GSBE Marketing-Finance Symposium:

The Whole is Greater than the Sum of its Parts (III)

Maastricht, October 8, 2015

Prof. Dr. ir. Joost M.E. Pennings
Overview of Presentation

1. **Contracting & value creation**
   
   **Study 1:** Linking Channel Contracting to Shareholder Value: A Marketing-Finance Approach

2. **Traders behavior using MF approach**
   
   **Study 2:** Behavioral anomalies of Chicago Traders

3. **Reverse engineering & feasible-financial product identification**
   
   **Study 3** Case study “developing a world commodity index futures contract”
Study 1: Linking Channel Contracting to Shareholder Value: A Marketing-Finance approach

- Transforming financial objectives to marketing actions

Motivation: A key question raised by managers during depth interviews:

“How can we translate our focus on shareholder value into marketing decisions?”
Shareholder Value & Cash flow
Volatility → Risk Adjusted Cost of Capital

• Role of Marketing & Finance
  – Marketing activities can reduce the volatility of cash flows,
    • effectively lowering the firm’s cost of capital and reducing its working capital (cash) needs
    • lower cost of capital increases the firm’s net present value and hence improves shareholders’ wealth.
      » Lowering its cash needs,
      » return freed-up working capital to its shareholders for reinvestment purposes
Shareholder Value & Channel Contracts

We focus on the cash flow consequences of channel contracts as it directly relates to cash flow volatility and hence SHV

- **Spot Contracts:**
  - price of transaction determined at time of delivery; price unknown at time of contract engagement

- **Fixed-Price Contracts:**
  - price of transaction determined at time of contract engagement; price known from the start of contract relationship
Contractual Relationship

<table>
<thead>
<tr>
<th>Party 1</th>
<th>Party 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>Quantity</td>
</tr>
<tr>
<td>Quality</td>
<td>Quality</td>
</tr>
<tr>
<td>Price</td>
<td>Price</td>
</tr>
<tr>
<td>Time of Exchange</td>
<td>Time of Exchange</td>
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<tr>
<td>Place of Exchange</td>
<td>Place of Exchange</td>
</tr>
</tbody>
</table>

cash-flow preferences
Contract Relationship "Preferences"

- Marketing manager’s *internal environment*:
  - Risk attitude and risk perceptions

- Marketing manager’s *external environment*:
  - Shareholders
Contract Relationship Preferences: Hypotheses

- **H1:** CMs with a high focus on **SHV** are likely to prefer forward contract relationships over cash forward contract relationships.

- **H2:** **Risk aversion** and **risk perception** are positively related to the CM’s preference for a forward contract relationship over a cash relationship.
Preferred vs. Realized Channel Contracts

- Different degrees of focus on shareholder value may lead to **incongruity in contract preferences** ↔ interdependence between channel members

- Power, Conflict, and.....termination of the contract relationship?
Incongruent Contract Preferences & Financial facilitating Services (e.g. Derivatives)

- Financial Facilitating Services (FFS) can complement the cash flow consequences of a channel contract.

That is:

The cash flow from a forward contact =

1. Cash flow from spot contract +
2. Cash flow generated by taking a position in a derivative
Conflicting Contract Relationship Preferences

- H3: Channel conflict caused by **contract preference in congruency** increases the probability of channel members’ using financial facilitating services.
Conceptual model

**Internal environment**
- Channel member's Risk attitude, Risk perception and their interaction

**Channel conflict**
- Incongruity in contract preferences

**External environment**
- Managerial focus on shareholder value

**H1**
- Channel member's Contract preference
  - cash contract
  - forward contract

**H2**
- Realized channel contract relationship
  - cash contract
  - forward contract

**H3**
- Use of financial facilitating services
Empirical Study

• 140 marketing managers of food marketing channel (Producers, Wholesalers & Processors)

• Computer guided interviews

• Unique data set: soft data & accounting data
## Analysis & Results

### TABLE 1
Descriptive Statistics of the Sample

<table>
<thead>
<tr>
<th>Legal Form of Enterprise</th>
<th>Revenue in Euros*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private company</td>
<td>15.5%</td>
</tr>
<tr>
<td>Private limited company</td>
<td>70.9%</td>
</tr>
<tr>
<td>Public limited company</td>
<td>13.6%</td>
</tr>
<tr>
<td></td>
<td>Less than 1 million</td>
</tr>
<tr>
<td></td>
<td>1- 2.5 million</td>
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<tr>
<td></td>
<td>2.5 -5 million</td>
</tr>
<tr>
<td></td>
<td>5-10 million</td>
</tr>
<tr>
<td></td>
<td>Over 10 million</td>
</tr>
<tr>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highest Educational Degree of Respondent</th>
<th>Type of Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school</td>
<td>Producer</td>
</tr>
<tr>
<td>College</td>
<td>Wholesaler</td>
</tr>
<tr>
<td>University</td>
<td>Processors</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Business</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer</td>
<td>11.8%</td>
</tr>
<tr>
<td>Wholesaler</td>
<td>59.0%</td>
</tr>
<tr>
<td>Processors</td>
<td>29.2%</td>
</tr>
</tbody>
</table>
Risk attitudes

![Graph showing utility vs. price for Manufacturers, Wholesalers, and Processors.](image-url)
## Analysis & Results

### Characteristics of Channel Members

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Entire Sample (n= 127)</th>
<th>Producers (n= 15)</th>
<th>Wholesalers (n= 75)</th>
<th>Processors (n=37)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Preferences</td>
<td>Cash: 46.5%</td>
<td>Cash: 73.3%</td>
<td>Cash: 49.4%</td>
<td>Cash: 29.6%</td>
</tr>
<tr>
<td></td>
<td>Forward: 53.5%</td>
<td>Forward: 26.7%</td>
<td>Forward: 50.6%</td>
<td>Forward: 70.4%</td>
</tr>
<tr>
<td>Experiencing Channel Contract Conflict</td>
<td>52.0%</td>
<td>35.7%</td>
<td>54.8%</td>
<td>48.6%</td>
</tr>
<tr>
<td>(Channel member’s contract preference is not the one that has been realized)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Facilitating Services Usage</td>
<td>55.9%</td>
<td>40.0%</td>
<td>62.6%</td>
<td>48.6.1%</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>Parameter estimate</td>
<td>p-value</td>
<td>Correctly classified choices</td>
<td>PRPE</td>
</tr>
<tr>
<td>------------</td>
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</tr>
<tr>
<td><strong>Hypothesis 1</strong>&lt;br&gt;Independent variable: &lt;br&gt;Channel members’ contract preferences &lt;br&gt;(0 = cash contract, 1 = forward contract)&lt;br&gt;Dependent variables: &lt;br&gt;Managerial focus on shareholder value</td>
<td>1.299</td>
<td>0.005</td>
<td>82.9%</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Hypothesis 2</strong>&lt;br&gt;Independent variable: &lt;br&gt;Channel members’ contract preferences &lt;br&gt;(0 = cash contract, 1 = forward contract)&lt;br&gt;Dependent variables: &lt;br&gt;Risk attitude</td>
<td>2.894</td>
<td>0.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk perception</td>
<td>3.238</td>
<td>0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction between risk attitude and risk perception</td>
<td>0.237</td>
<td>0.006</td>
<td>78.2%</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Hypothesis 3</strong>&lt;br&gt;Independent variable: &lt;br&gt;Channel members’ use of financial facilitating services &lt;br&gt;(0 = not using, 1 = using)&lt;br&gt;Dependent variable</td>
<td>Channel conflict</td>
<td>1.192</td>
<td>0.004</td>
<td>87.2%</td>
</tr>
</tbody>
</table>
Relating Top Management Questions to Frontline Marketing Actions

• Do frontline marketing managers need help from a third party?
  
  → Yes. When the strive for shareholder value leads to channel conflicts

• Do suppliers and customers have to have the same focus on shareholder value in order to establish long term relationships?
Relating Top Management Questions to Frontline Marketing Actions

- How will the use of financial facilitating services change markets and channel relationships?

- Financial facilitating services can be used to redistribute cash flow volatility outside the marketing channel.
Study 2: Marketing managers’ behavior using MF approach

How do market managers behave in the context of using FFS?

- Behavioral finance literature
  - Risk behavior literature
    - Anomalies
Drivers of Anomalies

• Prospect Theory
  – A theory that people value gains and losses differently
    • loss-aversion theory
      – According to prospect theory, losses have more emotional impact than an equivalent amount of gains

• Probability weighting
  – expresses that people tend to overreact to small probability events, but under react to medium and large probability events
Probability weighting & Marketing Managers’ use of FFS

- Study how professional marketers behave in situations of risk and uncertainty
  - allowing for loss aversion and probability weighting
- Investigate how individual characteristics influence trading behavior
- Investigate how trading behavior affects performance in the market
Results: Manager # 1

\[ U(x) = \begin{cases} 
  x^{0.7682} & \text{if } x > 0 \\
  -(-x)^{1.1621} & \text{if } x \leq 0 
\end{cases} \]

Gains: \( w(p) = \exp\left[-(-\ln(p))^{1.2439}\right] \)

Losses: \( w(p) = \exp\left[-(-\ln(p))^{0.8057}\right] \)
Results: manager # 7

\[ U(x) = \begin{cases} 
  x^{0.4987} & x > 0 \\
  -(-x)^{0.7826} & x \leq 0 
\end{cases} \]

gains: \( w(p) = \exp[-(-\ln(p))^{3.2494}] \)

losses: \( w(p) = \exp[-(-\ln(p))^{1.7927}] \)
Results of 50 Chicago managers

- There is large variability in the magnitude of the parameters of the utility and weighting functions.
  - These differences may also represent several differences in behavior.

- Interaction between utility and weighting functions may lead to many other behavior patterns.
Results of 50 Chicago Managers

- Performance of traders significantly different!
  - Best performers: Traders that do not exhibit loss aversion and probability weighting!

Can we become better traders?
→ Selection & Learning
Example: Optimal use of futures in case of loss aversion

\[ h = \frac{(1 - \lambda) \cdot \mu_f}{(\theta_G + \lambda \theta_L) \cdot \sigma_f^2} - \frac{\sigma_{cf}}{\sigma_f^2} \]

- \( \mu_f \) = expected change in futures price
- \( \sigma_f^2 \) = variance of futures price change
- \( \sigma_{cf} \) = covariance between cash and futures price change
- \( \lambda \) = loss aversion
- \( \theta_G, \theta_L \) = risk aversion
Study 3: Developing Risk Management Instruments

- Needs (instrumental, convenience)
  - Alternative price risk management instruments
    - Choice behavior of customers
      - Service design
        - Service delivery
          - Exchange

- Technical feasibility
  - liquidity
    - hedging efficiency
      - cash market size
        - homogeneity
          - Underlying commodity characteristics
Study 3: Case Study
Reverse engineering & feasible-financial product identification

- Statistical tools that can map “soft” variables like attitudes & intentions to concrete product attributes!

  - Product attributes include for futures are for example:
    - Contract size
    - Specification of underlying product
    - Way of trading
Goal: Creating high volume “world” commodity index

- Reduce *residual risk of users*
- Produce *speculation opportunities*
- Broaden the spectrum of users:
  - hedgers – investors – locals
Reverse engineering & feasible financial product identification

1. Commodities included
   (3 commodities: B, C, and P)

2. Volume weighting scheme

3. Re-balancing (volume) scheme

4. Price weighting scheme
Reverse engineering & feasible financial product identification

Commodities included → BC; BP; CP; BCP

1. Volume weighting scheme (per country)

E = total export volume
G = gross indigenous production
I = total import volume
2. Rebalancing rule

\[ M = \text{monthly} \]
\[ A = \text{annually} \]
\[ Y = \text{over the calculation period} \]
Reverse engineering & feasible financial product identification

3. **Index Value: Price Weighting**
   - Average weekly price
   - Weighting the weekly average prices by the volume for each individual country
Reverse engineering & feasible financial product identification

4. Index performance evaluation

- Hedging effectiveness
  - hedgers
  - investors

- Arbitrage possibilities
  - Locals/traders/speculators/investors
Reverse engineering & feasible-financial product identification

- **Hedging profiles:**
  - HP1: b producer in country j
  - HP2: c producer in country j
  - HP3: p producer in country j
  - HP4: trader in country j
Study 4: Case Study
Reverse engineering & feasible-financial product identification

- **Fund (speculative) profiles:**
  - FP1: Inflation index (HCPI)
  - FP2: German discount rate
  - FP3: FTSE UK top 100-index
  - FP4: German DAX-index
  - FP5: CAC 40-index
  - FP6: EURO.NM all share-index
  - FP7: Dow Jones Stoxx Euro-index
  - FP8: FTSE Euro top 100-index
Reverse engineering & feasible-financial product identification

- **72 indices**
  - x 15 countries
  - x 4 HPs
  - x 8 FPs
  - = 12960 performance evaluations

A set of indices selected for behavioral analysis
A General Conceptual Model

Finance approach
- Technical information
  - Financial service
  - Technical feasibility

Behavioral approach
- Customer specific information
  - Customer
  - Financial needs and customer choice behavior

Integration
- Economic feasibility?
  - Behavioral issue

Behavioral-Finance approach
- Technical feasibility?
  - Finance issue
Case Study: Developing Commodity Futures Index X

• Research questions:
  – What is the optimal specification for the futures / options (combining this info with technical feasibility & finance results)?
  – Can we identify different segments of potential customers? → customized product development
Preference Structure of Customers

- Importance of each attribute (e.g. way of trading)
- Utility of level of attribute (e.g. way of trading: electronically vs. open outcry)
Research Design

• **Target Group**
  - Potential users of index product

• **Focus groups**
  - Revealing what attributes they deem important
  - Decision criteria

• Based on the group discussion we developed futures and options profiles
Research Design: 32 index commodity profiles (proto types) (options and futures)

- Characteristics of contracts
  - contract value (€25,000, €100,000, €250,000 and €1,000,000)
  - trade frequency (1× per day, 2× per day, 5× per day, continuous)
  - way of trading (electronically vs. floor)
  - number of expiration dates (¼ & ½ year, ¼,½ & 1 year, ¼,½,1&2 years, ¼,½,1,2&3 years)
  - option type (American vs. European)
Research Design:
32 index commodity profiles (options and futures)

- Respondents: 100 investors
  - Professional investors (including top management members of blue chip companies)
  - Private investors
Research Design

• Respondents had to rank the various profiles

• During the ranking, the computer program estimated the utility attached to each attribute and level

• Estimating probability of using “ideal” profile
Results

Normalized stress: 0.0710

- Futures
- Options
- Professional investors
- Private investors
Results
What about financial / technical constraints? (The F in MF Approach!)

Product development department concerns:

- Easy of Clearance (Easy ↔ Difficult)
- Liquidity (Low ↔ High)
- Costs (Low ↔ High)
Include the F in M map!
Optimal Solution?

Multiple Axial Partitioning Constraints (MAPC)

- Impose constraints on the product map, in such a way that convex regions in the map correspond to unique combinations of product characteristics and feasibility from financial/technical/strategic considerations (constraining attributes)
Solution

Normalized stress: 0.0848

- Futures
- Options
- Professional investors
- Private investors
Conclusions

- New statistical MF tool available that:
  - Can transform customers’ preferences in concrete attributes of futures/options
  - Are able to take the technical constraints into account
  - And hence operationalize our new approach toward product development
Is This Technique The Holy Grail?

- No, it is a decision support system for both the marketing and product development department

- The concept structures product development → significant increase in success rate

- New developments in research
  - Neurosciences – Marketing-Finance interface