LINKING NONFINANCIAL METRICS TO FINANCIAL PERFORMANCE

Christopher D. Ittner
EY Professor of Accounting

ONLINE

Linking Nonfinancial Performance to Financial Results is a Key Component of Managerial Decision-Making

- Forecasting future cash flows from investments in intangible assets
- Choosing projects with the greatest expected financial payback
- Selecting performance measures for evaluating managerial and business performance (for example, measurement dashboards and scorecards)

Some Fundamental Questions

- What should we be measuring? What are the key drivers of financial success?
- How do we rank or weight the various nonfinancial measures?
- How do you make tradeoffs among different types of measures?
- What are the appropriate performance targets?

Some Possible Methods to Address These Questions

- Intuition
- Management consensus
- Measurement frameworks or benchmarking studies
- Informal data analyses
- Rigorous predictive analytics methods

Performance Measurement Theory Provides a Structure for this Analysis

- Develop an explicit “causal” business model (or “strategy map”) describing how value drivers are linked to strategy
- Identify specific value propositions or hypotheses
- Test the hypotheses (and determine whether the model and/or data are adequate)
- Incorporate the results in decision-making models and performance evaluations
- Use the analyses as a learning tool for continually refining strategy, value propositions, and measures

LINKING NONFINANCIAL METRICS TO FINANCIAL PERFORMANCE

The Steps

Some Fundamental Questions

- To what extent does the business model incorporate the right drivers of financial success?
- How do you use the business model to allocate resources?
- How do you set targets for the measures?

STEP 1: Identifying the Right Drivers

- Develop a causal business model that:
  - Is linked to organizational strategy
  - Articulates the key, hypothesized drivers of financial performance
- Construct reliable and valid measures for the key drivers
- Verify the linkages in the business model

EXAMPLE: A Major Fast Food Chain

- Company operates or franchises 6,000+ stores, which offer both in-store purchases and delivery
- Overall profitability was not growing enough to meet either internal or external expectations
- A series of meetings involving senior-level executives from all functional areas produced a consensus business model
- The consensus business model was developed using only management intuition (i.e., without any real data analysis)

A Major Fast Food Chain

Consensus Business Model

A Major Fast Food Chain

- Employee turnover became the primary measure used for decision-making and performance evaluation (“we just know this is the key driver”)
- Expensive human resource programs (retention bonuses) were put into place to reduce turnover
- However, subsequent statistical analysis revealed:
  - Stores with same overall turnover, but very different financial performance
  - More profitable stores had higher employee turnover
  - Only turnover among supervisory personnel had any relation to store financial performance

A Major Fast Food Chain

- Management intuition was only partially correct
- The turnover measure was changed from overall turnover to turnover by employee category
- Further analysis provided an estimate for the financial cost of turnover (and an upper bound for the size of the retention bonus)
- Subsequent studies expanded the analyses to examine the relationships between employee measures, customer measures, and store profitability (i.e., test the bigger business model)

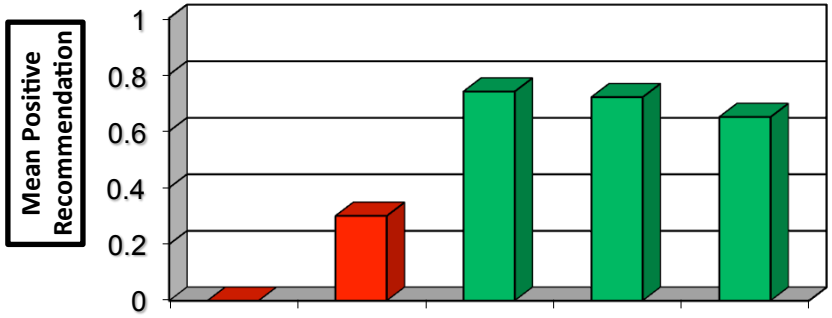
STEP 2: Target Setting

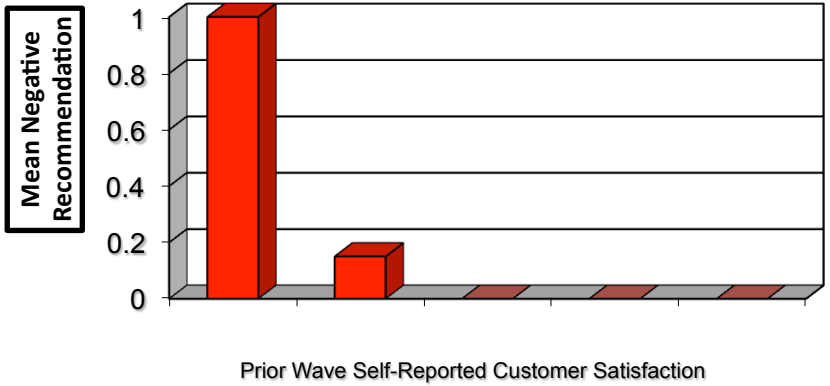
- Common intuition: “More is better”; “100% need to be 100% satisfied”
- Considerable difficulty setting goals for any nonfinancial performance measure
- Difficult to set targets for different measures when no common denominator exists (Is a 10% decrease in customer complaints equivalent to a 3% reduction in defect rates?)
- Non-linear functional relations and tradeoffs among financial and non-financial measures complicate goal setting

An Example: Personal Computer Manufacturer

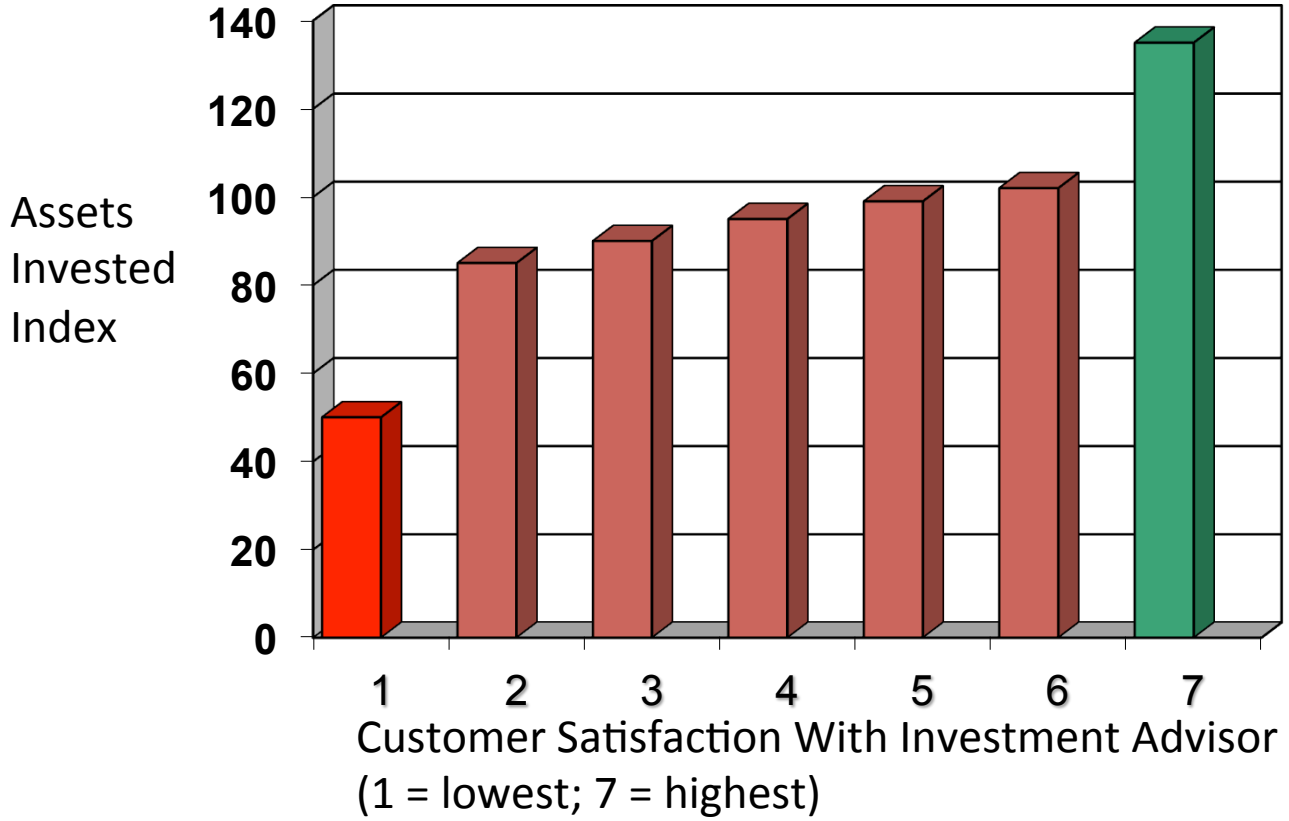
- Hypotheses in Business Model:
  - More satisfied customers recommend the company's products to others (positive "word of mouth")
  - Dissatisfied customers complain to others about the product (negative "word of mouth")
  - Greater positive word of mouth increases future financial performance; greater negative word of mouth reduces future financial performance

Computer Manufacturer's Recommendation Study



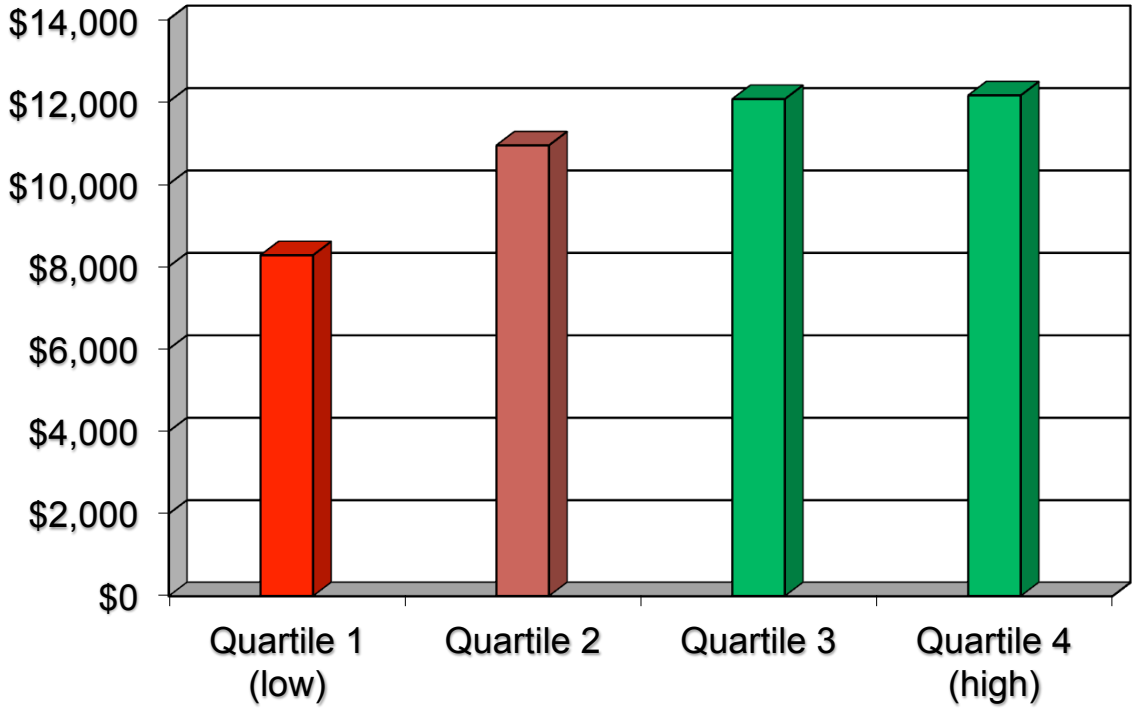


An Opposite Result: Investor Advisor Rating and Assets Invested



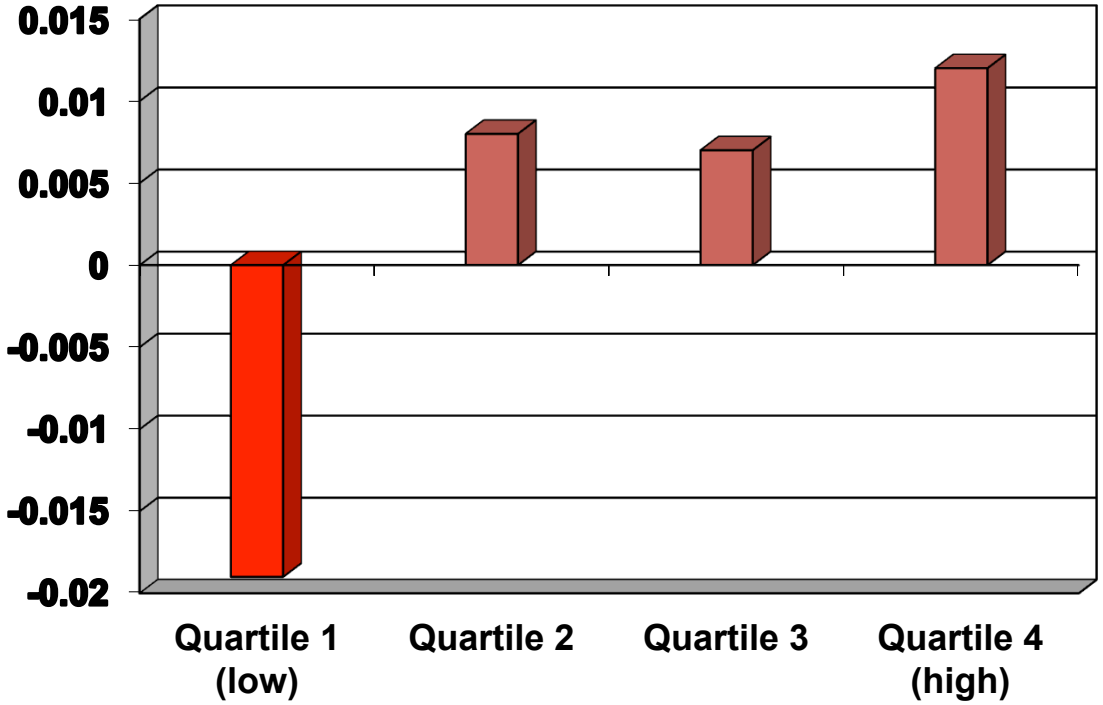
Market Valuation of Customer Satisfaction

Mean market value (in millions of dollars) impact of American Customer Satisfaction Index Scores <u>after</u> controlling for accounting book value



Market Response to Disclosure of Customer Measures

Cumulative ten-day "excess" return following release of ACSI scores



LINKING NONFINANCIAL METRICS TO FINANCIAL PERFORMANCE

Some Comprehensive Examples

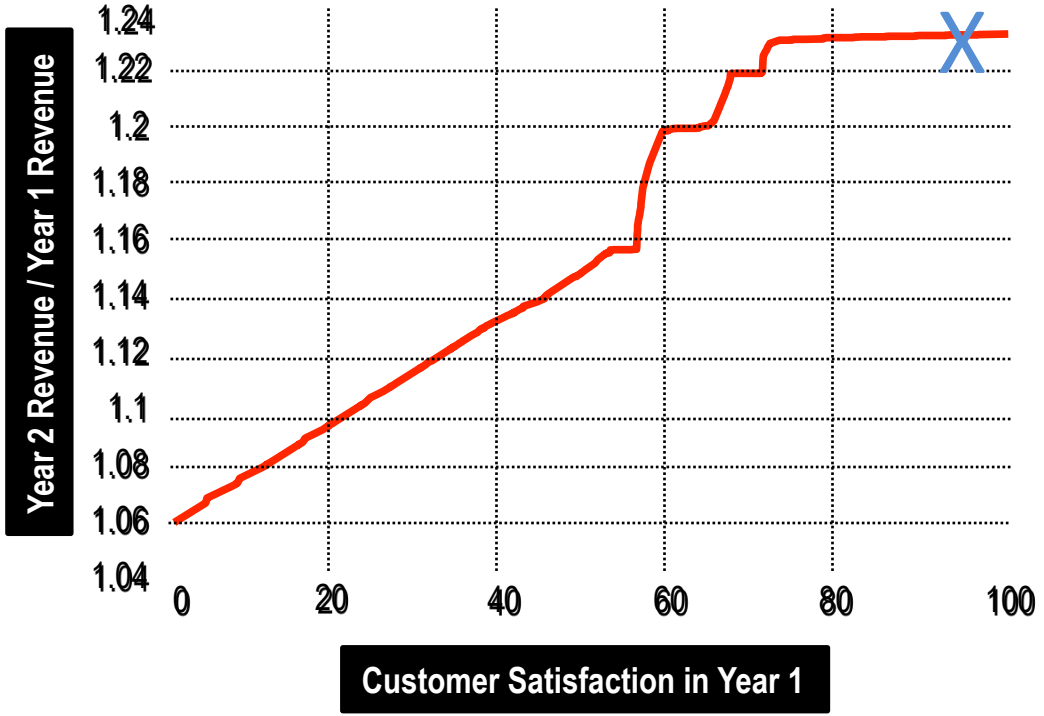
An Advertising Organization

- A hypothesis in the business model:
  - More satisfied customers purchase more in the future (additional sales of same service; upgrade existing services; cross-sell other services)
- Despite considerable expenditures on marketing research, this company had little insight into whether improvements in customer satisfaction ultimately produced increases in future financial performance
- The Chief Financial Officer desired more detailed evidence about whether customer satisfaction should be used for managerial performance evaluation, compensation programs, and corporate strategy

Analysis of Customer Revenue Growth

Source: Ittner and Larcker, *Journal of Accounting* Research (1998) -- Data from 2,156 individual customers

Analysis of Customer Revenue Growth



Source: Ittner and Larcker, *Journal of Accounting* Research (1998) -- Data from 2,156 individual customers

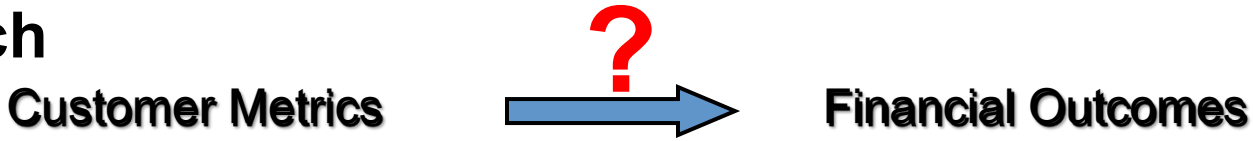
Analysis of Customer Revenue Growth

Source: Ittner and Larcker, *Journal of Accounting* Research (1998) -- Data from 2,156 individual customers

Technology Services Firm

- Senior management required the marketing organization to demonstrate whether customer satisfaction and other nonfinancial metrics were related to future financial outcomes
- Necessary data were scattered across different functional areas (“data fiefdoms”)
- Financial outcomes associated with marketing and quality metrics had never been examined by the company
- There was strong intuition that customer and quality metrics had to be related to financial results (“we just know that it is true”)

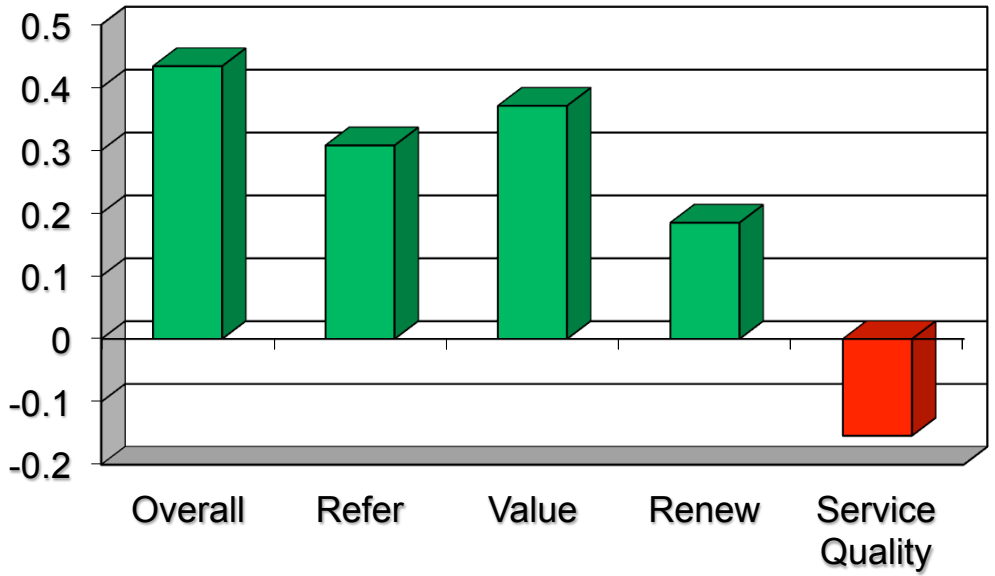
Approach



- Financial outcomes of interest:
  - Annual revenue growth
  - Clients with an annual revenue growth greater than 15%
- Operational metric: Composite measure for quality of service
- Customer metrics (measured on a five-point scale):
  - Overall satisfaction
  - Willingness to be a reference
  - Value assigned to service
  - Likelihood of renewal

Analysis of Future Revenue Growth

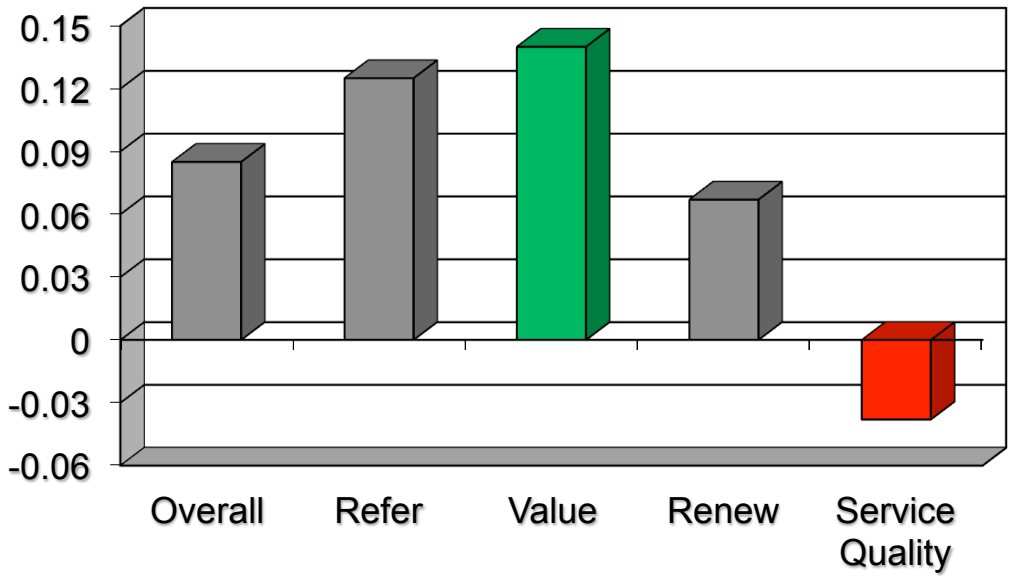
Regression coefficient linking customer score and future revenue growth



INTERPRETATION: "One-unit" (out of five) increase in Overall is related to a future increase in annual revenue growth of .434 (or 43.4%)

Analysis of High Future Revenue Growth

Regression coefficient linking customer score and high future revenue growth



INTERPRETATION: Since the dependent variable is coded as zero/one, the coefficient should be thought of as indicating that increases are moving the client closer to the high growth (> 15%) category

Note: Only the regression coefficient for Value is statistically significant

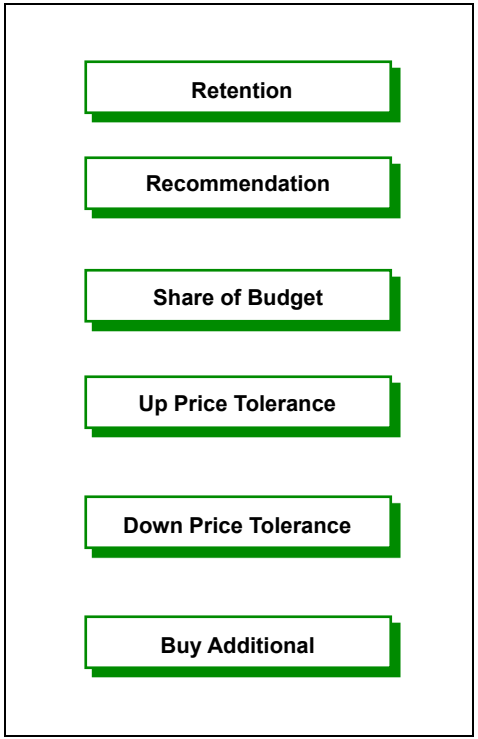
LINKING NONFINANCIAL METRICS TO FINANCIAL PERFORMANCE

Incorporating Analysis Results in Financial Models

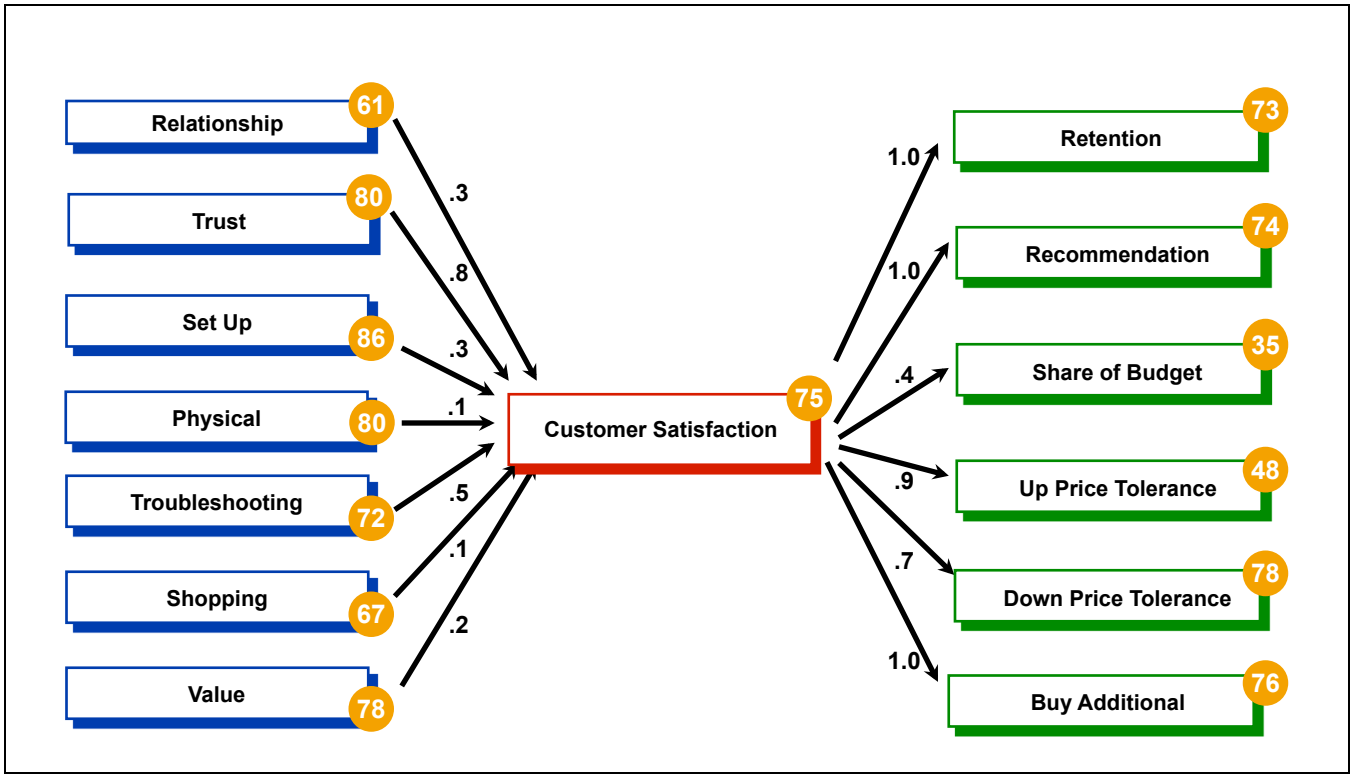
Computer Hardware Manufacturer

- Company is a major supplier of computer equipment to many consumers and businesses
- Senior-level management desired a model to manage and evaluate customer initiatives
- Develop action plans to increase the value of the “customer asset”

Desired Outcomes of Customer Satisfaction



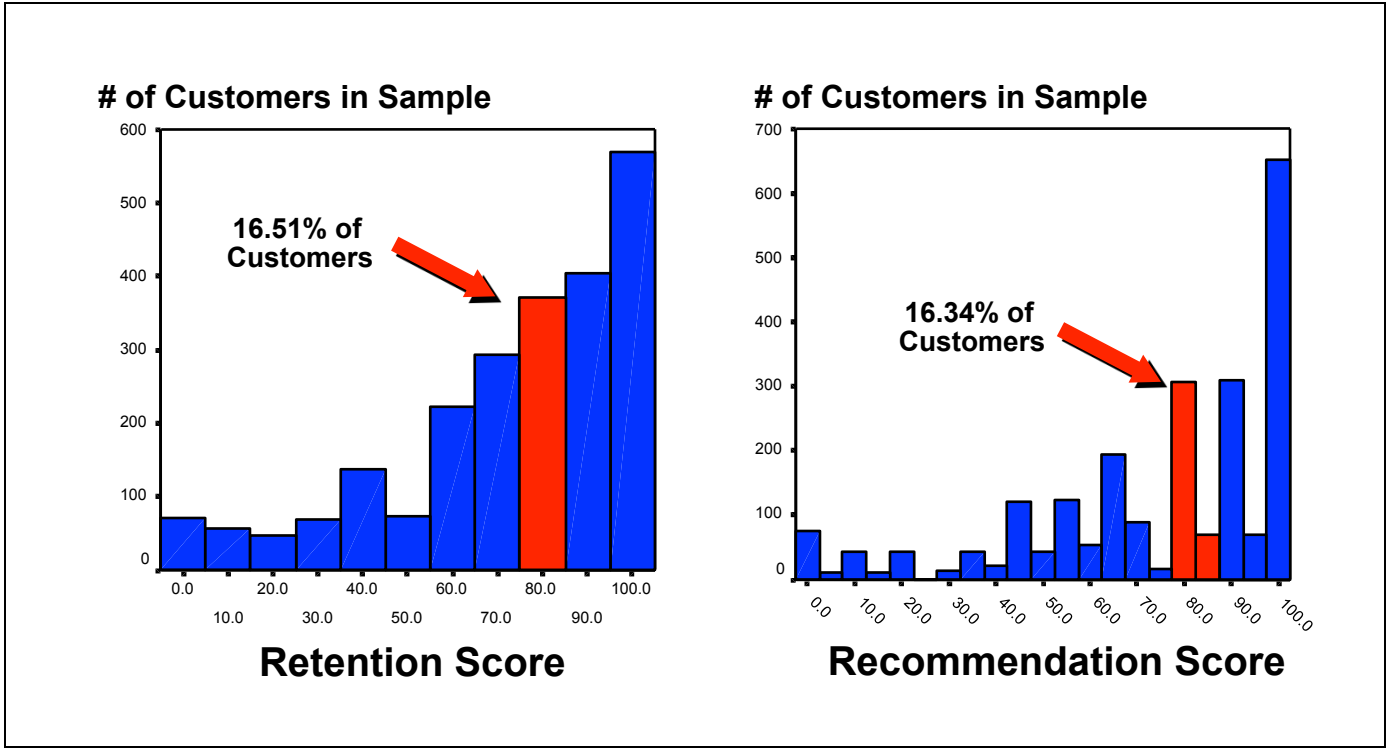
Linking Drivers, Satisfaction, and Outcomes



Further Research Revealed:

- Retention
  - If the retention score was 90 or above (below 90), the customer bought the same brand again 56.76% (30.77%) of the time -- a change of 25.99%
- Recommendation
  - If the recommendation score was 90 or above (below 90), the customer recommendation resulted in 1.52 (0.87) purchases of the same brand -- a change of 0.65
- Implications:
  - Select action plans to move customer scores over 90
  - Assume that action plans can move customer retention and recommendation scores a maximum of 10.00 points

Focusing on Critical Customers



Expected Economic Value

Customers Affected by Action Plan (% Changed):						
Repurchase:	16.51%					
Recommendation:	16.34%					
Parameters to be Specified:						
Evaluation Horizon (years):		5				
Discount Rate (%):		15.00%				
Total Number of Customers Potentially Affected by Action Plan:		1,000,000				
Margin ($) on Each Sale:		$145.00				
Cost of Action Plan:		$5,000,000				
		year 1	***year 2***	***year 3***	***year 4***	***year 5***
Year(s) of Next Purchase Decision: (note: 0 = no purchase; 1 = purchase)		0	1	0	0	1
		year 1	***year 2***	***year 3***	***year 4***	***year 5***
Year(s) of Positive Recommendation: (note: 0 = no recommendation; 1= recommendation)		1	1	1	1	1
Change in % retention (repurchase) for a customer moving from a score below approximately "90" to a score above "90":		25.99%				
Change in number of recommendations buying the same brand for a customer moving from a score below approximately "90" to a score above "90":		0.65				
Cash Flow Analysis:						
Year:	**0**	**1**	**2**	**3**	**4**	**5**
Gross:	($5,000,000)	15,396,067	21,617,269	15,396,067	15,396,067	21,617,269
Discounted:	($5,000,000)	13,387,885	16,345,761	10,123,164	8,802,752	10,747,603
Total Net Present Value of Action Plan:			**$54,407,165**			

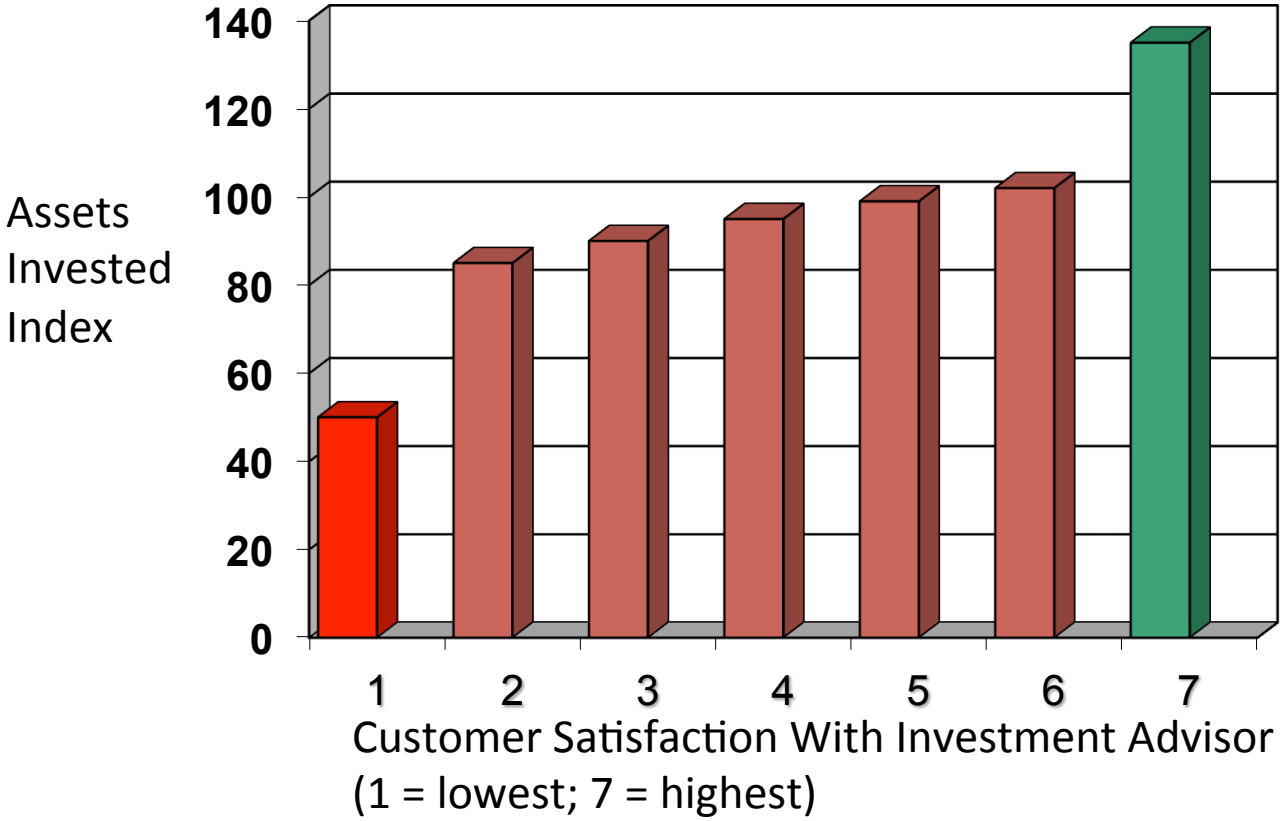
LINKING NONFINANCIAL METRICS TO FINANCIAL PERFORMANCE

Using Analytics to Choose Action Plans

Linking Nonfinancial and Financial Results in Broader Business Models

- Examining nonfinancial metrics in isolation of other related metrics is not especially sophisticated and can lead to *misleading* or *incomplete* inferences
- A better approach is to develop and test broader business models where:
  - Non-financial metrics (e.g., employee) are related to other non-financial metrics (e.g., customer)
  - Non-financial metrics (e.g., employee and customer) are ultimately related to financial outcomes (e.g., revenues, return on assets, and/or stock price returns)

Financial Services Firm Revisited



Financial Services Firm Revisited

- The firm sought to understand the key drivers of future financial performance in order to:
  - develop their strategy
  - select action plans with the largest expected economic payoffs

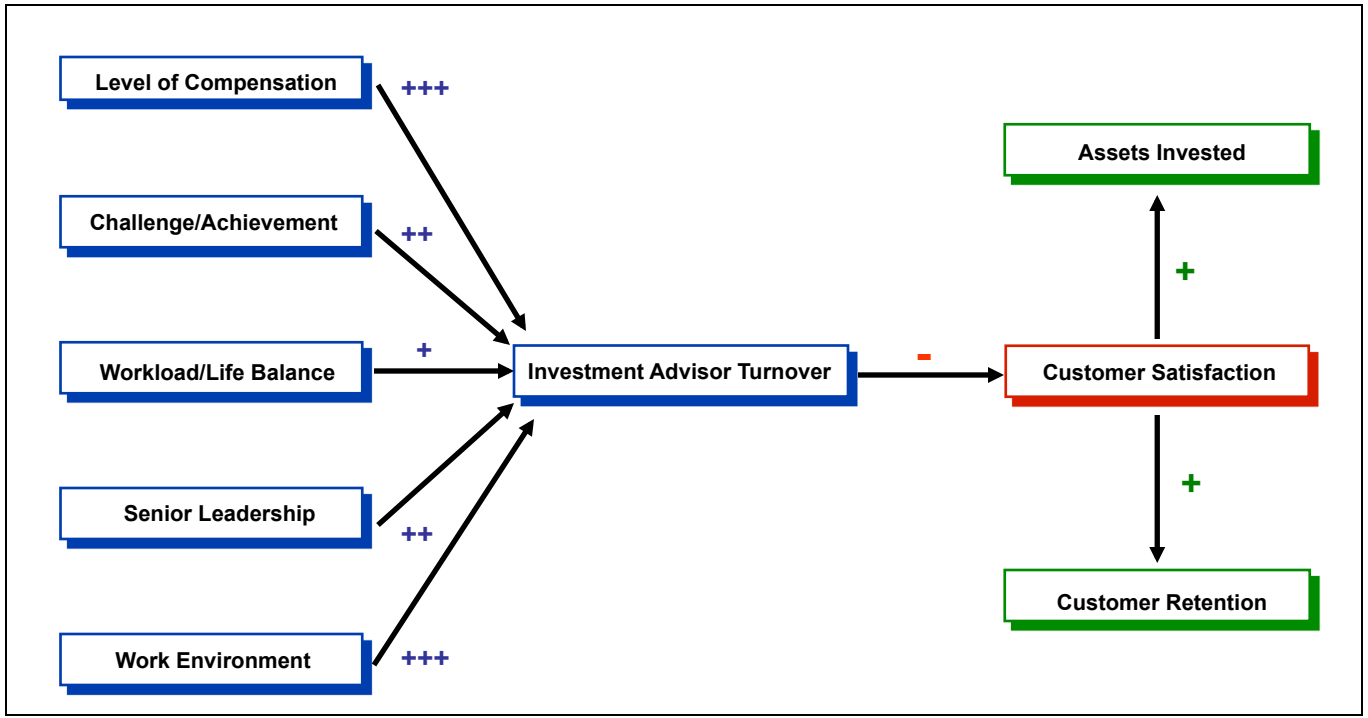
- As seen in the analytic analyses, increases in customer retention and assets invested (or under management) had a direct impact on future economic success

- However, the drivers of customer retention and assets invested were not known

Customer Satisfaction with Advisor

- Additional analysis revealed that customer satisfaction with the investment advisor was related to:
  - Trustworthiness
  - Responsiveness
  - Knowledge
- However, the key determinant was investment advisor turnover (i.e., customers wanted to deal with the same person over time)
- *Given these results, the company next identified the drivers of investment advisor voluntary turnover*

Linking Employees to Customers



Notation: +/- refers to a strong statistical positive/negative link
(precise numbers are not reported due to company request)

Resulting Actions

- Level of compensation (e.g., salary and bonus) and work environment (e.g., availability of helpful and knowledgeable colleagues) were the most important drivers of advisor turnover
- These observations were used to develop human resource action plans to reduce advisor voluntary turnover
- These results were also the basis for computing the economic value (expected Net Present Value) of human resource initiatives and the economic value of investment advisors

LINKING NONFINANCIAL AND FINANCIAL PERFORMANCE

Organizational Issues

Common Reasons for Analysis Difficulties

- Predictive analytics can provide many benefits—but many companies find it incredibly hard to do
- Insufficient model development
  - No linkages modeled
  - Over-reliance on benchmarking and generic measurement frameworks
- Measures with poor psychometric properties
  - Too few questions
  - Too few scale points (e.g., “top-box”)

Common Reasons for Analysis Difficulties

- Measuring the wrong attributes and not understanding the underlying drivers of performance
- Piecemeal analyses
  - Little attempt to comprehensively test intuition or hypotheses
  - “Islands of analysis” and “strategy silos”
  - Lack of resources and appropriate skill sets (“Lots of data but no information”)

Common Reasons for Analysis Difficulties

- Data and information system limitations
  - No common identifiers or unit of analysis across measures
  - Inconsistent measurement
  - Systems not integrated
  - Lack of necessary accounting data (e.g., customer profitability)

- Political Issues
  - Data fiefdoms
  - May not match intuition (which makes it wrong)
  - Don’t want to know the answer
  - Organizational power issues

Key Questions That Need to be Addressed

- What is the firm's business model? How specifically is the company or business unit expected to create value?
- What data are currently available to test the value propositions? (Try not to reinvent the wheel)
- What are the desired economic outcomes? (revenues, profits, win/loss, retention, etc.)
- What is the appropriate unit of analysis? (office, plant, region, customer, product/service, program/initiative, etc.)
- What organizational mechanisms can be used to ensure ongoing analysis?


Wharton
University of Pennsylvania

ONLINE