Innovative Financing Scheme by RFID

Tatsuya Inaba (Kanagawa Institute of Technology)
Jiro Kokuryo (Keio University)
Jin Mitsugi (Keio University)
Outline

• Introduction to ABL (Asset Based Lending)
  – Limitations of current ABL

• Proposal of financing scheme by RFID

• Identification of better SCM for the proposal
  – Simulation of the impact of SCM parameters

• Conclusion
Introduction to ABL

• ABL: Asset Based Lending
  – Utilize movable assets as collateral
    • Movable assets: machines, account receivables, inventory
  – More stable to cash-flow based financing
    • ABL is based on a real economy

• Limitation of ABL
  – Difficult to monitor the status of collateral
    • Periodic reporting is required sometimes
  – Difficult to manage using collateral registry
    • Collateral registry improves the security of banks…
    • But items are difficult to specify in the first place…
Collateral registry in Japan

• Two types
  – Uniquely specified asset (e.g., machines)
  – Group asset (e.g., inventory)

• Group asset registration
  – Only possible to register items in a certain geographic location (e.g., Warehouse A of company B)
  – Items in transit are out of the scope of this law

• This is reasonable because items in warehouse can be specified and seized, whereas items in transit cannot.
• However, using RFID it is possible to specify items in any location.
Assumption of proposal

- RF tags with unique ID (Asset ID) are applied to group asset
- Unique ID for collateral (Collateral ID) as for business deal
- Networked RFID is used
Asset monitoring flow

- **ID relation mgmt DB**
- **Supplier Event DB**
- **Buyer Event DB**
- **RFID Registry**
- **FSC (Bank)**

- **Collateral ID**
- **Location of ID** relation mgmt DB
- **Asset ID**
- **DB location**
- **Asset ID**
- **Location of collateral asset**
- **Asset ID**
- **Location of collateral asset**

- **Collateral ID**
- **Location of ID**
Requirements of this scheme

- Assignment of unique identification (Asset ID) of group asset
- Management of group asset
- Management of group assets that are handled in multiple parties’ facilities
- Assignment of unique identification (Collateral ID) of a group of group assets for a loan
- Management of the relation between Asset IDs and Collateral ID

All the requirements are feasible under current technologies and standards
Identification of better SCM for proposal

• To use ABL with inventory as collateral…
  – Monetary value is important

• If monetary value is the same,
  – How to select item?
  – Any good SCM operation to take advantage of ABL?

Answer these questions by simulation
Parameter identification by simulation

- Amount and volatility affects loan credit
  - Low amount of inventory is less valuable as collateral
  - High volatility of inventory increases risk as collateral

- SCM operation parameters should be carefully selected

Evaluate SCM parameters using hypothetical scenario with two party SCM (supplier and buyer)
Questions to be answered

• Which policy is favorable to ABL, periodic inventory management or fixed quantity inventory management?
• Where should we transfer ownership of items for ABL?
• How long should we employ as production cycle time?
• What kind of impact does order cost has on ABL?
• Does RF tag application point affect ABL? If yes, what kind of impact?
- **Periodic inventory management**  
  - Base stock inventory management policy

- **Fixed order quantity**  
  - Economic Order Quantity (EOQ)
Inventory management policy assessment

**Periodic inventory mgmt**

- Supplier ave. inv
- Supplier inv. std.
- Buyer ave. inv
- Buyer inv. std.

**Fixed order quantity**

- Supplier ave. inv
- Supplier inv. std.
- Buyer ave. inv

Graphs showing the relationship between lead time and average inventory, with standard deviation as a parameter.
Questions to be answered

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• Where should we transfer ownership of items for ABL?
• How long should we employ as production cycle time?
• What kind of impact does order cost has on ABL?
• Does RF tag application point affect ABL? If yes, what kind of impact?
“Slap & Ship” operation

• To meet mandate from retailers, some manufacturer applies tag right before shipment or outsource tag application.
Impact of tag application point

Tag at production

Tag at shipment

Graphs showing the impact of tag application point on inventory levels.
Conclusion

• RFID-based ABL is proposed and showed its feasibility with networked RFID and existing IT

• SCM operation parameters are assessed and found parameters that works for and against ABL
  – Periodic inventory management is better than fixed quantity inventory management in ABL
  – Slap & ship policy makes inventory less attractive in ABL


