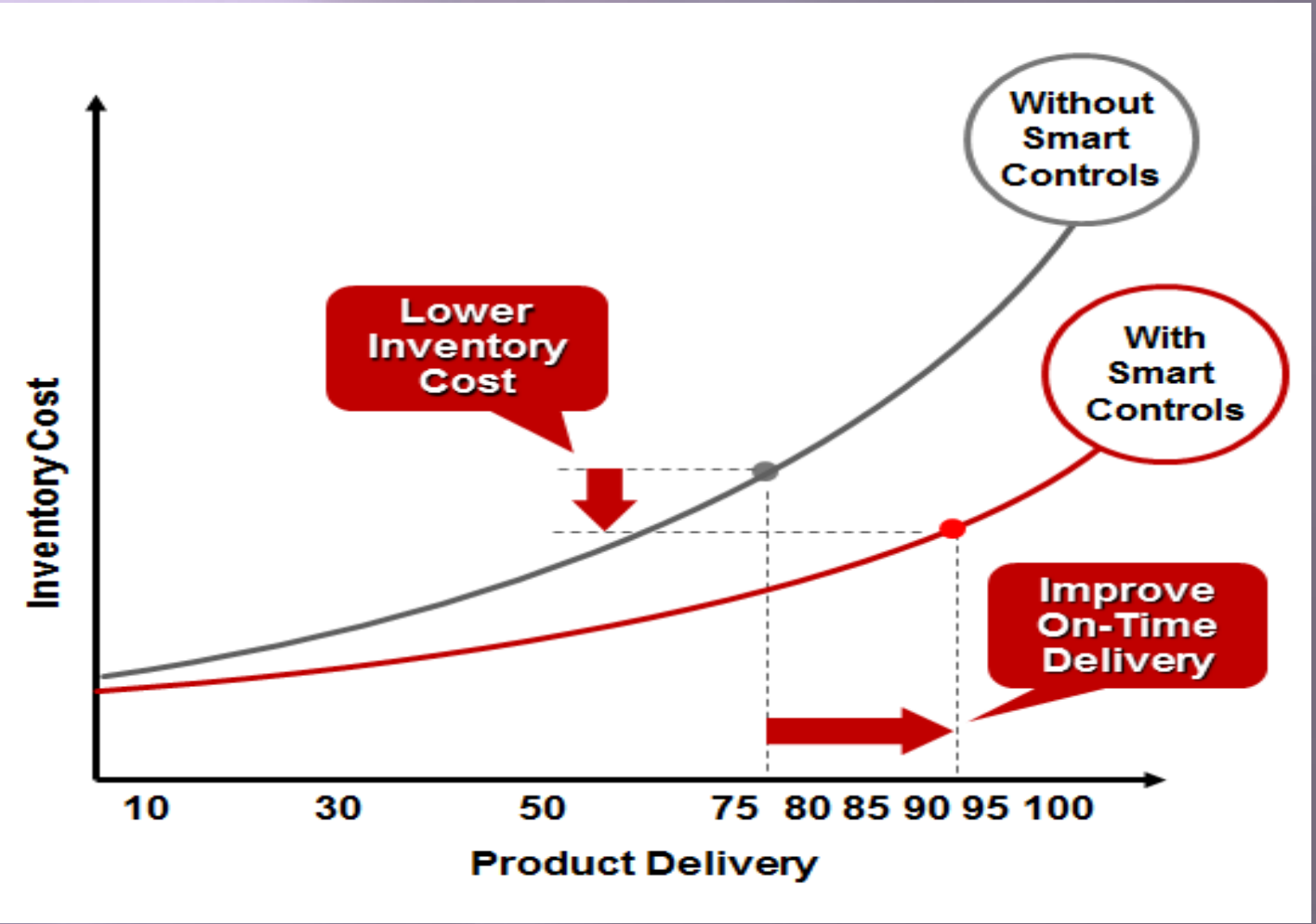
SUPPLY CHAIN MANAGEMENT INVENTORY PLANNING AND MANAGEMENT

Possibilities reducing inventory with increasing services of delivery

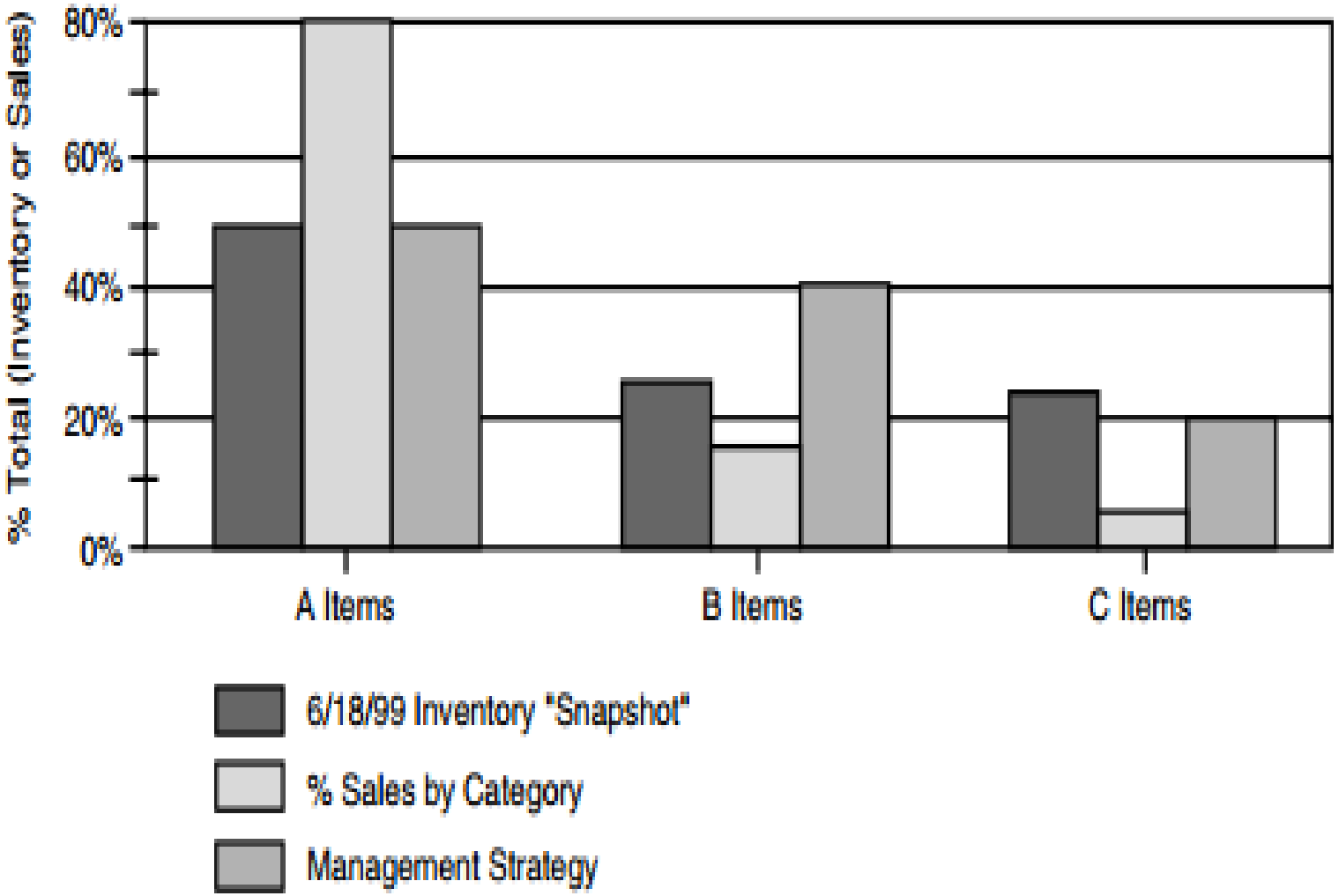


The main 5 aspects that force to increased return on inventory and increased inventory availability

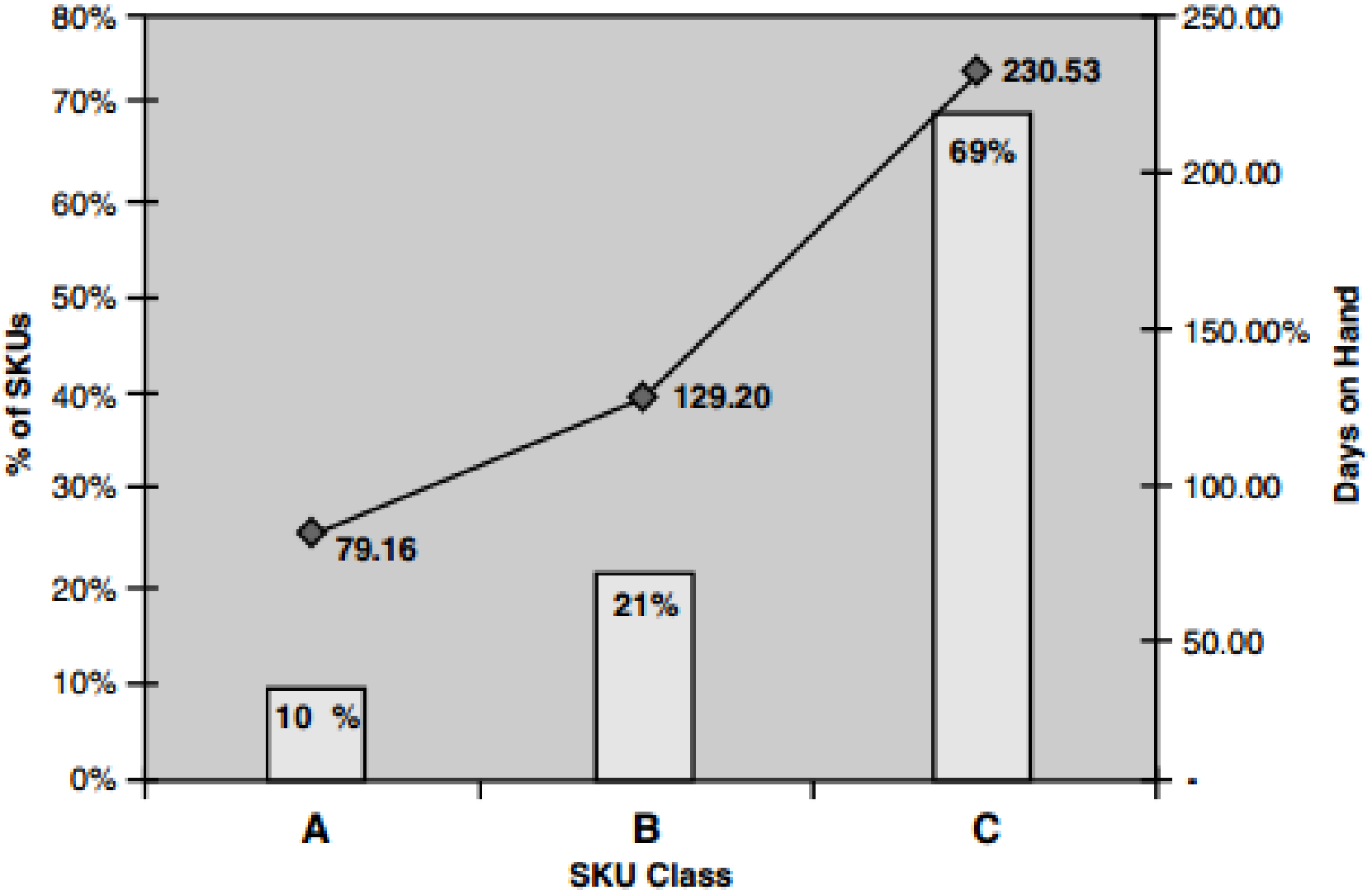
1. Improved forecast accuracy
2. Reduced cycle times
3. Lower purchase order/setup costs
4. Improved inventory visibility
5. Lower inventory carrying costs

INVENTORY ACTIVITY PROFILING

Inventory synchronization profile.



ABC days-on-hand inventory profile.



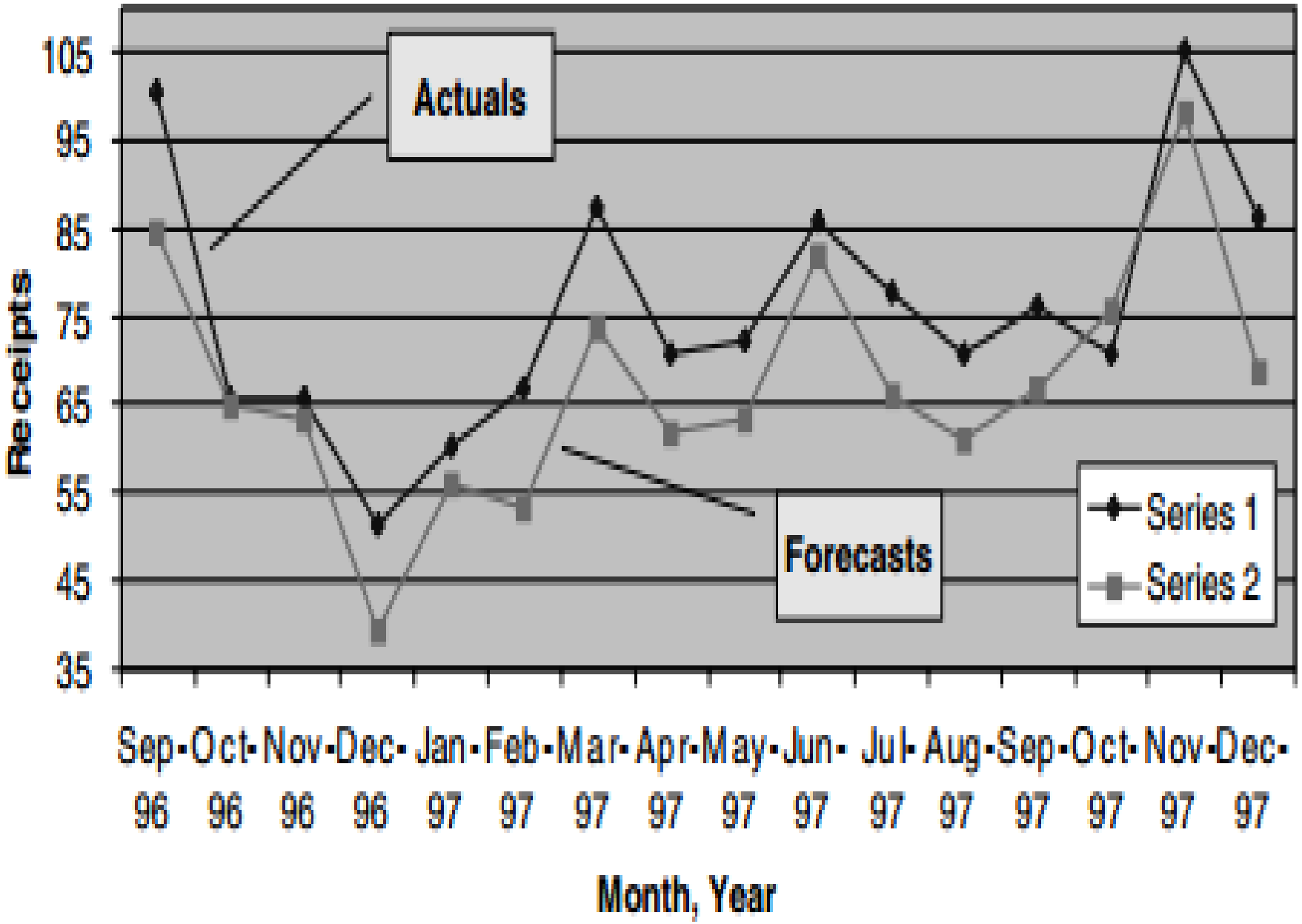
INVENTORY PERFORMANCE MEASUREMENT

"Measures how many times a company's inventory has been sold (turned over) during a period of time."

INVENTORY PERFORMANCE MEASUREMENT

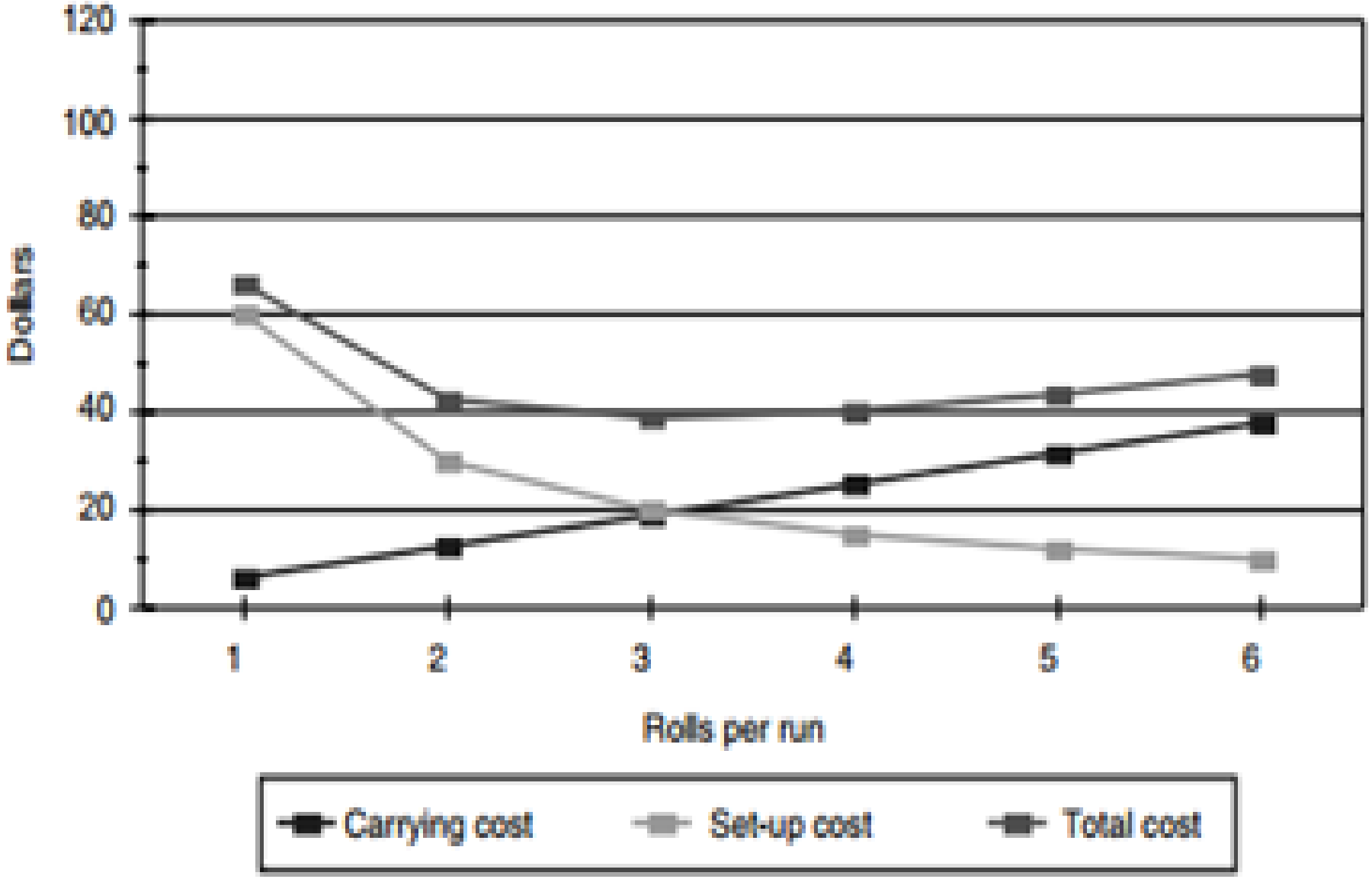
Inventory Accuracy	$\frac{\text{Actual Qty. per SKU}}{\text{System reported Qty}}$
Damaged Inventory	$\frac{\text{Total damaged value}}{\text{Total inventory value}}$
Inventory Turns (Inventory Turnover)	$\frac{\text{Annual cost of Sales}}{\text{Average Inventory Level}}$
Inventory Months of Supply	$\frac{\text{Inventory on hand}}{\text{Average monthly usage}}$

FORECASTING

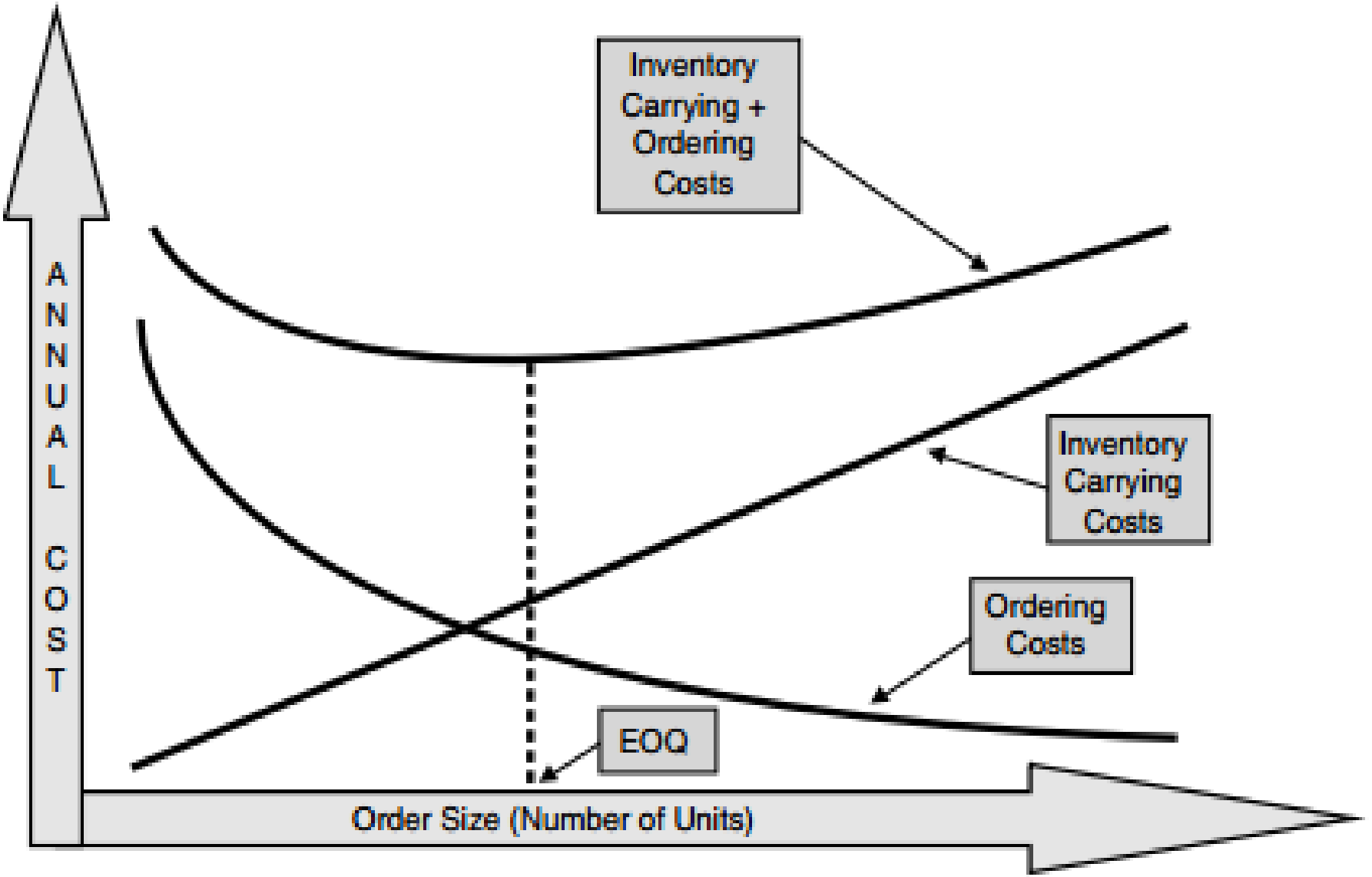

105
95
85
75
65
55
45
35
Receipts
Actuals
Forecasts
Series 1
Series 2
Sep-96
Oct-96
Nov-96
Dec-96
Jan-97
Feb-97
Mar-97
Apr-97
May-97
Jun-97
Jul-97
Aug-97
Sep-97
Oct-97
Nov-97
Dec-97
Month, Year

ORDER QUANTITY ENGINEERING

Manufacturing run quantity analysis.



Order quantity tradeoff curves.



FILL RATE PLANNING

INVENTORY CONTROL POLICY AND REPLENISHMENT DESIGN

Manual inventory control

- *Two-bin systems (2BS)*
- *Visual review (VR)*

Basic replenishment schemes

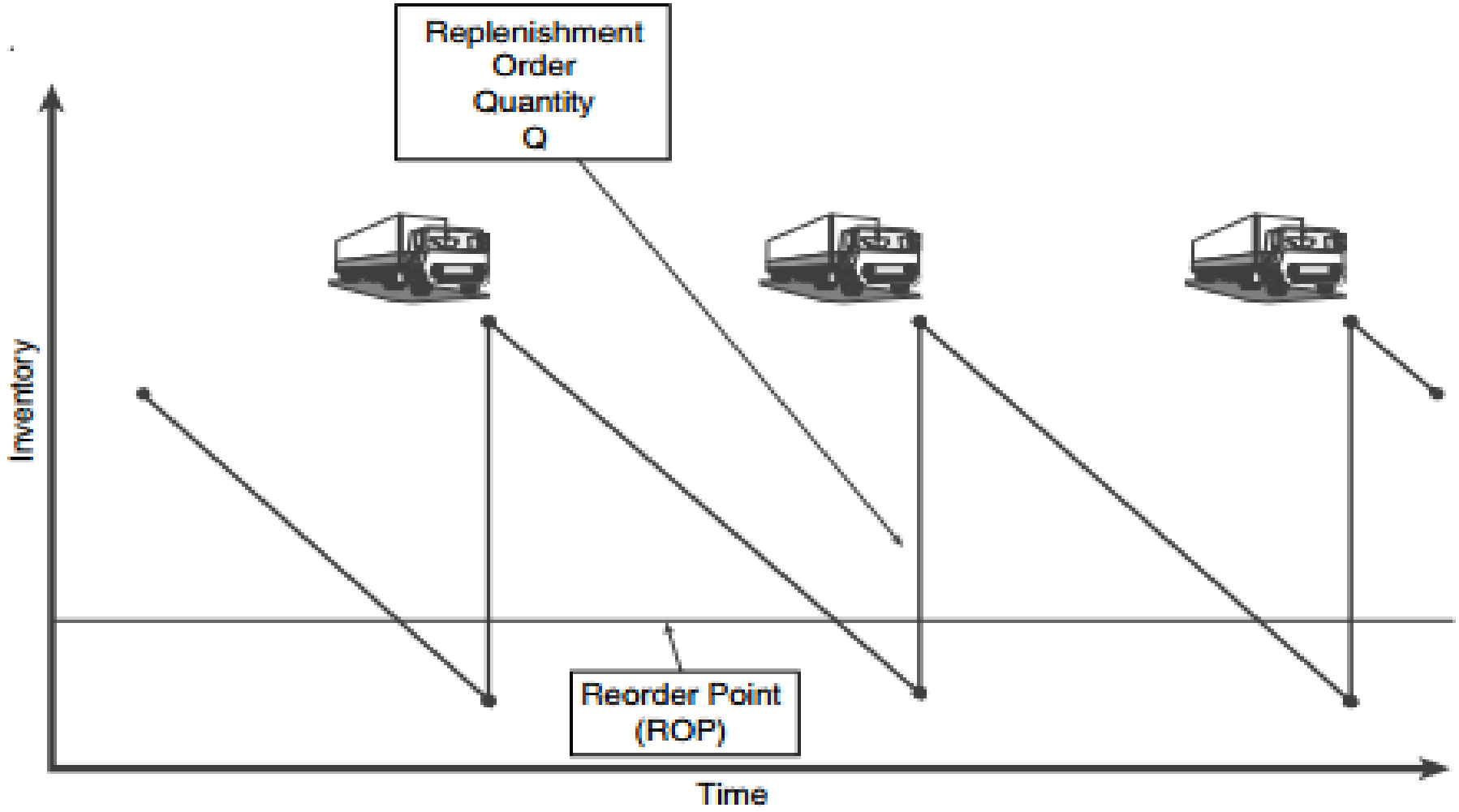
- *Re-Order Point* (ROP) with *Economic Order Quantities* (EOQ) — ROP/EOQ
- Re-Order Point (ROP) with *Order Up to Levels* (OUL) — ROP/OUL
- *Review Time Period* (RTP) with Order Up to Levels (OUL) — RTP/OUL
- Review Time Period with Re-Order Points and Order-Up-To Levels — RTP/ROP/OUL

Advanced control policies

- *Joint Replenishment Programs* (JRP)
- *Distribution Requirements Planning* (DRP)
- *Continuous Replenishment Programs* (CRP)

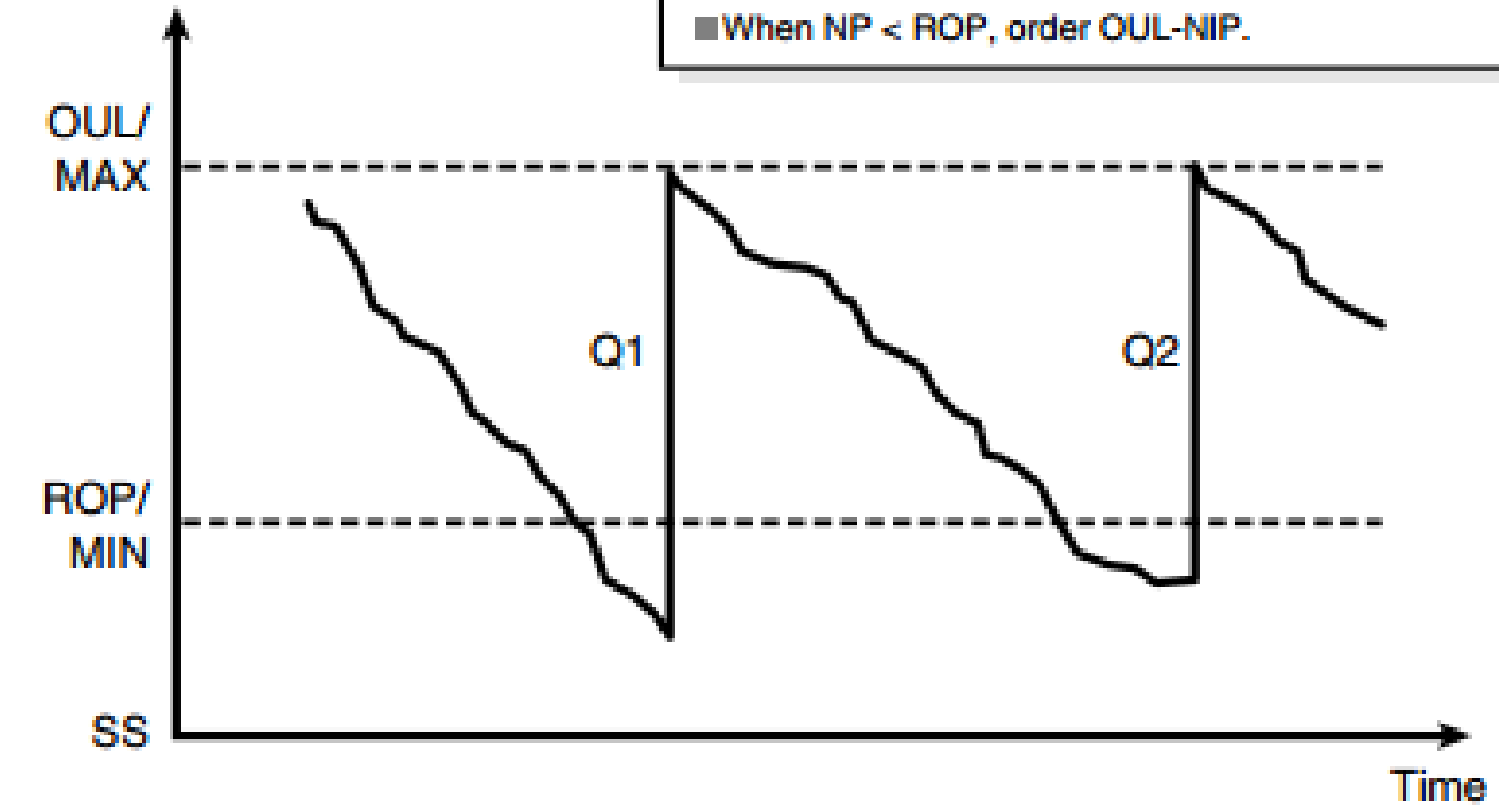
INVENTORY CONTROL POLICY AND REPLENISHMENT DESIGN

Reorder point with an EOQ.

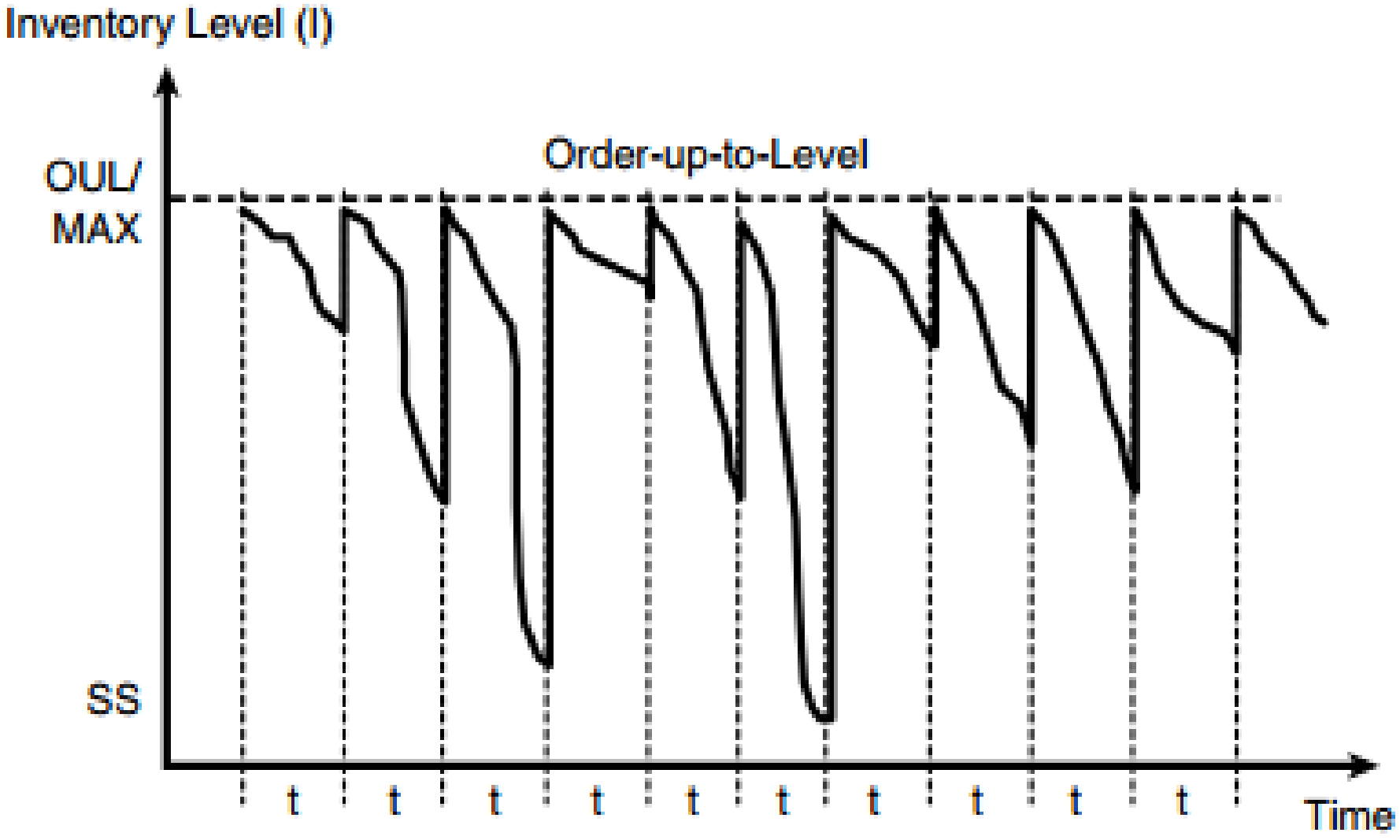


Reorder point with a fixed OUL

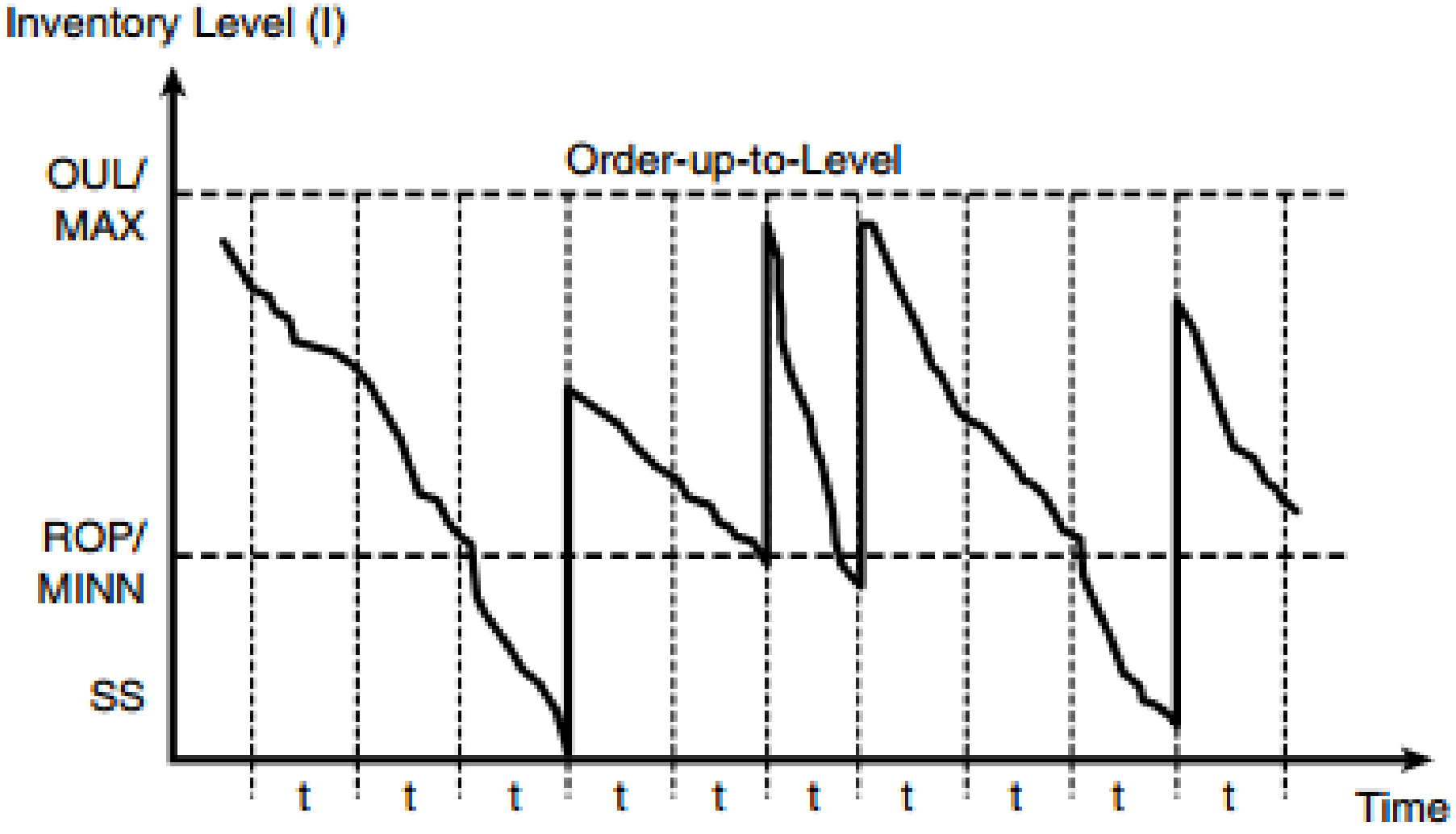
- Under continuous review, when the net inventory position (NP) is less than (<) the reorder point (ROP), an order is released such that NP = OUL.
- When NP < ROP, order OUL-NIP.



Review time period with OULs



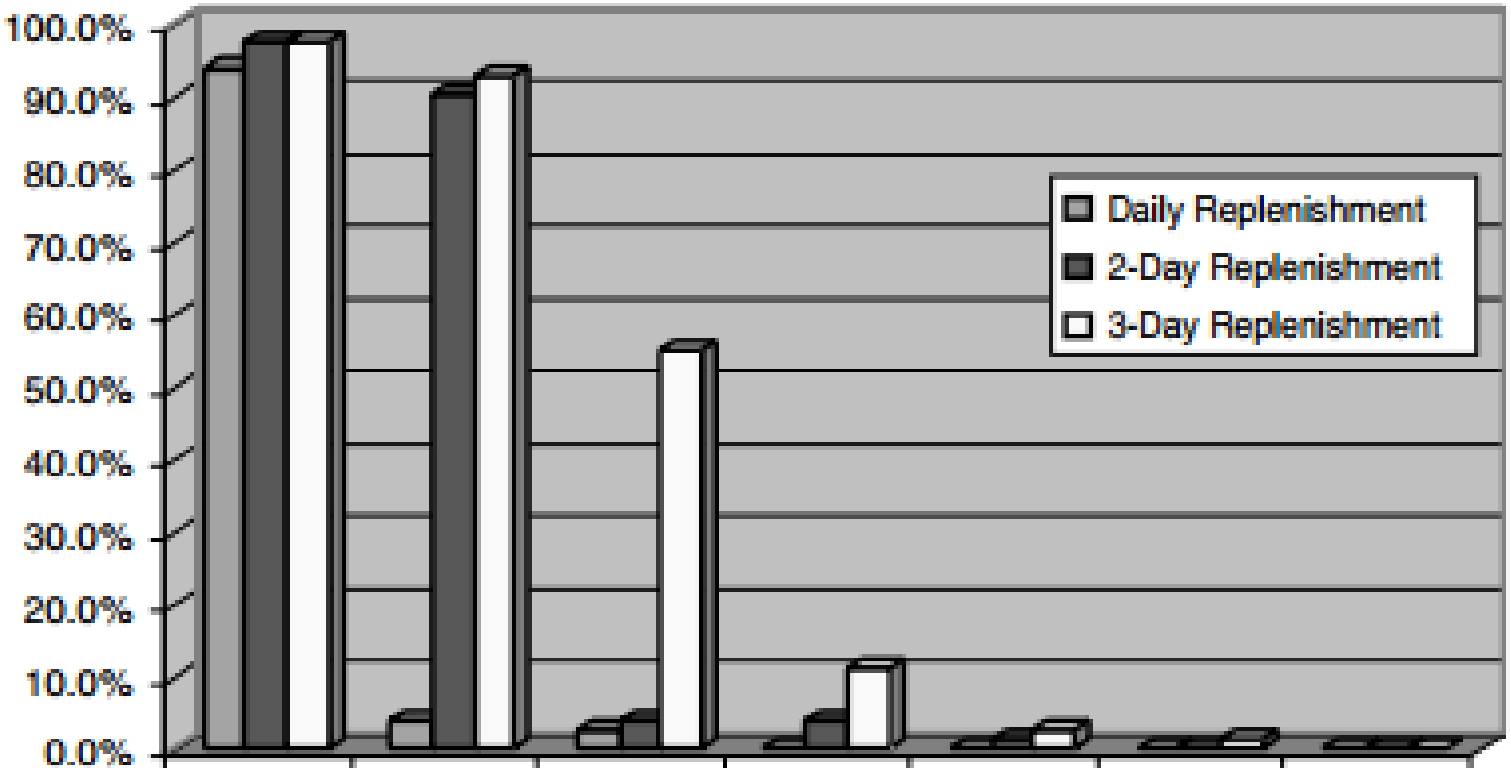
Review time periods, ROPs, and OULs



Advantages and disadvantages of Basic Replenishment Schemes

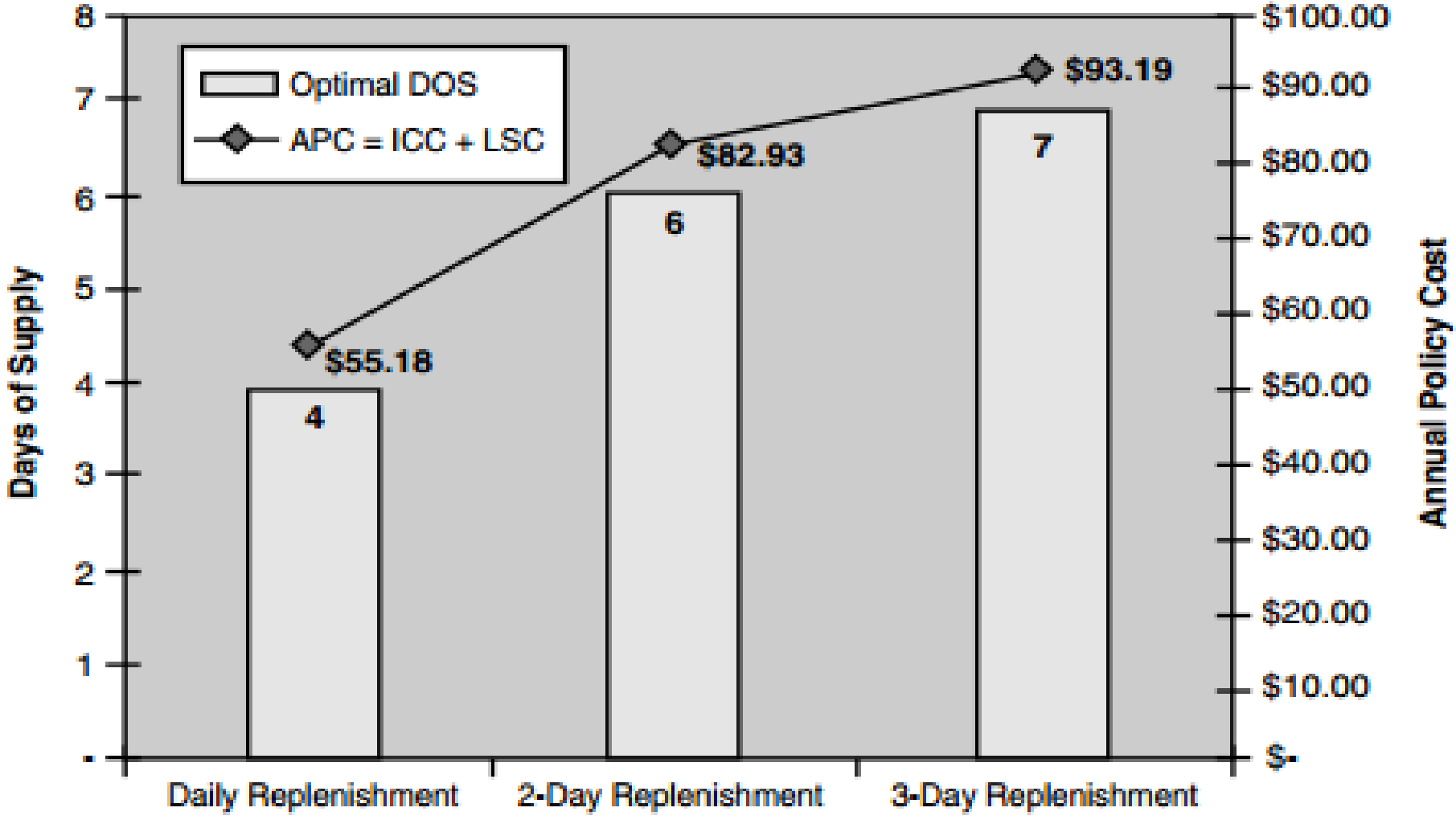
Control Policy	Advantages	Disadvantages	Notes
ROP/EOQ	Simple system. Fixed order quantity.	Can't cope with big swings.	EOQ computation may be unreliable.
ROP/OUL	Best ROP/OUL = best ROP/EOQ.	Heavy computational effort not justified except for A items.	Most popular policy but with arbitrary parameters.
RTP/OUL	Coordination of replenishment of related items. Regular opportunity to adjust the OUL.	Carrying costs are higher than in continuous review systems.	Good when demand pattern is changing regularly with time.
RTP/ROP/ OUL	Overall least cost control policy.	High computational effort. Difficult to understand.	Not justifiable for B or C items.

Inventory control policy simulation results

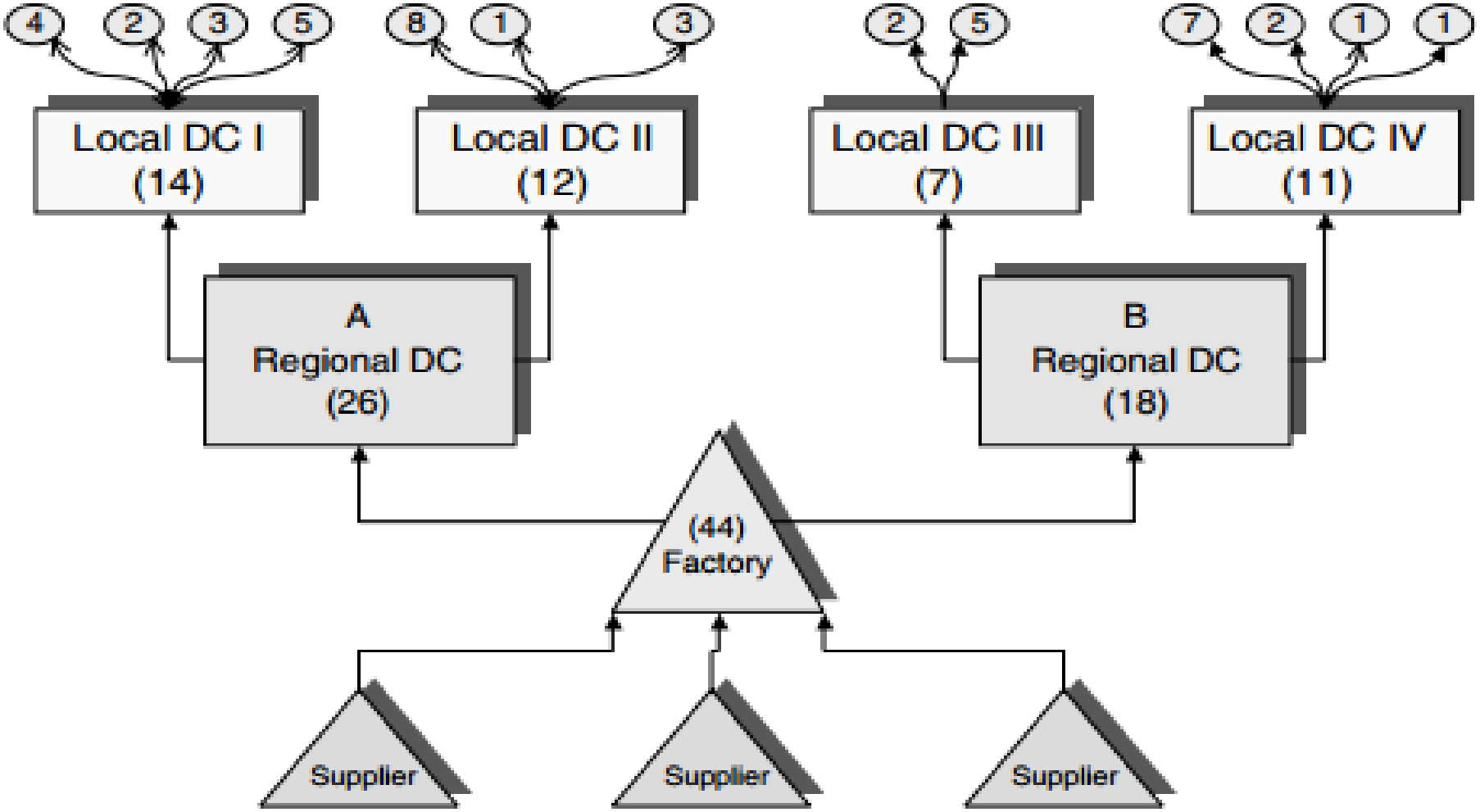


ROP Days on Hand	1	2	3	4	5	6	7
Daily Replenishment	93.8%	3.8%	2.5%	0.0%	0.0%	0.0%	0.0%
2-Day Replenishment	97.5%	90.0%	3.8%	3.8%	1.3%	0.0%	0.0%
3-Day Replenishment	97.5%	92.5%	55.0%	11.3%	2.5%	1.3%	0.0%

Replenishment scheme simulation results

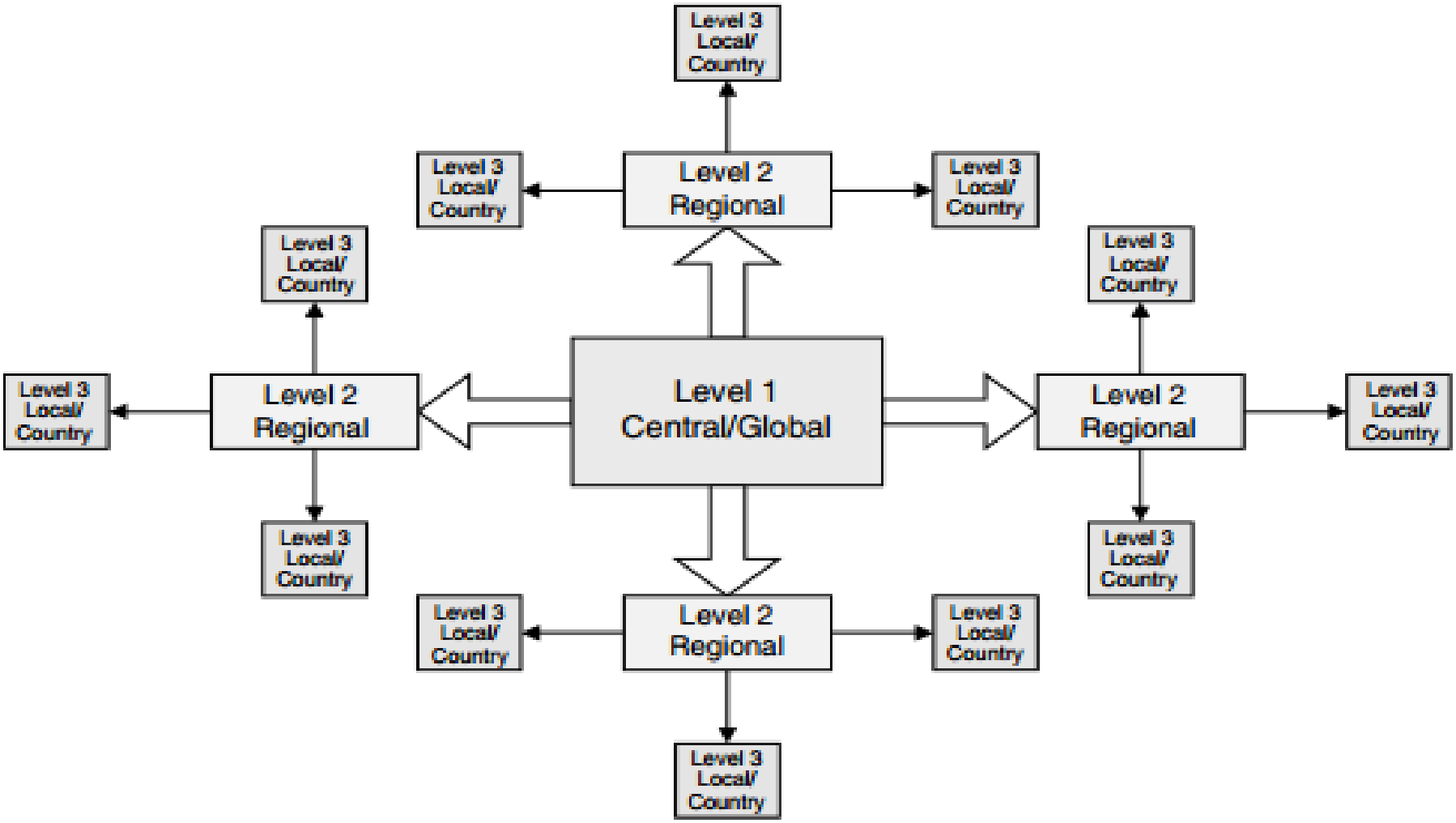


Distribution requirements planning example



INVENTORY DEPLOYMENT

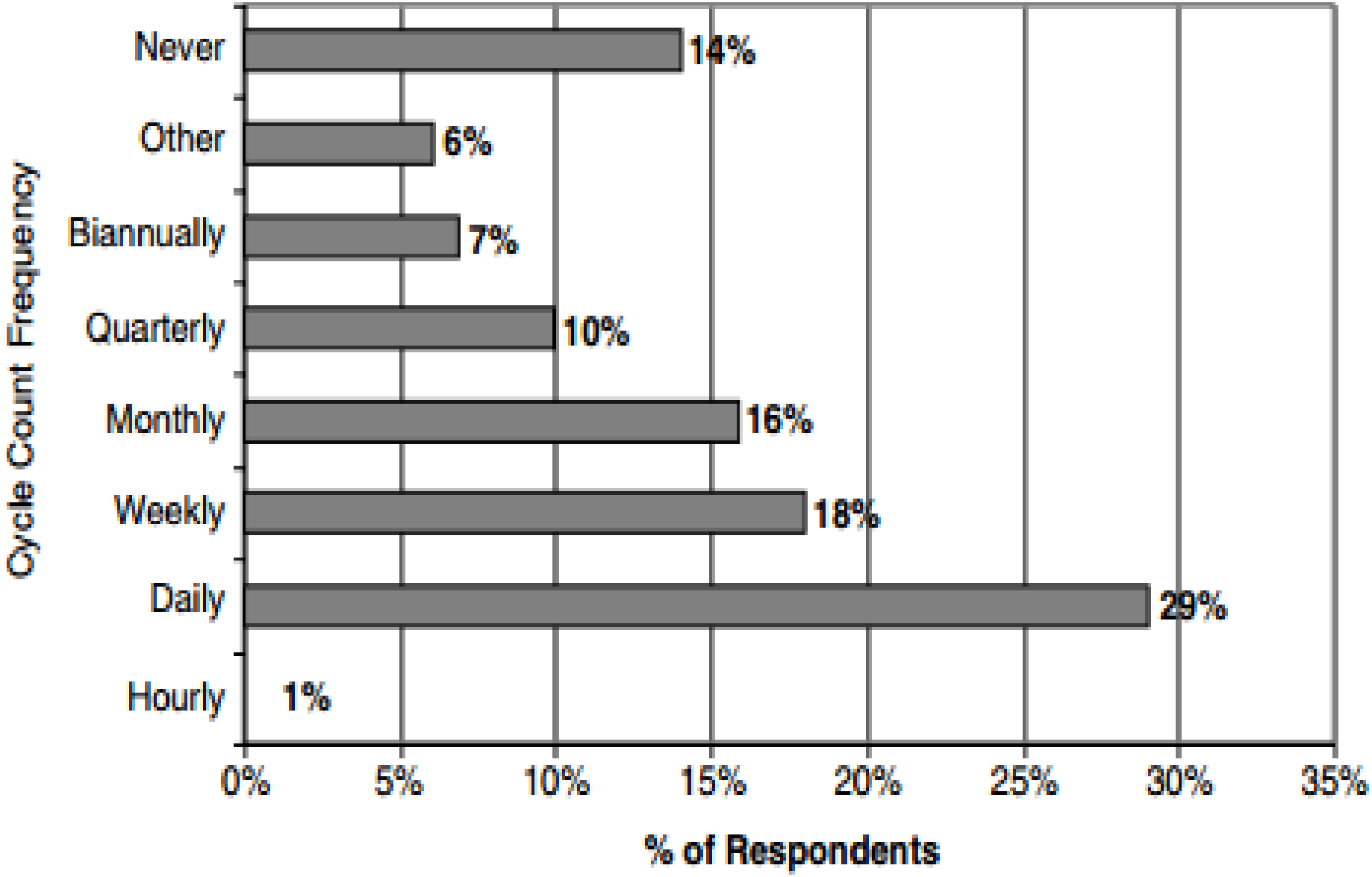
Three-level deployment model.



Manufacturing and Distribution Speculation and Postponement

Manufacturing/Procurement		Distribution: Speculation	Distribution: Postponement
	Speculation	*Full speculation* Products are made to a production forecast and pre-positioned in a distribution network. Ex. Campbell's Soup, Coke	*Distribution postponement* Products are made or purchased based on forecasted demand and held centrally for distribution. Ex. L.L. Bean, Lands' End Sears.com
	Postponement	*Manufacturing postponement* Products are engineered, made, and/or assembled after an order has been received at a variety of locations close to customers. Ex. Flower Shop, Subway	*Full postponement* Products are engineered, made, and/or assembled after an order has been received at a single location. Components may even be merged-in-transit. Ex. Dell Computer, MICRON

Cycle counting frequencies




Prevent shortages and production
INVENTORY MANAGEMENT SYSTEM
IMS
Track inventory levels in real time
Optimize warehouse organization

THE END

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