Do Competitive Advantages Lead to Higher Future Rates of Return?

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Research Questions

• What is a competitive advantage?
• Do competitive advantages lead to increased future profitability?
• Using ex-post realizations of profitability, we measure success of competitive advantages as:
  – Explanatory power
  – Persistence
Why is It Important?

• Managerial decision-making
  – Where should the firm concentrate its resources and effort?

• Analysis context
  – Examining the behavior of operating income by competitive advantages refines the predictive value of its components
    • Steady state versus positive/negative growth rates (implications for truncation period)
    • Important for both equity investors and creditors
Competitive Advantage Candidates

• Traditional
  – Economies of Scale
  – Product Differentiation
  – Innovation
  – Capital Requirements

• Expanded
  – Power over Suppliers
  – Power over Customers
  – Credible Threat of Expected Retaliation (financial flexibility)
Particulars

• Profitability
  – Return on Net Operating Assets (RNOA)
  – Adjust for Risk
  – Within Industry Analysis
  – Study mean effects and condition on level of competitive advantage effort to study over-time effects
  – One-year and five-years ahead horizon

• Sample
  – 1972 to 2003
  – 65,220 firm-year observations
Overview of Results

• Largest returns come from power over suppliers and the credible threat of expected retaliation
  – Result in a 3% risk- and industry-adjusted RNOA premium even after 5 years
• Bargaining power over customers results in modest long-term gains
• Traditional advantages such as product differentiation, innovation and capital intensity are not effective at protecting future profitability
Return on Net Operating Assets (RNOA)

• Measure of operating profitability (Nissim and Penman 2001)
  – Shown to be more relevant for forecasting future profitability than ROE or ROA (Fairfield et al 1996)

• Effects of financial leverage are eliminated
  – Zero NPV activities that cannot be a sustainable source of profitability
Risk-Adjusted Profitability

• Differences in risk among firms may contribute to the level of profitability needed to generate a “normal” return or to non-convergence of profitability over time

• Important to “risk-adjust” profitability to separate differences in risk from effects of competitive advantages
  – Risk-adjustment process is innovation in this paper
Risk of Operations

• Most prior studies focus on equity risk
• Need a measure of operational risk
  – Cost of capital for operations versus cost of capital for equity
  – Operational risk will not be depend on source of financing
Risk-Adjustment Method

- Use method from Easton and Sommers (JAR 2007) as starting point
  - Can estimate the cost of equity capital using current accounting data

\[
\frac{\text{eps}_{jt}}{\text{bps}_{jt-1}} = \delta_0 + \delta_1 \frac{p_{jt} - \text{bps}_{jt}}{\text{bps}_{jt-1}} + \zeta_{jt}
\]

where \( \delta_0 = r_E \), \( \delta_1 = (r_E - g)/(1 + g) \)
Risk-Adjustment Method
(Continued)

This is transformed to allow for estimation of the cost of capital of operations via the following regression equation:

$$\frac{OI_{jt}}{NOA_{jt-1}} = \delta_0 + \delta_1 \frac{V^{Oper}_{jt} - NOA_{jt}}{NOA_{jt-1}} + e_{jt}$$

where $$\delta_0 = r^{Oper}$$, $$\delta_1 = \left(\frac{r^{Oper} - g}{1 + g}\right)$$

where $$V^{Oper} = MVE + NFO$$
Summary Statistics

• Median RNOA before risk-adjustment = 10.4%
  – Nissim and Penman (2001) reported 10.0%

• Median RNOA after risk-adjustment = 3.3%
  – Implied cost of capital for operations of 7.1%
Industry Adjustment

• Controlling for industry eliminates differences in operating cycle, business model, resources, growth, and technology across industries
  – Allows for generalizability across industries within economy

• Use Fama and French (1997) 48 classifications to adjust dependent and independent variables
Descriptive Statistics – Table 2

• Median RNOA^{RA} is 3.3%
• Highest RNOA^{RA} industries:
  – Tobacco (10.1%), Trading (9.4%), Insurance (8.3%), Defense (7.2%), Printing (5.8%), Consumer Goods (5.2)
• Lowest RNOA^{RA} industries:
  – Coal (0.9%), Medical Equipment (1.1%), Precious Metals (1.1%), Communications (1.2%), Real Estate (1.3%), Agriculture (1.5%), Petroleum (1.7%), Lab Equipment (1.7%), Candy (1.7%)
Base Model

\[ RNOA_{t+1}^{RA} = \alpha_0 + \alpha_1 RNOA_t^{RA} + \alpha_2 \Delta RNOA_t^{RA} + \alpha_3 G_t^{NOA} + \alpha_4 Age_t + \alpha_5 OpSize_t + \epsilon \]

• Control for current level and change in profitability
  – Serially correlated with future profitability (Fairfield and Yohn 2001)
• Control for growth in NOA (denominator)
• Firm-level controls
  – Age
  – Size of operations (MVE + NFO)
• Vary dependent variable by horizon
  – \( t + 1 \), \( t + 5 \)
Expanded Models

Traditional:

\[
RNOA_{t+1}^{RA} = \alpha_0 + \alpha_1 RNOA_{t}^{RA} + \alpha_2 \Delta RNOA_{t}^{RA} + \alpha_3 G_{t}^{NOA} + \alpha_4 Age_{t} + \alpha_5 OpSize_{t} + \alpha_6 CoS_{t} + \\
\alpha_7 AdvInt_{t} + \alpha_8 Innov_{t} + \alpha_9 CapInt_{t} + \varepsilon
\]

Expanded:

\[
RNOA_{t+1}^{RA} = \alpha_0 + \alpha_1 RNOA_{t}^{RA} + \alpha_2 \Delta RNOA_{t}^{RA} + \alpha_3 G_{t}^{NOA} + \alpha_4 Age_{t} + \alpha_5 OpSize_{t} + \alpha_6 CoS_{t} + \\
\alpha_7 AdvInt_{t} + \alpha_8 Innov_{t} + \alpha_9 CapInt_{t} + \alpha_{10} OLLev_{t} + \alpha_{11} InvTurn_{t} + \alpha_{12} ARTurn_{t} + \\
\alpha_{13} MktShr_{t} + \alpha_{14} FLev_{t} + \alpha_{15} ExFunds_{t} + \varepsilon
\]

Diminishing Returns:

\[
RNOA_{t+1}^{RA} = \alpha_0 + \alpha_1 RNOA_{t}^{RA} + \alpha_2 \Delta RNOA_{t}^{RA} + \alpha_3 G_{t}^{NOA} + \alpha_4 Age_{t} + \alpha_5 OpSize_{t} + \alpha_6 CoS_{t} + \\
\alpha_7 \Delta CoS_{t} + \alpha_8 AdvInt_{t} + \alpha_9 \Delta AdvInt_{t} + \alpha_{10} Innov_{t} + \alpha_{11} \Delta Innov_{t} + \alpha_{12} CapInt_{t} + \\
\alpha_{13} \Delta CapInt_{t} + \alpha_{14} OLLev_{t} + \alpha_{15} \Delta OLLev_{t} + \alpha_{16} InvTurn_{t} + \alpha_{17} \Delta InvTurn_{t} + \\
\alpha_{18} ARTurn_{t} + \alpha_{19} \Delta ARTurn_{t} + \alpha_{20} MktShr_{t} + \alpha_{21} \Delta MktShr_{t} + \alpha_{22} FLev_{t} + \\
\alpha_{23} \Delta FLev_{t} + \alpha_{24} ExFunds_{t} + \alpha_{25} \Delta ExFunds_{t} + \varepsilon
\]
% Increases in Explanatory Power (Adj. R²)

<table>
<thead>
<tr>
<th>% Inc. over:</th>
<th>Traditional</th>
<th>Expanded</th>
<th>Dim. Returns</th>
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</thead>
<tbody>
<tr>
<td>t + 1</td>
<td></td>
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<tr>
<td>Base</td>
<td>6.72%</td>
<td>25.15%</td>
<td>32.53%</td>
</tr>
<tr>
<td>Traditional</td>
<td></td>
<td>17.27</td>
<td>24.19</td>
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<tr>
<td>Expanded</td>
<td></td>
<td></td>
<td>5.90</td>
</tr>
<tr>
<td>t + 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base</td>
<td>35.68%</td>
<td>78.12%</td>
<td>108.86%</td>
</tr>
<tr>
<td>Traditional</td>
<td></td>
<td>31.28</td>
<td>53.94</td>
</tr>
<tr>
<td>Expanded</td>
<td></td>
<td></td>
<td>17.26</td>
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</tbody>
</table>
## Regression Results: $\text{RNOA}_{t+1}$ (Model 4)

<table>
<thead>
<tr>
<th>Base &amp; Controls</th>
<th>Coeff.</th>
<th>t-stat</th>
<th>Traditional</th>
<th>Coeff.</th>
<th>t-stat</th>
<th>Expanded</th>
<th>Coeff.</th>
<th>t-stat</th>
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<tbody>
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<td><strong>Intercept</strong></td>
<td>0.001</td>
<td>0.31</td>
<td></td>
<td>-0.279</td>
<td>-5.52</td>
<td></td>
<td>0.063</td>
<td>4.12</td>
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<tr>
<td><strong>RNOA_t</strong></td>
<td>0.906</td>
<td><strong>11.54</strong></td>
<td></td>
<td>0.032</td>
<td>0.30</td>
<td></td>
<td>0.114</td>
<td>4.31</td>
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<tr>
<td><strong>ΔRNOA_t</strong></td>
<td>-0.141</td>
<td><strong>-3.45</strong></td>
<td></td>
<td>-0.286</td>
<td>-2.34</td>
<td></td>
<td>0.046</td>
<td>2.97</td>
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<tr>
<td><strong>G\textsuperscript{NOA}</strong></td>
<td>-0.122</td>
<td><strong>-6.99</strong></td>
<td></td>
<td>0.013</td>
<td>0.03</td>
<td></td>
<td>-0.136</td>
<td><strong>-3.96</strong></td>
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<tr>
<td><strong>Age</strong></td>
<td>-0.002</td>
<td>-0.48</td>
<td></td>
<td>-1.282</td>
<td>-5.73</td>
<td></td>
<td>-0.073</td>
<td><strong>-3.04</strong></td>
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<tr>
<td><strong>OpSize</strong></td>
<td>0.002</td>
<td>0.96</td>
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<td>0.291</td>
<td>0.59</td>
<td></td>
<td>0.053</td>
<td>1.05</td>
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<tr>
<td><strong>CapInt</strong></td>
<td>-0.814</td>
<td>-4.33</td>
<td></td>
<td>-0.133</td>
<td>-0.64</td>
<td></td>
<td>0.156</td>
<td>0.35</td>
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<tr>
<td><strong>ΔCapInt</strong></td>
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<tr>
<td><strong>Innov</strong></td>
<td>-1.282</td>
<td>-5.73</td>
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<td></td>
<td>-0.099</td>
<td>-1.25</td>
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<tr>
<td><strong>ΔInnov</strong></td>
<td>0.291</td>
<td>0.59</td>
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<td></td>
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<td>0.053</td>
<td>1.05</td>
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<td><strong>ArtTurn</strong></td>
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<td></td>
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<tr>
<td><strong>ΔArtTurn</strong></td>
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<tr>
<td><strong>MktShr</strong></td>
<td>-0.099</td>
<td>-1.25</td>
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<td></td>
<td></td>
<td></td>
<td>0.156</td>
<td>0.35</td>
</tr>
<tr>
<td><strong>ΔMktShr</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FL ev</strong></td>
<td>0.007</td>
<td>3.30</td>
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<td></td>
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</tr>
<tr>
<td><strong>ΔFL ev</strong></td>
<td>0.044</td>
<td>3.87</td>
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<tr>
<td><strong>ExFund</strong></td>
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<td><strong>2.75</strong></td>
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<tr>
<td><strong>ΔExFund</strong></td>
<td>0.071</td>
<td><strong>2.63</strong></td>
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</tbody>
</table>

**Adjusted $R^2 = .2196$**
Convergence Analysis

• Determines whether current level of competitive advantage results in sustainable future profitability over five subsequent years

• Inherent survivorship bias
  – Should bias toward convergence (and therefore against results)
Convergence of Industry- and Risk-Adjusted RNOA over 5-Year Horizon
Convergence based on Economies of Scale

Risk-Adjusted Return on Net Operating Assets

Year Relative to Portfolio Formation Year

- Low
- Mid-Low
- Mid
- Mid-High
- High

0.8%
Convergence based on Adv. Intensity

Year Relative to Portfolio Formation Year

Risk-Adjusted Return on Net Operating Assets

Low  | Mid  | High

Convergence 0.4%
Convergence based on Innovation

Risk-Adjusted Return on Net Operating Assets

Year Relative to Portfolio Formation Year

-0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08

Low to Mid-Low  Mid  Mid-High  High

-1.3%
Convergence based on Capital Intensity

Risk-Adjusted Return on Net Operating Assets

Year Relative to Portfolio Formation Year

-0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08

-0.03 -0.02 -0.01 0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08

0 1 2 3 4 5

-1.4%
Convergence based on Operating Liability Leverage

Year Relative to Portfolio Formation Year

Risk-Adjusted Return on Net Operating Asset

- Low
- Mid-Low
- Mid
- Mid-High
- High

2.7%
Convergence based on $1 / \text{Inventory Turnover}$

![Graph showing Risk-Adjusted Return on Net Operating Assets over years relative to portfolio formation year. The x-axis represents years relative to the portfolio formation year, ranging from 0 to 5. The y-axis represents the risk-adjusted return on net operating assets, ranging from -0.03 to 0.08. The graph includes lines for different risk categories: Low, Mid-Low, Mid, Mid-High, and High. The graph indicates an overall increase in risk-adjusted return as the years progress, with a convergence noted by the line for the High category rising to 0.8%.]
Convergence based on $1/\text{Receivables Turnover}$

Year Relative to Portfolio Formation Year

Risk-Adjusted Return on Net Operating Asset

$1.3\%$
Convergence based on Market Share

![Diagram showing convergence based on market share with a text note of 0.7%]
Convergence based on Financial Leverage

![Graph showing risk-adjusted return on net operating assets over years relative to portfolio formation year. The graph displays convergence based on financial leverage with a convergence trend indicated at 2.3%.]
Convergence based on Excess Funds

![Graph](image-url)
Concluding Remarks

• Greatest long-term benefits come from power over suppliers and the credible threat of expected retaliation

• Proxies for traditional competitive advantages such as product differentiation, innovation, and capital intensity are not effective at protecting future profitability