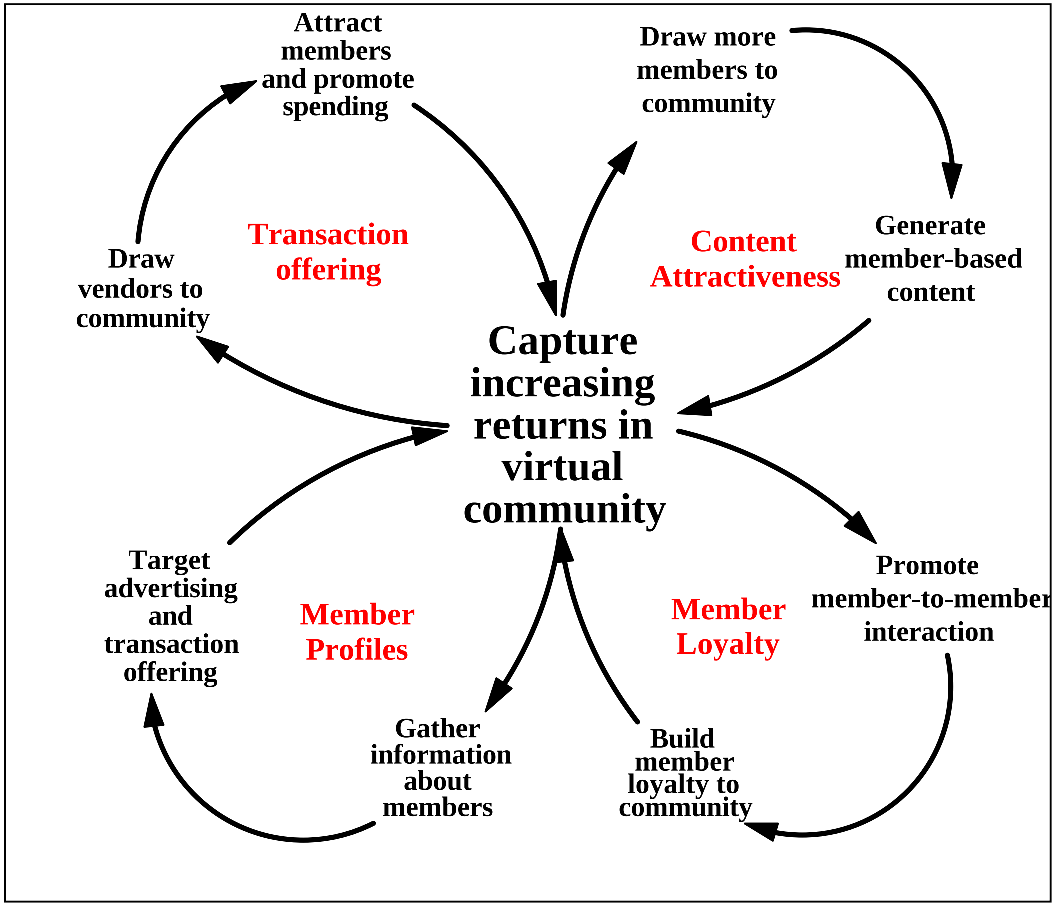
To Main Proceedings Document

Figure 1 - Hagel & Armstrong's Model on Online Communities



From Hagel/Armstrong, Net Gain, Expanding Markets through Virtual Communities, 1997, page 56.

Figure 2

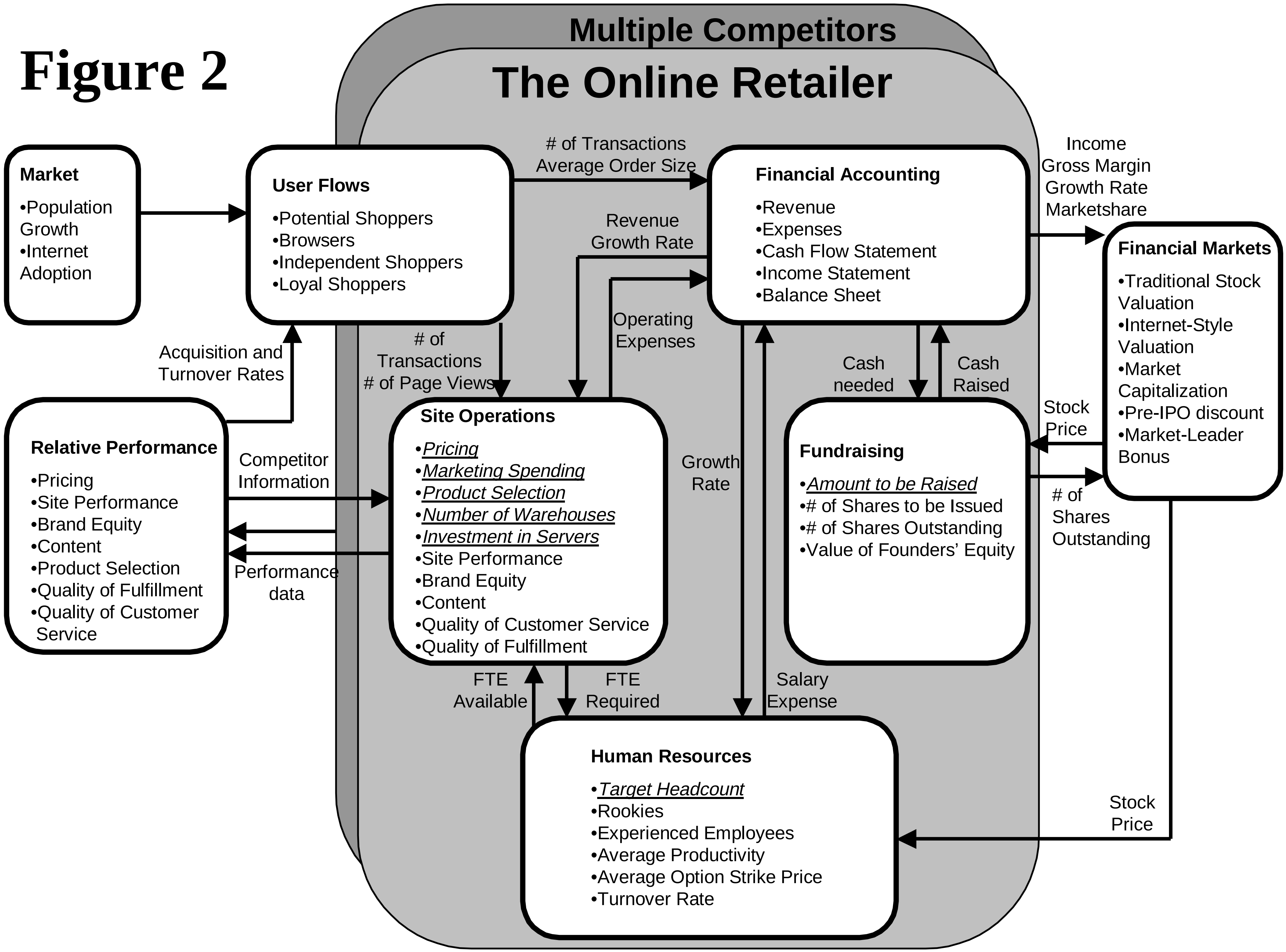
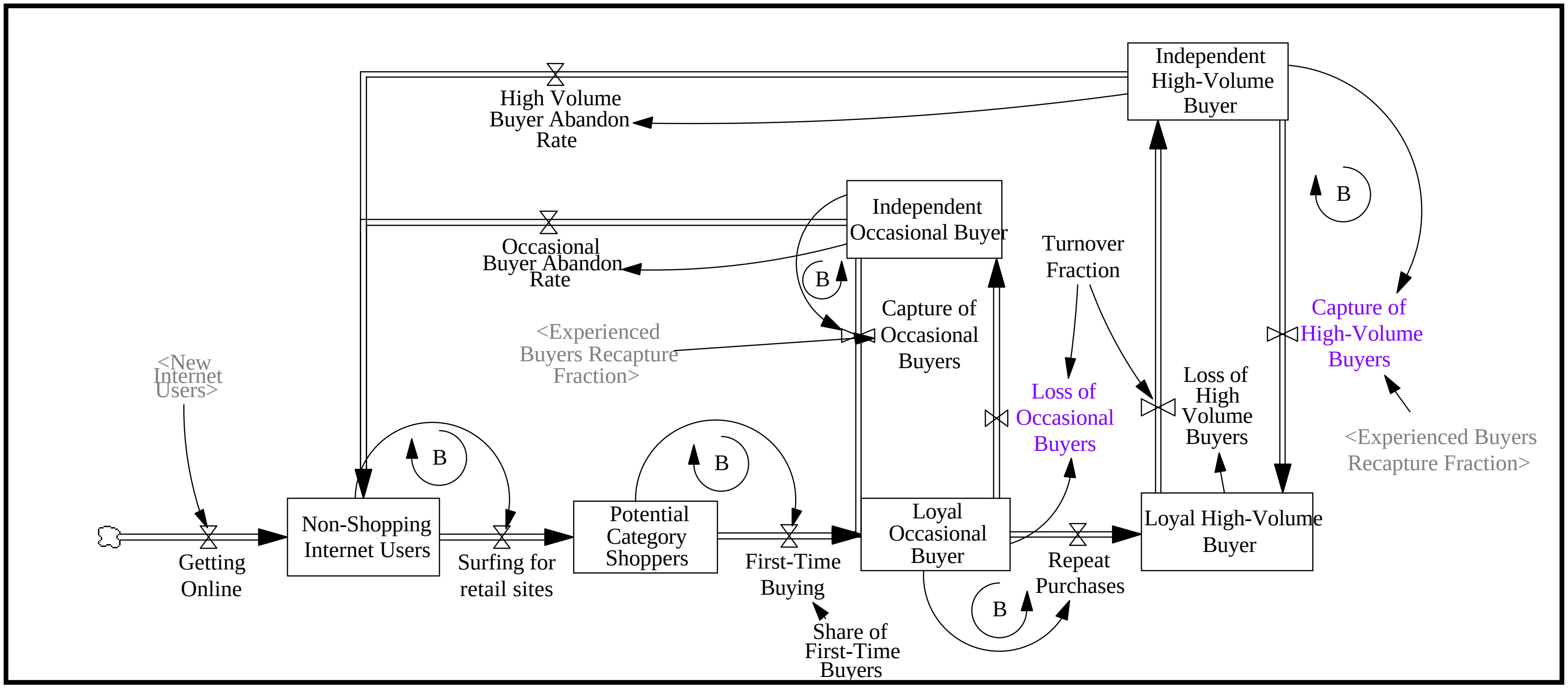
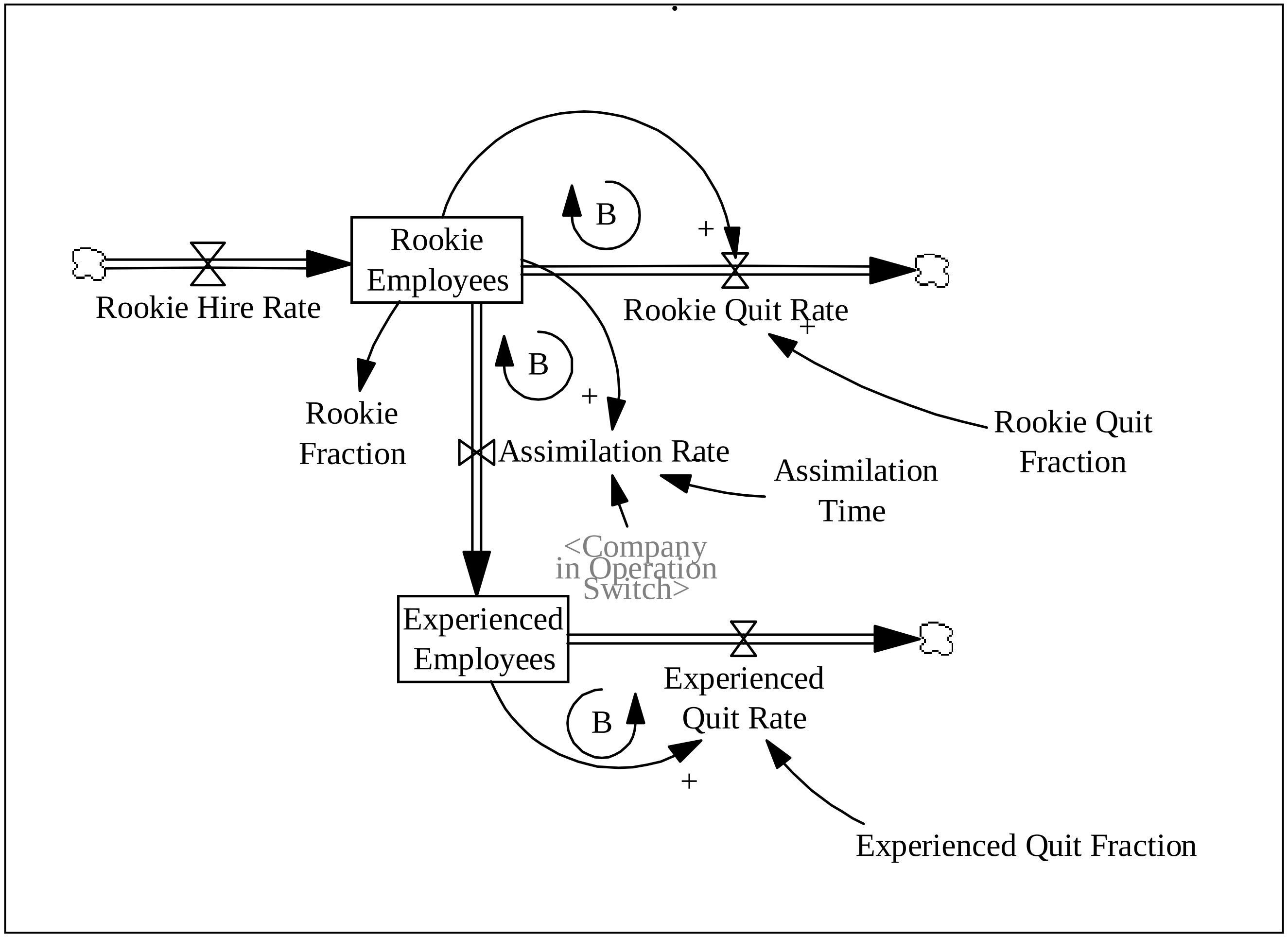

Multiple Competitors
The Online Retailer
Market
•Population Growth
•Internet Adoption
User Flows
•Potential Shoppers
•Browsers
•Independent Shoppers
•Loyal Shoppers
# of Transactions
Average Order Size
Financial Accounting
•Revenue
•Expenses
•Cash Flow Statement
•Income Statement
•Balance Sheet
Income
Gross Margin
Growth Rate
Marketshare
Financial Markets
•Traditional Stock Valuation
•Internet-Style Valuation
•Market Capitalization
•Pre-IPO discount
•Market-Leader Bonus
Revenue
Growth Rate
Operating Expenses
# of Transactions
# of Page Views
Acquisition and Turnover Rates
Cash needed
Cash Raised
Stock Price
Relative Performance
•Pricing
•Site Performance
•Brand Equity
•Content
•Product Selection
•Quality of Fulfillment
•Quality of Customer Service
Competitor Information
Performance data
Site Operations
•Pricing
•Marketing Spending
•Product Selection
•Number of Warehouses
•Investment in Servers
•Site Performance
•Brand Equity
•Content
•Quality of Customer Service
•Quality of Fulfillment
Growth Rate
Fundraising
•Amount to be Raised
•# of Shares to be Issued
•# of Shares Outstanding
•Value of Founders' Equity
# of Shares Outstanding
FTE Available
FTE Required
Salary Expense
Human Resources
•Target Headcount
•Rookies
•Experienced Employees
•Average Productivity
•Average Option Strike Price
•Turnover Rate
Stock Price

Figure 3 - User Flows



This stock-and flow structure describes the acquisition and retention of users by the different companies in the market. Note that the Loyal Buyer Stocks exist separately for each company.

Figure 4 - The Hiring and Training Cycle



Source: Inspired by Figure 12-11 in Sterman, Business Dynamics, Systems Thinking and Modeling for a Complex World, page 491. See also James Lyneis, Corporate Planning and Policy Design A System Dynamics Approach, Chapter 13, 1980.

Figure 5 - Tracking Option Strike Price relative to Stock Price

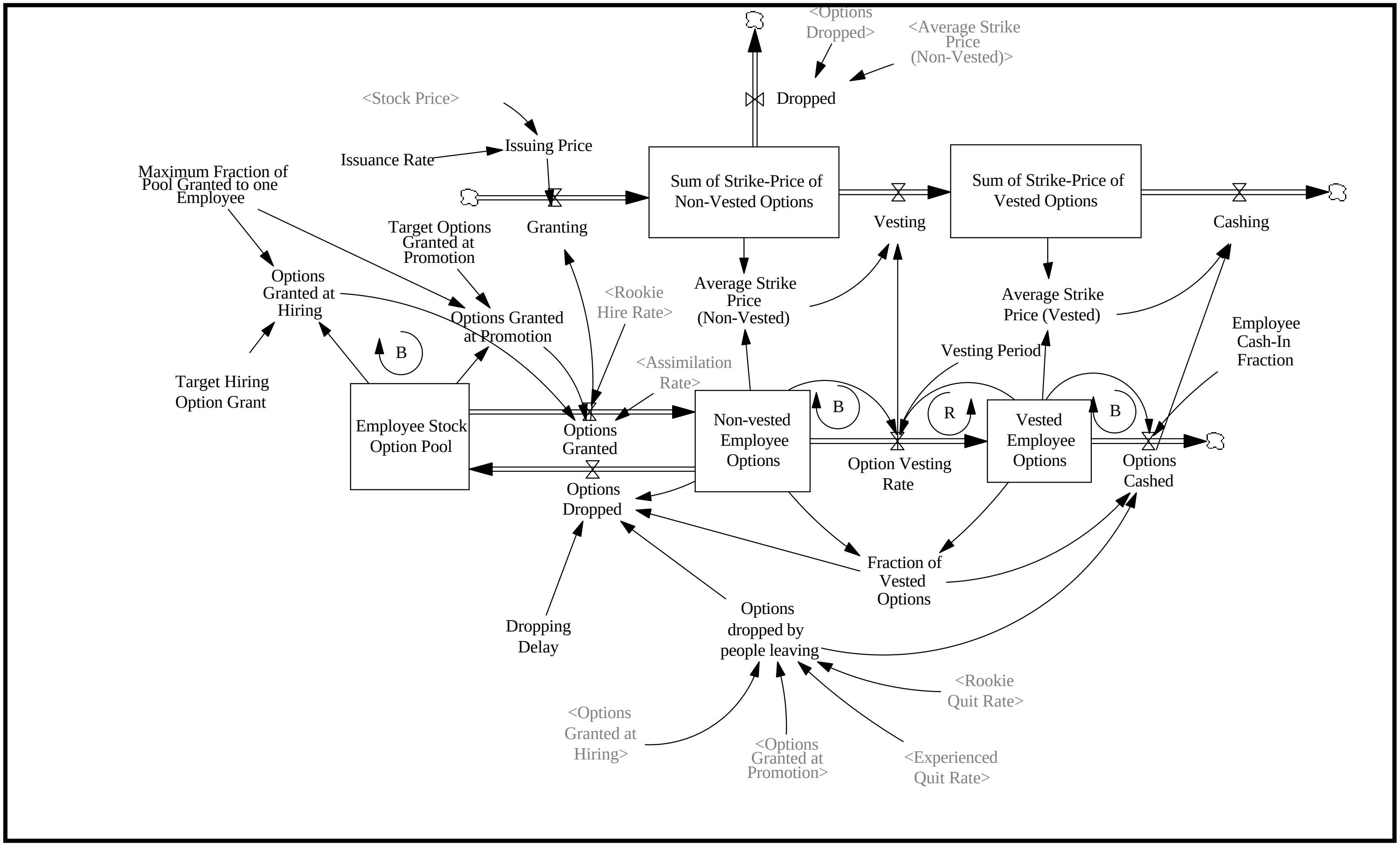


Figure 6 - The Internet-Style Valuation

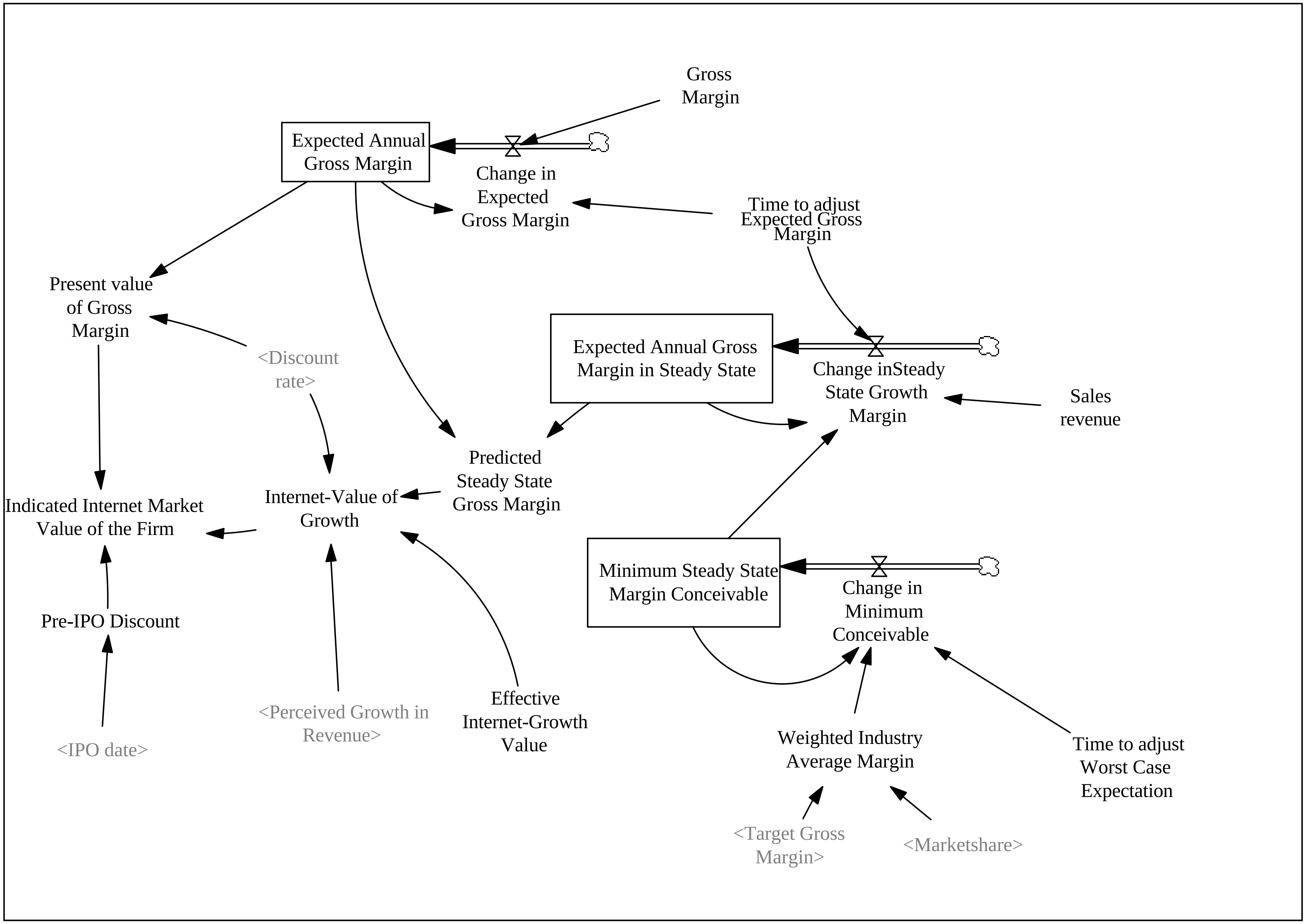


Figure 7 - Two Modes of Stock Valuation

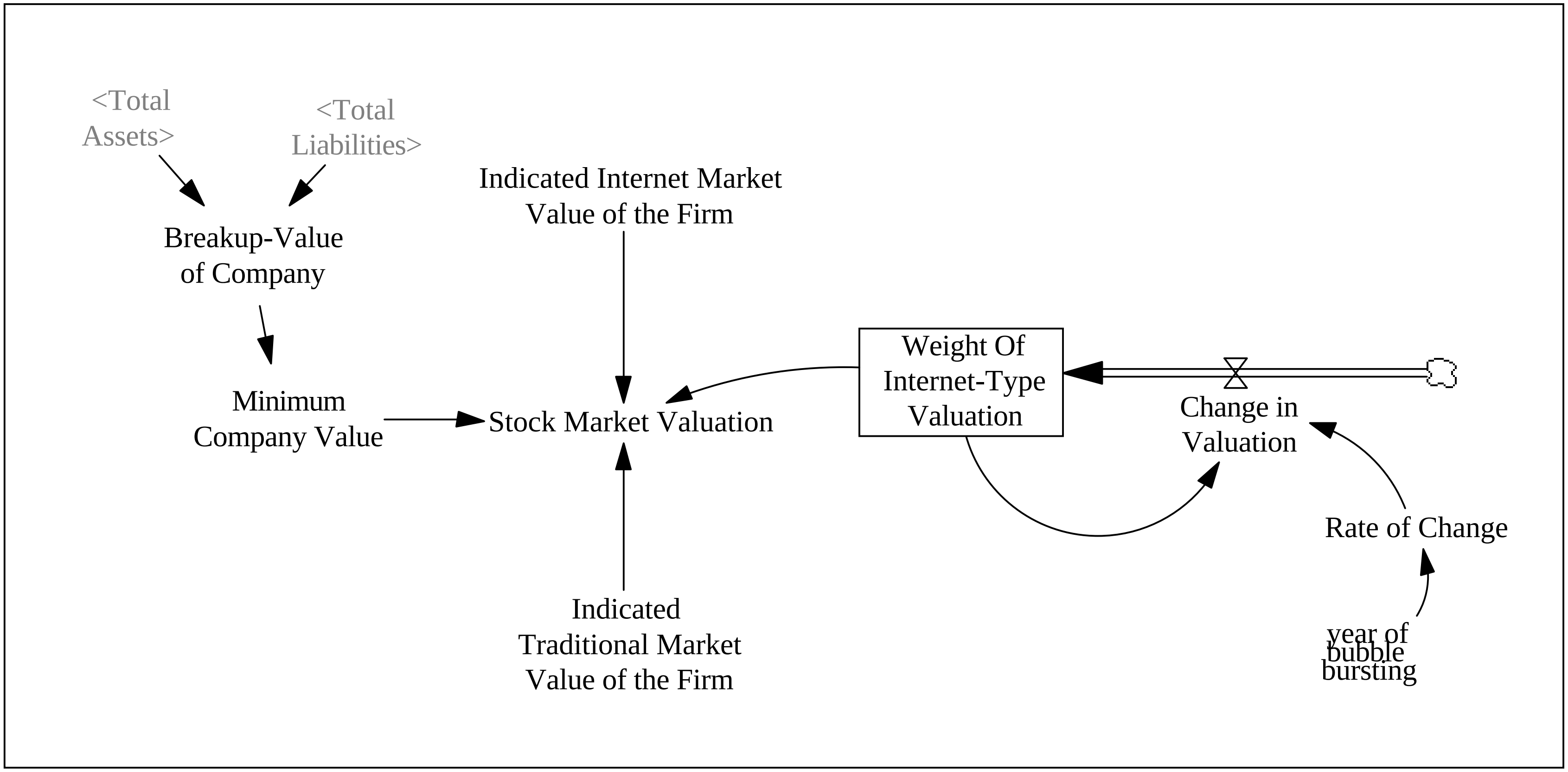
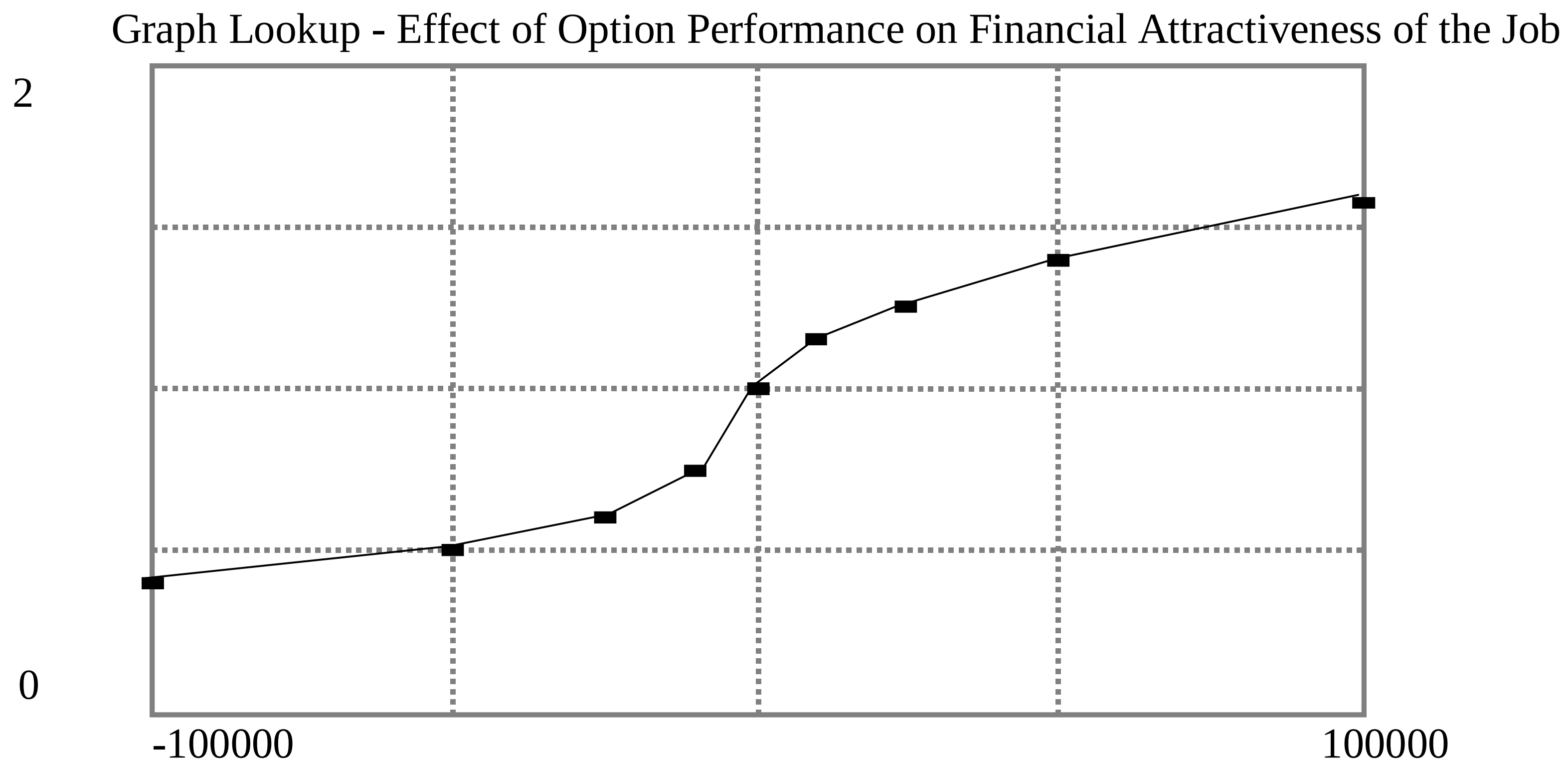


Figure 8 - Testing Robustness



This graph describes the impact of the current difference between option strike price and stock price on Financial Attractiveness of the Job. A positive value increases attractiveness, a negative value decreases attractiveness

Figure 9 - Testing Robustness

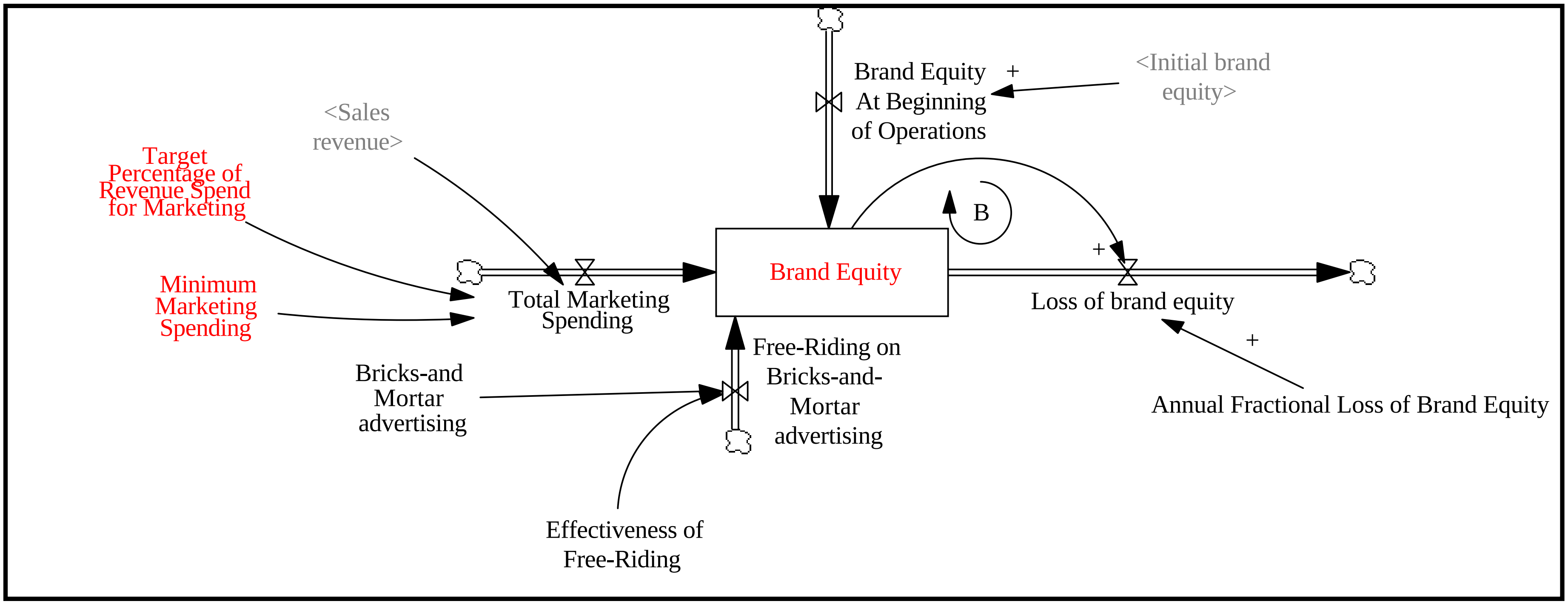
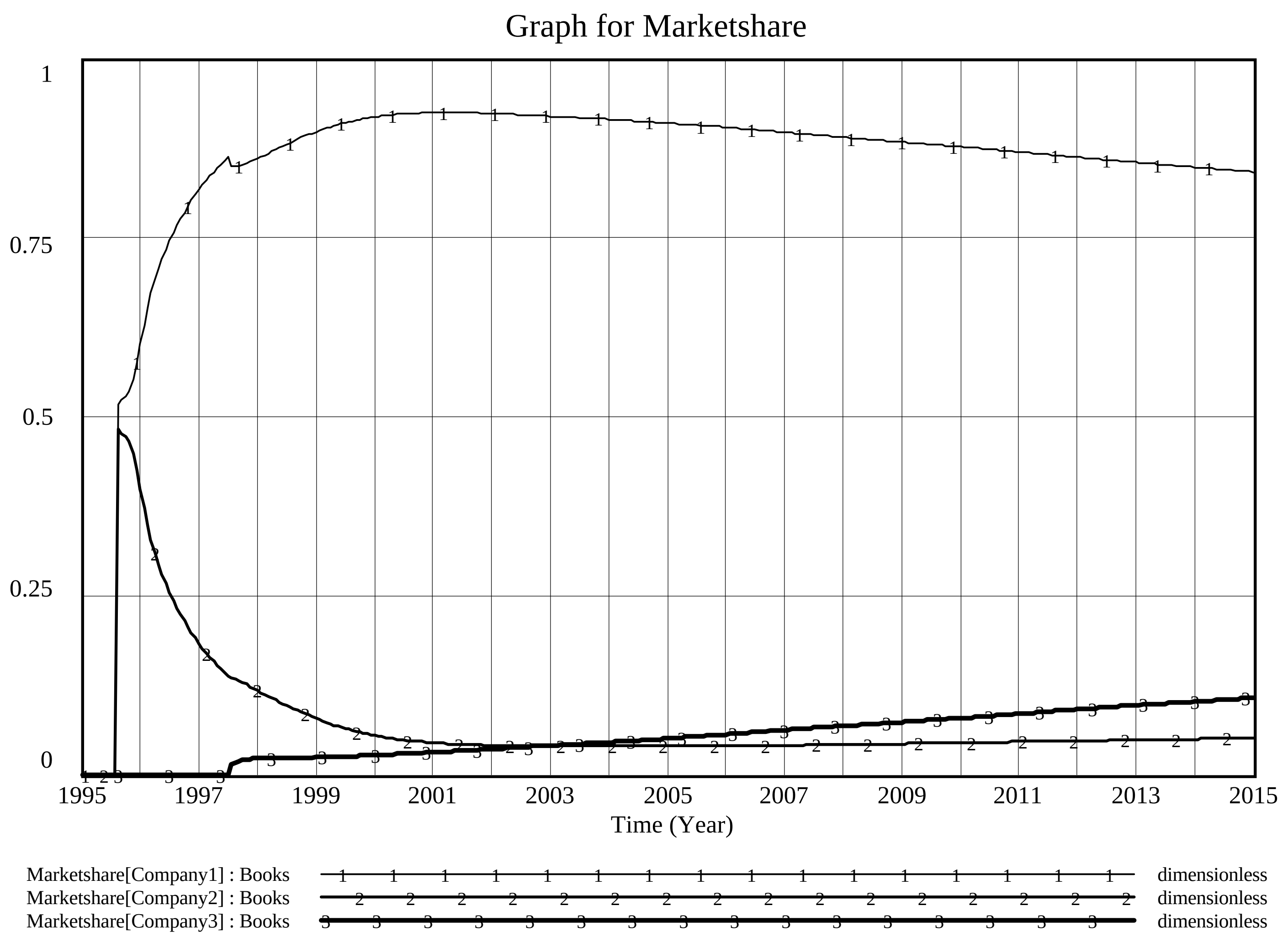
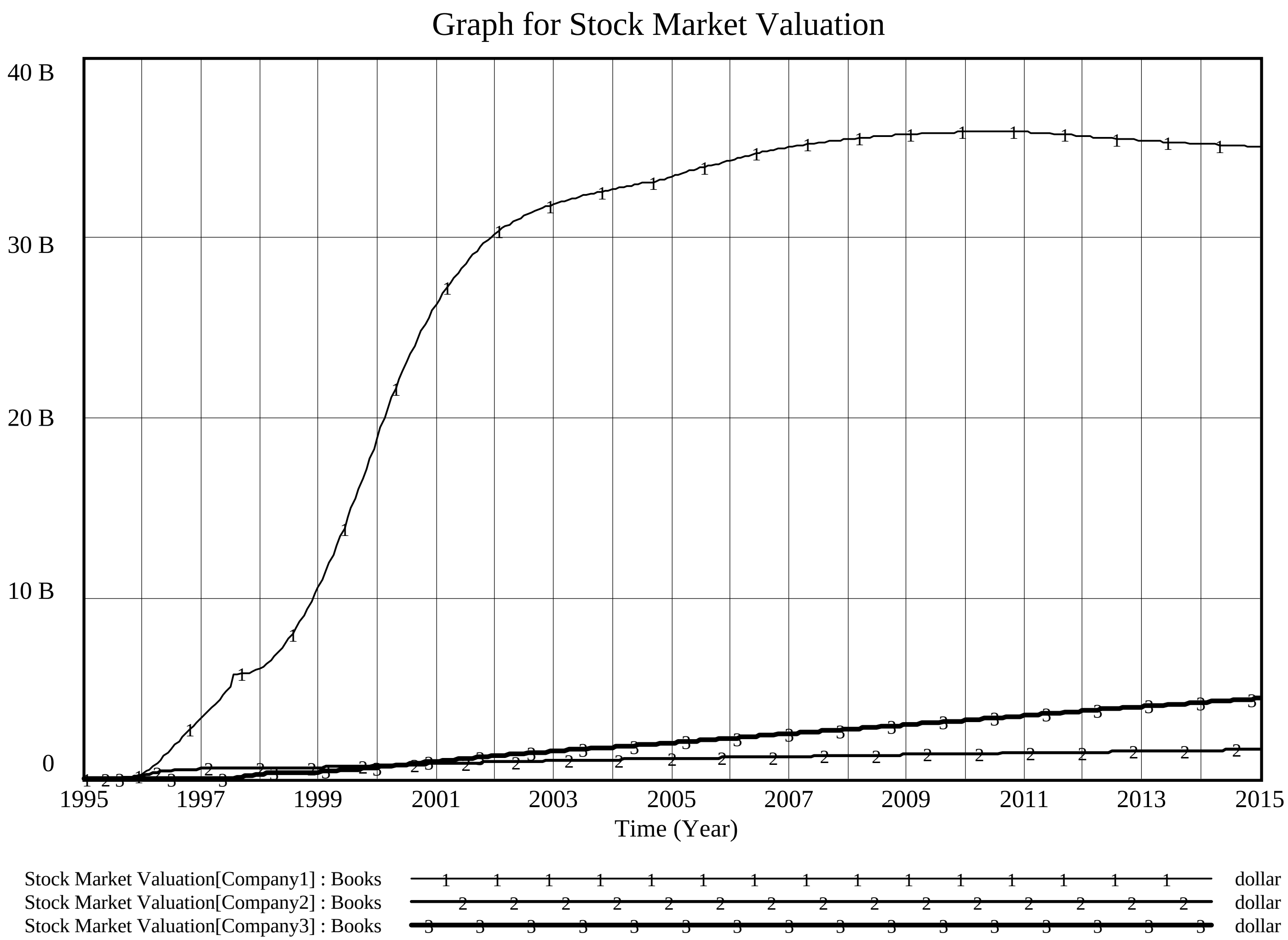


Figure 10 - Base Case 1 (Books)



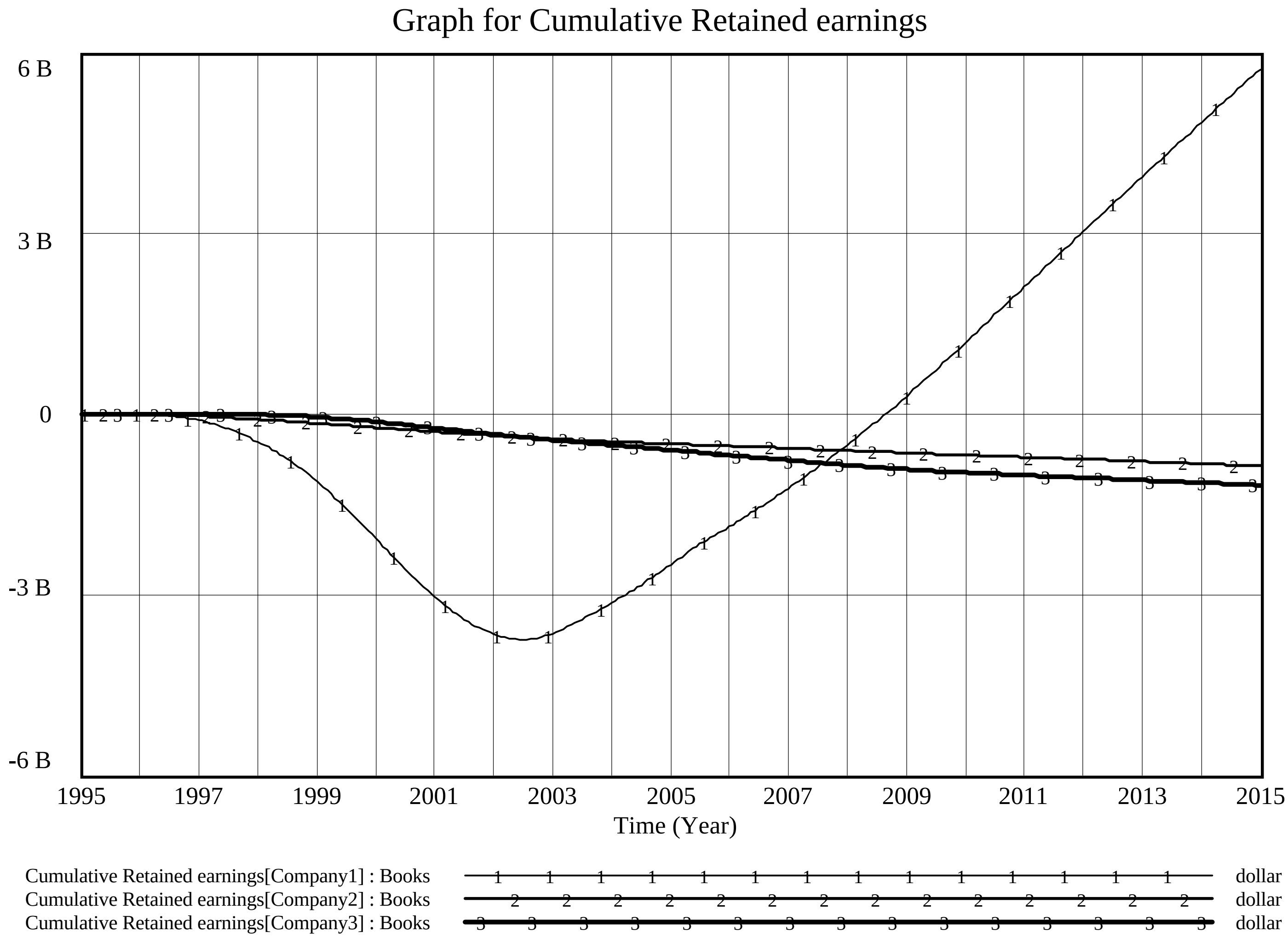
The base case produces a familiar result: the aggressive early-mover (Company 1) dominates, the bricks-and-mortar player (company 3) and others struggle to catch up.

Figure 11 - Base Case 1 (Books)



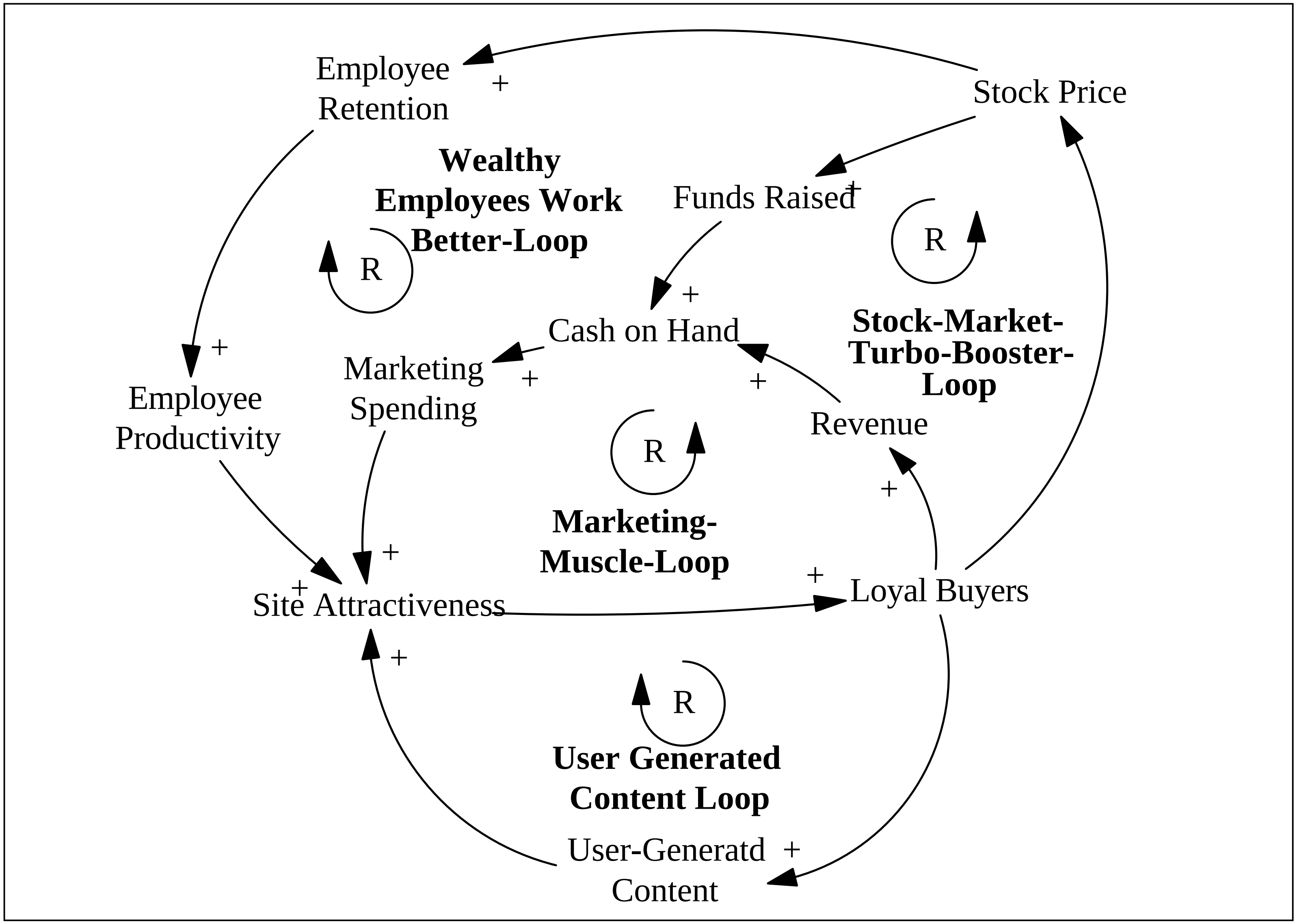
The base case produces a familiar result: the aggressive early-mover dominates, other players, including the bricks-and-mortar player struggle to catch up.

Figure 12 - Base Case 1 (Books)



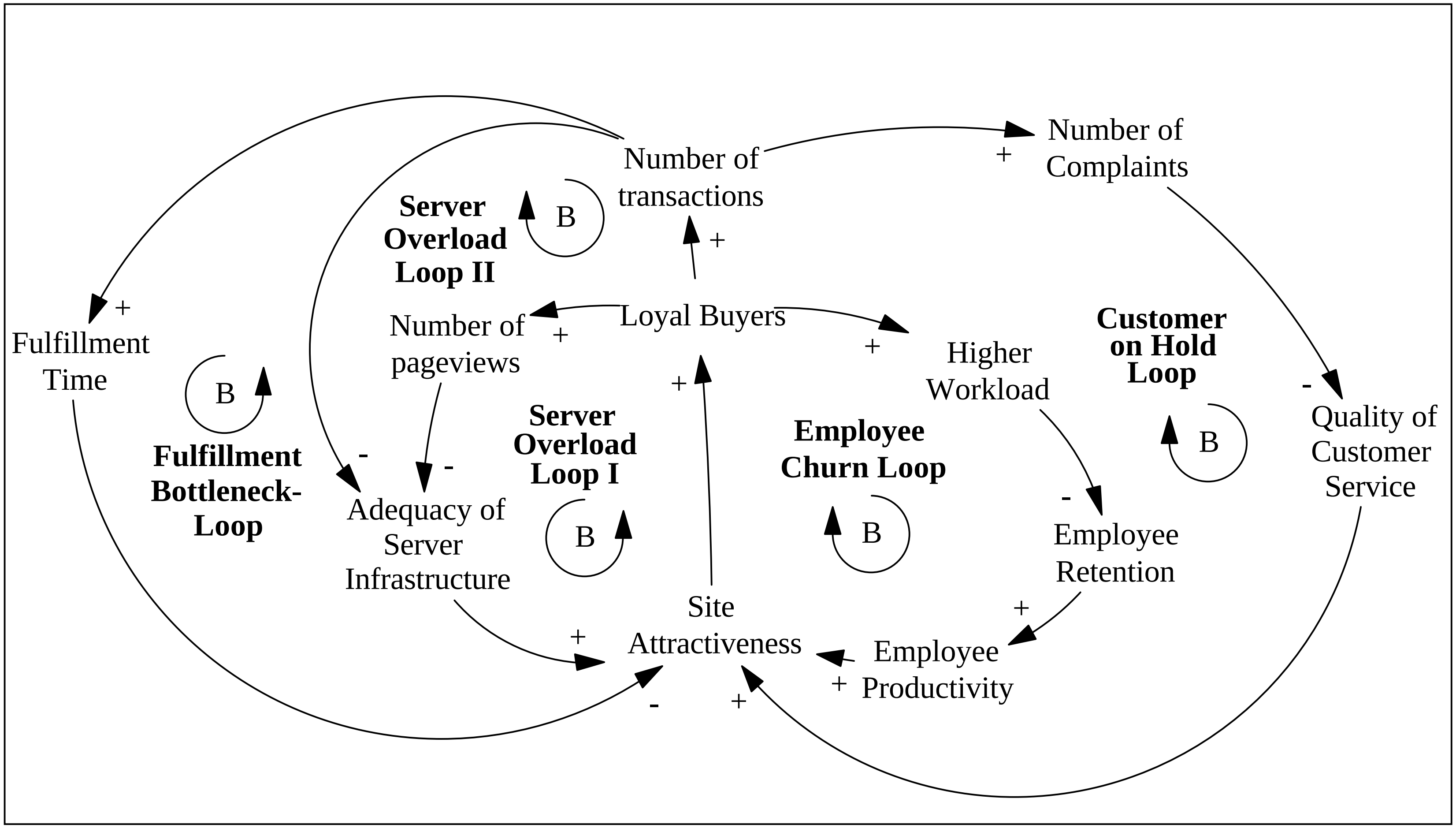
The base case produces a familiar result: the aggressive early-mover (Company 1) dominates, the bricks-and-mortar player (company 3) and others struggle to catch up.

Figure 13 - Growth Loops



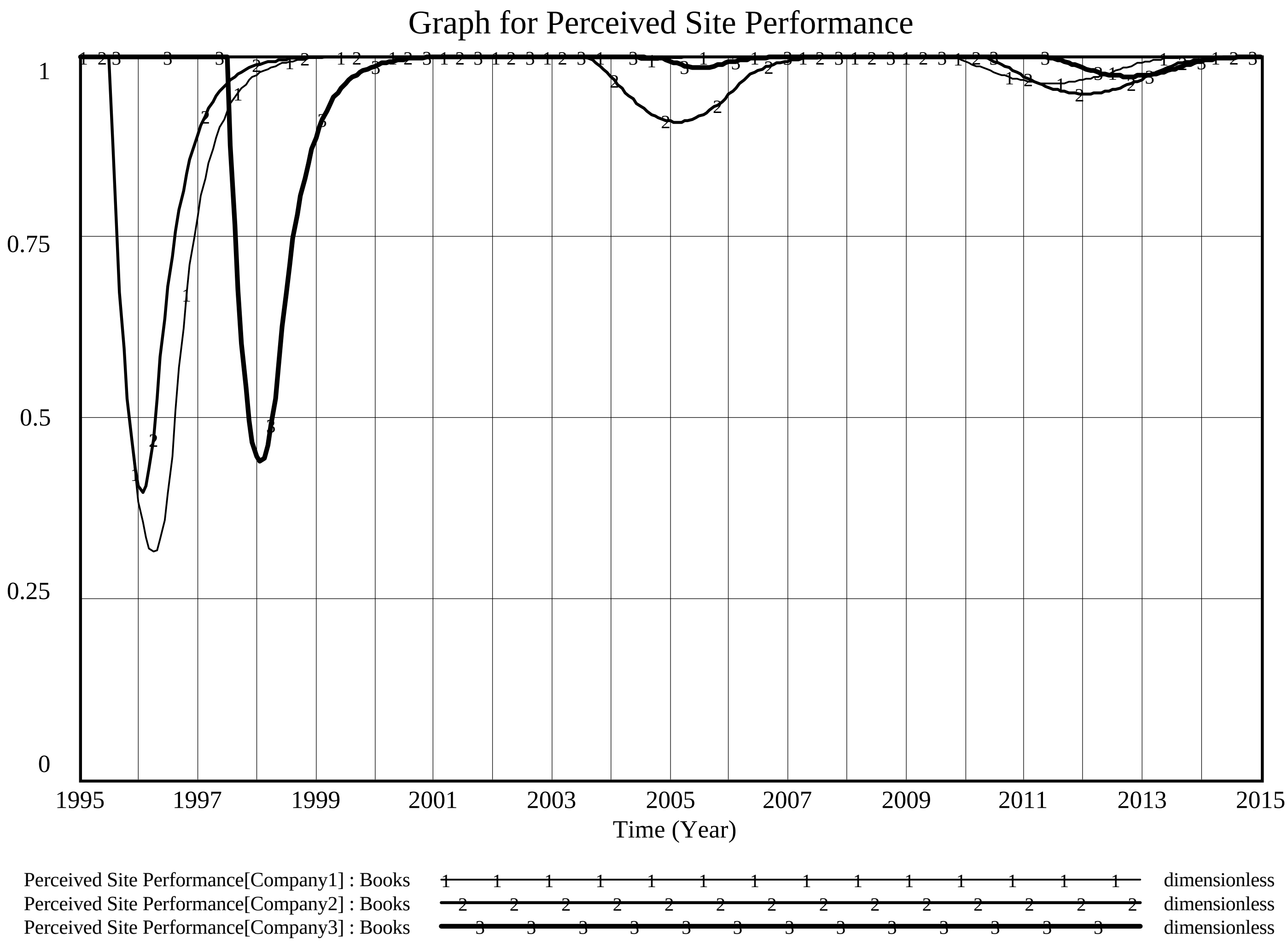
This graph describes some of the key growth loops in online retailing.

Figure 14 - Balancing Loops



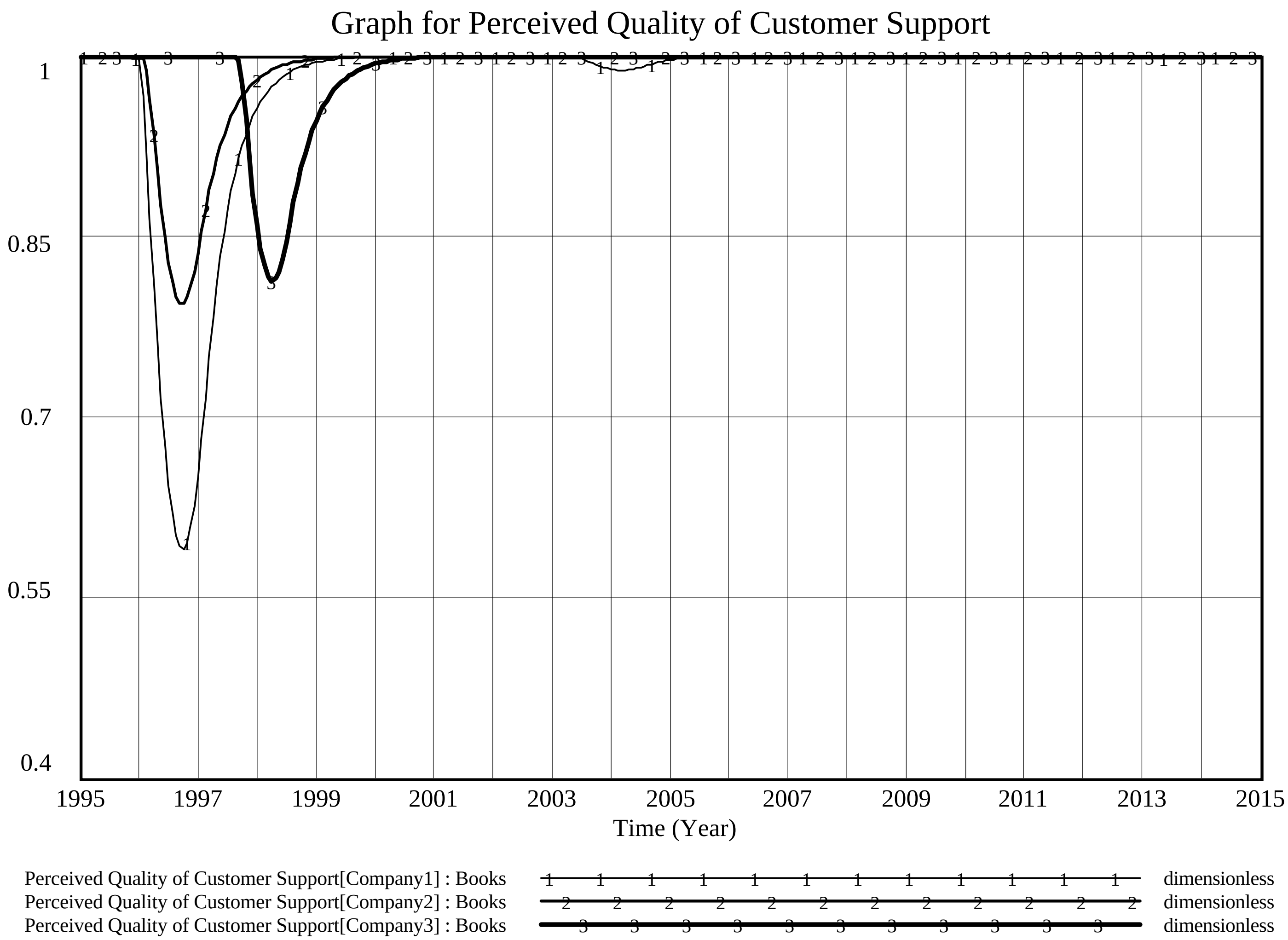
This graph shows some of the limits to rapid growth.

Figure 15 - Base Case 1 (Books)



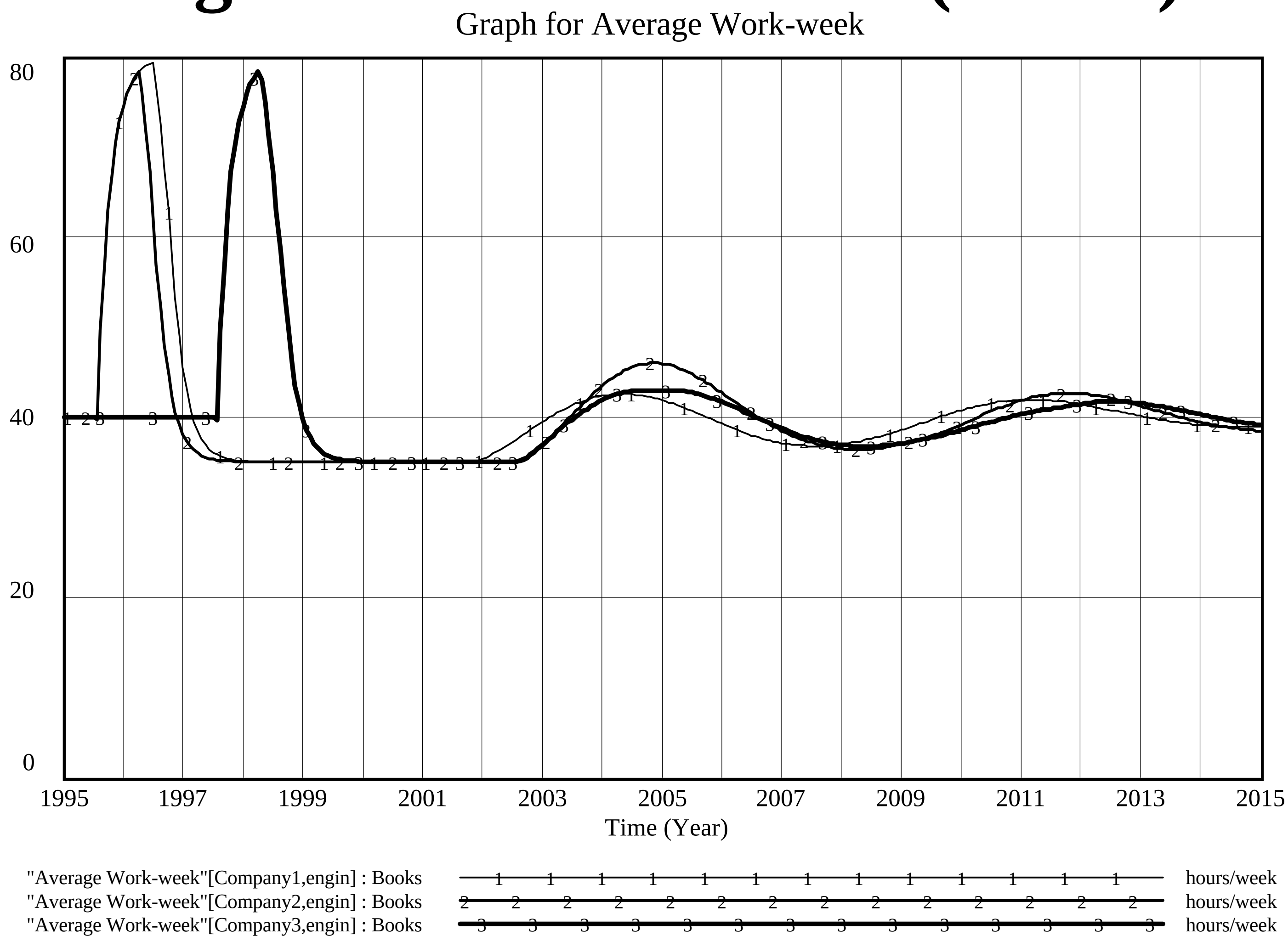
The aggressive early-mover (company1) shows the worst site performance during the early rapid growth, but recovers as growth stabilizes.

Figure 16 - Base Case 1 (Books)



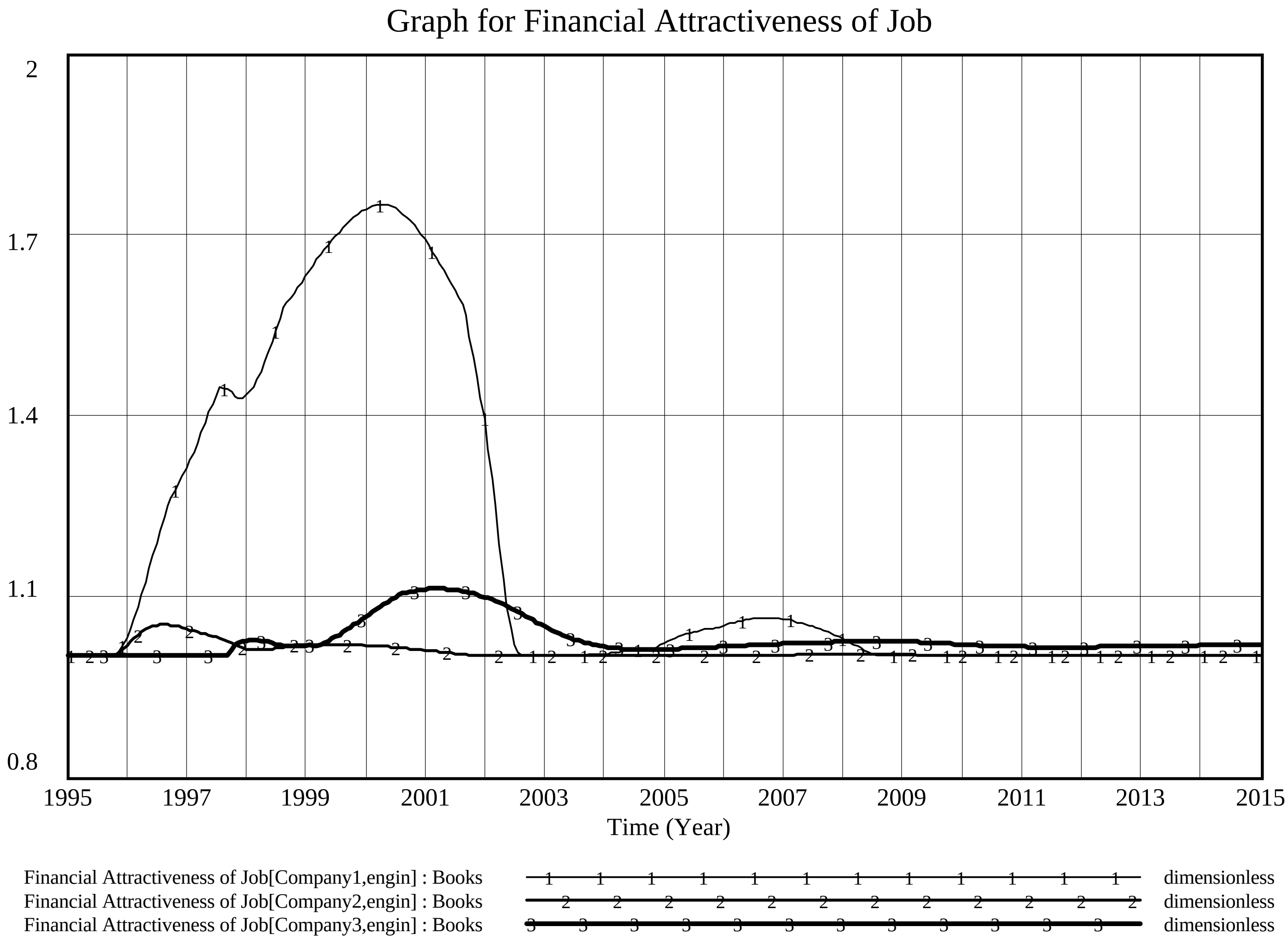
The aggressive early-mover (company1) also shows the worst performance in customer support during the early rapid growth, but recovers as growth stabilizes.

Figure 17 - Base Case 1 (Books)



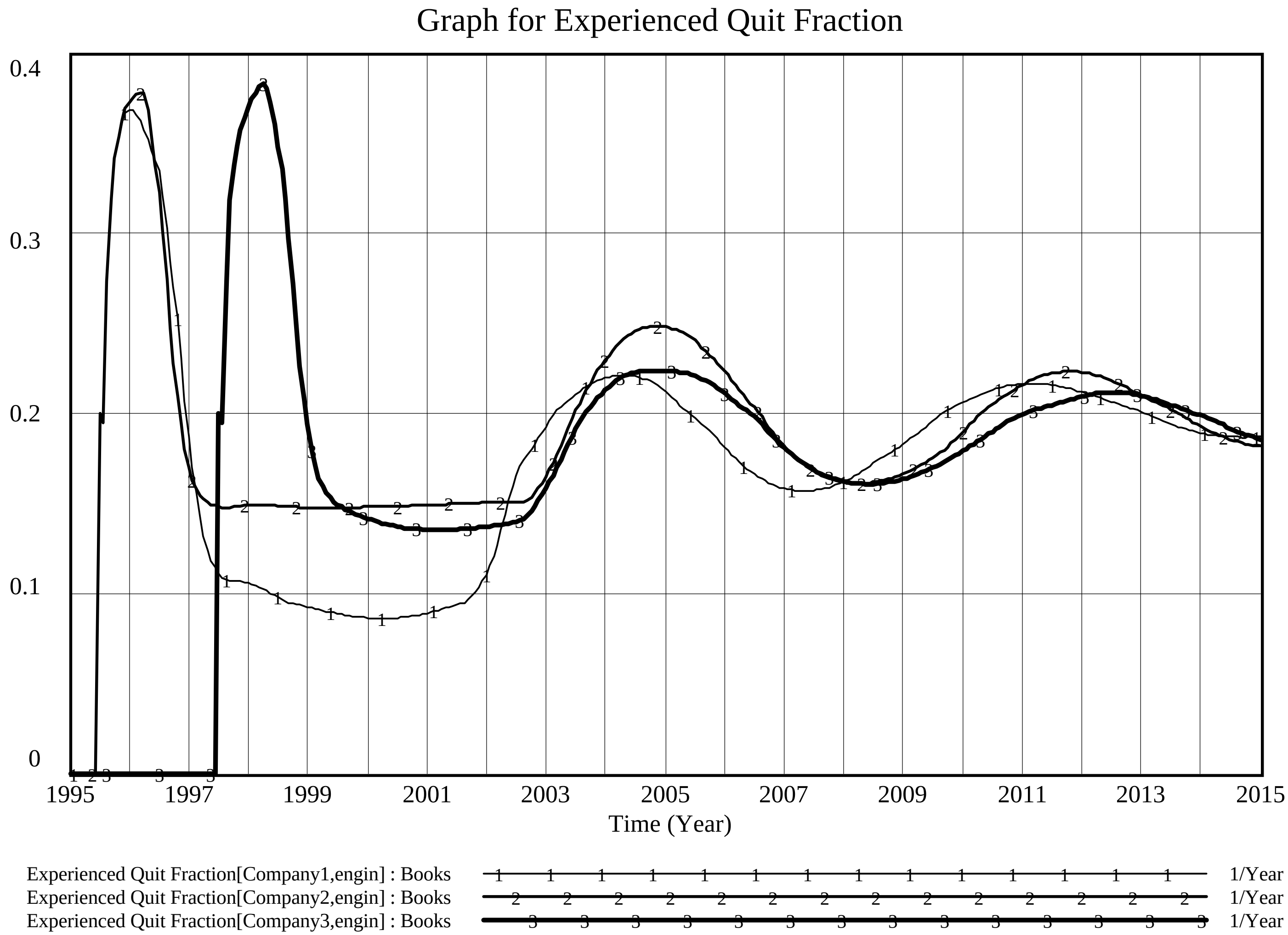
The aggressive early-mover (company1) requires its workers to work long hours during the early growth ...

Figure 18 - Base Case 1 (Books)



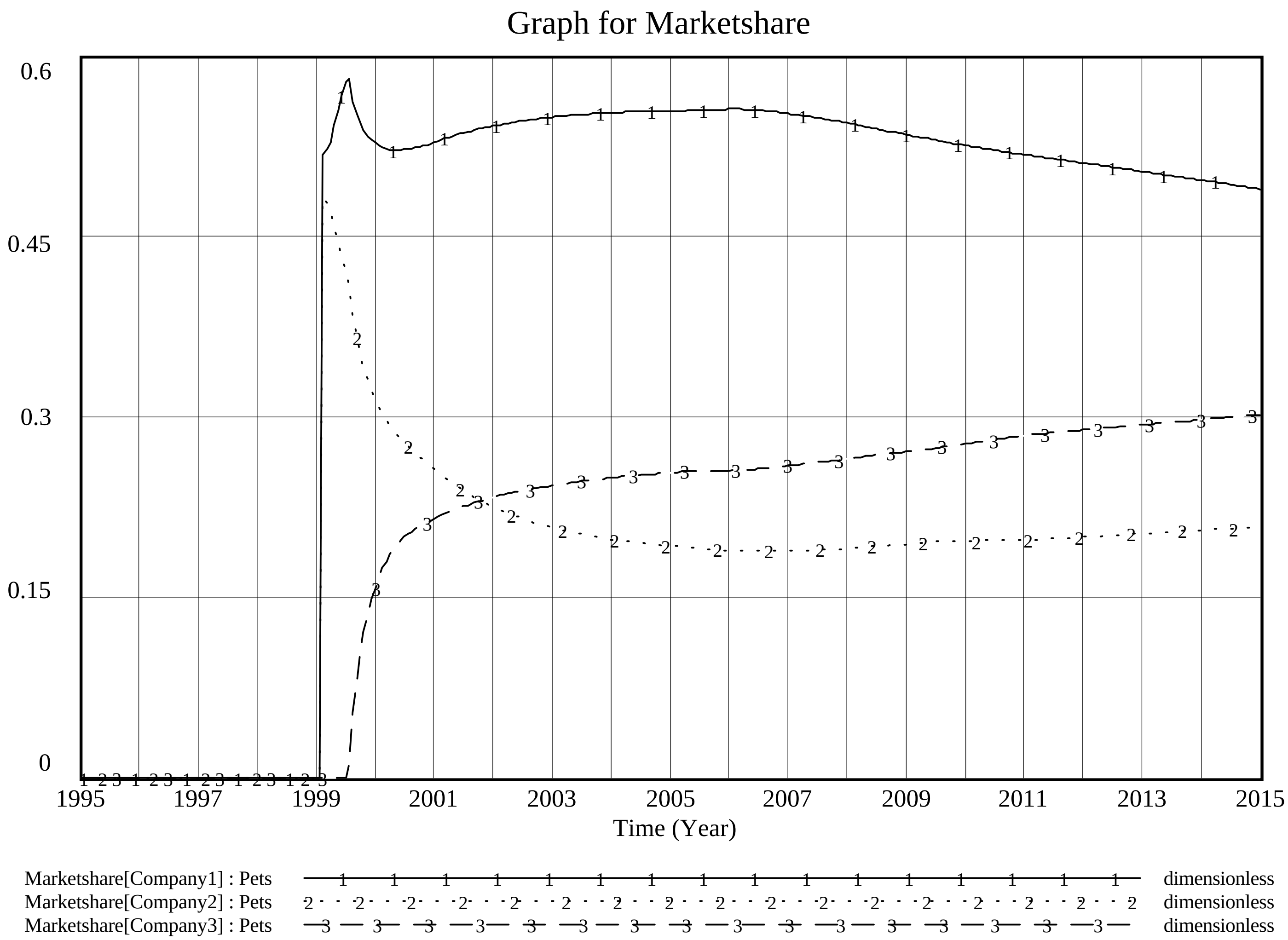
… but workers are happy because of the performance of the stock price realtive to their options.

Figure 19 - Base Case 1 (Books)



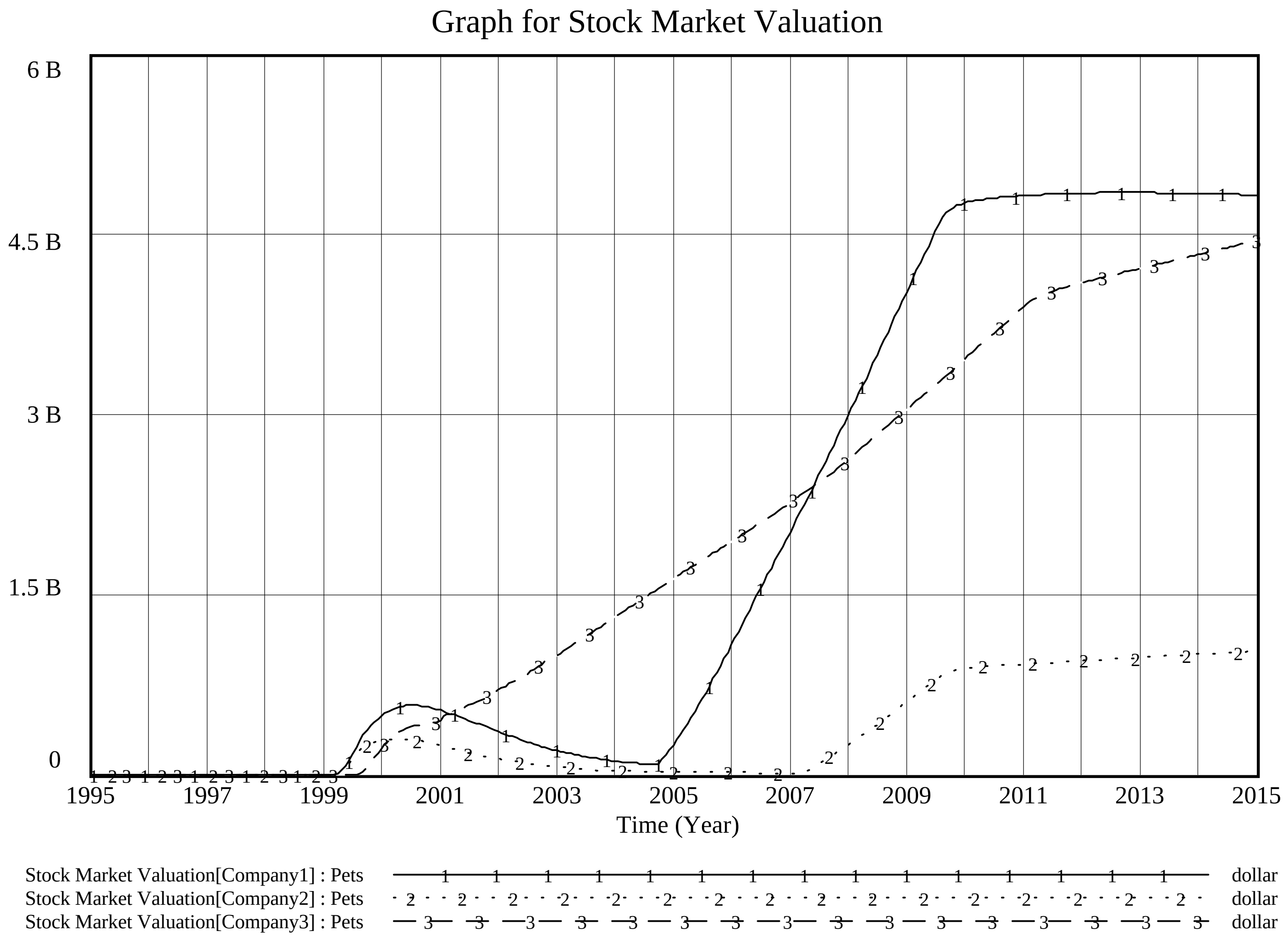
Therefore the aggressive early mover (Company1) enjoys lower employee turnover than the competition.

Figure 20 - Base Case 2 (Pet Supplies)



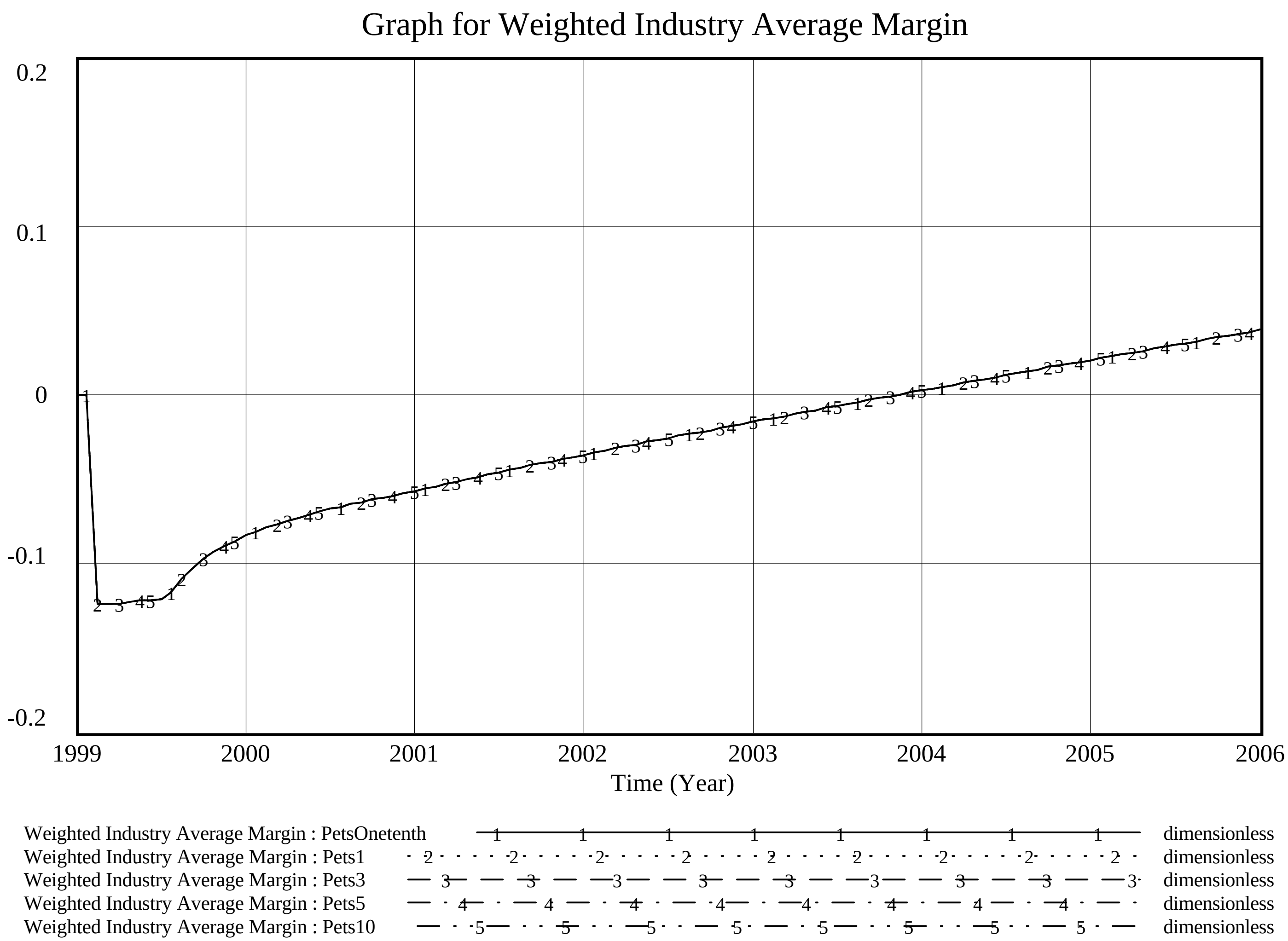
The base case produces a familiar result: the aggressive early-mover dominates, other players, including the bricks-and-mortar player struggle to catch up.

Figure 21 - Base Case 2 (Pet Supplies)



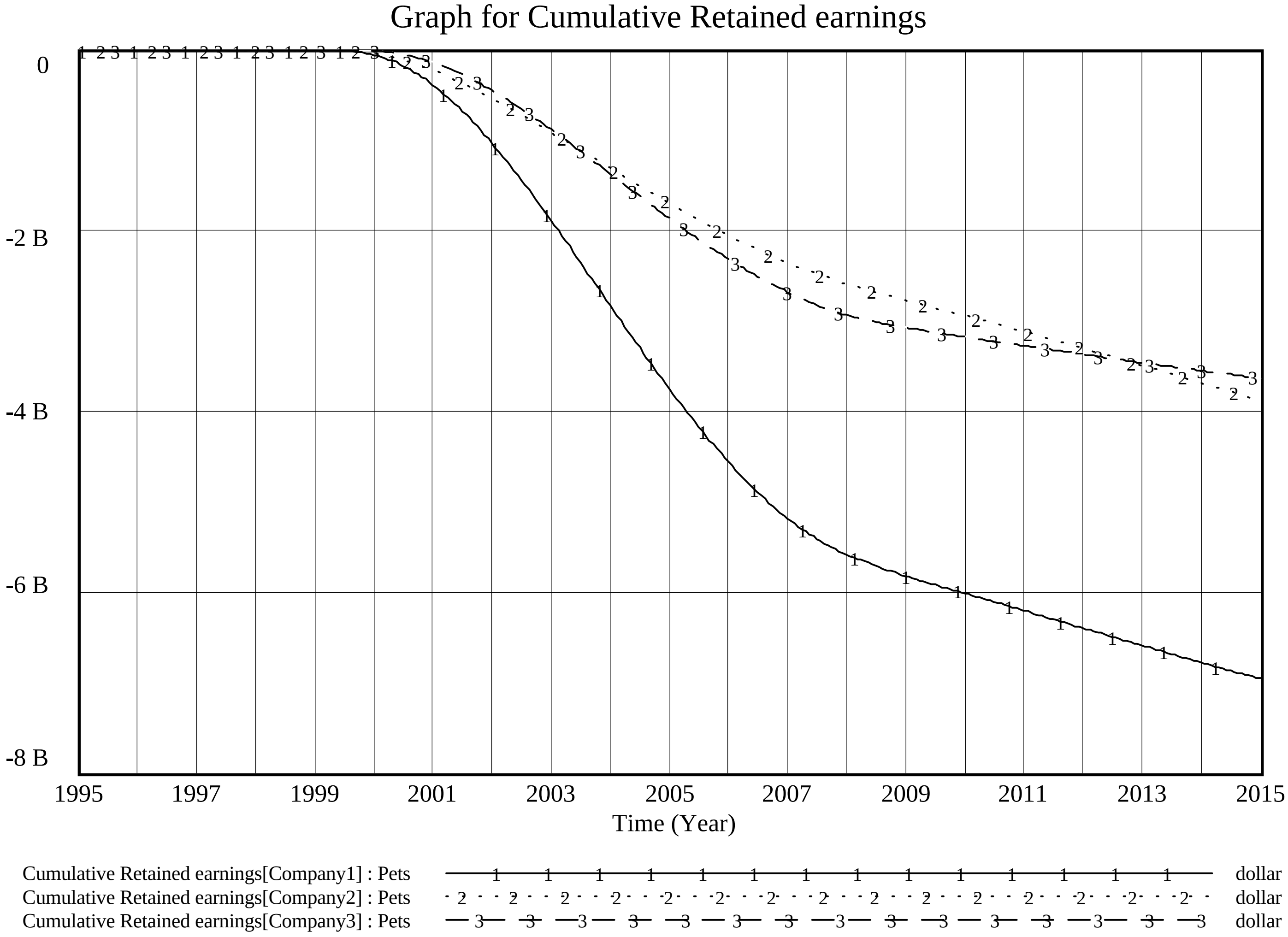
Despite its huge market share lead, Company 1 suffers in terms of valuation until its gross margin turns positive in mid- 2004.

Figure 22 - Base Case 2 (Pet Supplies)



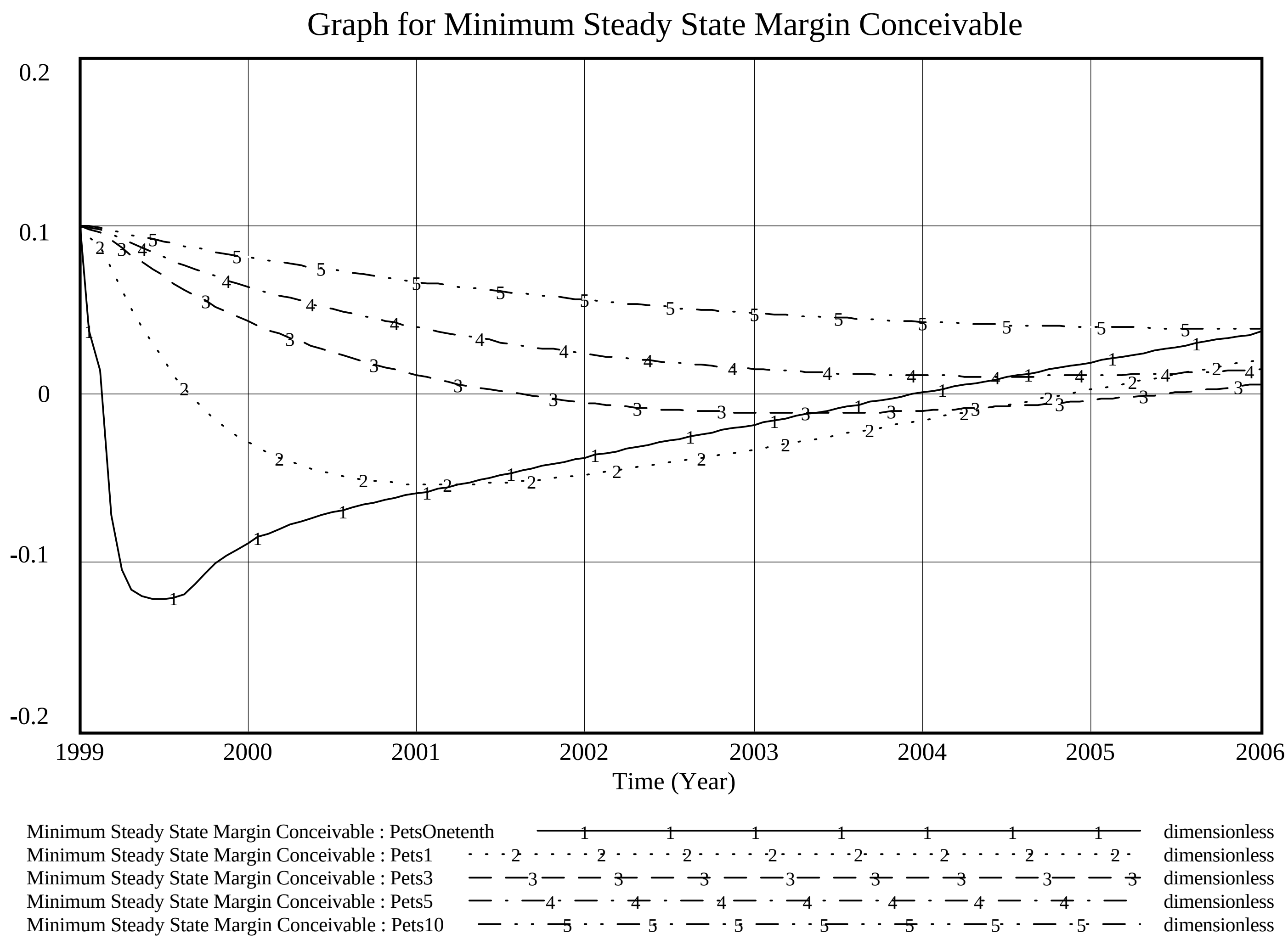
Margins in online pet supplies retailing are assumed to improve over time.

Figure 23 - Base Case 2 (Pet Supplies)



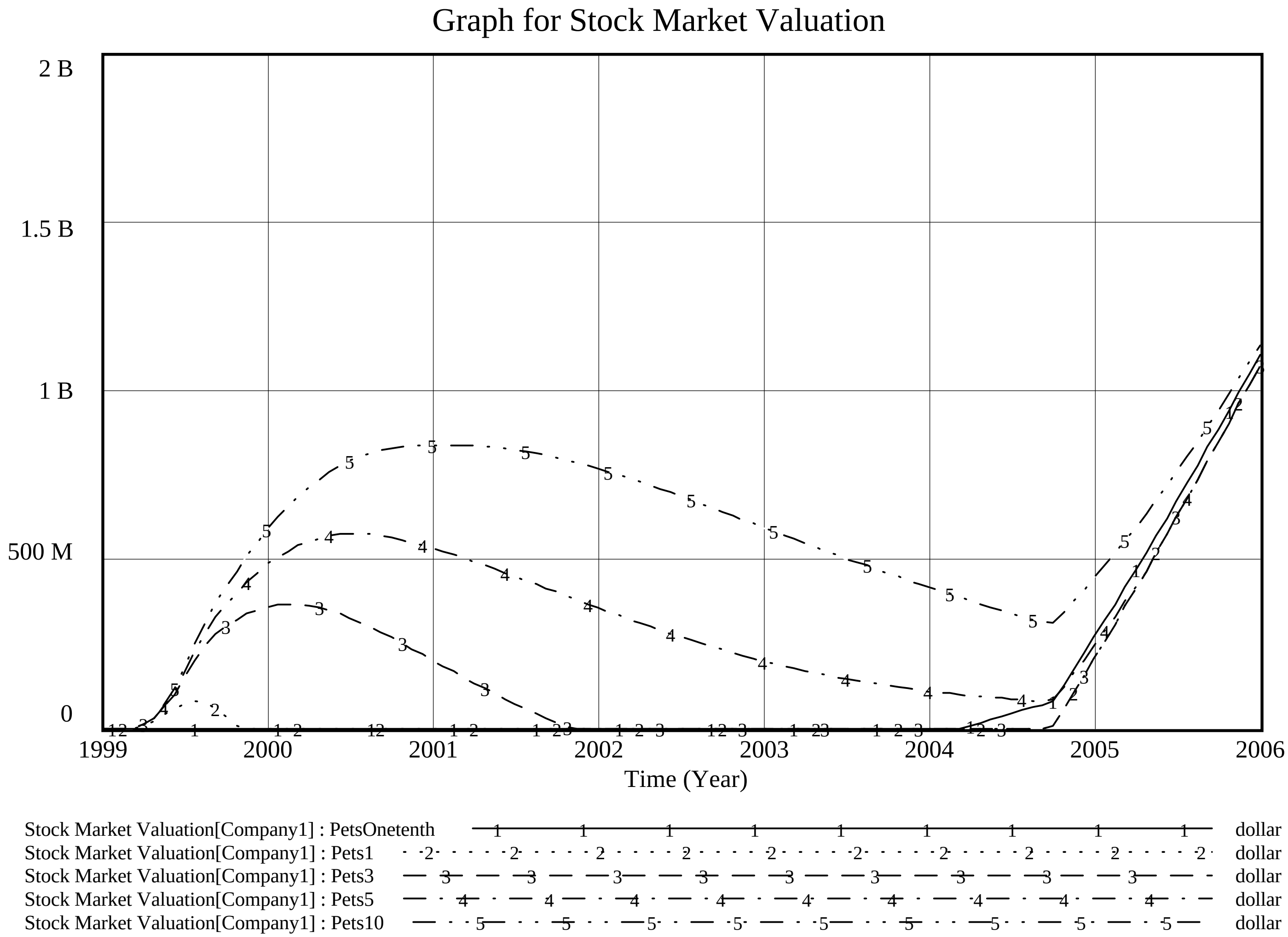
Despite a positive gross margin, companies continue to make losses.

Figure 24 - Base Case 2 (Pet Supplies)



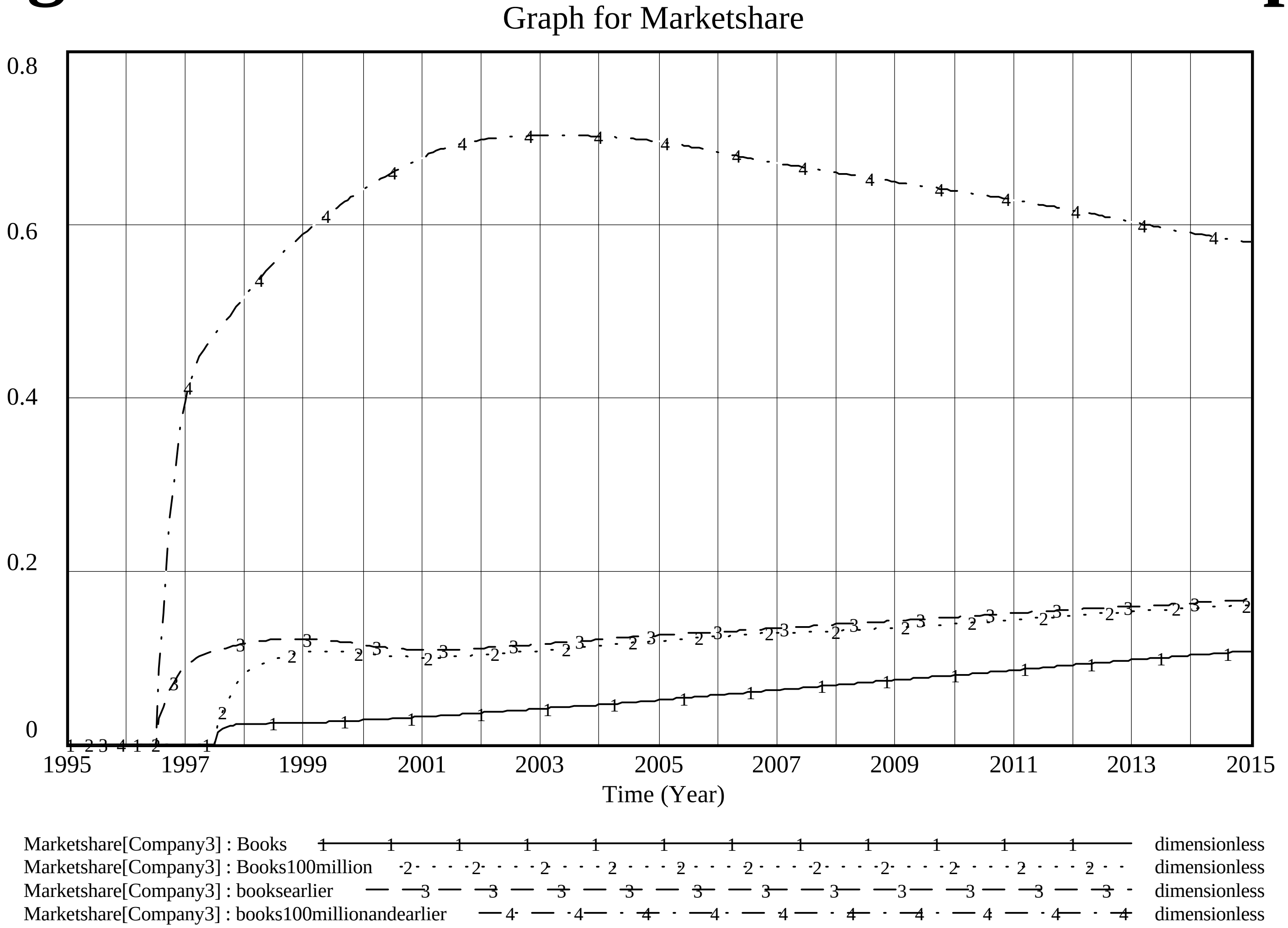
If the adjustment time for expectations is three years or less, the market will temporarily assume that margins in the mature state are negative ….

Figure 25 - Base Case 2 (Pet Supplies)



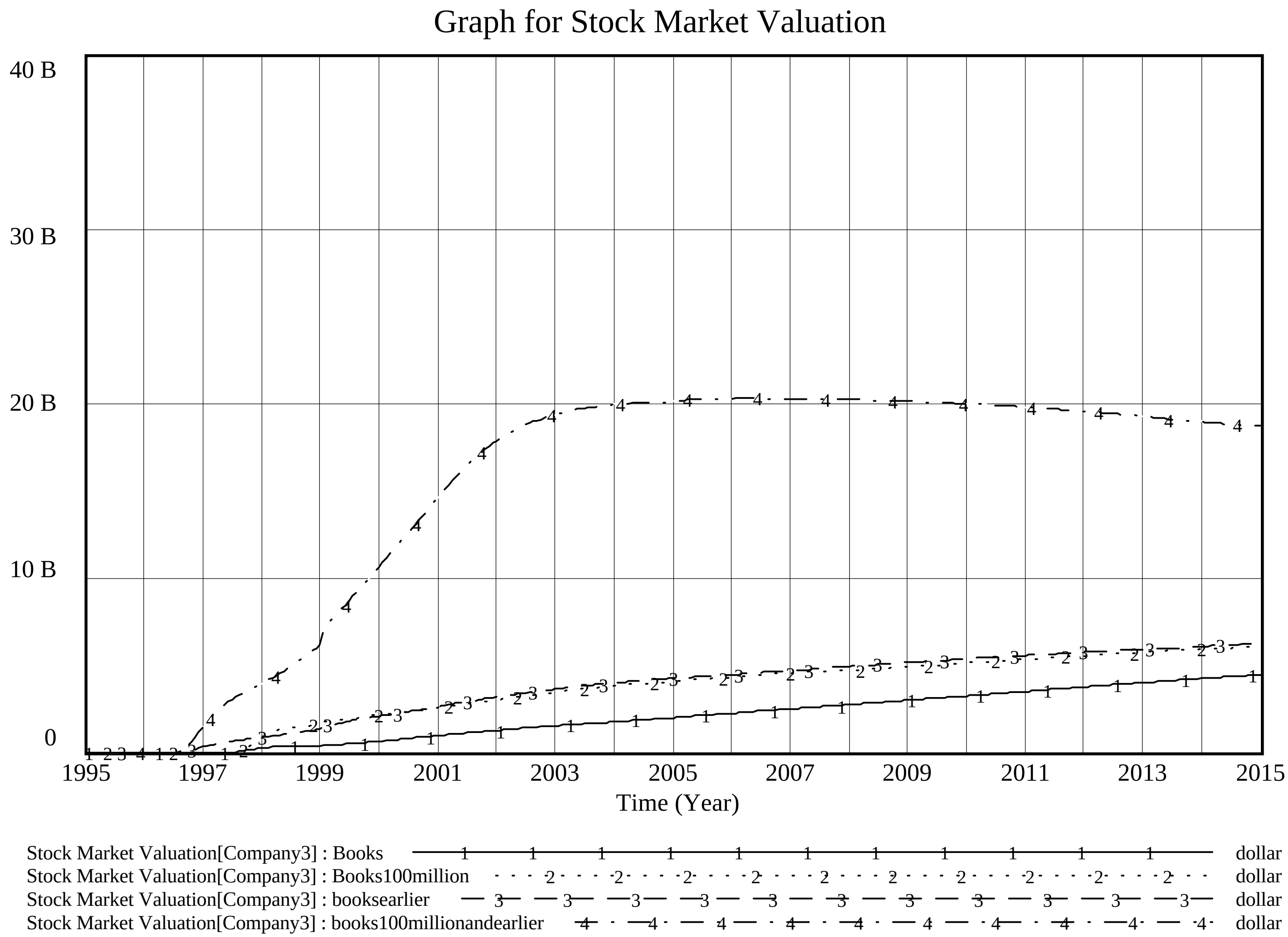
… which leads to failure as the company cannot raise money to sustain its losses.

Figure 26 - Bricks-and-Mortar Catch up



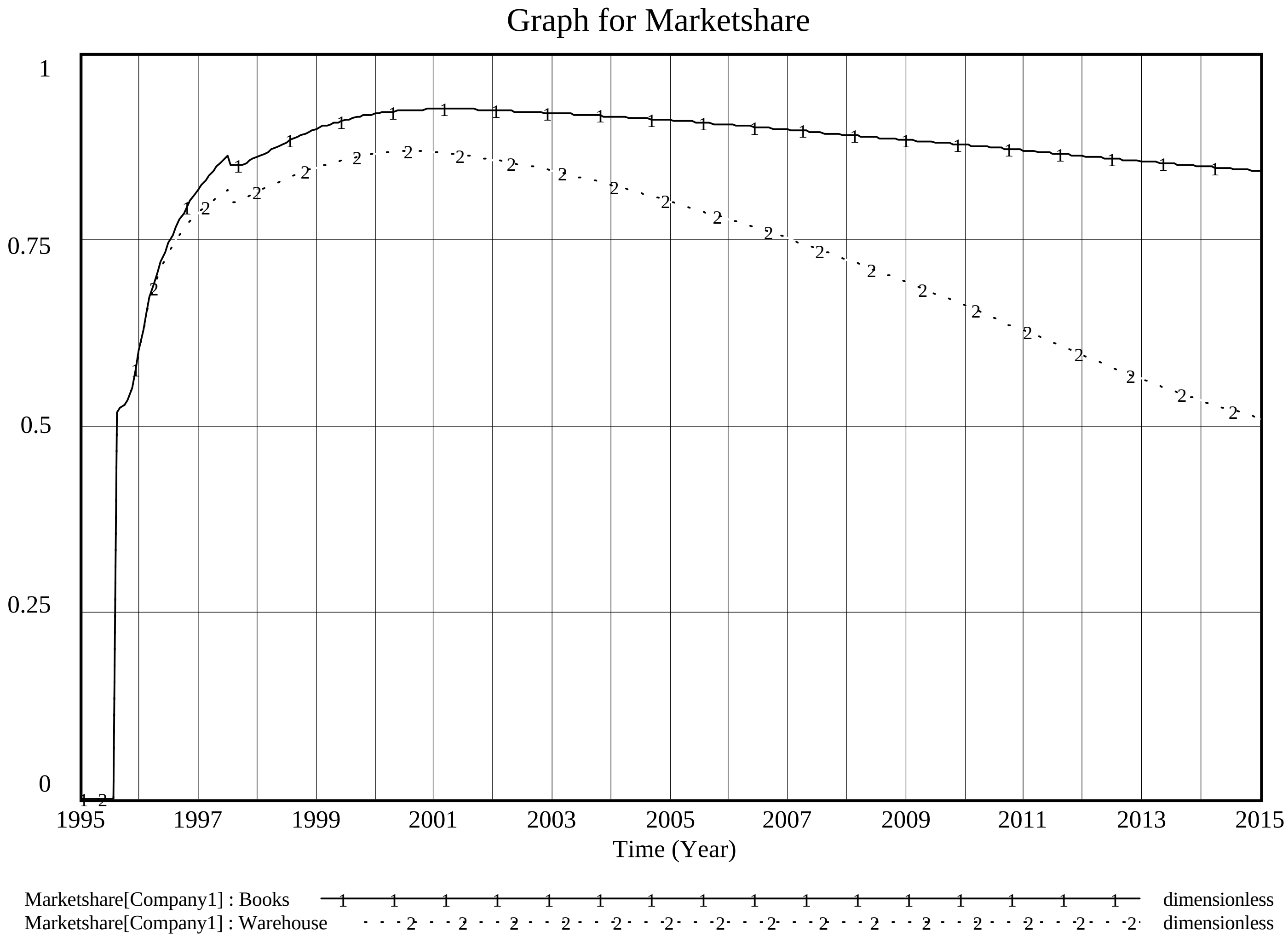
The market share of the late comer (Company 3) in year 2000 increases by a factor of four if either the company spend an extra $100 million on marketing or would have started earlier by a year. The combined impact of those changes is even more powerful.

Figure 27 - Bricks-and-Mortar Catch up



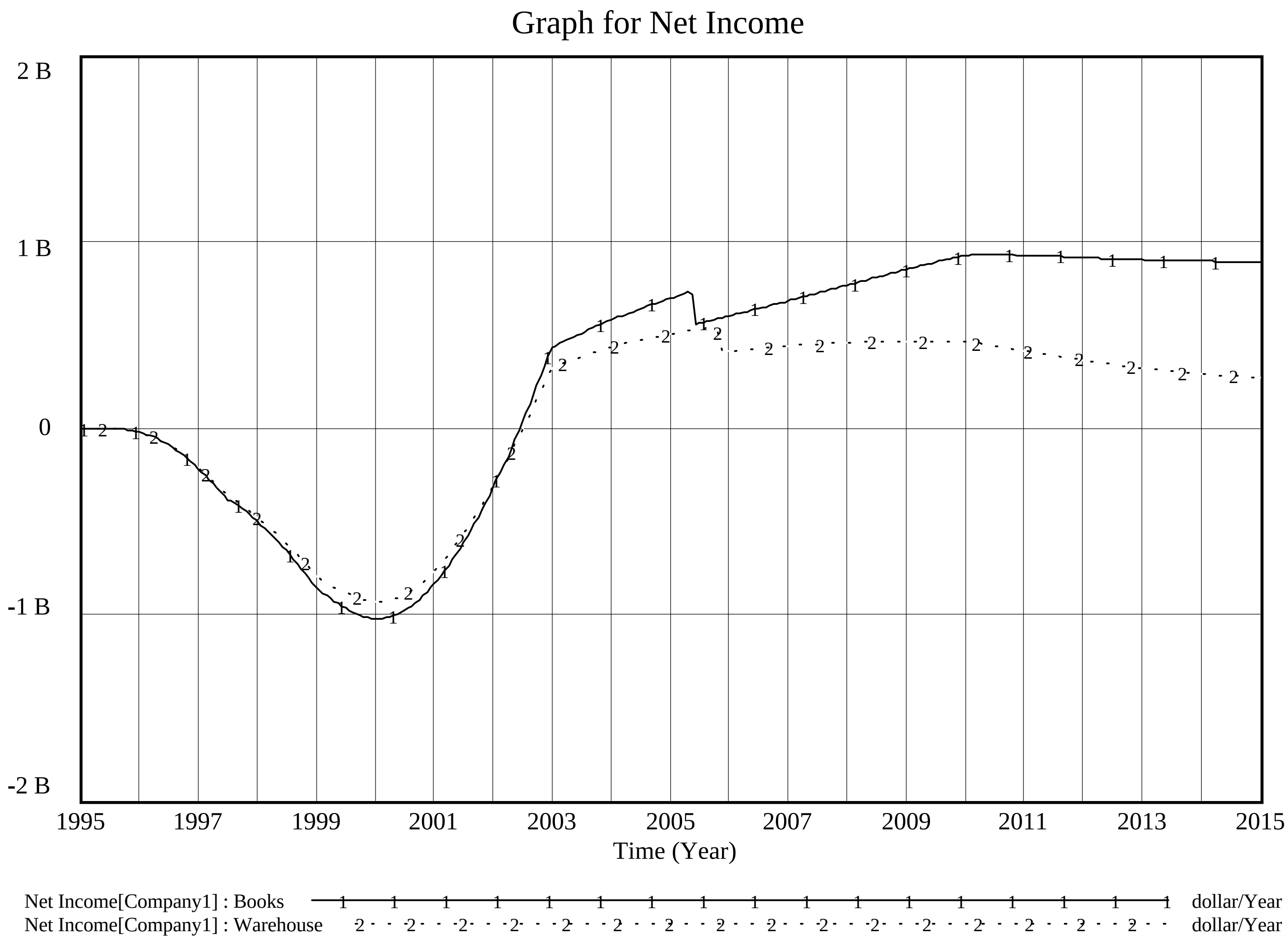
The Valuation of the late comer (Company 3) in year 2000 increases significantly if either the company spend an extra $100 million on marketing or would have started earlier by a year. The combined impact of those changes is even more powerful.

Figure 28 - Poor Warehousing



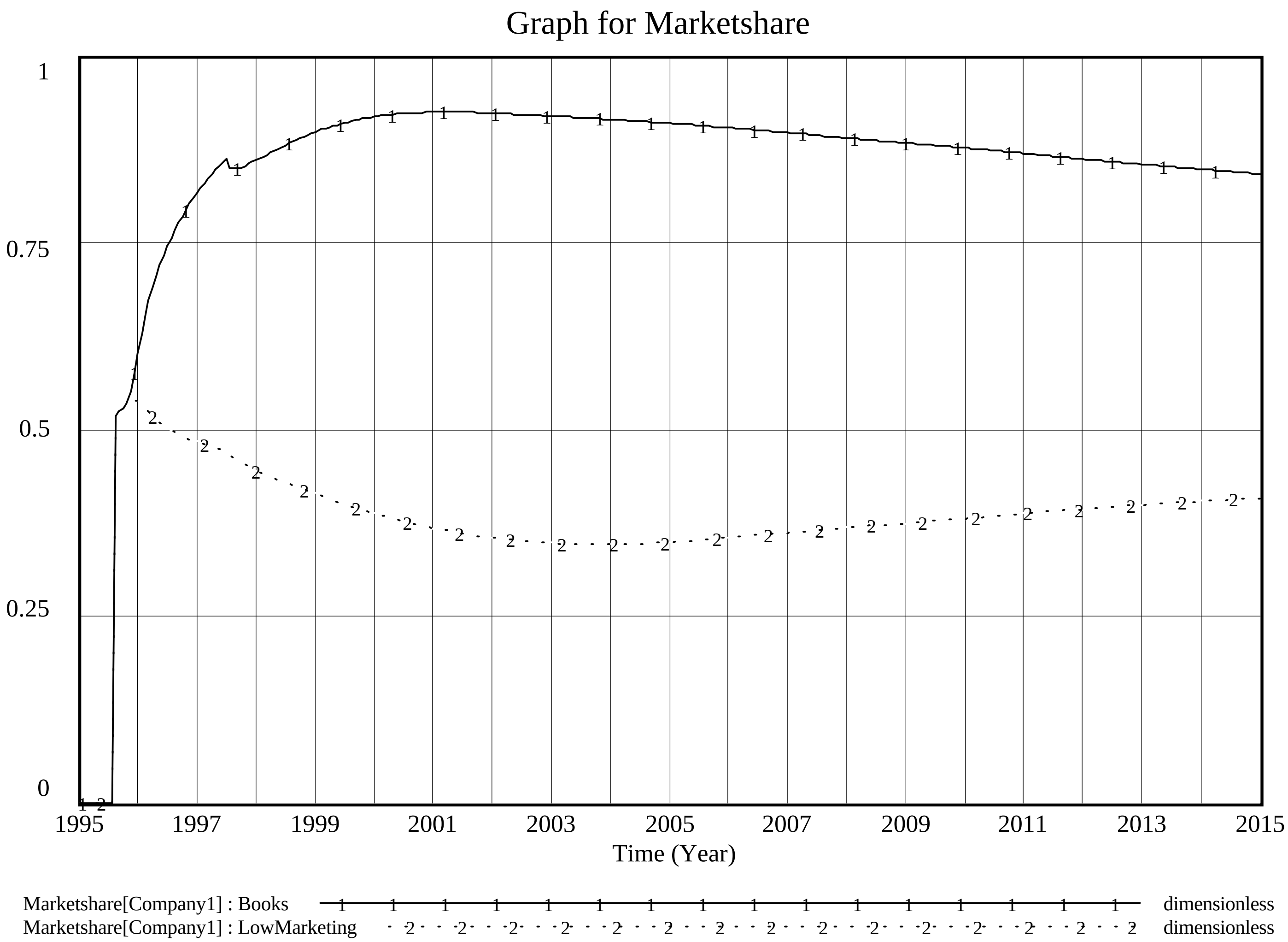
If the warehouse performance of Company 1 is reduced, it market share will suffer.

Figure 29 - Poor Warehousing



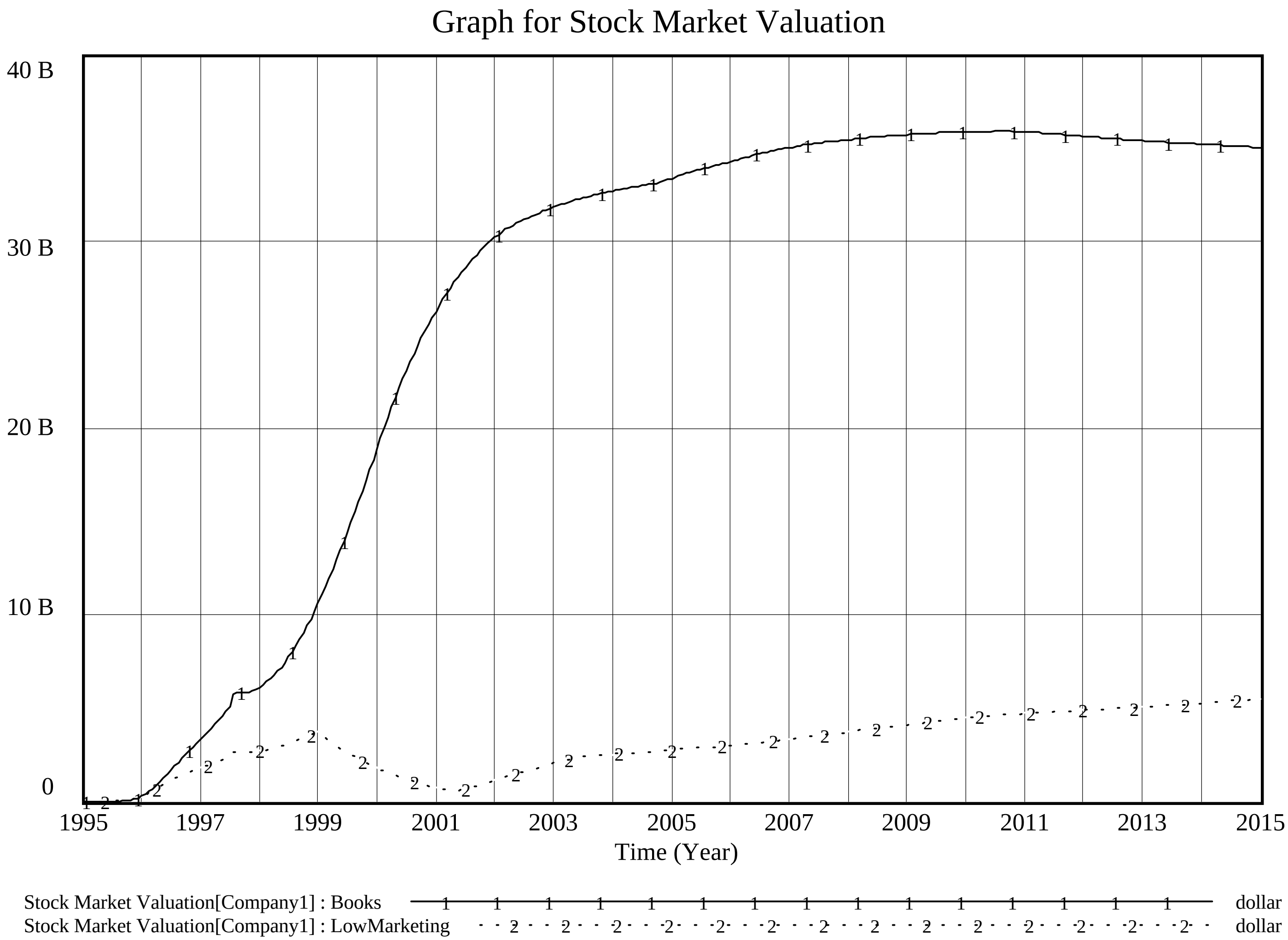
The reduced warehousing leads to small savings in the short term, but huge reduction in profits in the long term. Note: the fall in net income in 2005 is caused by the exhaustion of the tax-credit for prior losses.

Figure 30 - Low Marketing



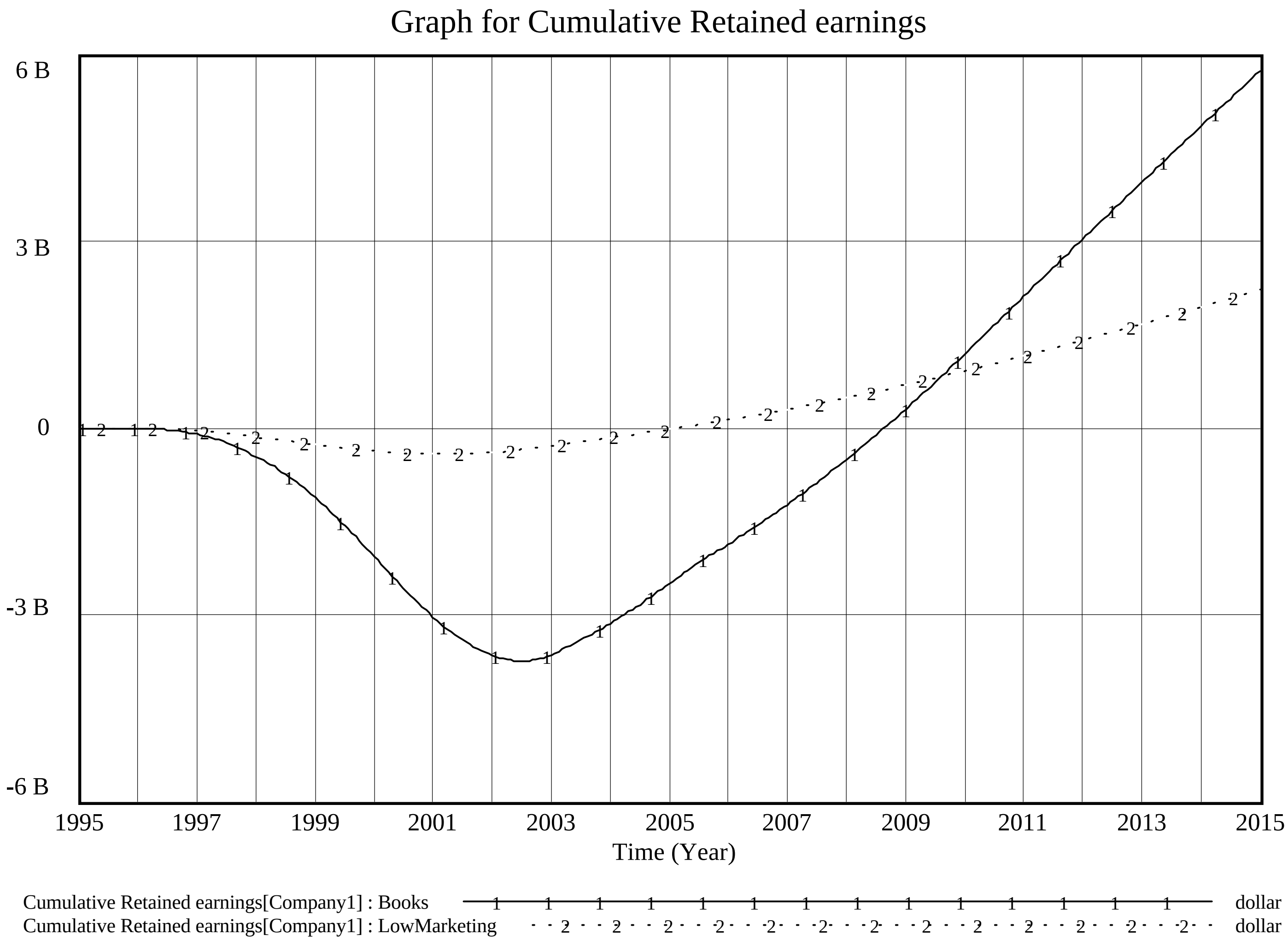
Reduced marketing spending results in a loss of market share.

Figure 31 - Low Marketing



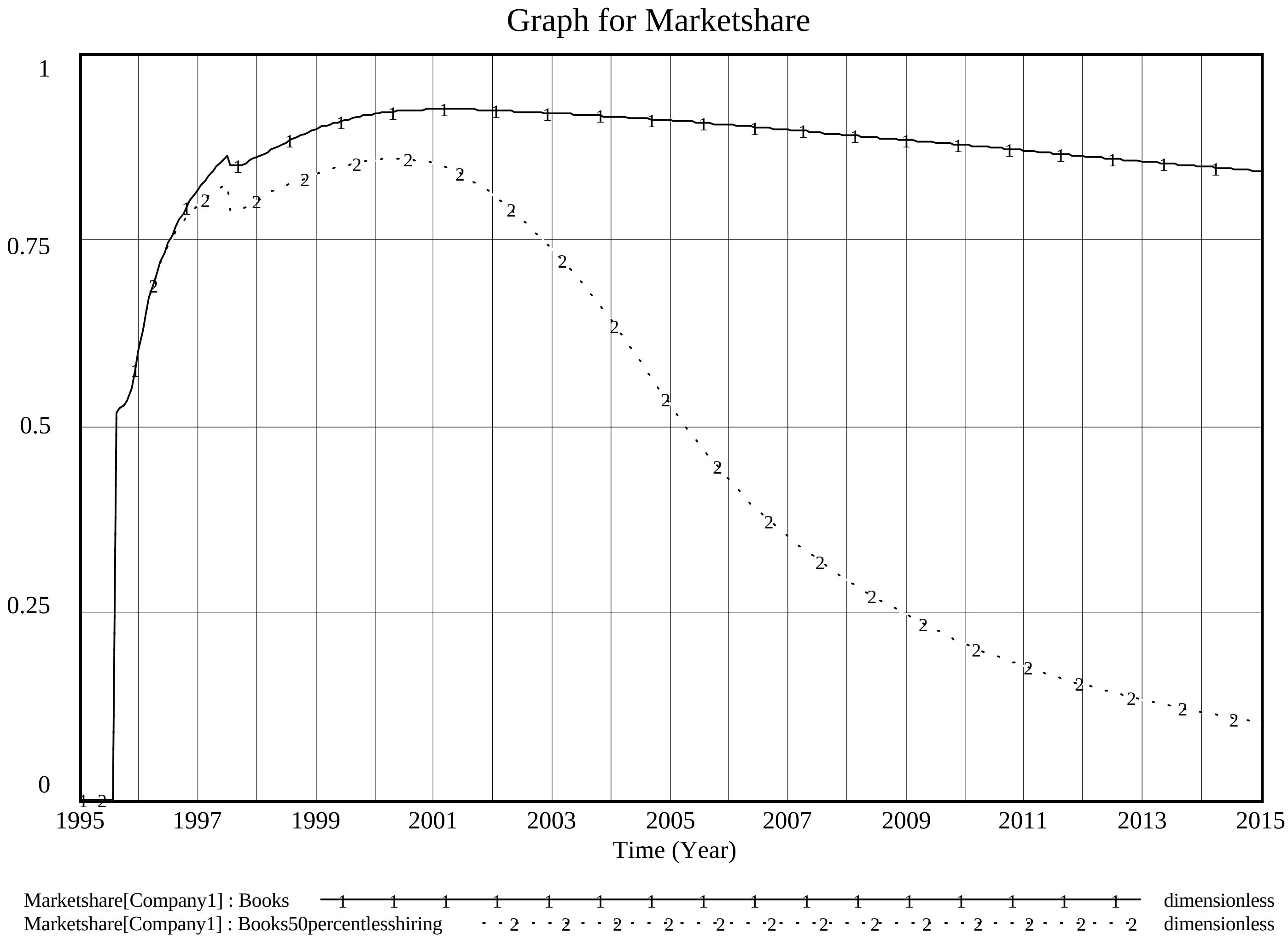
High Marketing spending is vastly superior as far as stock valuation is concerned.

Figure 32 - Low Marketing



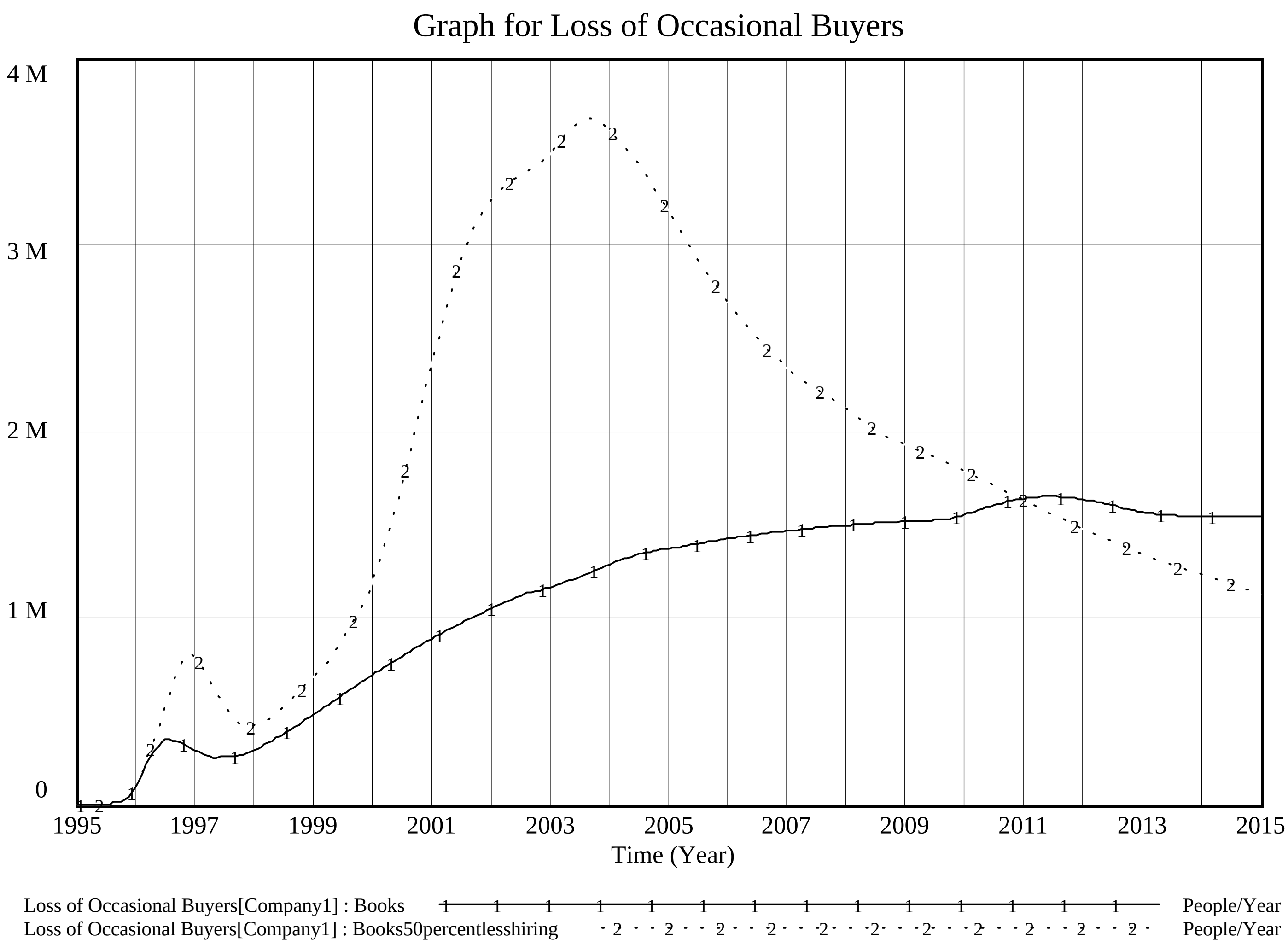
Retained earnings In the short-and-medium term, the low marketing strategy produces better retained earnings as it avoid a huge billion dollar investment upfront. Only in the long run does the high marketing spending pay of.

Figure 33 - 50% Hiring



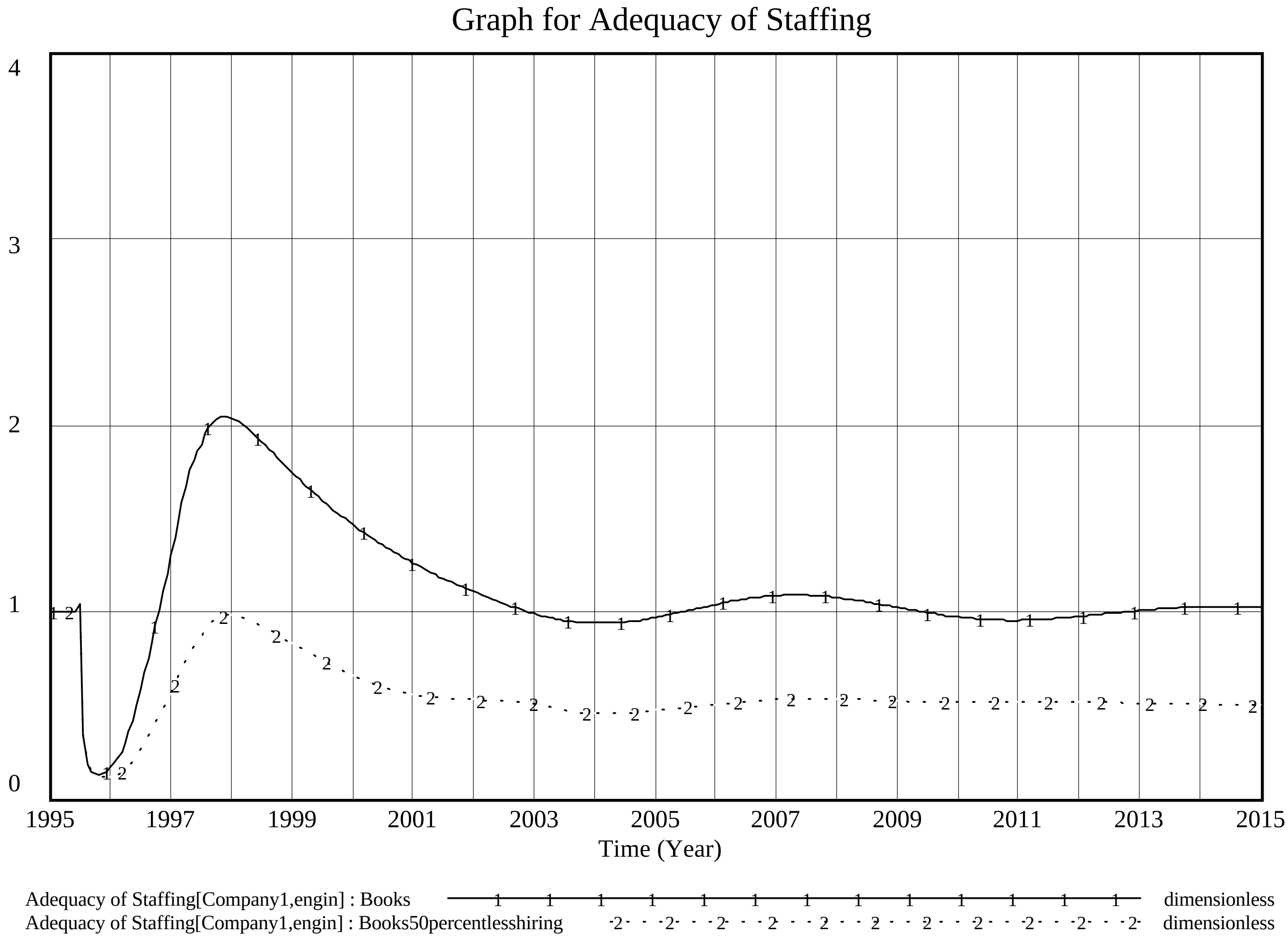
The aggressive early-mover (Company 1) loses its dominant market position if hiring is neglected.

Figure 34 - 50% Hiring



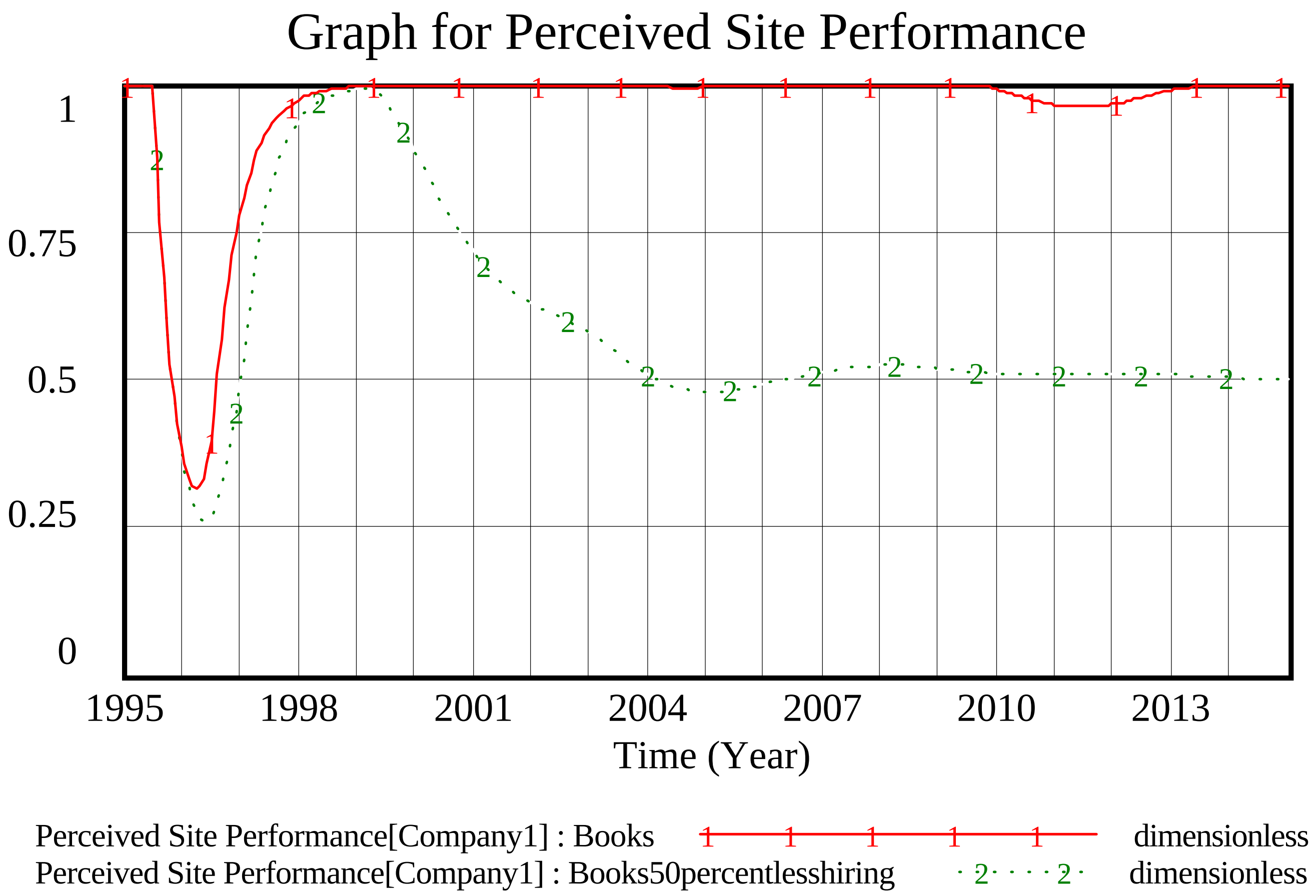
The impact of reduced hiring is most visible in the area of turnovers. Millions of customers, just acquired at immense costs are lost due to poor performance.

Figure 35 - 50% Hiring



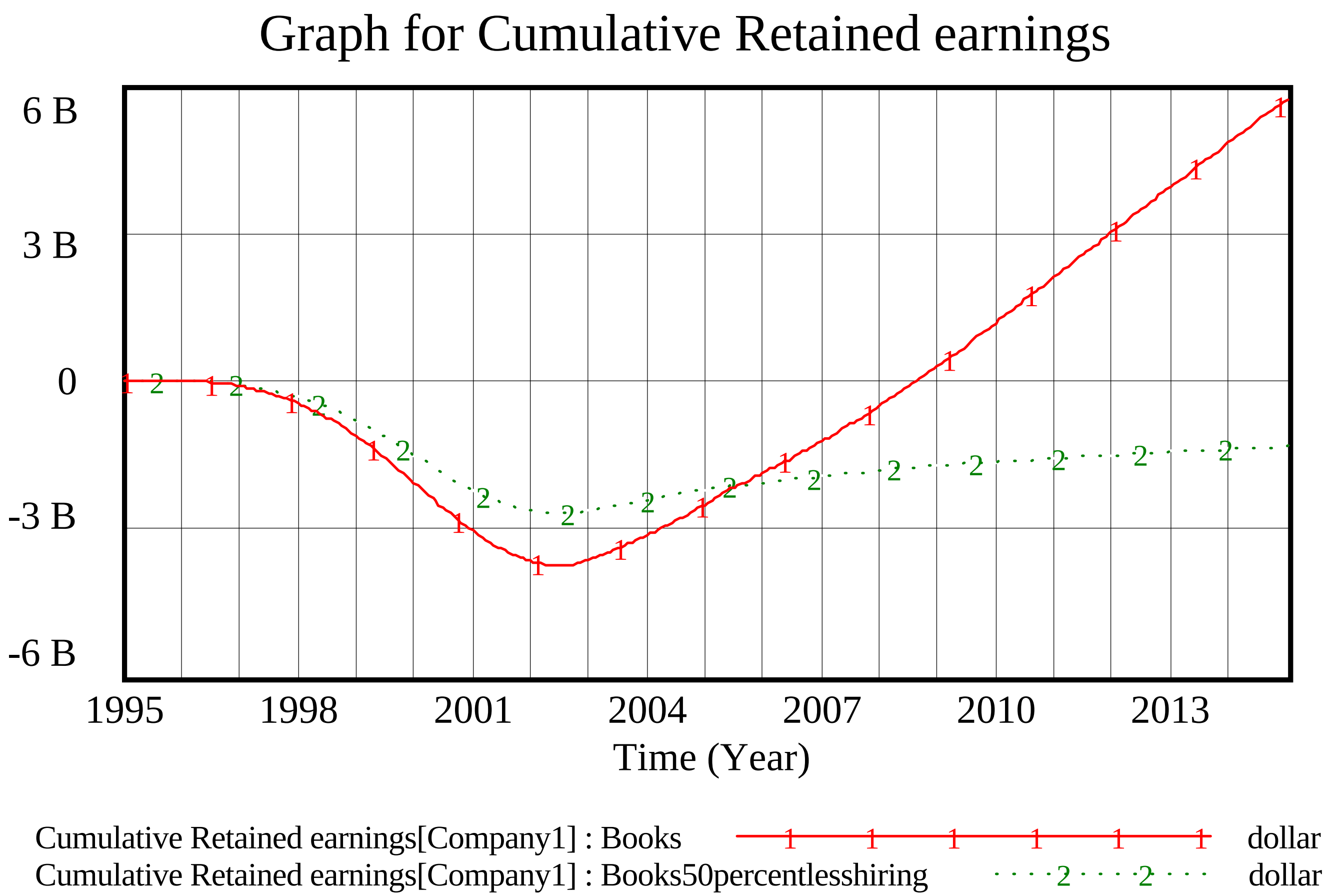
Reduced hiring leads to permanent understaffing of engineers.

Figure 36 - 50% Hiring



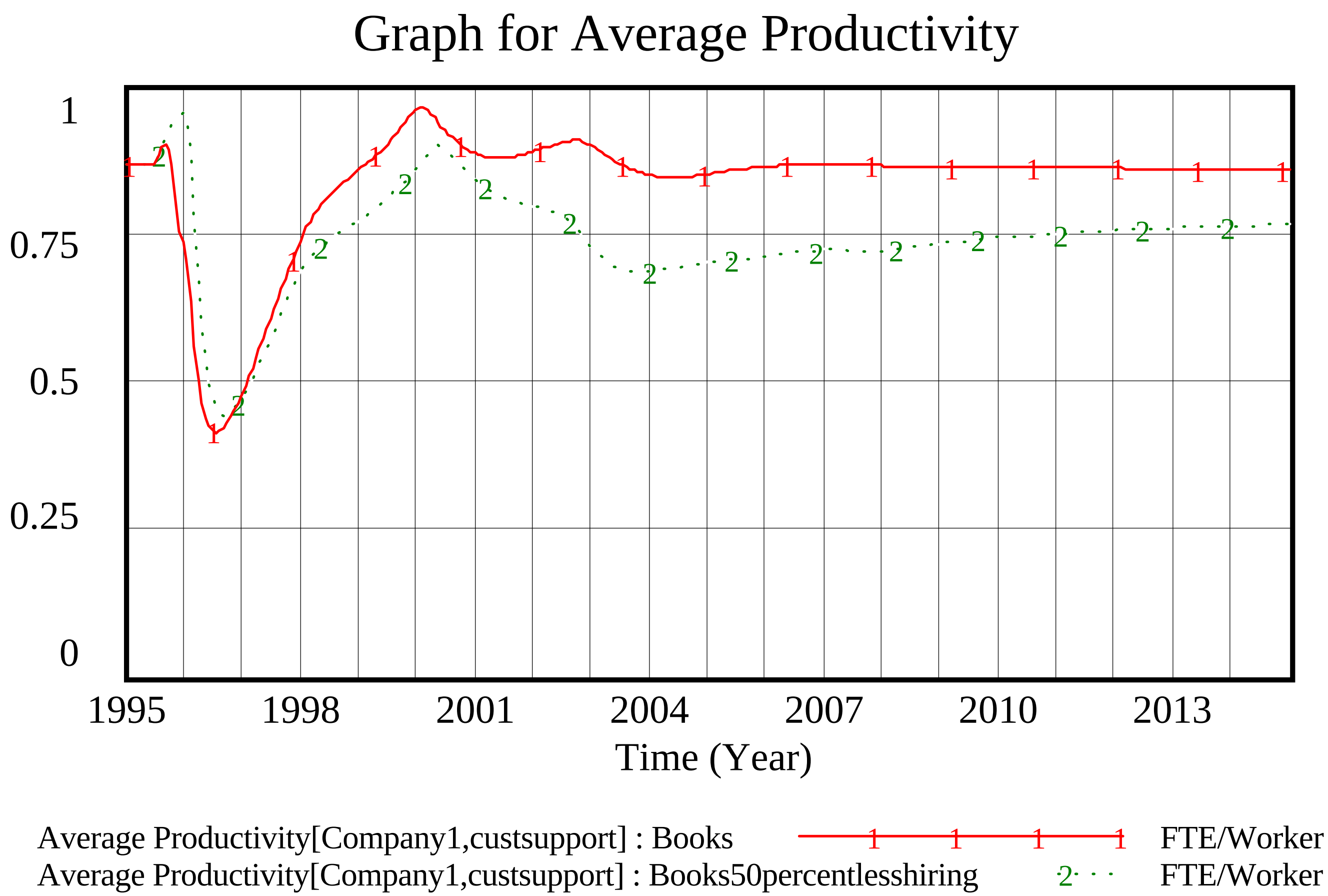
Without adequate staffing, Site performance falls significantly.

Figure 37 - 50% Hiring



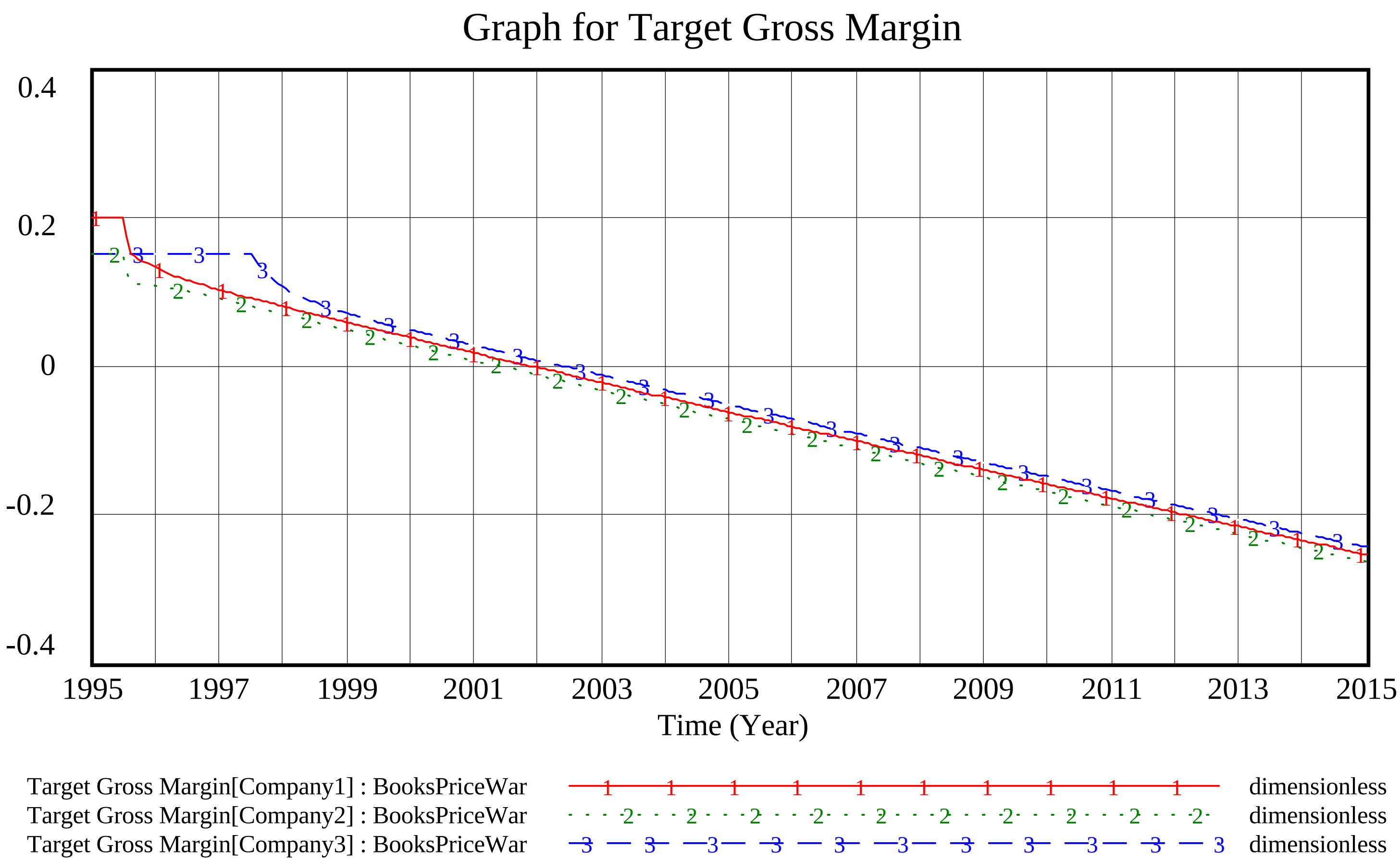
In the short-run, the savings through understaffing appear to outweigh the damage done, but in the long run the company fails to achieve profitability.

Figure 38 - 50% Hiring



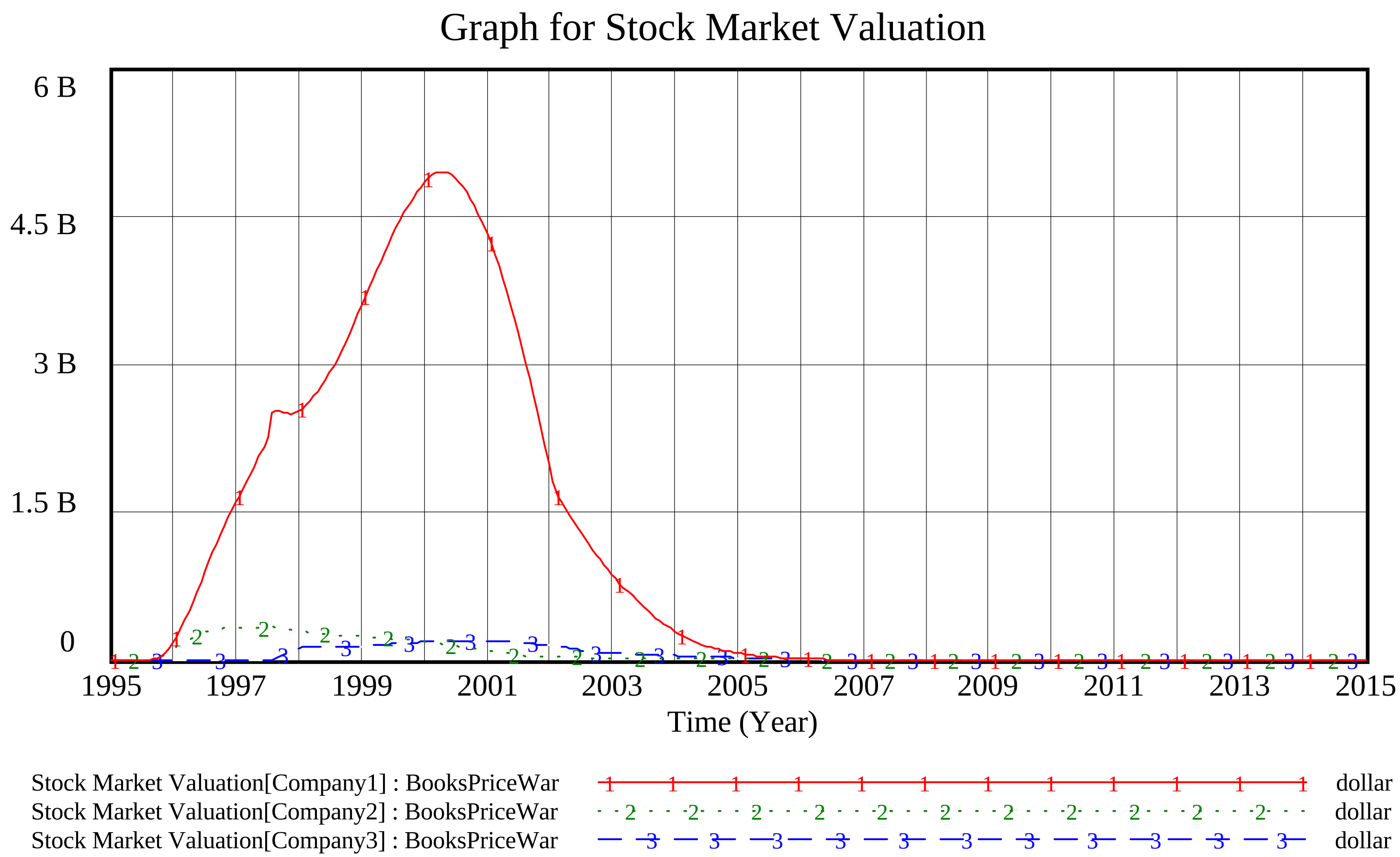
The high turnover leads to a reduction in average profitability that further aggravates the personnel shortage.

Figure 39 - Price War



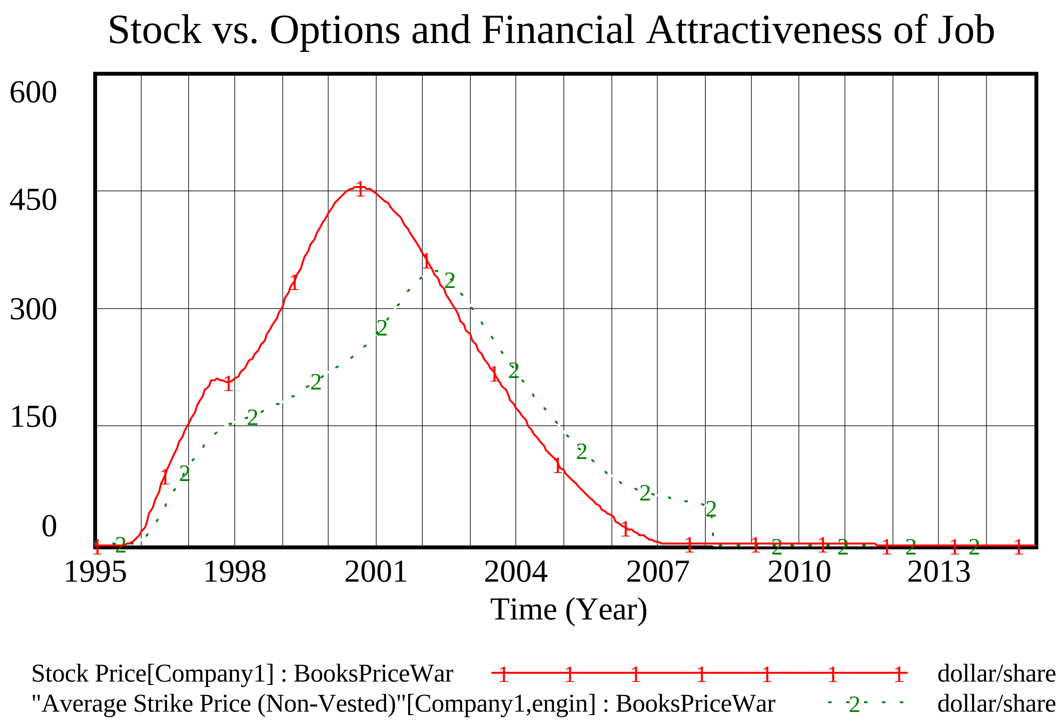
This graph shows how the competitors drive down gross margin in this scenario.

Figure 40 - Price War



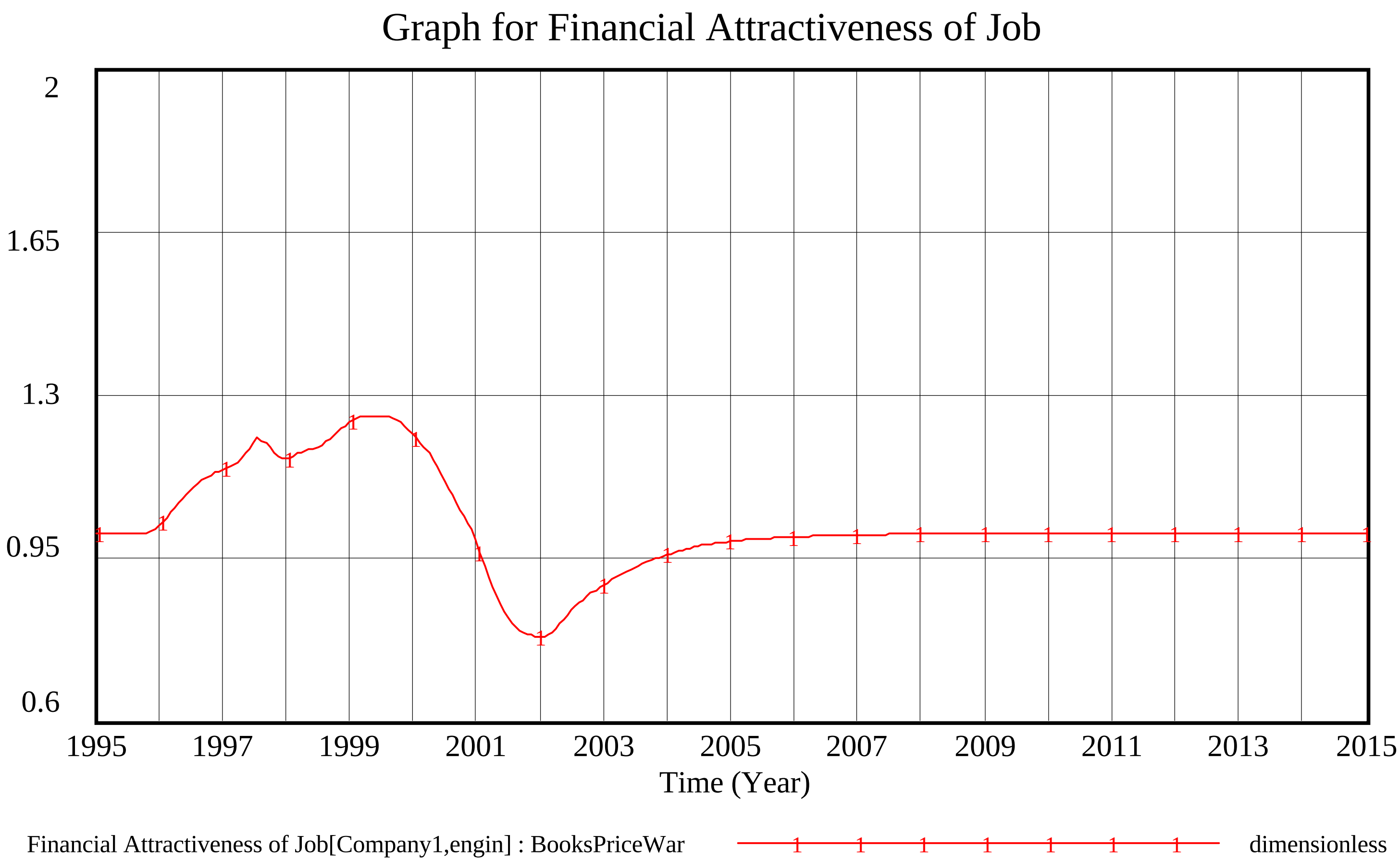
In the end, everybody loses as the financial markets stop supporting these loss-making companies. One company temporarily attracts a lot of investment, though as a level significantly lower than without the price war.

Figure 41 -Price War



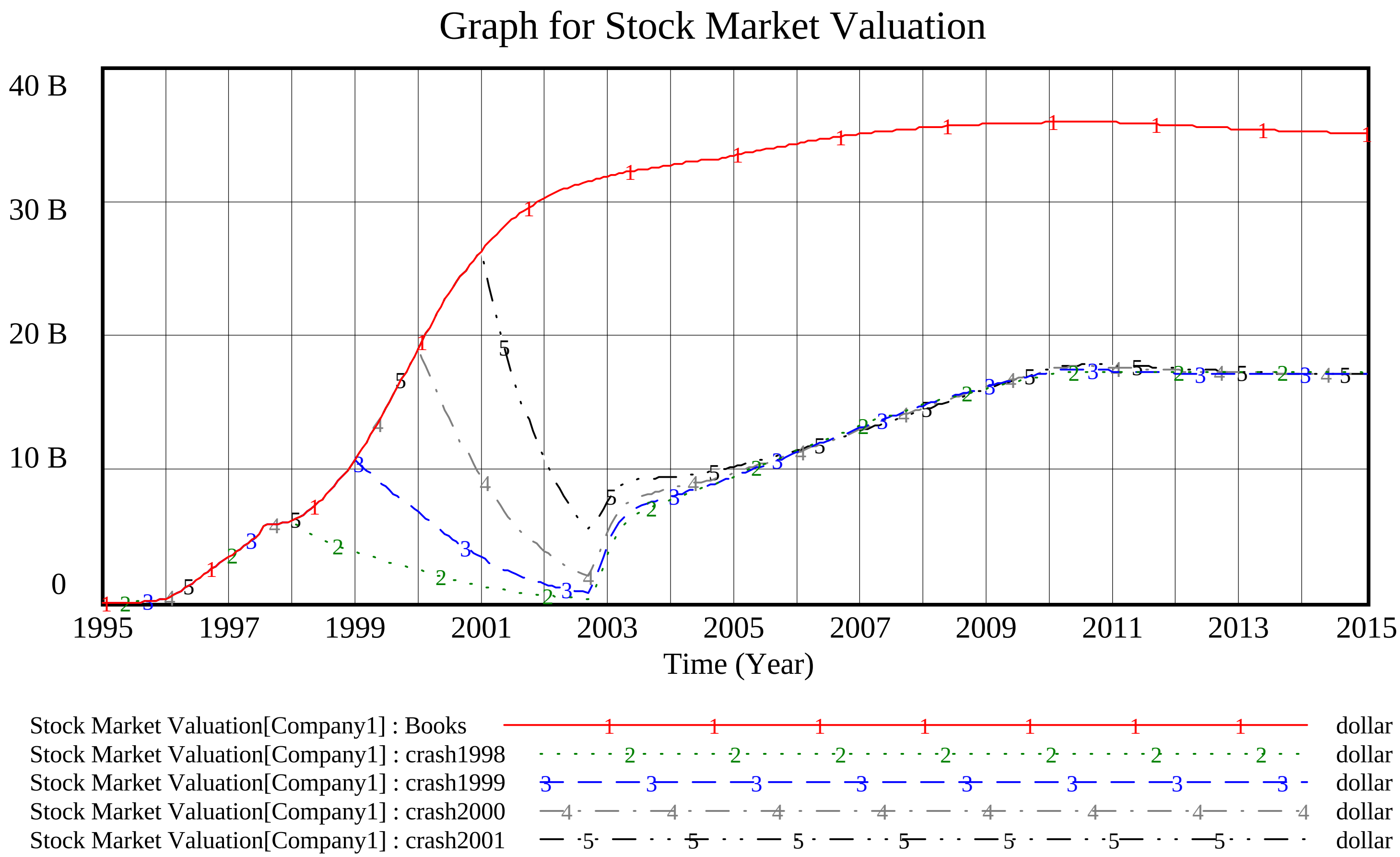
The average option strike price trails the stock price with a delay. If the stock price is higher, employees are happy and loyal. If the stock price falls the option price, employees are increasingly likely to jump ship..

Figure 42 - Price War



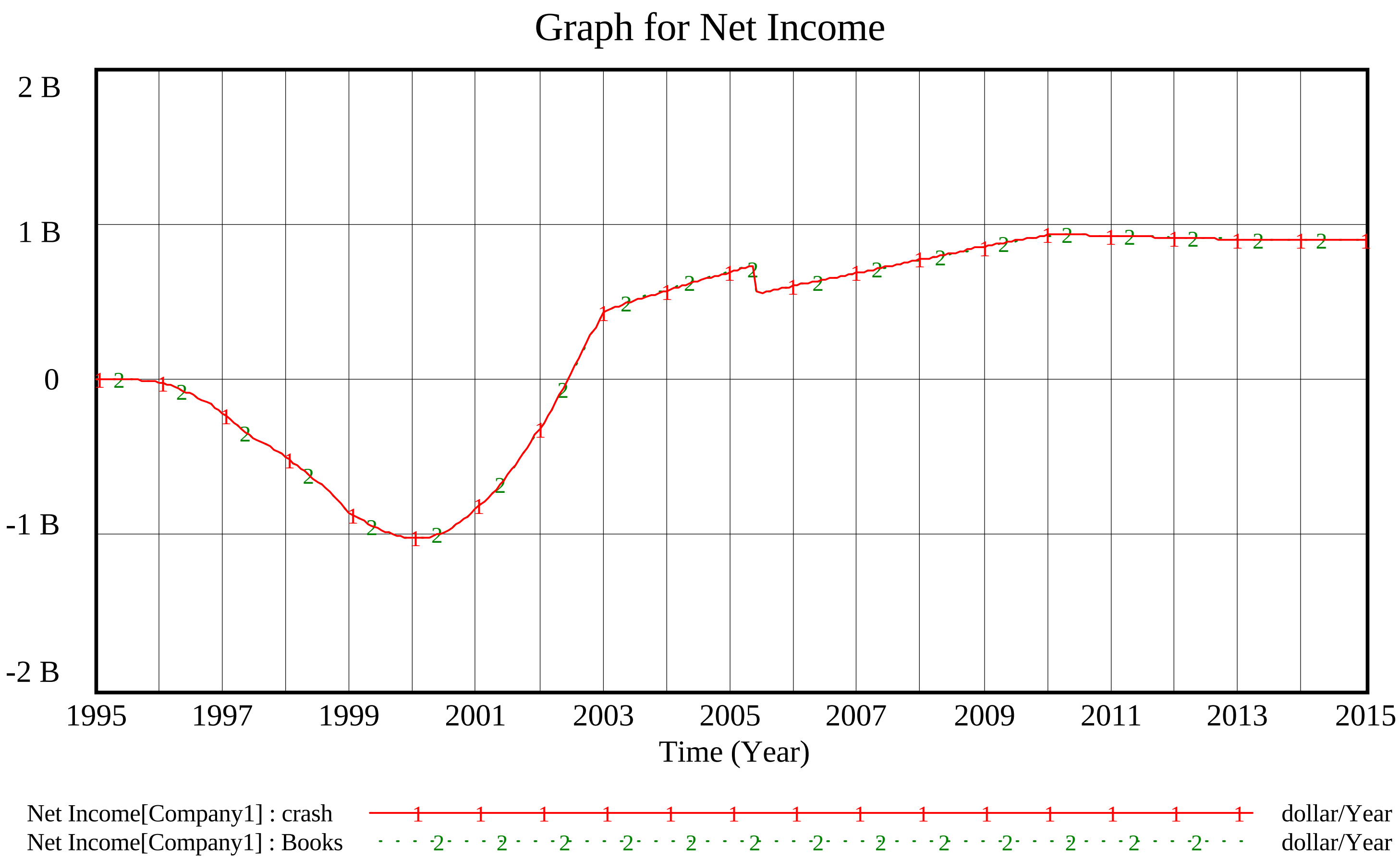
This is the impact of the stock and option performance (Figure 40) on financial attractiveness of the job..

Figure 43 - Stock Crash



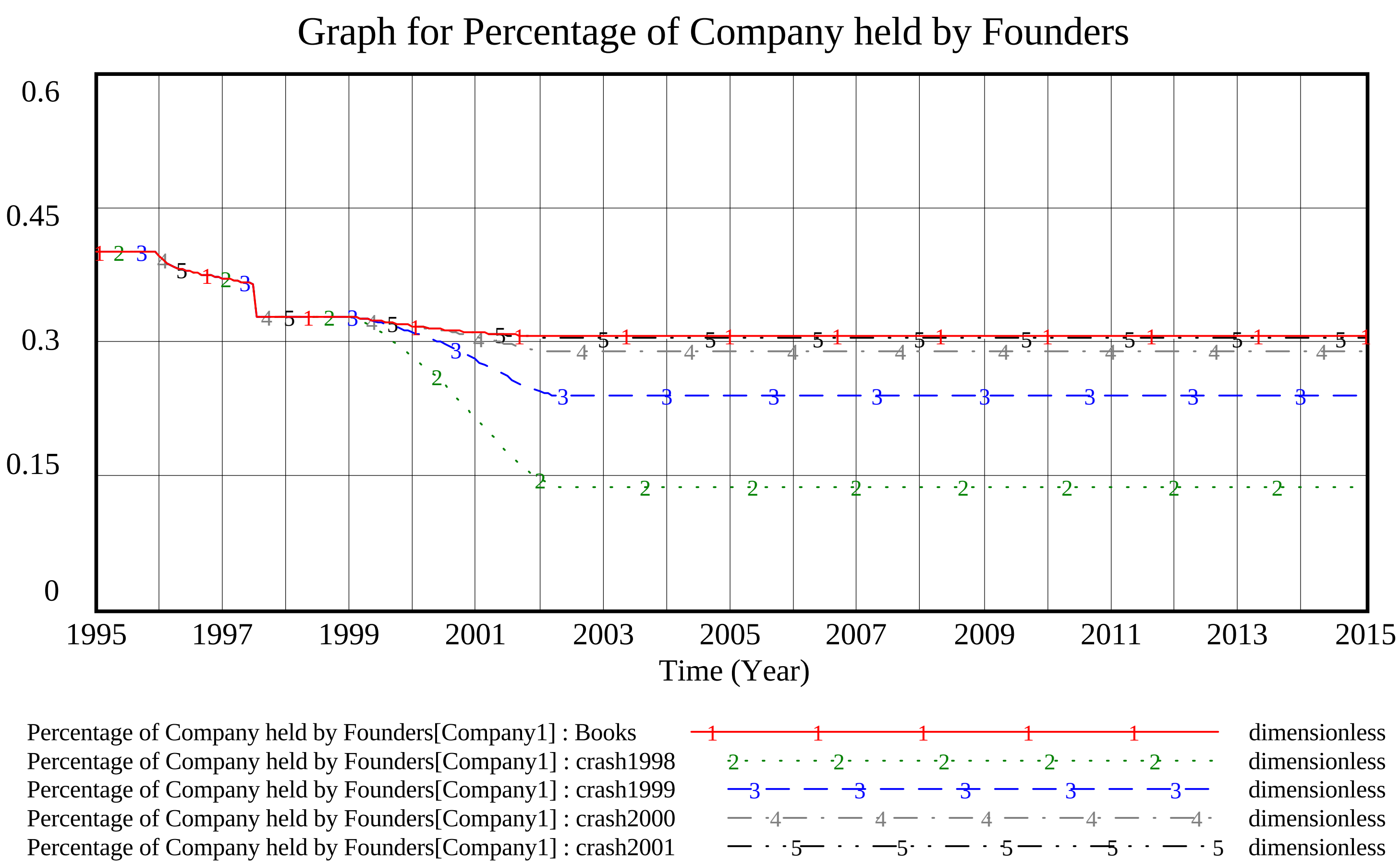
This graph shows the impact of changing the stock valuation from Internet-style to traditional methods at different points in time between 1998 and 2001.

Figure 44 - Stock Crash



Company 1 survives the crash by turning profitable in 2002. The kink in income in 2005 is due to the exhaustion of the tax-shield created by prior losses.

Figure 45 - Stock Crash



Even with company survival, the crash has a significant impact on company ownership by the founders. The earlier the crash, the higher the percentage of the company that founders had to give up to finance the losses.