Alternate Pricing Model for Transportation Contracts

Presented by:
Atmaja Sinha & Rakesh Thykandi
Introduction

• US trucking industry has been experiencing a capacity shortage since mid 2017, leading to higher costs and rejections by carriers

• Carrier-shipper relationships become crucial and shippers need to be the ‘shipper of choice’

• Long-term contracts often don’t align with current market dynamics

• Market-driven index can help in better carrier compliance and cost reductions
‘Transportation contracts are often made for a period of 1-2 years, which makes them irrelevant to the market dynamics. The project explores the feasibility of novel index-based pricing models for the long-term transportation contracts.’

### Key Terms

- **Tail lane** – Lane characterized by low or intermittent shipment volumes
- **Line haul cost** – Shipment transportation cost after excluding fuel, accessorial and non-compliance costs
- **Spot Premium** – Cost difference between shipments fulfilled by spot market and contracted carriers
- **Auction Ratio** – Percentage of shipments fulfilled by spot market
- **DAT index** – Monthly national average line haul rates for the US trucking market
Hypothesis

- A market relevant index regulating contract rates leads to fewer loads going to spot market.
- Dynamic pricing will lead to reduced line haul costs.
Project Methodology

1. Cleaned and joined the cost and bid files to obtain lane type
2. Extracted tail lane shipments
3. Summarized shipments by month (Auction Ratio, Spot Premium, LH Costs)
4. Formulated Auction Ratio as a function of Spot Premium
5. Shortlisted 4 DCs with a statistically significant relation between spot premium and auction ratio
6. Developed an index for contract price
   \[ i_t = (1 + \alpha) \]
7. Optimized \( \alpha \) to maximize number of shipments moved to contract
8. Evaluated model performance over train and test data sets (12 months each)
9. Calculated monthly delta for contract spend, spot spend and net spend
## Results Summary

<table>
<thead>
<tr>
<th></th>
<th>Wisconsin</th>
<th>Pennsylvania</th>
<th>California</th>
<th>Missouri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipments moved in training period</td>
<td>19</td>
<td>64</td>
<td>11</td>
<td>96</td>
</tr>
<tr>
<td>Shipments moved in testing period</td>
<td>20</td>
<td>37</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td>Auction Ratio for testing period (original)</td>
<td>73%</td>
<td>48%</td>
<td>40%</td>
<td>48%</td>
</tr>
<tr>
<td>Auction Ratio for testing period (index)</td>
<td>69%</td>
<td>46%</td>
<td>36%</td>
<td>46%</td>
</tr>
<tr>
<td>Alpha</td>
<td>8</td>
<td>6</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Cost diff. Contract (test period) $</td>
<td>21k</td>
<td>82k</td>
<td>52k</td>
<td>68k</td>
</tr>
<tr>
<td>Cost diff. Spot (test period) $</td>
<td>-38k</td>
<td>-57k</td>
<td>-24k</td>
<td>-53k</td>
</tr>
<tr>
<td>Cost diff. Total (test period) $</td>
<td>-17k</td>
<td>25k</td>
<td>27k</td>
<td>14k</td>
</tr>
</tbody>
</table>
Impact of index-based pricing on Auction Ratio & Costs

California

Wisconsin
Conclusion

Index based pricing can result in cost savings and reduction in auction ratios.

A national index may not be sufficient for all regions.

Carrier buy-in and a strong partnership is critical for implementing index based pricing.

Delve into upcoming initiatives such as freight futures (Nodal Exchange, DAT and FreightWaves initiative) that enable market hedging.
Opportunities for Future Research

- Factor in cost of service and non-compliance
- Expand model to include regional variations by using granular DAT data
- Explore the reasons for rejection by carriers – Capacity shortage, spike in demand, distance travelled, anticipated weather events
- Evaluate feasibility of using a tiered index pricing depending on the percentage of committed loads accepted by the contract carriers