OVERVIEW

- Research - purpose and outline
- Review of mechanisms to cushion delivery systems
- Insights on managing supply chain
To examine how companies cushion their delivery systems from the instability of their markets

- Case-based research: 7 reviews
- Illustrate using 3 case analyses
OVERVIEW

- Research - purpose and outline
- Review of mechanisms to cushion delivery systems
- Insights on managing supply chain
Overall delivery system design

One element - how to cushion it from inherently unstable markets

Consensus in literature - companies use some combination of

- Inventory
- Order backlog
- Capacity
CUSHIONING OUTCOMES

- Identified three categories:
  - Basic category
  - Secondary category
  - Supplementary category
As never sell and make exactly in the same period need to decide the basic category of cushioning mechanism.
STRATEGIC TRADE OFFS

- Order backlog: lead-time vs delivery speed
- Inventory: costs vs cash flow
SECONDARY CATEGORY

- Range of options
  - Forecasting
  - Demand management
  - Scheduling
  - Process improvement
  - Planned capacity
SUPPLEMENTARY CATEGORY

- Overtime
  - Unplanned
  - As needed
  - Last resort
CUSHIONING OUTCOMES

Order backlog

Overtime working

Unstable market

Stable delivery system

Inventory

Basic mechanisms
Secondary mechanisms
Supplementary mechanisms
## COMPANY USE OF MECHANISMS

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<th>Case</th>
<th>Basic</th>
<th>Secondary</th>
<th>Supplementary</th>
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OVERVIEW

- Research - purpose and outline
- Review of mechanisms to cushion delivery systems
- Insights on managing supply chain
1. Many dimensions of task - one is to recognise that company’s suppliers also wish to cushion their delivery systems from market instability.
2. Will choose from the same mechanisms.
MANAGING SUPPLY CHAINS
MANAGING SUPPLY CHAINS

- Look to cushion
- Same list
- Instability in a supplier’s market is its customer
- Supplier choice from list is in response to a company’s own behaviour
Uncertain demand = make-to-order response
= increase in material lead-time
Operations lead-time comprises same elements for both customer and supplier
AN ILLUSTRATION

Company’s operations lead-time

Order backlog  Process lead-time
or Material lead-time

Supplier’s operations lead-time

Order backlog  Process lead-time
or Material lead-time
RESEARCH FINDINGS
(Firm A)

- Automotive component supplier
- Major customer is UK-based car plant
- Customer provided:
  - 3 month / 1 month forecast
  - 1 week firm schedule
- Car enters assembly stage - data fed back - synchronised manufacture
- Off-line assembly parts provision
- Company’s process improvements
  - E.g. 22 parts per million
RESEARCH FINDINGS

(Firm A)

- **Inventory outcomes**
  - Decreased by 75%
  - 2 days of components
  - 2 hours off-line assembled units
RESEARCH FINDINGS

(Firm A)

- To better handle own unstable demand patterns, car plant introduced annualised hours

**Result**
- De-stabilised supply chain
- Increased supplier’s overtime and costs
RESEARCH FINDINGS

(Firm B)

- European manufacturer of OE pumps for oil, chemical and water industries
- Moved to focused unit based on customers’ industrial sector
- Led to sales growth in all business units
Originally, Firm B manufactured own machined castings, purchased other components and assembled pumps

- High and low volume pump sales
- Make-to-order with 6 week lead-time
- 4 weeks for castings/components plus 2 weeks to assemble
RESEARCH FINDINGS

(Firm B)

- Group set up casting plant in India
- Pressure for subsidiary companies to source castings from India
  - Underpin investment rationale
  - Result in overall lower units costs per casting
RESEARCH FINDINGS
(Firm B)

- Result
  - Closed casting facility
  - Sourced high volume castings from India
  - Sourced low volume castings locally
RESEARCH FINDINGS

(Firm B)

■ **Outcome for high volume business**
  - Increased casting lead-time from 4 to between 16 and 24 weeks
  - Pump lead-time 18 weeks (at best)
  - Potential loss of sales and market share
RESEARCH FINDINGS
(Firm B)

- To overcome problems
  - Decided to hold unmachined casting inventories
  - Make-to-order with a 6 week lead-time
    - 4 weeks machining and components
    - 2 weeks assembly
  - Pressure by Group to reduce inventory levels
    - Holding costs
    - Cash flow
RESEARCH FINDINGS
(Firm B)

- **Low volume business**
  - Castings sourced locally
  - Unit costs 4 to 5 times that of high volume castings
  - Local suppliers = MTO = order backlog
  - Increase in material lead-time from 4 to between 6 and 10 weeks
  - Low volume business = 13% sales but about 35% profit
RESEARCH FINDINGS

(Firm B)

- **Outcome of low volume business**
  - Buy supplier capacity by guarantee of use
  - In times of below forecast orders use capacity for high volume castings = increased unit costs
RESEARCH FINDINGS
(Firm C)

- Make-to-order, engineered products
- Existing business
  - Order-winners: technical capability
  - Qualifiers: price, delivery reliability and quality conformance
- New business
  - Order-winners: technical capability and delivery speed
  - Qualifiers: as for existing business
RESEARCH FINDINGS

(Firm C)

- Company's operations lead-time: 21 days
- Material lead-time: 18 days
- Process lead-time: 3 days
RESEARCH FINDINGS

(Firm C)

Company's operations lead-time: 21 days

Material lead-time: 18 days

Process lead-time: 3 days

To decrease operations lead-time need to decrease material lead-time
RESEARCH FINDINGS
(Firm C)

- Company's operations lead-time: 21 days
- Material lead-time: 18 days
- Process lead-time: 3 days
- Supplier's operations lead-time
- Order backlog or Material lead-time: 12 days
- Process lead-time: 6 days
RESEARCH FINDINGS

(Firm C)

Company's operations lead-time
21 days

Material lead-time
18 days

Process lead-time
3 days

Supplier's operations lead-time

Order backlog or
Material lead-time
12 days

Process lead-time
6 days

To decrease supplier lead-time need to
decrease order-backlog or material lead-time
Way forward

- Guarantee supplier’s material inventory holding
- Guarantee capacity use
REFLECTIONS

- Recognise which mechanisms by type, role and impact
- Understand behaviour and impact on supplier
- Help manage supplier’s own cushioning mechanisms