Lingering Impacts of the Global Financial Crisis: Innovativeness of US Forest Sector Manufacturers

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Roadmap

- Innovativeness background
- Context of forest sector
  - Global financial crisis
- Study background
- Methods
- Preliminary results
Types of Innovation

- Product, process, business systems
Innovation vs. Innovativeness

Innovation

创新

to create

something new
Innovation vs. Innovativeness

Innovativeness

創新性

to create something new characteristics

Han 2010
Definitions – Innovativeness

“the propensity of firms to create and/or adopt new products, manufacturing processes, and business systems.” – (Knowles et al. 2008)
What do we know about forest sector innovativeness?
“We’re working with wood, so what is there?”

– American Manager
“...we just make buggy whips, as fast as we can.”

– American CEO
“...we are really trying to, as we say in our strategy, we are developing innovative solutions for our customers”

– European Manager
“the biggest problem with this firm is its management. Most of the top management has grown up with big mills and established customers, which require very little innovation. All new issues and ideas are horror for them.”

– as quoted in Björkdah and Börjesson (2011)
• “…over 90% of total wood products sales revenue comes from products which were developed and commercialised more than 20 years ago.”
Three Types of Innovativeness

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>3.5</td>
</tr>
<tr>
<td>Process</td>
<td>4.5</td>
</tr>
<tr>
<td>Bus Systems</td>
<td>3.0</td>
</tr>
</tbody>
</table>
Three Types of Innovativeness

Product | Process | Bus Systems
---|---|---
3.5 | 4.5 | 4.5

Cross sector 2013
The GFC
U.S. Housing Starts
December Annual Rate: 557,000

Source: census.gov/const/
How Companies React to Recessions

- Necessity the mother of rigidity/mother of invention (McKinley et al. 2013)
- Threat-rigidity/threat-invention or innovation (Staw et al. 1981)
Dillard Stud Mill

- **Largest stud mill in US** (capacity 450 million feet)
- **Great Recession drives change**
  - Opened mentality to value-added (being adaptive)
  - Customer focus
  - Employee driven
  - Toyota modeled – heavy reliance on lean
  - New relationship between sales and production
    - Weekly NP discussions

Information and examples provided by Tony Flagor
Dillard Stud Mill
3x4

Information and examples provided by Tony Flagor
Dillard Stud Mill
MSR 2x6

Information and examples provided by Tony Flagor
Dillard Stud Mill
7x9 RR Ties

Information and examples provided by Tony Flagor
Dillard Stud Mill
6x8 RR Ties

Information and examples provided by Tony Flagor
Dillard Stud Mill
Mixed Loads

Information and examples provided by Tony Flagor
Methods

- **Study G1** – data reflects 2012
  - SIC 24 in US
  - 976 firms
  - 142 valid responses (15%)
- **Study G2** – data reflects 2015
  - Respondents from Study I
  - 142 firms
  - 6 no longer in business
  - 55 valid responses (40%)
  - Basic t-tests, regression
Study Timeline

- Before GFC
- 2008: Global Financial Crisis
- 2012: First data collection
- 2015: Second data collection
- 2016
### G1: Innovativeness Change & Performance

<table>
<thead>
<tr>
<th></th>
<th>Increased innovativeness</th>
<th>No change in innovativeness</th>
<th>Decreased innovativeness</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>79</td>
<td>34</td>
<td>20</td>
</tr>
<tr>
<td>Composite Performance</td>
<td>3.54</td>
<td>3.41</td>
<td>3.19</td>
</tr>
<tr>
<td>Return on Sales</td>
<td>3.46</td>
<td>3.48</td>
<td>3.33</td>
</tr>
<tr>
<td>Sales Growth Rate</td>
<td>3.60&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.52</td>
<td>2.94&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>After Tax Return on Sales</td>
<td>3.46</td>
<td>3.33</td>
<td>3.17</td>
</tr>
<tr>
<td>Gross Profit Margin</td>
<td>3.55</td>
<td>3.30</td>
<td>3.33</td>
</tr>
</tbody>
</table>

*Note:* Games–Howell post hoc test (unequal variances assumed)  <sup>a</sup><i>p < 0.10</i>, range of $F = 0.118–2.418.$
G1: Results

Post-recession customer orientation

Post-recession competitor orientation

Post-recession interfunctional coordination

Pre-recession product Innovativeness

Pre-recession process and business systems Innovativeness

Post-recession performance

Hansen & Nybakk 2016
G1/G2: Innovativeness Over Study Period

Pre GFC vs. Post GFC:
- Prog
- Proc/Bus

Comparison:
- Pre GFC: Prod (3.2), Proc/Bus (3.1)
- Post GFC: Prod (3.3), Proc/Bus (3.4)
G1/G2: Innovativeness Over Study Period

<table>
<thead>
<tr>
<th>Year</th>
<th>Prod</th>
<th>Proc/Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre GFC</td>
<td>2.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Post GFC</td>
<td>2.8</td>
<td>3.3</td>
</tr>
<tr>
<td>2015</td>
<td>3.0</td>
<td>3.2</td>
</tr>
</tbody>
</table>
G2: Performance Improvement

- Return on sales
- Sales growth rate
- After tax return on assets
- Gross profit margin

<table>
<thead>
<tr>
<th>Much lower</th>
<th>Slightly lower</th>
<th>Same</th>
<th>Slightly higher</th>
<th>Much higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
G2: Innovativeness & Performance

Product Innovativeness

Process/bus systems Innovativeness

Performance
G2: Innovative Activities

- Developing new foreign markets
- Developing new domestic markets
- Investing in promotion/advertising
- Investing in sales (dept. and/or salespeople)
- Developing new products
- Being more flexible with production
- Aggressiveness of business tactics/practices
- Acquisition of competing companies
- Investing in customer relationships

<table>
<thead>
<tr>
<th>Decreased</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Increased</th>
</tr>
</thead>
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# G1/G2: Production Mix/Product Strategy

<table>
<thead>
<tr>
<th>Product Mix</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity</td>
<td>45.6%</td>
<td>48.6%</td>
</tr>
<tr>
<td>Specialty</td>
<td>32.6%</td>
<td>26.6%</td>
</tr>
<tr>
<td>Custom Made</td>
<td>22.7%</td>
<td>24.9%</td>
</tr>
</tbody>
</table>
G2: Innovation Strategy

• Explore (3.53)
  – Introducing a new generation of products
  – Extending product range
  – Opening up new markets
  – Entering new technology fields

• Exploit (4.28)
  – Improving yield or reduced material consumption
  – Reduce production costs
  – Improving production flexibility
  – Improving existing product quality

<table>
<thead>
<tr>
<th>Not at all important</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>
Conclusions

• GFC may have lasting “innovativeness effect”
  – Yet, some innovative activities reduced
• Process innovativeness remains key driver of firm performance
• Forest sector remains focused on exploitation rather than exploration
• Stay tuned😊
Literature

• Han, X. (2010). Internal Presentation to Wood Science and Engineering Faculty. Corvallis, OR.