Supply Risk Management

CIPS

June 2011
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A.T. Kearney used the text and graphs compiled in this report in a presentation; they do not represent a complete documentation of the presentation.
Agenda

- The supply risk challenge
- A.T. Kearney’s approach to Supply Risk Management
- A.T. Kearney’s Supply Risk Management experience
The supply risk challenge
New drivers and uncertainties will strongly impact future commodity markets underpinning the need for risk mgmt.

Drivers and Uncertainties

- Economic power migrates to Asia
- Changing industry landscape
- Business goes global
- Changing consumer landscape
- Environmental change
- Growing demands on businesses (CSR...)
- Pervasive insecurity
- ...
Especially price volatility has increased in the last years reaching in some periods very high levels

Commodity price evolution since January 2005

Source: Bloomberg, A.T. Kearney
So companies with a strong exposure to commodity markets have to encounter new challenges

### Major Challenges

<table>
<thead>
<tr>
<th>Ensuring Supply Security</th>
<th>Managing Price Risks</th>
<th>Managing Sustainability</th>
<th>Ensuring Raw Material Flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Develop strategic options for supply access at competitive prices</td>
<td>• Mitigate market price increase impacts and price volatility</td>
<td>• Long term management of sustainable sources for supply</td>
<td>• Develop and implement mitigation strategies/actions</td>
</tr>
<tr>
<td>• Assess logistics in tightening supply markets</td>
<td>• Assess value of alternative hedging strategies</td>
<td>• Acceptance of sustainable supply sources by the business units</td>
<td>• Increase specification flexibility</td>
</tr>
<tr>
<td>• Adjust supply strategies to changing market situations (e.g. bio fuel)</td>
<td>• Mandatory cover policy and clear governance</td>
<td>• Reduce input costs by supporting reduction of commodity usage</td>
<td></td>
</tr>
</tbody>
</table>
Nevertheless executives are not sufficiently prepared for meeting this challenges by putting SRM at the top of their agenda.

**Performance of own Supply Risk Management**

- in % of responding companies -

<table>
<thead>
<tr>
<th>Level</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very strong</td>
<td>7</td>
</tr>
<tr>
<td>Strong</td>
<td>44</td>
</tr>
<tr>
<td>Moderate</td>
<td>39</td>
</tr>
<tr>
<td>Weak</td>
<td>5</td>
</tr>
<tr>
<td>Very weak</td>
<td>5</td>
</tr>
</tbody>
</table>

**Introduction/Improvement plans with regard to Supply Risk Management**

- in % of responding companies -

<table>
<thead>
<tr>
<th>Time Frame</th>
<th>Introduction</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today</td>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>Next Year</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Within the next three years</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Not planned</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

Source: A.T. Kearney Supply Risk Management Study (Europe)
A potential reason is that there are a lot of misbeliefs around commodities and risk management

<table>
<thead>
<tr>
<th>Common Misbeliefs…</th>
<th>…and corresponding Truths</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;You can’t beat the market, so just index your prices in your contracts&quot;</td>
<td>Substantial <strong>savings can be achieved through dynamic contracting</strong> by varying contract timing, duration and index according to market situation</td>
</tr>
<tr>
<td>&quot;There is no way that we can forecast the future price development of the commodity markets&quot;</td>
<td>Often true; however the name of the game is to <strong>understand market drivers and trends</strong> and to take the right positions</td>
</tr>
<tr>
<td>“We are hit equally as our competitors”</td>
<td>A company that understands and <strong>acts upon its supply risk exposure will gain competitive advantage</strong>, as it understands underlying costs, limits the price exposure etc.</td>
</tr>
<tr>
<td>&quot;Our company’s policy is not to employ financial instruments as we don’t want to speculate&quot;</td>
<td>Each supply or sell-side contract has impact on the company’s commodity and therefore risk position; the <strong>size of the open position determines the level of risk and speculation</strong></td>
</tr>
<tr>
<td>&quot;Security of supply is our priority, therefore there is no place for contracting tactically&quot;</td>
<td><strong>Security of supply is an integral part of Commodity Risk Management.</strong> A strategic view on commodities will enable companies to take the appropriate decisions</td>
</tr>
</tbody>
</table>

Source: A.T. Kearney
A.T. Kearney’s approach to Supply Risk Management
The A.T. Kearney Supply Risk Management approach involves six elements

Elements of the A.T. Kearney approach to Supply Risk Management

- Define the risk agenda and objectives
  - Risk agenda: What are the risks to be considered e.g. Event based, Supplier consolidation, Price risks, etc...
  - Risk management objectives: What do the clients want to achieve, e.g. budget compliance, beat the market, etc....?

- Deploy Commodity strategies e.g. leverage the Purchasing Chessboard® strategies to shift supply/demand balance

- Gather supply market and supply chain dynamics information; this will be the starting point for defining applicable risk management levers

- Define contracting strategies, e.g. End-to-end commodity management/ Fingerprint methodology

- Deploy hedging strategies to ensure compliance with a desired risk profile (financial and non-financial instruments)

- Implement Process and organizational set-up to manage risk

All elements have been used successfully in various combinations in projects over the last years

Source: A.T. Kearney
A portfolio of diversified frameworks need to be adopted to fully cover Supply Risk Management

A.T. Kearney Tools supporting the Supply Risk Management approach

Supply Risk Management Assessment Tool

@Risk Methods/Risk reporting

Purchasing Chessboard®

Commodity Fingerprint methodology
Setting the risk agenda and objectives is the foundation for a company’s future Supply Risk Management

Setting the risk agenda and objectives

Revenues, costs

Top line risks
- Disruptions in physical material availability
- …

Minimize top line risks – secure supply
(Disadvantage: Potentially high costs)

Cover customer contracts
(Disadvantage: No comparative advantage, lack of alignment with financial plan)

Bottom line risks
- Material price changes
- Exchange rate changes
- …

Maximize the margin – beat the market
(Disadvantage: Potentially high residual risk if not hedged and not aligned with financial plan)

Minimize bottom line risks – ensure budget compliance
(Disadvantage: No comparative advantage)

The risk agenda and objectives result from a company’s risk appetite and risk bearing ability

Source: A.T. Kearney
Understanding supply chain dynamics will be key for deriving the right risk and hence commodity strategy.

Market transparency framework: Example steel

How will the input factors develop?

How will the supply-demand balance change?

Historical price and cost relationship

Steel price

Margin

SG&A

Opex

Alloys

Scrap

Coking coal

Iron ore

Jan. 04

Jan. 09

Input factor driven

Supply-demand driven

Gray: Negative margin
Source: A.T. Kearney
To achieve substantial savings in volatile markets we use a diversified portfolio of sourcing approaches.

**Demand and supply power**

- Number of credible suppliers
- Suppliers market share
- M&A dynamics
- Entry barriers
- Ease of substituting supplier
- Availability of products

**Demand power:**
- Your share of demand
- Growth offered to suppliers
- Opportunities for suppliers to develop competencies

**A.T. Kearney proprietary Purchasing Chessboard®**

**Internal communication**

- Board level stage setting: Breaking new ground by using differentiated strategies
- Functional leaders role setting: Defining a common language to set the business case and mobilize the organization
- Supply management direction setting: Mastering 64 deep-dive approaches to carry through the implementation
The Purchasing Chessboard® can be leveraged to manage risk, e.g. by shifting demand/supply power

**Potential A.T. Kearney Purchasing Chessboard® strategies (examples)**

- **Design for Sourcing**
  - Increase demand flexibility, e.g. from developing multiple formulas
  - Results in improved pricing power and security of supply

- **Vertical integration**
  - Integrate vertically either through acquiring assets or virtually through e.g. hedging
  - Results in overall decreased risk exposure and increased security of supply

- **Intelligent deal structure**
  - Adopt deal structures on both supply and customer sides to desire risk exposure
  - Results in decreased overall risk exposure

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Source: A.T. Kearney
4 The commodity fingerprint analysis determines contracting approaches within the risk objectives/limits

Fingerprint approach to manage supply risk

**Fingerprint of raw materials supply development (e.g. Acetone/ Phenol)**

<table>
<thead>
<tr>
<th>Product: Acetone</th>
<th>Dominating by-product: Phenol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target contract</td>
<td></td>
</tr>
</tbody>
</table>

**Contracting matrix for current and future supply situation**

<table>
<thead>
<tr>
<th>Future product criticality</th>
<th>Zone I</th>
<th>Zone II</th>
<th>Zone III</th>
<th>Zone IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed volume in advance</td>
<td>&lt;1 month</td>
<td>1 month</td>
<td>&lt;1 month</td>
<td>&lt;1 month</td>
</tr>
<tr>
<td>Share of spot purchase</td>
<td>Incr. strongly (50-50%)</td>
<td>Increase (30%)</td>
<td>Maintain low (&lt;10%)</td>
<td></td>
</tr>
<tr>
<td>Duration of contracts</td>
<td>12 months</td>
<td>12 months</td>
<td>12 months</td>
<td>12 months</td>
</tr>
</tbody>
</table>

**Results achieved**

- Savings of 3-10% can (at least) be achieved depending on situation:
  - In times of overcapacity, the client should get up to 5% price reduction compared to historic pricing (e.g. ICIS)
  - Playing the contracting right could give at least another 3-5%, by separating pricing (fixed vs indexed) from delivery time and/or based pricing on feedstock and fixed conversion instead of final raw material
- Strategy for securing supply defined with a potential effect several times that of the savings achieved
Commodity fingerprinting is built around monitoring the current operating rate compared to the COR\(^{(2)}\)

Supply criticality: Scale of current OR\(^{(1)}\) vs. COR\(^{(2)}\)

<table>
<thead>
<tr>
<th>Operating Rate</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very low operating rate</td>
<td>Low to Medium operating rate</td>
<td>Medium to High operating rate</td>
<td>Very High operating rate</td>
</tr>
</tbody>
</table>

\(OR = \) Operating rate, ratio of current production to capacity production

\(COR = \) Critical Operating Rate, rate at which production exceeds sustainable operations

Source: A.T. Kearney analysis
Commodity fingerprinting is used to systematically develop dynamic contracting strategies

Supply criticality: Inflection points for one chemical

**Supply/demand balance**

- **loose**
- **tight**

**Operating Rate**

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Getting “short”</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

**Getting “long”**

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staying “long”</td>
<td></td>
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<td></td>
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**Staying “short”**

<table>
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<th></th>
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<th>II</th>
<th>III</th>
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</table>

**Contracting Strategies**

<table>
<thead>
<tr>
<th>Contract length</th>
<th>Share of spot</th>
<th>Order volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑</td>
<td>↓</td>
<td>↑</td>
</tr>
<tr>
<td>↓</td>
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<td>↑</td>
<td>→</td>
</tr>
<tr>
<td>↑</td>
<td>↓</td>
<td>→</td>
</tr>
</tbody>
</table>

**Breakout:** Intelligent Deal Structure

- Secure supply
- Price advantage

Source: A.T. Kearney
Residual risk is managed within the boundaries of the risk objectives/limits with a consistent hedging strategy.

**Hedging strategies and financial impact**

<table>
<thead>
<tr>
<th>Hedging strategies and corresponding commodity price developments ($/bbl)</th>
<th>P&amp;L impact of the hedging strategies (mn €)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4 years</strong></td>
<td><strong>Spot</strong></td>
</tr>
<tr>
<td>Spot</td>
<td>1.726</td>
</tr>
<tr>
<td>40% Hedge</td>
<td>-4.6%</td>
</tr>
<tr>
<td>60% Hedge</td>
<td></td>
</tr>
<tr>
<td>90% Hedge</td>
<td></td>
</tr>
</tbody>
</table>

Source: A.T. Kearney
The operating model and organization depends on the risk management sophistication to be achieved

Risk management sophistication and organizational models

**Value creation**

**Risks**

**Organizational Models**

1. **Risk taker**
   - Basic operational risk awareness
   - No portfolio considerations
   - Random risk taking
   - Basic risk reduction by insurance

2. **Risk reducer**
   - Risk materialization consideration
   - Basic portfolio consideration (natural hedges)
   - Risk taking decisions
   - Advanced risk reduction for material risks

3. **Risk diversifier**
   - Risk-return optimization
   - Improvement of process efficiency and quality
   - Portfolio management
   - Risk-adjusted resource allocation

4. **Risk trader**
   - Integrated optimization of value drivers
   - Capturing of value-creating opportunities
   - Alignment of risk and corporate strategy

**Rewards**

**Source:** A.T. Kearney
However harvesting the benefits of improved Supply Risk Management is challenging

Requirements and benefits of state-of-the art Supply Risk Management

- Requires a different mind-set (Change management required)
- Requires new organizational structures/initiatives
- Requires new data and approaches/systems
- Requires strategic commitment of top management
- But…..

...delivers competitive advantages and positive P/L impact between 3-10% p. a. of purchasing value and in addition risk oversight for the company

Source: A.T. Kearney
A.T. Kearney Risk Management experience
Recent projects have delivered significant financial and non-financial results to our clients

### Selected case examples

<table>
<thead>
<tr>
<th>Global pharmaceutical player</th>
<th>Global automotive player</th>
<th>Global industrial player</th>
</tr>
</thead>
</table>

#### Situation
- **Historically limited focus on costs**: main focus on secure trustworthy and reliable supply of chemicals and solvents
- Supplier pricing: mostly multi-year contracts linked to index
- **Highly exposed to volatile Aluminum LME prices**: as supplier only offer max 5% reduction on LME spot prices
- Hedging in place; however volume not fully covered
- **Client Purchase organization faced significant price increases** on commodities with 2-4% bottom line effect
- **No transparency** of raw material price developments cost effect

#### Approach
- **Commodity Fingerprint** analysis, analyzing the commodities’ supply/demand balance situation across the value chain
- **Purchasing Chessboard®** strategies for relevant categories
- **Understand overall** Group demand and market dynamics
- Generate **new ideas** to improve sourcing practices
- Process and model to understand client’s commodity exposure were develop
- **Market forecast reports** structure developed and reliable sources defined

#### Results
- **3–10% benefits** compared to original situation from Commodity fingerprint
- **Securing of supply** for critical chemicals limiting a significant potential negative effect on almost all operations – R&D, final testing, etc.
- **New pricing strategies** defined with **lower volatility** than LME:
  - Index based prices formula linked to input factor, e.g. alumina
  - Long-term fixed contracts on e.g. conversion costs part
  - Project started to **improve risk management** and hedging policy
  - Implementation of **new process** and set-up for managing commodity market development
  - **Proactively raise prices** to mitigate for raw material development: **2-4% profit effect**
  - Transfer to Global responsible at the Client’s Global Service Center

#### Areas
- 1
- 2
- 3
- 4
- 5
- 6

Source: A.T. Kearney