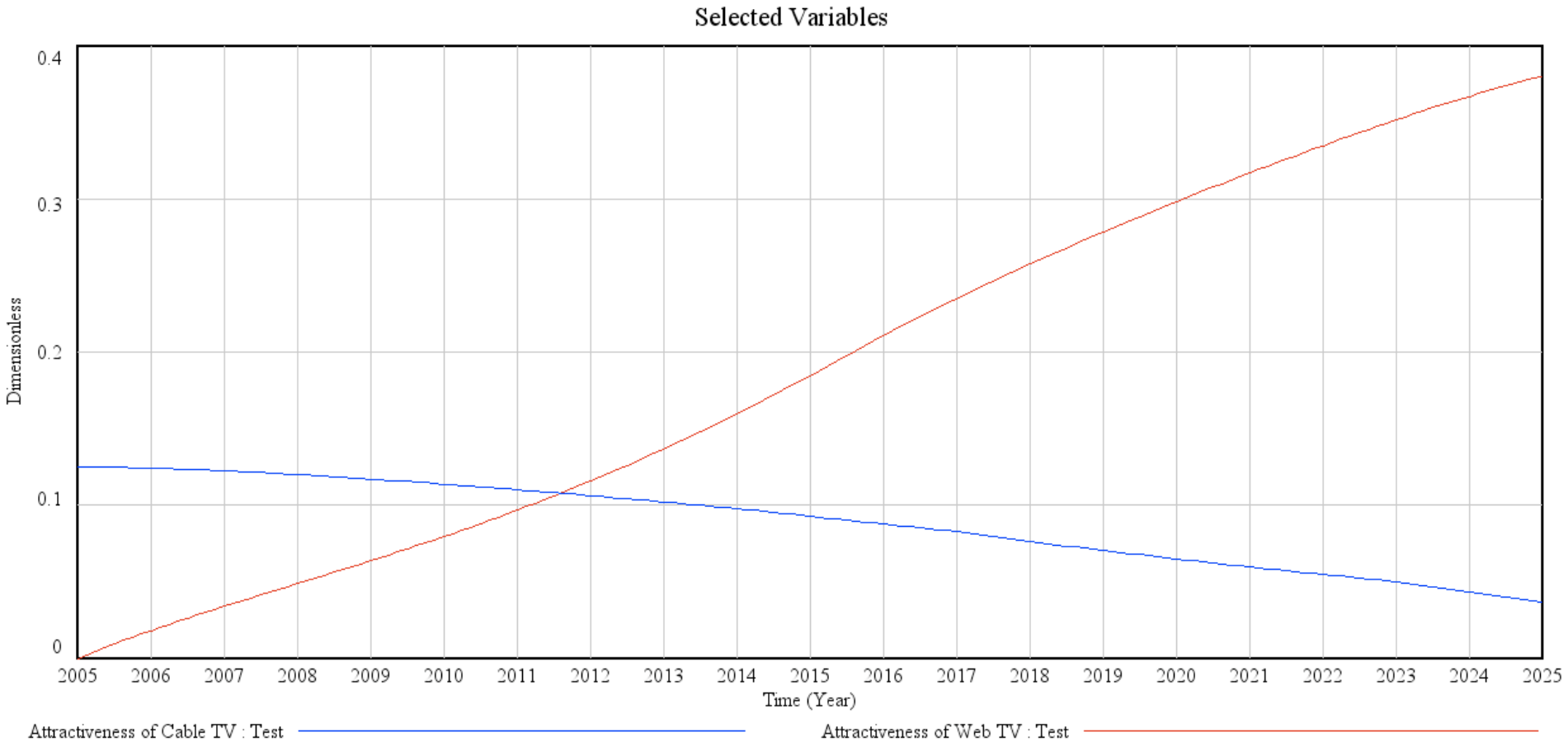
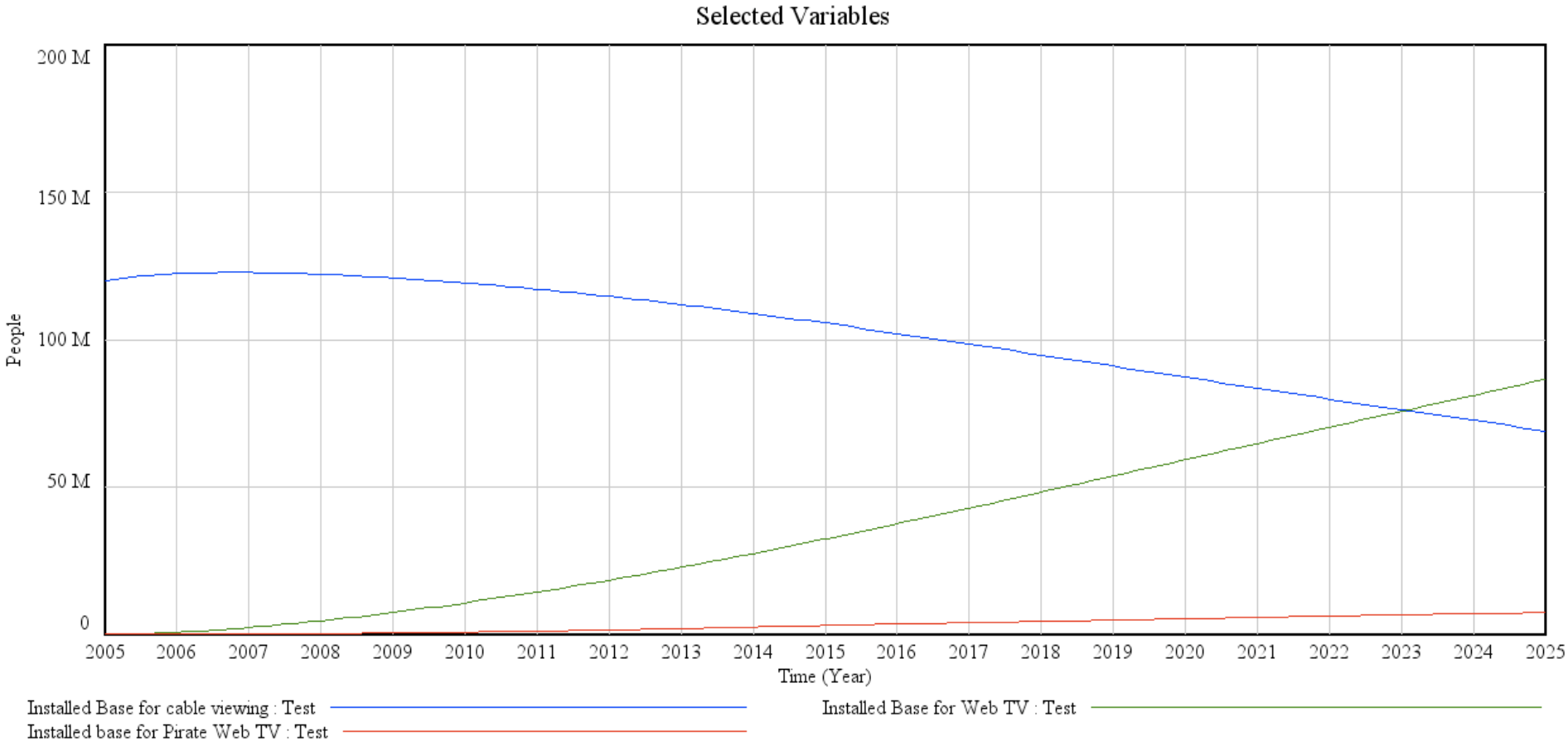


Results as of today: compared prices



Results as of today: compared attractivenesses



Results as of today: market shares