Commodity Risk Management: Supply Chain Best Practices
May 24th, 2017: Session Code: JA17

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Executive Vice President
Global Risk Management Corp.

Commodity trading is not suitable for all investors. There is an inherent risk of loss associated with trading commodity futures and options on futures contracts, even when used for hedging purposes. Only risk capital should be used when investing in the markets. Past performance is not indicative of future results.
Agenda

I. Commodity Market Volatility

II. Case Study: The Impact of Commodity Prices on Financial Results & Supply Chain Metrics

III. Best Practices of Commodity Risk Management in the Supply Chain
COMMODITY MARKET VOLATILITY
Today’s Purchasing Environment is Heavily Influenced by Outside Factors:

- Energy Markets
- Weather
- Terrorism
- Food Contamination
- Global Commodity Cycles
- Growing Asian Demand
- Government Ag Policy
- Speculative Fund Money
- Bio Fuels
- Internal Risk Communication
- Competitive Issues
- Price Forecasting Error
- $USD

Global Risk Management
What is Volatility?
Volatility by Asset Class

Currencies | Interest Rates | Equity Indices | Commodities
---|---|---|---
0% | 10% | 20% | 30% | 40% | 50% | 60% | 70%

Bar chart showing volatility for different asset classes.
Commodity Market Volatility

Why are commodities more volatile than other asset classes?

- Mother Nature
- Institutional and Speculative Investors
- Government Policy
- Liquidity
- Economics 101 as it pertains to inelastic demand
IMPACT OF COMMODITY PRICE VOLATILITY ON OPERATING RESULTS:
KEURIG GREEN MOUNTAIN INC.
## Keurig Green Mountain Inc.

<table>
<thead>
<tr>
<th>Consolidated Statements of Operations (Dollars in ‘000’s)*</th>
<th>September 26th 2015</th>
<th>% of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>$4,520,031</td>
<td>100%</td>
</tr>
<tr>
<td>Cost of Sales</td>
<td>2,912,507</td>
<td>64%</td>
</tr>
<tr>
<td>Gross Profit</td>
<td>1,606,524</td>
<td>36%</td>
</tr>
<tr>
<td>Selling &amp; Operating Expenses</td>
<td>539,259</td>
<td>12%</td>
</tr>
<tr>
<td>General &amp; Administrative Expenses</td>
<td>287,591</td>
<td>6%</td>
</tr>
<tr>
<td>Restructuring Expenses</td>
<td>15,250</td>
<td>1%</td>
</tr>
<tr>
<td>Operating Income</td>
<td>$765,424</td>
<td>17%</td>
</tr>
</tbody>
</table>

*Source: Keurig Green Mountain Inc. Form 10-K file 11/19/2015*
## GRM Cost of Sales Assumptions *

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Sales</td>
<td>$2,912,507</td>
<td>100%</td>
</tr>
<tr>
<td>Coffee Costs</td>
<td>873,752</td>
<td>30%</td>
</tr>
<tr>
<td>Non-Coffee Costs</td>
<td>2,038,755</td>
<td>70%</td>
</tr>
</tbody>
</table>

* GRM Estimation for Illustration Purposes
Understanding Your Risks

Historical coffee prices best fit to a lognormal distribution
Risk Analytics – Stochastic Modeling

Simulated Impact of Coffee Prices on Operating Income

- Operating Income
- Minimum: -$780,820.43
- Maximum: $1,312,365.42
- Mean: $765,379.99
- Std Dev: $197,965.72
- Values: 10,000

$765,424
Simulated Results

A one SD increase in coffee prices reduces operating income to $580 Million

$765,424
Simulated Results

What is the probability unfavorable movements in coffee prices will reduce operating income by $100 Million?

Simulated Impact of Coffee Prices on Operating Income

- Minimum: $-780,820.43
- Maximum: $1,312,365.42
- Mean: $765,379.99
- Std Dev: $197,965.72
- Values: 10000

$765,424
Key Concepts and Terms

- **Volatility**: Statistical measure of market variation.

- **Risk**: Volume of commodities x volatility

- **Hedge Coverage**: The use of futures, options or fixed-price agreements to reduce commodity risk.

- **Financial Risk Tolerance**: Amount of money the company can afford to lose without changing the way it does business. Typically a % of the key financial metric.

- **Product Pricing Window**: The amount of time it takes to implement a product price change in response to a competitive action, significant cost change, or price leadership role.

- **Even Position**: When sales and commodity coverage are in balance and profit margins are secured. This should match the product pricing window. Positions “long” or “short” of even add risk. Also know as “Neutral Cover.”
Even Position Length is Identified

- If raw material cost is known when prices are set… No risk
- Keep purchases and sales in balance
- When purchases extend to cover sales, the position is “neutral”

- The length of commodity coverage that balances the business’ ability to deliver its financial objectives with its competitive position in the industry
- Incremental coverage long or short of even creates risk
Neutral Cover Length—Key Questions

- Time to implement price change?
- Consumer elasticity?
- Who leads?
- Customer willingness?
- Competitive cover?
- Cost savings?
- Cost of holding cover?
- Supply assurance?
7 Best Practices

**Effective Hedging**
- approved strategies
- approved tools
- new tools
- tools match risk profile

**Decision Making**
- accurate positions
- quantified impacts
- quantified risk
- “what if” scenarios

**Consistency**
- BU alignment
- knowledgeable
- role understood
- well trained

**Tool Utilization**
- BU Alignment
- Flexibility
- Policy and Controls
- Strategy Analysis
- Personnel

**Creates Internal Synergy**
- $ risk tolerance
- product pricing horizons
- purchasing expectations
- communication
- margin centric risk management

**Business Adaptation**
- flexible strategies
- adjust to business environment
- maintain competitive costs
- match risk profile
- BU alignment

**Internal Protocol**
- written document
- broad adherence
- 8 critical factors
- BU alignment

**Process Rigor**
- market conditions
- seasonal tendency
- statistical analysis
- market risk/reward
- business risk/reward
Benchmarking current risk management processes against industry “best practices” highlights area of strengths and concerns.

Areas reviewed

- Business unit alignment: 25%
- Policy and controls: 20%
- Reporting: 15%
- Personnel: 15%
- Strategy analysis rigor: 10%
- Hedge tools and utilization: 10%
- Strategy flexibility: 5%
## Risk Management Scorecard - Example

<table>
<thead>
<tr>
<th>I. Business Unit Alignment</th>
<th>Score</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unified and quantified definition of risk</td>
<td>2.0</td>
<td>40%</td>
</tr>
<tr>
<td>Sr. Mgmt involved in extended position decisions</td>
<td>3.0</td>
<td>25%</td>
</tr>
<tr>
<td>Formal commodity and business strategy review process</td>
<td>2.0</td>
<td>25%</td>
</tr>
<tr>
<td>Mgmt consistently draws on commercial expertise</td>
<td>2.0</td>
<td>10%</td>
</tr>
</tbody>
</table>
Purchasing Role is Not Understood

The Company's most important goal of the Commercial Department and its commodity risk management process should be to:

<table>
<thead>
<tr>
<th>Generate significant savings versus the market</th>
<th>Sr Team</th>
<th>Finance</th>
<th>Marketing</th>
<th>Commercial</th>
<th>Sales</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protect margins on all forward priced products</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Protect costs versus plan</td>
<td>3</td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capture savings versus year ago if possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy in the lower percentile of a historical pre-</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Sr. Management Comments:

• Would like to see Purchasing to play around the edges, doesn’t believe they can beat the overall market.

• Purchasing needs to be focused to beat the market.

• Purchasing goal should be to provide a level of certainty.

• Primary goal of the Purchasing team is to beat the market by 3% over a period.

• Goal, keep the factory running. Add value wherever they can
### How long does it take to make a finished product price change in response to changing commodity costs?

<table>
<thead>
<tr>
<th>Time Periods</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Period or Less</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2 Periods</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>3 Periods</td>
<td>6</td>
<td>29%</td>
</tr>
<tr>
<td>4 Periods</td>
<td>4</td>
<td>19%</td>
</tr>
<tr>
<td>5 Periods</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>6 Periods</td>
<td>8</td>
<td>38%</td>
</tr>
<tr>
<td>7 Periods</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>More Than 7 Periods</td>
<td>1</td>
<td>5%</td>
</tr>
</tbody>
</table>

Follow-up revealed a 4 month window to actually affect a change.
Acceptable Risk Tolerance - Survey Responses

How large of a commodity cost surprise can be absorbed by the business within a fiscal year without major earnings impact?

<table>
<thead>
<tr>
<th>Range</th>
<th>Number of Response(s)</th>
<th>Response Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 200,000 AUD</td>
<td>2</td>
<td>8.3%</td>
</tr>
<tr>
<td>&gt;200,000 AUD to 500,000 AUD</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>&gt;500,000 AUD to 1,000,000 AUD</td>
<td>7</td>
<td>29.1%</td>
</tr>
<tr>
<td>&gt;1,000,000 AUD to 1,600,000 AUD</td>
<td>4</td>
<td>16.6%</td>
</tr>
<tr>
<td>&gt;1,600,000 AUD to 3,600,000 AUD</td>
<td>5</td>
<td>20.8%</td>
</tr>
<tr>
<td>&gt;3,600,000 AUD</td>
<td>3</td>
<td>12.5%</td>
</tr>
<tr>
<td>No Responses</td>
<td>3</td>
<td>12.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Initial responses indicated wide divergence

Follow-up identified a unified definition of risk at $3 million
Case Study – Quantifying risk across a diverse portfolio of businesses

- Businesses stated they could absorb $80 million commodity risk
- Sr. Management was shocked by the magnitude
- Analysis reduced acceptable portfolio risk to $55 million
- New policies were implemented to reduce that potential impact

<table>
<thead>
<tr>
<th>Business</th>
<th>Risk Tolerance</th>
<th>Pricing Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5.0</td>
<td>6 months</td>
</tr>
<tr>
<td>B</td>
<td>1.0</td>
<td>1 year</td>
</tr>
<tr>
<td>C</td>
<td>0.0</td>
<td>1 month</td>
</tr>
<tr>
<td>D</td>
<td>5.0</td>
<td>Weekly</td>
</tr>
<tr>
<td>E</td>
<td>4.0</td>
<td>Monthly</td>
</tr>
<tr>
<td>Total (not all divisions shown)</td>
<td>$80.0</td>
<td></td>
</tr>
</tbody>
</table>
Process Discovers Hidden Risk

**Internal Risk**
- Poor sales, demand, and position reporting systems
- Nonexistent or inconsistent understanding of financial risk
- Risk not quantified
- Product pricing strategies not understood throughout
- Disconnect between margin/product pricing and commodity strategies
- Heavy commodity price forecasting and personal bias focus
- Lack of experience/trained personnel
- Lack of ongoing disciplined RM process

**External Risk**
- Expanded market volatility
- Outside market influences leading to unpredictable market behavior
- Economy leading to poor financial performance
- Uncompetitive cost structures
Presentation Highlights

- Commodity markets are increasingly volatile and can significantly impact raw material costs & profit margins

- Stochastic modeling is a valuable tool to quantify, simulate, and communicate risk

- Integrating the 7 best practices of a commodity risk management program will lead to an enduring competitive advantage for your organization
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Why Do Clients Hire GRM?

• **Trust** – At GRM, we earn our client’s trust by maintaining the strictest level of confidentiality, ethics and uncompromised objectivity at every level of the relationship.

• **Customer Service** – GRM delivers its industry recognized level of customer service through exceptional responsiveness, live access to our team and critical updates on events that impact our clients business.

• **Knowledge** – We leverage our holistic farm-to-fork industry knowledge to provide strategic business solutions for the benefit of our clients.

• **Experience** – We have sat in your chair; GRM brings over 150 years of diverse experience, allowing us to connect with the unique challenges of our clients.

• **Problem Solving** – Through a blend of creative thinking and advanced analytics we provide customized solutions to the business challenges of our clients.

• **Industry Credibility** – GRM’s outstanding credibility in the food & agriculture industry allows us to partner with outside resources to expand our service offerings to our clients.