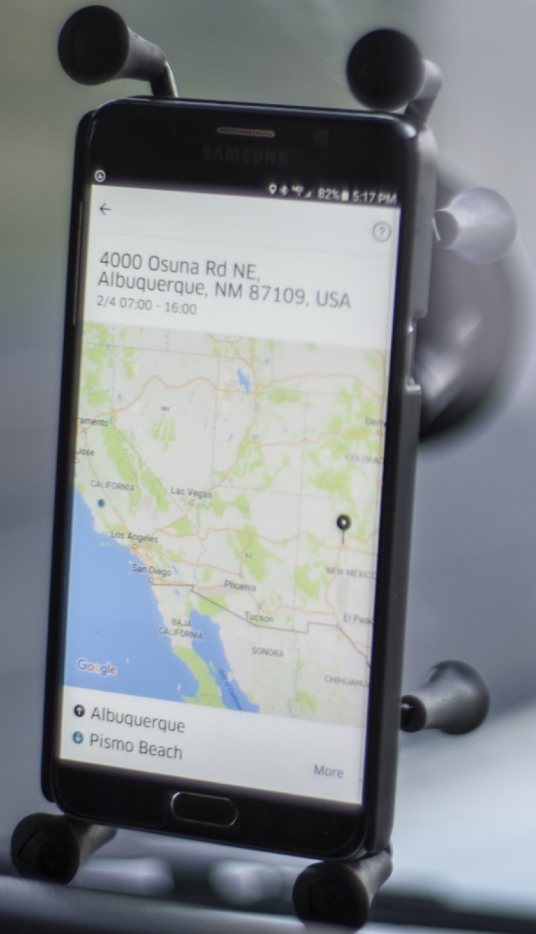


Uberization of Freight Procurement



Ignacio Helguera Sánchez
Mita Hendra Mukti
Advisor: Dr. Christopher Mejía Argueta

Capstone Project Final Presentation
May 22, 2018

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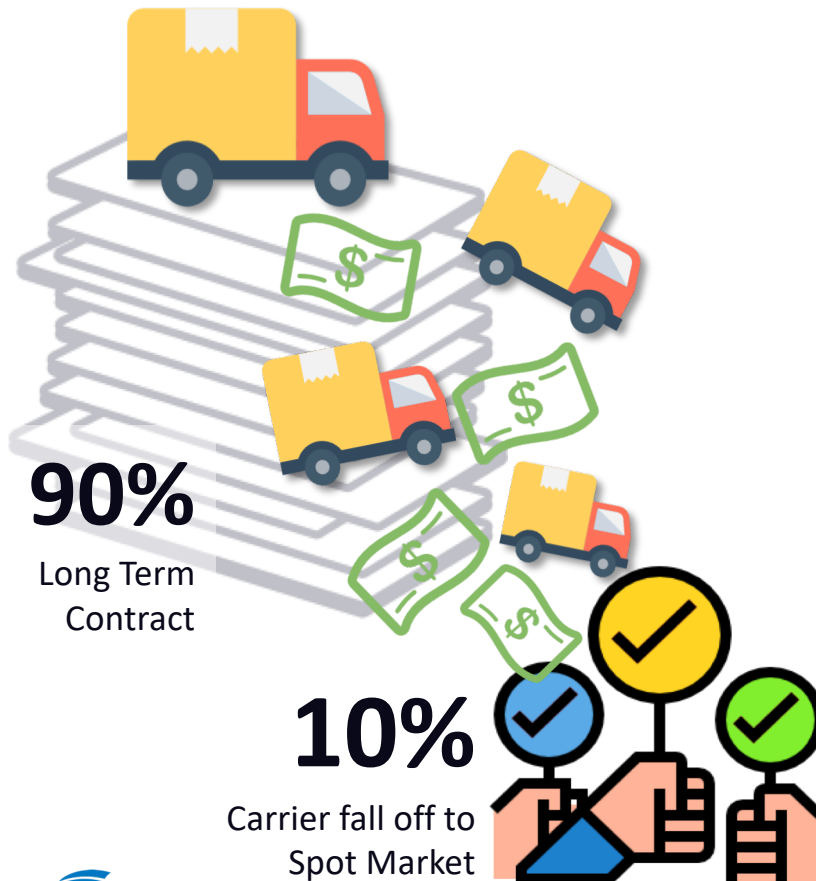
May 22, 2018

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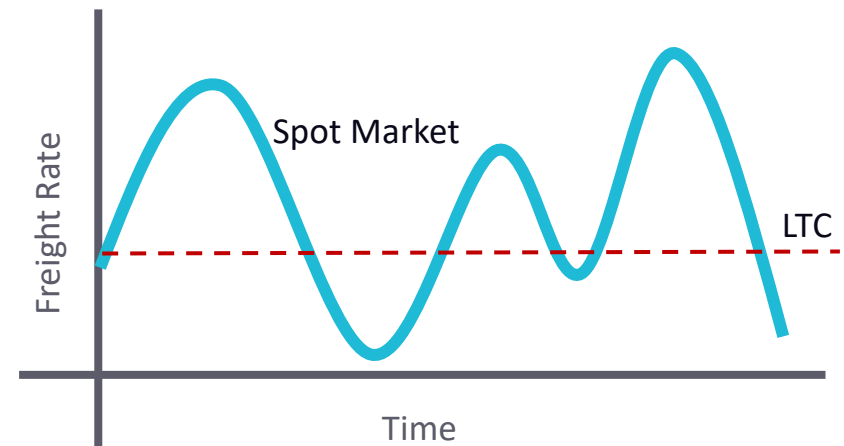


Long-Term Contract drives long procurement cycles which results in significant financial risk for shippers and carriers

In 2016, US business spent \$1,392.64B on logistics related expenses. 19% of it was accounted for by full-truckload alone.



A shipper pays **20%** more for freight in spot market compared to what would be agreed upon in a Long-Term Contract.

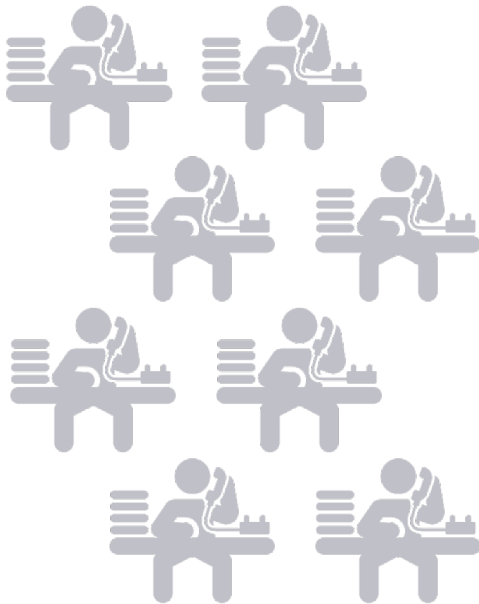


Assuming shippers could book a truck instantly, how would their procurement strategy change?

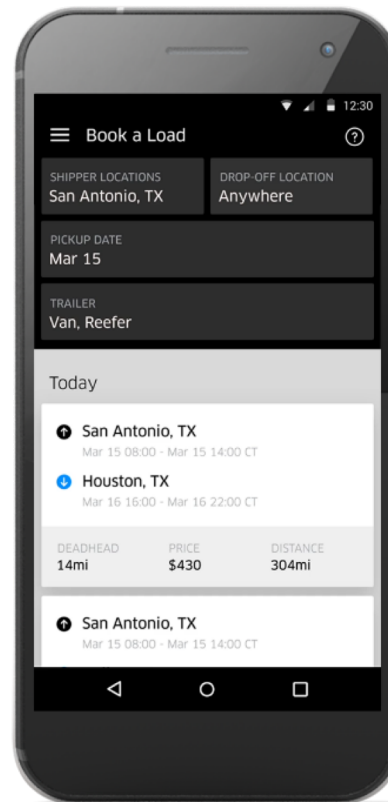
Our hypothesis is that there would be a financial benefit to all parties from faster, more liquid transportation transactions.

>15,000

registered freight
brokerages in the US*



Digital Freight Matching (DFM) is a digital process that matches a load with a nearby available carrier.



Our Hypothesis

Real-Time Access and
Discoverable Price



Fast, Lower Margin
Transportation Providers



Transparency and Visibility



Market Liquidity

*Source: www.supplychaindigital.com 2016



MIT Supply Chain
MANAGEMENT

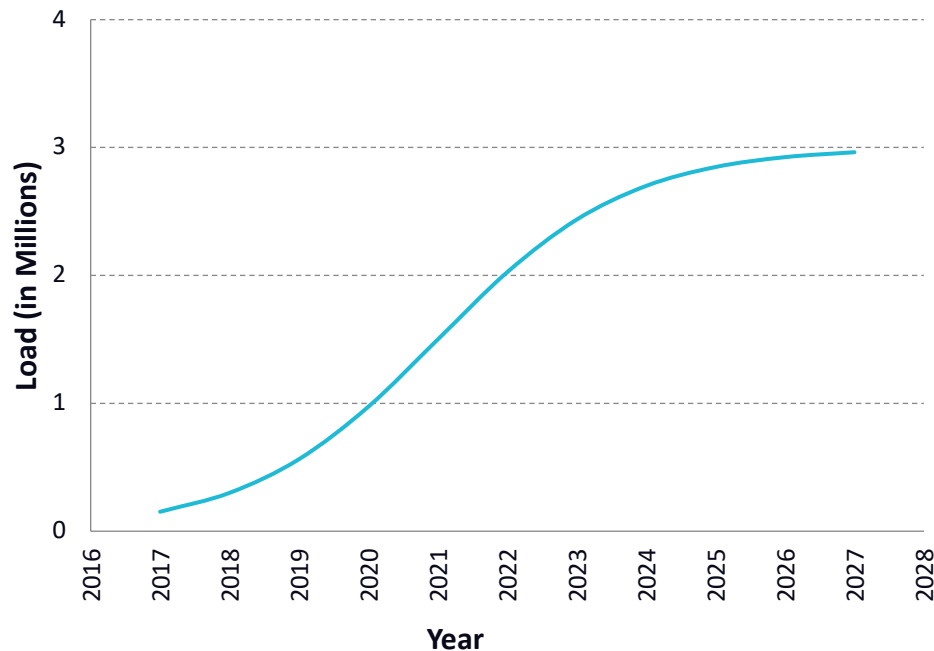
UBER FREIGHT

We developed a behaviorally based conceptual model to analyze the effects of digital freight matching app

Dynamics Hypothesis

Digital Freight Matching Adoption Rate will follow S-shaped curve

Shipper Adoption to Uber Freight



Approach

System Dynamics, because...

- understand complex behavior and the cause of changes in decision
- represent of real system
- simulate interactions among different variables

1

Conducted qualitative research on freight procurement

2

Identified System Dynamics Variables and Equations

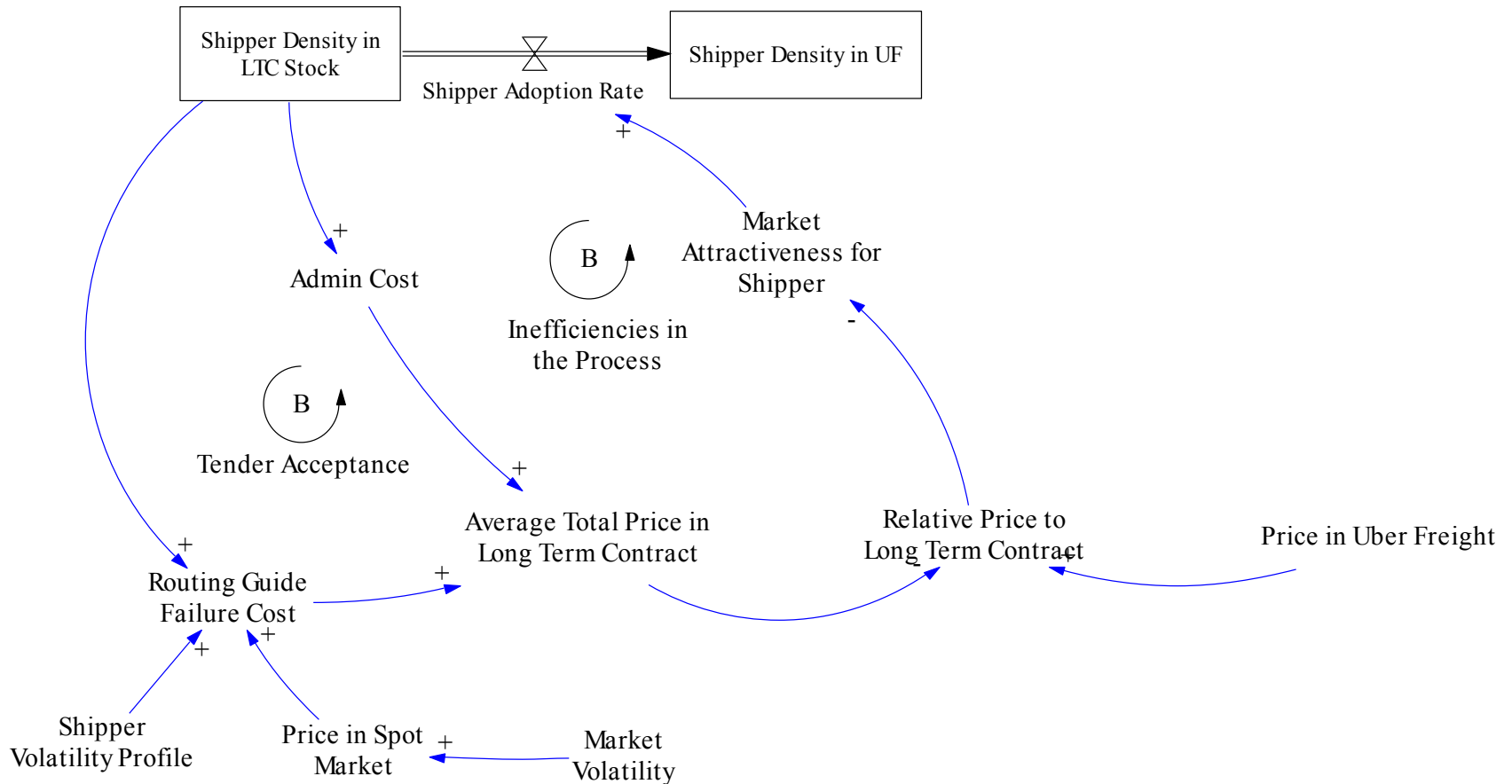
3

Developed Stock and Flow Diagrams

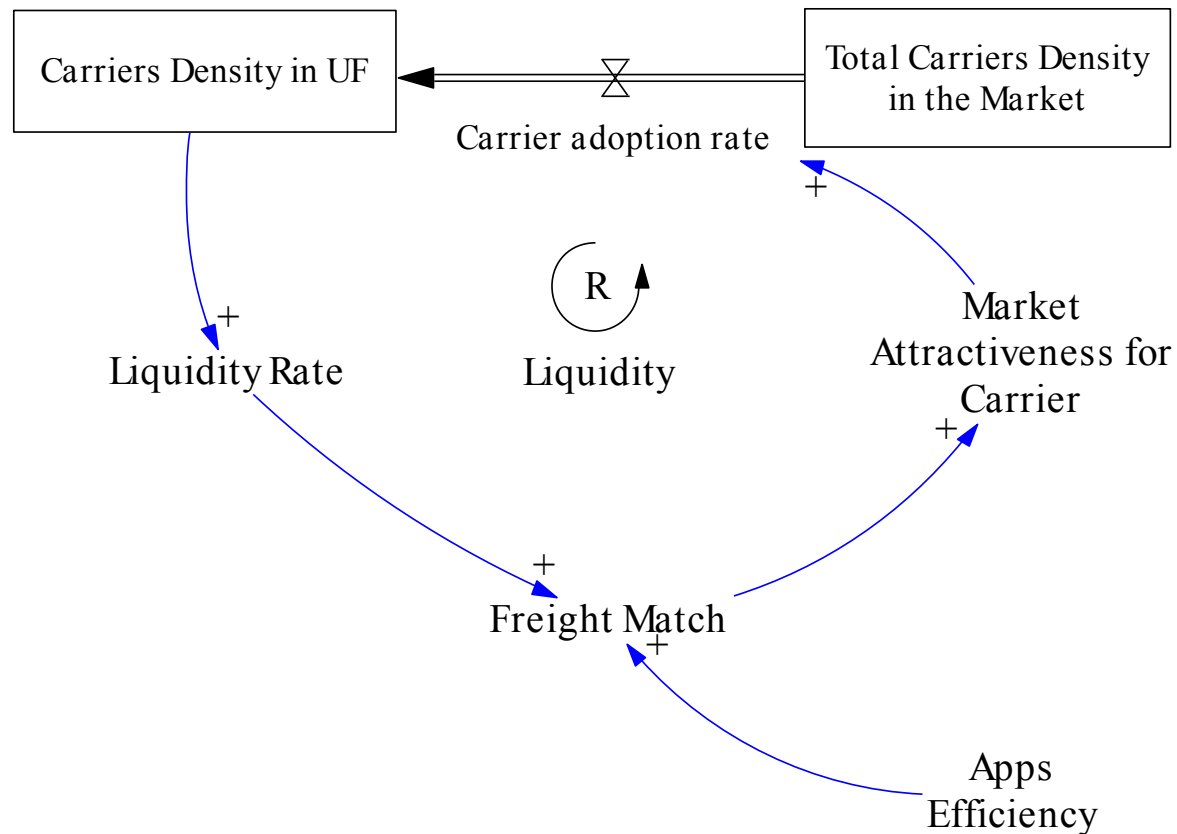
4

Conducted simulation and scenario analysis

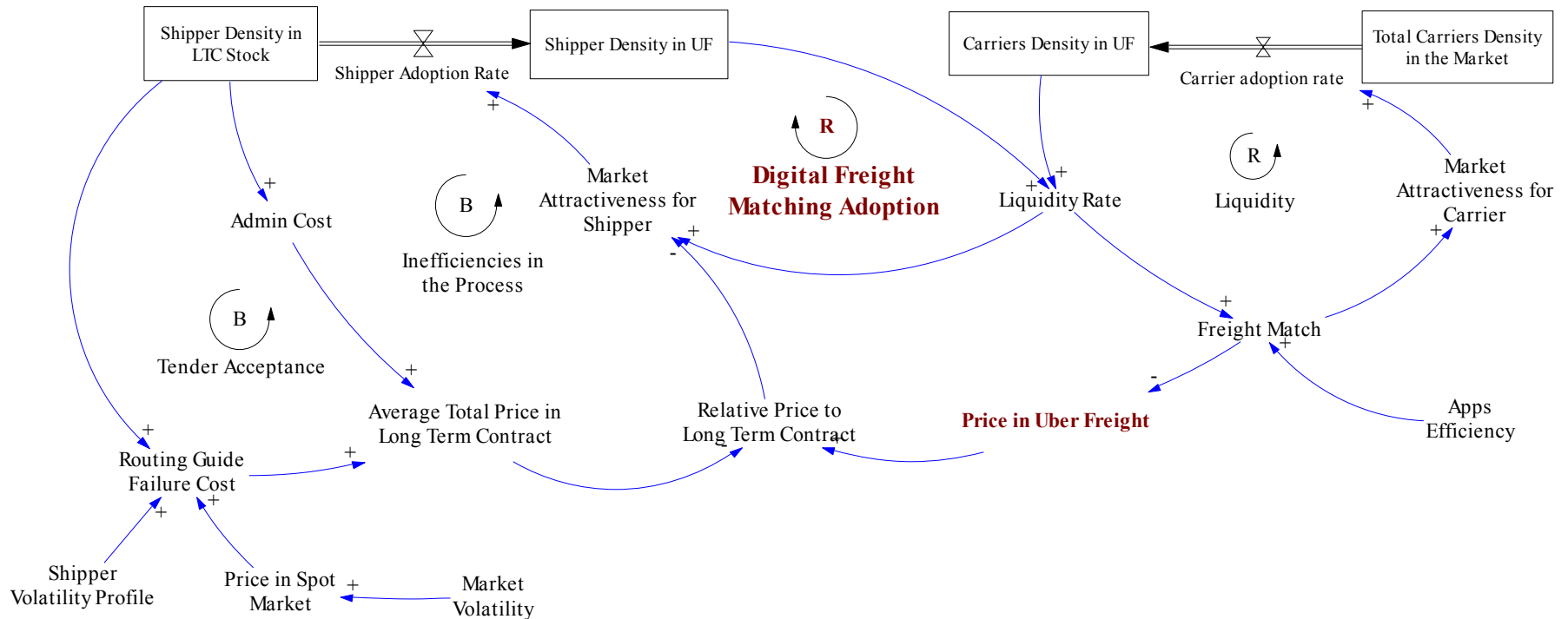
Shipper's freight cost and the relative price to switch to different method determines its procurement strategy



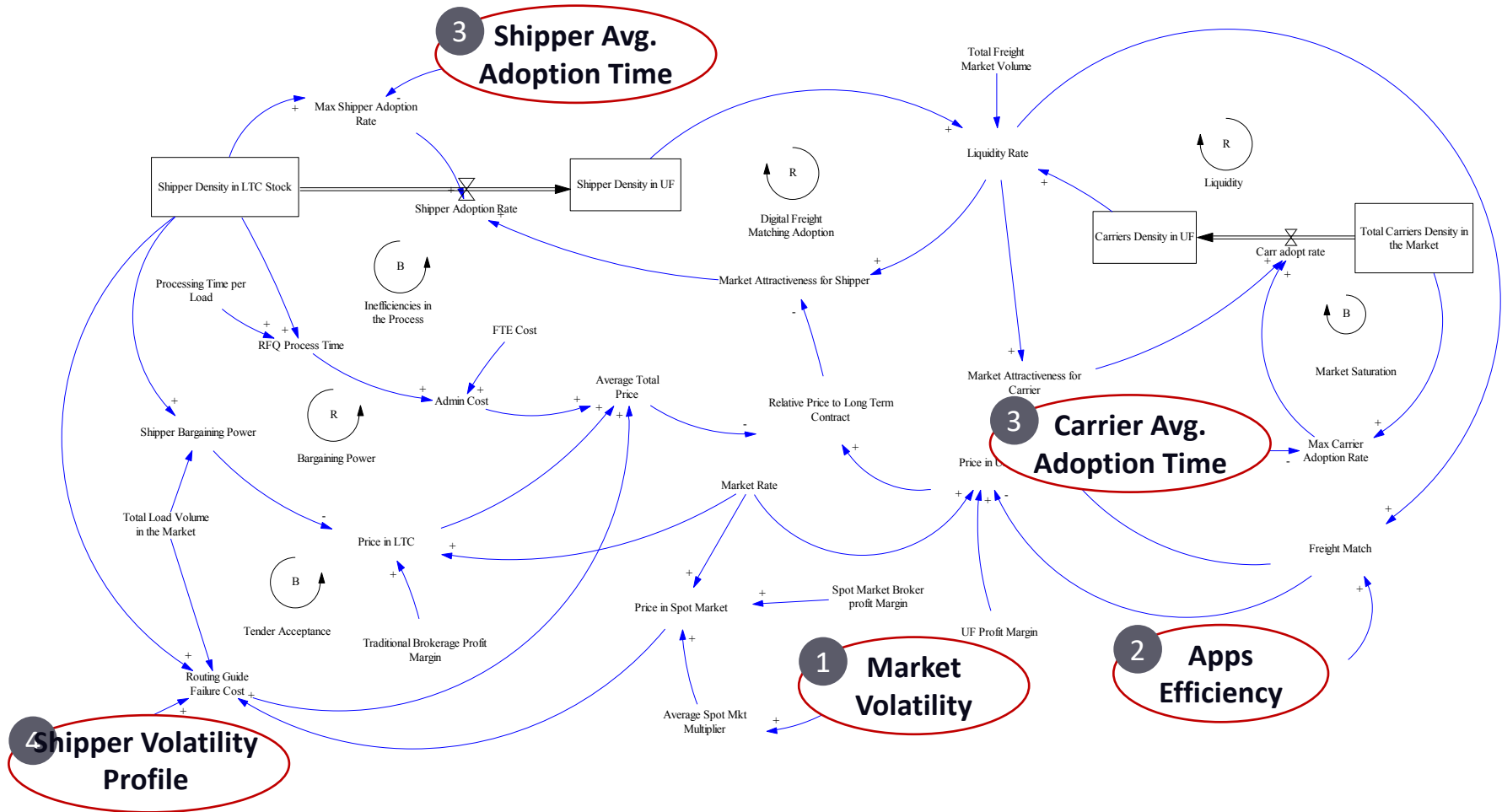
The ease of creating a match between shippers and carriers in Uber Freight will drive apps adoption



Market liquidity increases the attractiveness of utilizing digital freight matching platform



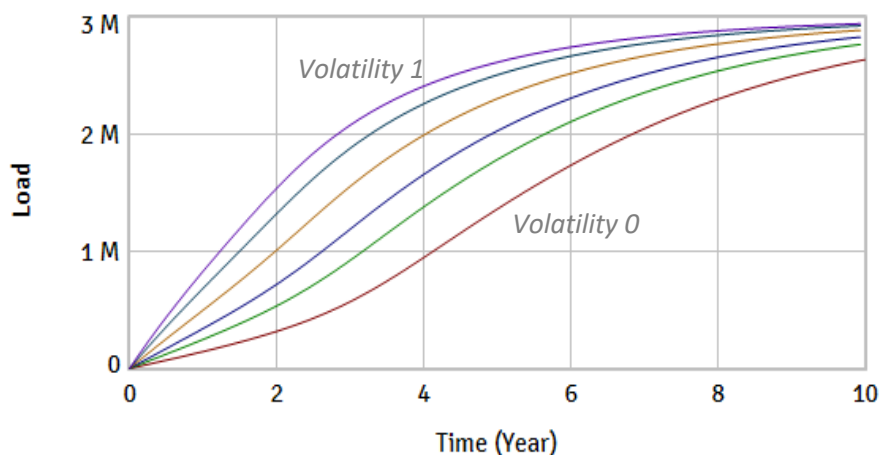
We conducted sensitivity analysis with a more comprehensive Stock and Flow diagram



Simulation 1 – Growing Market Volatility increases Shipper Adoption Rate



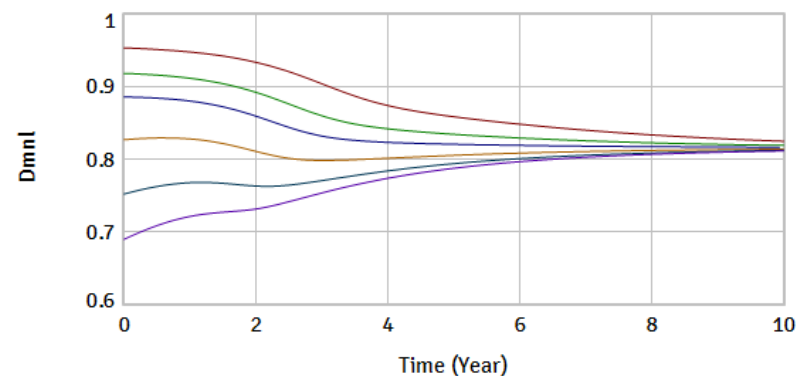
Shipper Density in UF



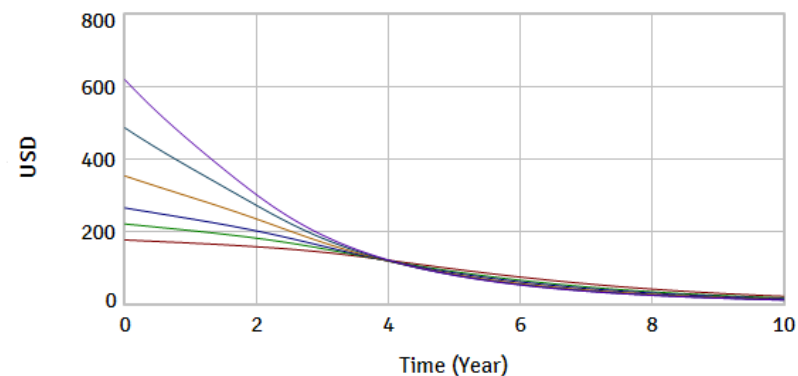
- Volatility 0
- Volatility 0,1
- Volatility 0,2
- Volatility 0,4
- Volatility 0,7
- Volatility 1

A 100% increase in market volatility (from 0.1 to 0.2) creates a 15% increase in shipper density by half of the time needed to achieve market saturation.

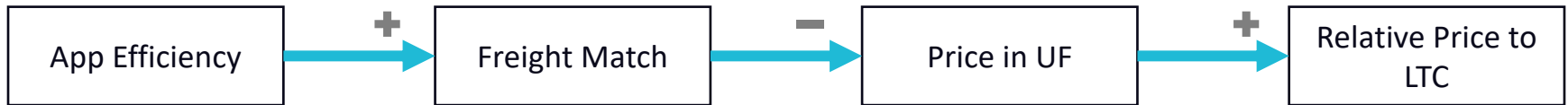
Relative Price to Long Term Contract



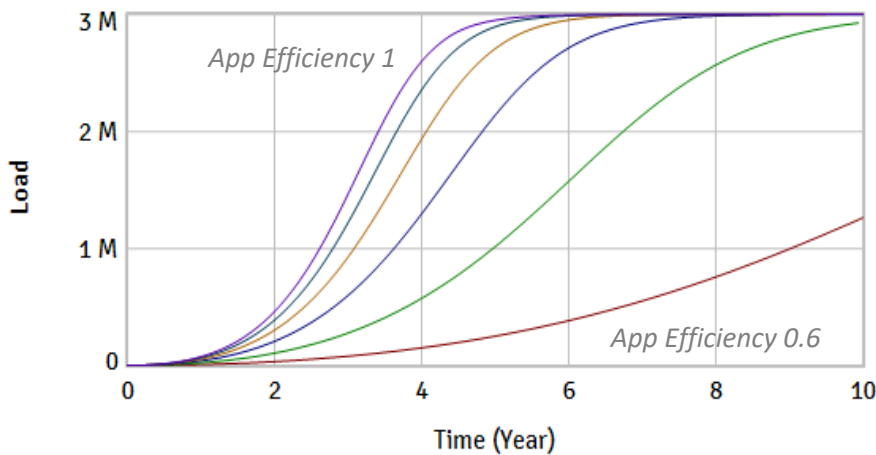
Routing Guide Failure Cost



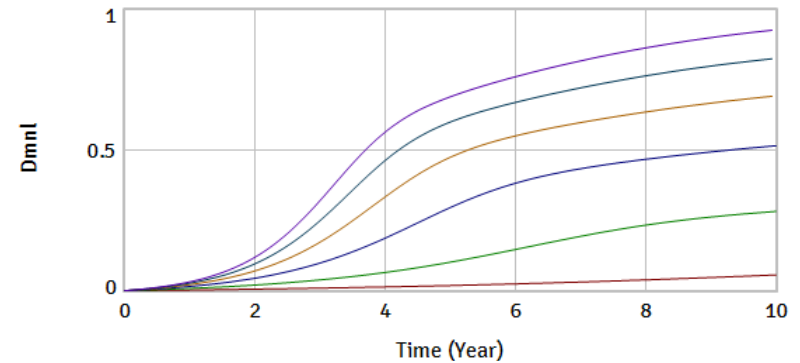
Simulation 2 – Higher App Efficiency expedites Carrier Adoption rate



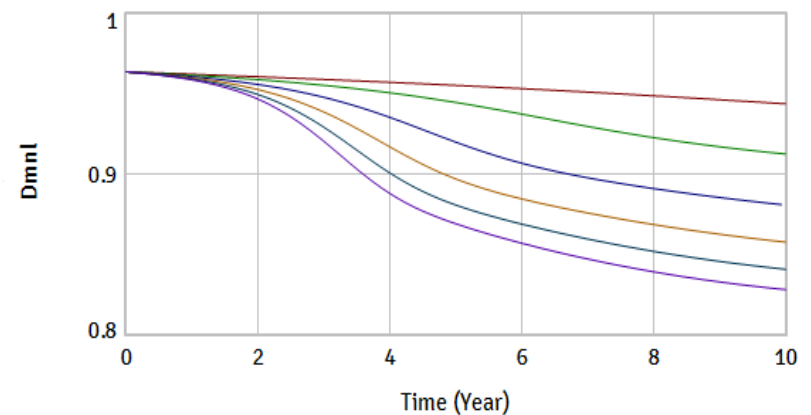
Carriers Density in UF



Freight Match



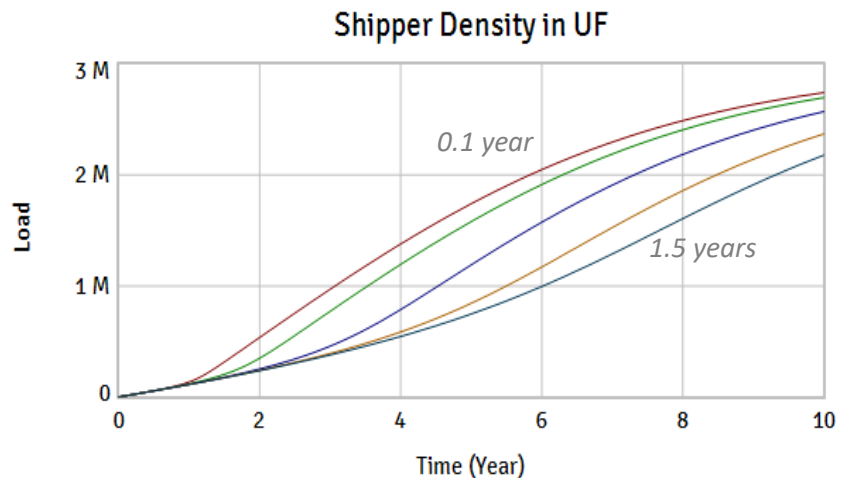
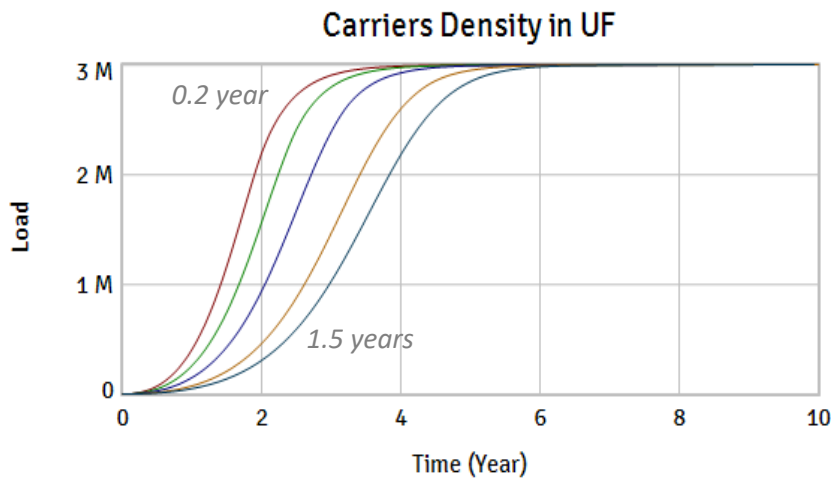
Relative Price to Long Term Contract



- App Efficiency 0,6
- App Efficiency 0,8
- App Efficiency 0,9
- App Efficiency 0,95
- App Efficiency 0,98
- App Efficiency 1

An increase of 10 basis points in the app efficiency (from 80% to 90%) reduces the total time to achieve the maximum carrier density by 30%. While apps efficiency below 80% leads to very low adoption rate.

Simulation 3 – Reduction in apps adoption time influences both shippers and carriers

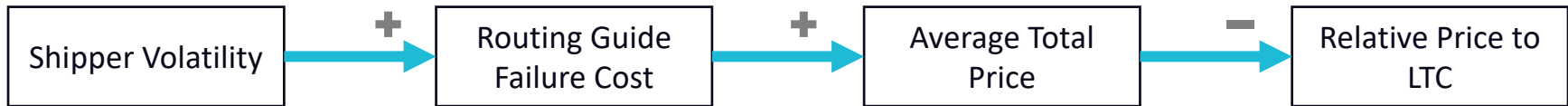


- 0,2 years to adopt UF
- 0,3 years to adopt UF
- 0,5 years to adopt UF
- 1 years to adopt UF
- 1,5 years to adopt UF

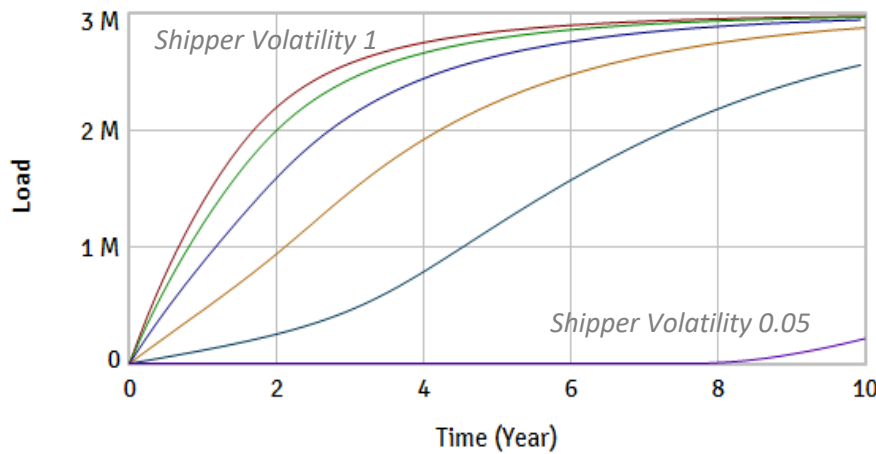
- 0,1 years to adopt UF for a carrier
- 0,2 years to adopt UF for a carrier
- 0,5 years to adopt UF for a carrier
- 1 years to adopt UF for a carrier
- 1,5 years to adopt UF for a carrier

A reduction of 50% of the carrier adoption time, from 1 to 0.5 year, will increase shipper density by 10% in half of the time required to achieve equilibrium in the shipper density. Similarly, a reduction of the shipper adoption time will increase the carrier density over the same period of time

Simulation 4 – Higher Shipper Volatility Profile increases both carrier and shipper adoption rate



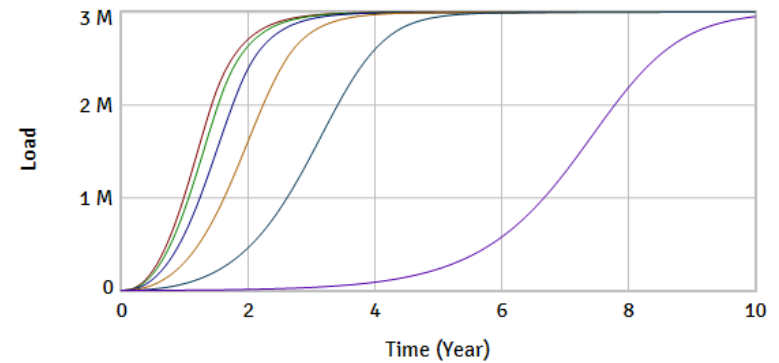
Shipper Density in UF



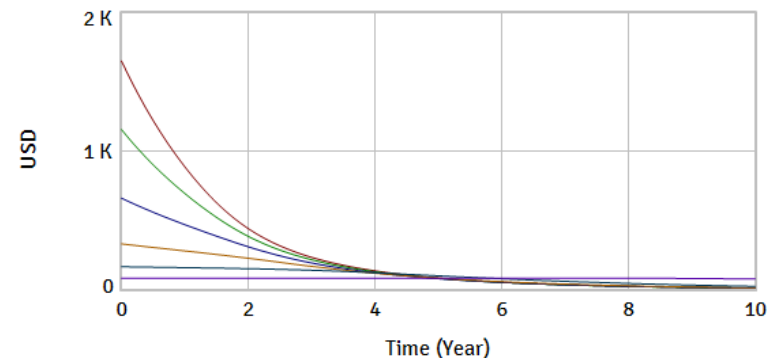
- Shipper volatility 1
- Shipper volatility 0,7
- Shipper volatility 0,4
- Shipper volatility 0,2
- Shipper volatility 0,1
- Shipper volatility 0,05

A 100% increase in Shipper Volatility Profile, from 0.1 to 0.2, will reduce approximately by 30% the time it will take to achieve the equilibrium in carrier density

Carriers Density in UF

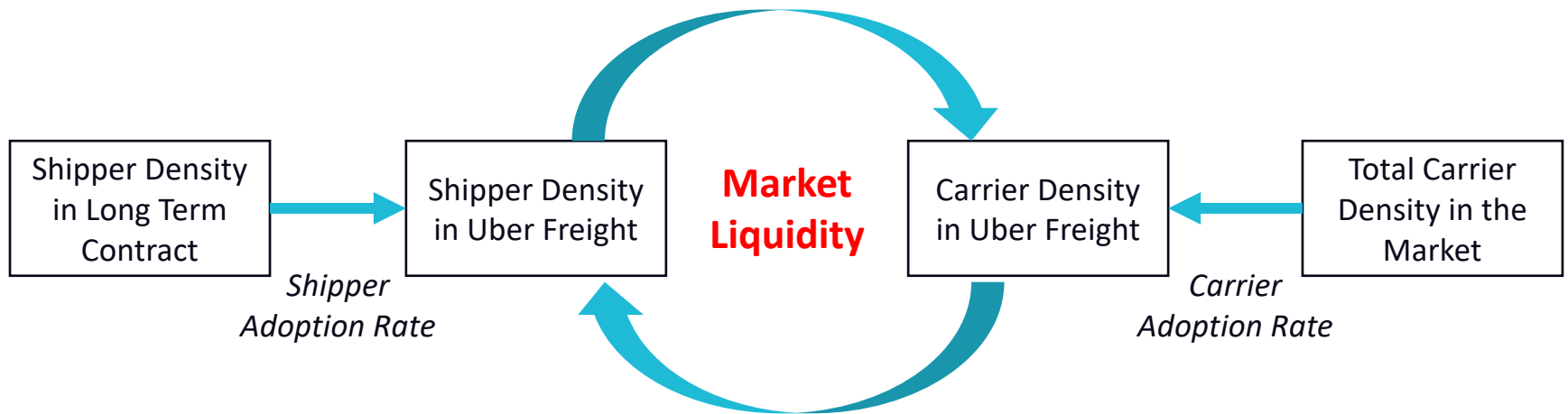


Routing Guide Failure Cost



Given the option, shippers would willingly switch to the lower cost faster alternative

In a more liquid market, shipper will benefit from using the on-demand app to book freight, compared to locking down the price and particular shipment lanes through a Long Term Contract.



Digital freight matching app is an alternative, and eventually a replacement for traditional Long Term Contract

Market Volatility and Shipper Volatility Profile

- Flexibility to secure capacity in fast-changing environment
- Attract shippers operating in a highly volatile environment or having limited transaction data

Apps Efficiency

- For carriers: autonomy to select and set shipment schedule
- For shippers: needs to be fully integrated with the company's TMS; add real-time traceability

Average Apps Adoption Time

- Reducing the adoption time will increase market liquidity
- Needs to balance the costs and benefits of driving apps adoption

THANK YOU

