Business Strategy and Financial Accounting Research: A Text-Analysis Approach

Rajiv Banker
with Xinjie Ma

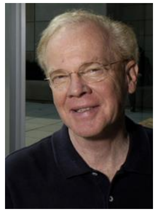
Presentation at Yale University on October 11, 2019

Motivation

- Many prior accounting research studies have focused on earnings and related measures of financial performance

- It is well-recognized that the nature of business operations, especially strategy, matters in studies of earnings behavior
  - Earnings properties are jointly determined by the nature of the business and accounting choices **-Dechow et al. (Journal of Accounting and Economics 2010)**
  - Many prior studies present evidence for earnings management based on earnings properties and invoke agency costs theory as the explanation; but few studies directly examine how firm fundamentals affect earnings properties under the null hypothesis of no earnings management **-Ball (Accounting Horizons 2013)**

Patricia Dechow



Ray Ball

Research objectives

- **Develop and validate text-based measures of business strategy**
  - Generic strategies (Porter, 1980)
  - Value propositions (Treacy and Wiersema, 1993)

- **Document relation between strategy and earnings properties**
  - Earnings persistence
  - Earnings volatility
  - DuPont Analysis

- **Document relation between strategy and accounting policies**
  - Income-statement conservatism
  - Matching of revenue and expenses

- **Document relation between strategy and executive compensation contracts**

Generic strategies and value propositions

Porter (1980)
Generic Strategies

Treacy and Wiersema (1993)
Value Propositions

Cost leadership

Differentiation

Operational excellence

Customer intimacy

Product leadership

Kaplan and Norton (2000)
Balanced Scorecard

A textual measure of strategy

<u>Step 1:</u> Identify a common source of textual data

- 10-K Item 1 Business (from 1995 to 2015)
- Use Python to extract texts between "Item 1" and "Item 2" (before 2005) or between "Item 1" and "Item 1A" (after 2005)

<u>Step 2:</u> Develop a keyword list

- Build on Porter (1980) and later work
- Capture both strategic positioning and detailed function-level activities

<u>Step 3:</u> Count with flexibility

- Generate the word frequency matrix (70,604 firm-year obs * 77 keyword variables)

<u>Step 4:</u> Factor analysis

- Interpret and label the factors using factor loadings

Three dimensions of strategy measures

Product leadership	Customer intimacy	Operational excellence
technolog	*brand*	*reduce cost*
proprietary	*quality*	*efficient*
R&D	*marketing*	*low cost*
intellectual propert	*customer service*	*improve cost*
patent	*innovat*	
techni	*trademark*	
reliab		
new product		

These correspond to Treacy and Wiersema's value propositions

Textual measure validation

Content validity

Represents all facets of a given construct?

Reliability

Test-retest reliability?

Intra-class Correlation Coefficient (0<ICC<1)

- 0.99
- 0.98
- 0.97

Construct validity

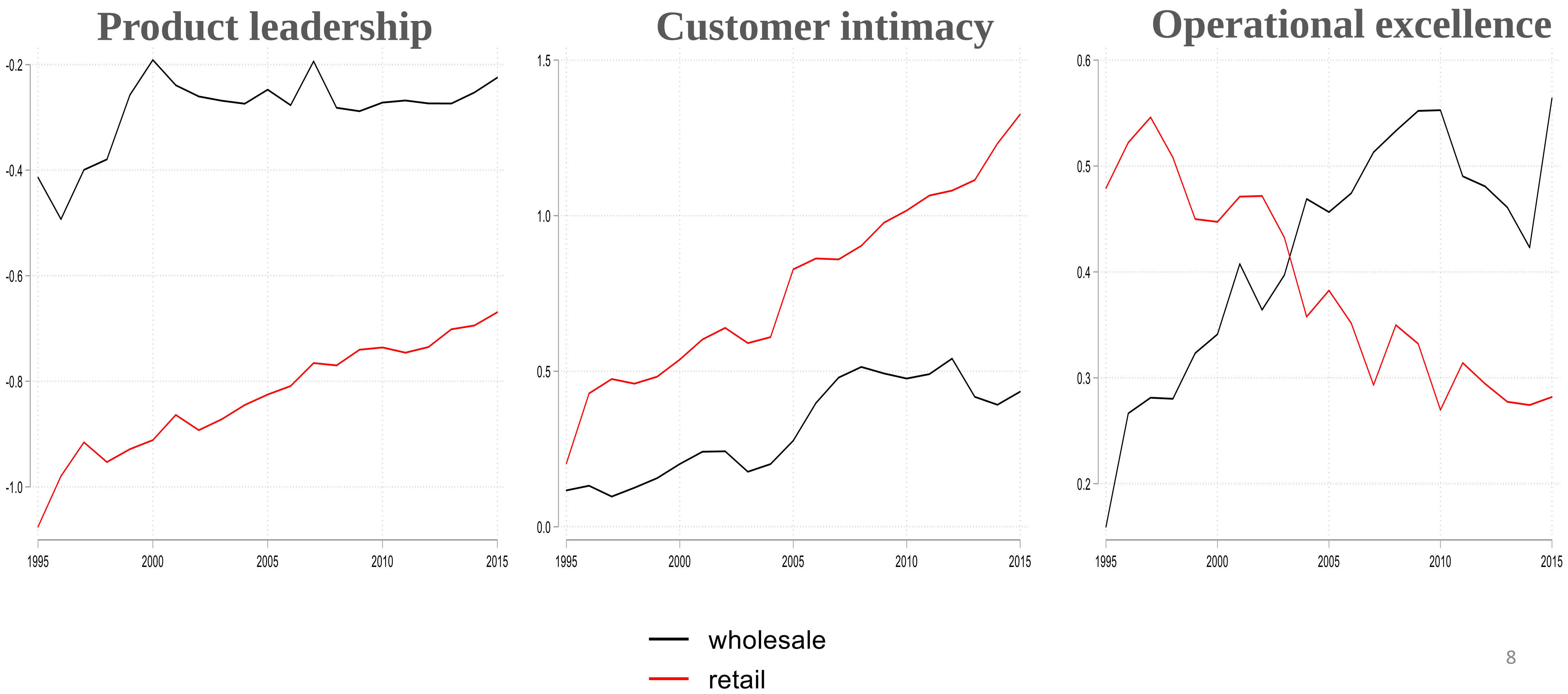
Measures the intended construct?

Regression tests

- Industry Comparisons
- Investment activities

Source: Shadish, Cook, Campbell. 2002. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Wadsworth Cengage learning: Boston, MA.

Wholesale vs. Retail Industries

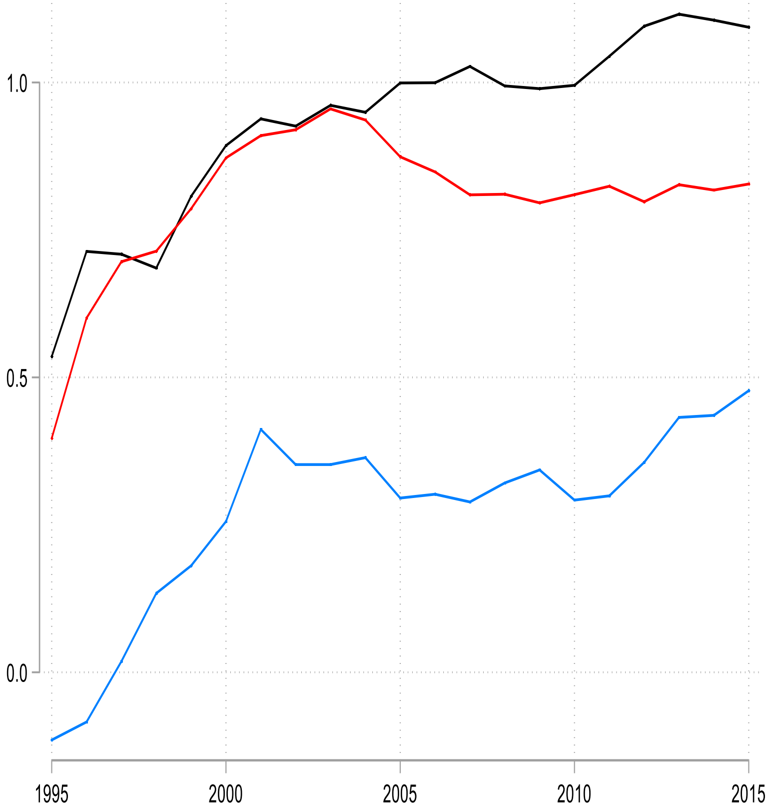


Wholesale vs. Retail industries

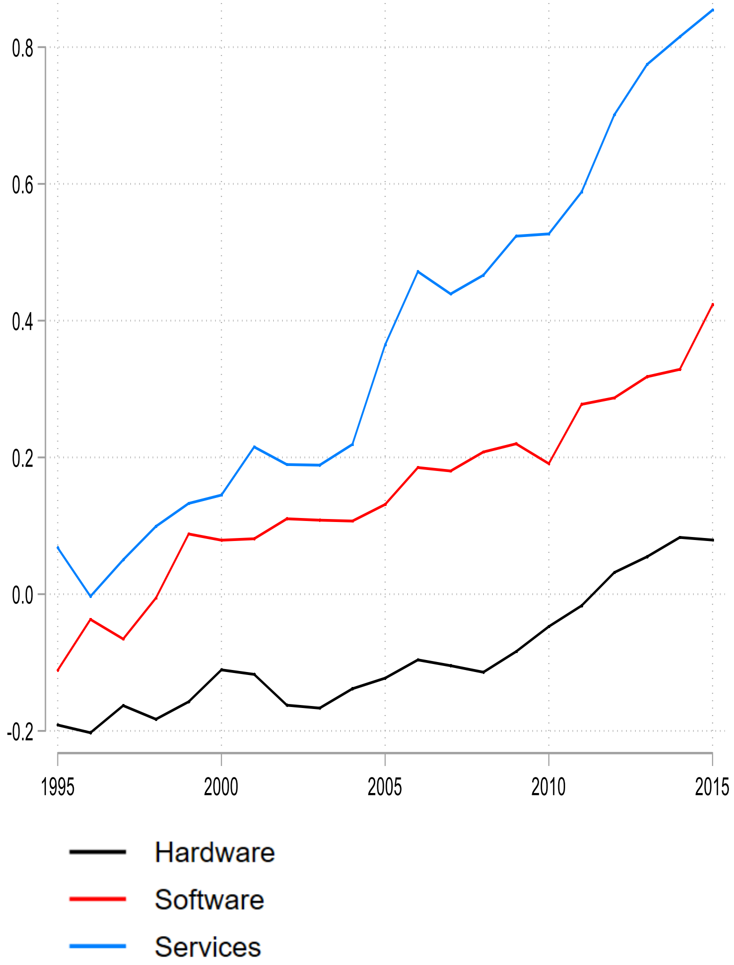
- Wholesale industry focuses more on product leadership compared to the retail industry
- Retail industry focuses more on customer intimacy compared to the wholesale industry
- Retail industry used to have a greater focus on operational excellence than the wholesale industry, but the situation reversed after 2003 with the trend starting much earlier than 2003

Hardware vs. Software vs. IT Services industries

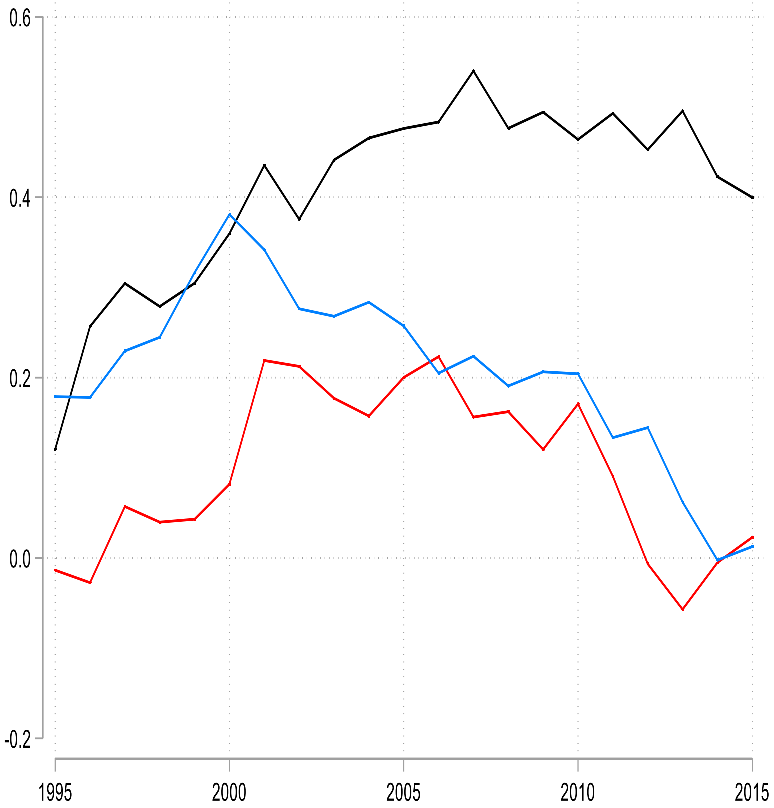
Product leadership



Customer intimacy



Operational excellence



Hardware vs. Software vs. IT Services industries

- Hardware firms focus more on product leadership and operational excellence

- Software firms focus more on product leadership increasing until 2001 but flattened out after 2001 (dot.com bubble burst)

- Services firms used to focus on operational excellence but after 2001 they focus more on customer intimacy

Which strategic investment is most important?

Strategy		Strategic investments
Product leadership	?	*Advertising*
Customer intimacy	?	*CAPEX*
Operational excellence	?	*R&D*

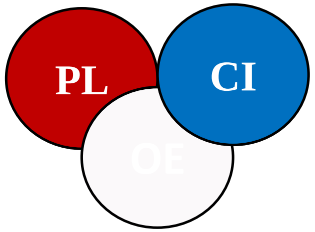
Strategic investments

- **Product-leadership** firms invest most in **R&D**
- **Customer-intimacy** firms invest most in **advertising**
- **Operational-excellence** firms invest most in **capital expenditure**

DuPont analysis

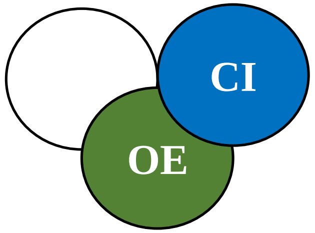
<u>Gross margin</u>

– *Product-leadership* and *customer-intimacy* firms have higher gross margin



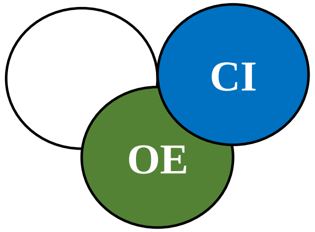
<u>Asset turnover</u>

– *Customer-intimacy and operational-excellence* firms have higher asset turnover ratio



<u>Profitability</u>

– *Customer-intimacy and operational-excellence* firms are positively associated with ROA



Earnings properties

- Does generic strategy affect earnings persistence?
  - Yes: *product-leadership* firms have **more persistent earnings** than *customer-intimacy* and *operational-excellence* firms
    - ❑Sustainability of competitive advantages

- Does generic strategy affect earnings volatility?
  - Yes: *product-leadership* firms have **more volatile earnings** than *customer-intimacy* and *operational-excellence* firms
    - ❑Differences in outcome uncertainty

- Apparently contradicts prior belief that high persistence implies lower volatility!
    - ❑Dichev and Tang, *JAE*, 2009; Frankel and Litov, *JAE*, 2009

Accounting policies

- Is generic strategy associated with conservatism measures?
  - Yes: *product-leadership* firms appear to have **more balance-sheet conservatism** and **less income-statement conservatism** as measured in prior studies than *customer-intimacy* and *operational-excellence* firms
    - ❑Unrecognized intangible assets and growth potential
- Is generic strategy associated with revenue-expense matching?
  - Yes: *product-leadership* firms have **weaker contemporaneous revenue-expense matching** than *customer-intimacy* and *operational-excellence* firms
    - ❑More expenses recognized before revenue realization
- Is the "accounting policy" measure a separate managerial choice or simply a result of strategy choice?

Cash flow patterns

Operating cash flows

– *Product-leadership* firms tend to have negative operating cash flows

Investing cash flows

– *Operational-excellence* firms tend to have negative investing cash flows

Financing cash flows

– *Product-leadership* firms tend to have positive financing cash flows

Liquidity and solvency

Short-term liquidity

– *Product-leadership* firms have higher cash ratios

Long-term solvency

– *Product-leadership* firms have lower leverage ratios

Financial flexibility

– *Product-leadership* firms require financial flexibility

Strategy and risk

- *Product-leadership* firms have higher earnings volatility
- *Product-leadership* firms have lower estimated bankruptcy risk *(Altman Z-score)*
- *Product-leadership* firms have lower empirical likelihood of bankruptcy
- Earnings volatility does **not** imply bankruptcy risk

Executive compensation

Pay mix

– *Product-leadership* firms rely more on equity based pay than *customer-intimacy* and *operational-excellence* firms

Performance measures

– *Product-leadership* firms tend to rely on measures of product innovation
– *Customer-intimacy* firms tend to focus on customer satisfaction and quality measures
– *Operational-excellence* firms tend to focus on productivity and cost-reduction measure

Managerial ability

– *Product-leadership* firms have CEOs with higher managerial ability scores
– *Operational-excellence* firms have CEOs with lower managerial ability scores
– *Product-leadership* CEOs have higher compensation than *operational-excellence* CEOs

Strategy and managerial incentives

- *Product-leadership* firms have higher *Vega*

- *Operational-excellence* firms have lower *Vega*

Vega is the sensitivity of chief executive officer (CEO) compensation to stock price volatility

Conclusion

- Generic strategies and value propositions explain many constructs and relationships commonly examined in financial accounting research and taught in financial statement analysis courses

- Ignoring strategy in empirical analysis may create an omitted variable problem