BACKGROUND

- Risk aspect of construction materials cost estimation
  
  - Materials cost equal 50-60% of project cost (Spillane, 2011)
  

- Current approaches for material risk assessment are deterministic (EUFRAM, 2014)

- Construction contract cannot address materials prices fluctuation (Thomas, 2014)
  
  - Risk mitigation via indemnification and insurance provisions
OBJECTIVES

- Identify best practices in the area of airline fuel hedging
- Use the fuel hedging as an outline for implementation in the construction industry
- Develop a step-by-step guideline to applying hedging to material pricing in the construction industry
What is hedging?

Best Practices

- Most common fuel hedging contracts
  - Call options and collar options
  - Swaps

- The fuel hedging decision is taken by:
  - Hedging committee
THE AIRLINE HEDGING PROCESS

1. Identify Risks
2. Analyze Risks
3. Develop Risk Management Policy
4. Who Executes Hedging Policy
   - Strike Value
   - Tick Value
   - Maximum Payment
5. Purchase Hedging Contracts
6. Reporting
CONSTRUCTION MATERIALS HEDGING
STEP-BY-STEP GUIDELINE

Identify and Analyze Risks

Determine Tolerance for Risk

Develop Hedging Management Policy

Develop Hedging Execution Strategies

Implementation

Monitoring, Analyzing and Reporting Risk

Feedback Loop
STEP 1: IDENTIFY AND ANALYZE RISKS

- Apply during the bid process
- Estimate material cost
- Identify the type of materials that affects the company
STEP 2: DETERMINE TOLERANCE FOR RISK

- Analyze the price volatility
- Decide at what point price volatility become unacceptable
  - Consider any schedule penalties
STEP 3: DEVELOP HEDGING MANAGEMENT POLICY

- Describe the decision-making process
- Define who executes the hedging
  - Hedging committee
STEP 4: DEVELOP HEDGING EXECUTION STRATEGIES

- Determine which hedging instruments should be used
  - Swaps and options (i.e. call or collar options)
STEP 5: IMPLEMENTATION

- Over-The-Counter (OTC) market

- Address the following points:
  1. Strike value
  2. Tick value
  3. Maximum payment
  4. The duration of the hedging contract
A hypothetical example of a call option

<table>
<thead>
<tr>
<th>Terms</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage</td>
<td>The life of the project (or a phase of the project)</td>
</tr>
<tr>
<td>Period</td>
<td></td>
</tr>
<tr>
<td>Index</td>
<td>Average price of 1 ton of steel</td>
</tr>
<tr>
<td>Strike Value</td>
<td>$800/Ton of steel</td>
</tr>
<tr>
<td>Tick Value</td>
<td>$100/Ton of steel</td>
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<tr>
<td>Limit</td>
<td>$500,000 (for 5,000 ton of steel)</td>
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<tr>
<td>Premium</td>
<td>$50,000</td>
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</tbody>
</table>
STEP 6: MONITORING, ANALYZING AND REPORTING RISK

- Evaluate materials risks continuously
- Determine if the existing policy and strategies are still valid
- Modify hedge policy when market conditions change
STEP 7: FEEDBACK LOOP

- Revise the entire process of material hedging
  - Based on Step 6
CONCLUSION

- Applying material hedging should not be overlooked by construction companies.

- The guideline presented by this research:
  - Helps construction companies mitigate the risk of construction materials.
  - Improves the ability of construction companies to submit a low price bid.
FURTHER RESEARCH

- Investigate the cost of material hedging
  - Could be added to the tolerance phase of this research

- Investigate the best way to settle the hedging contract
  - Simulate different scenarios of hedging situation
Thank you!