



POLITECNICO
MILANO 1863

STRATEGIC CAPACITY MANAGEMENT

Operations Strategy

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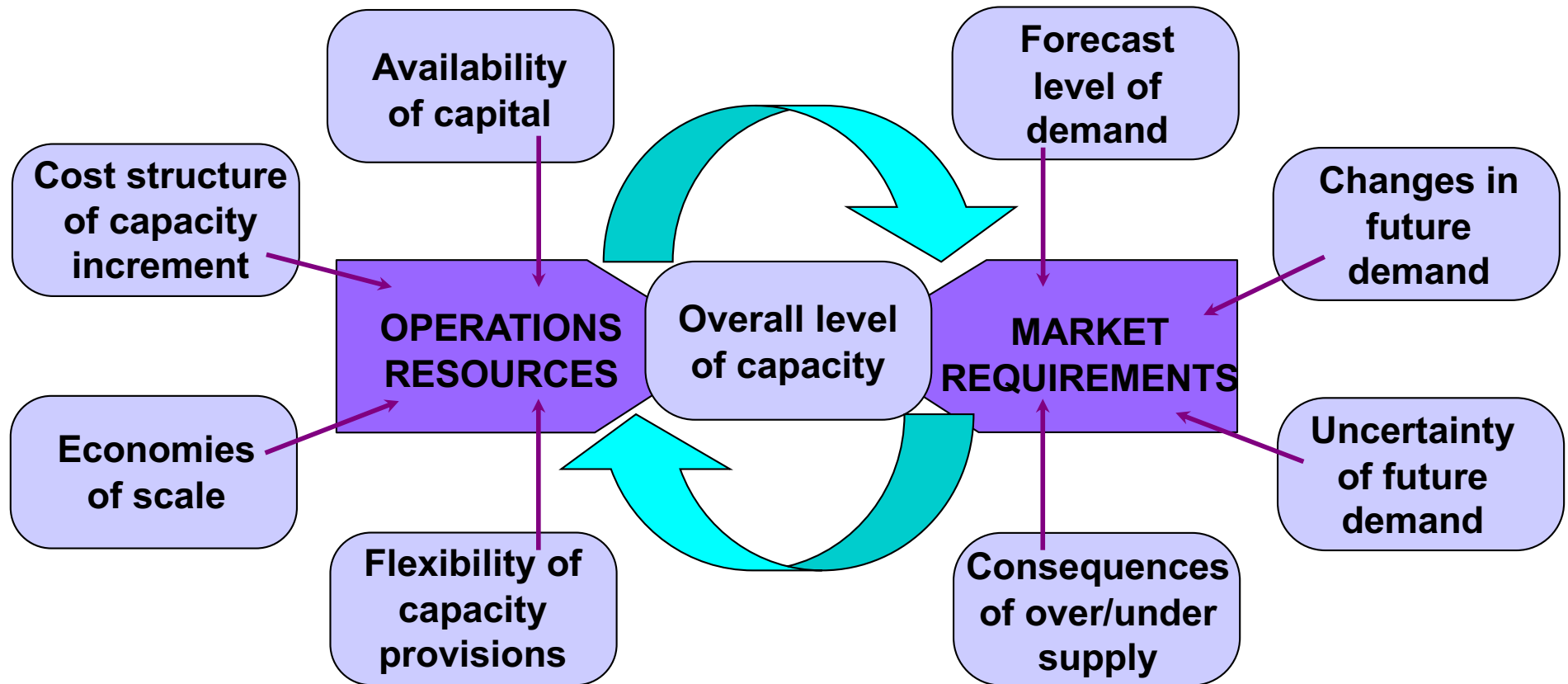
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Characteristics of capacity strategies

- Timing of change
- Magnitude of change
- Attention to transient

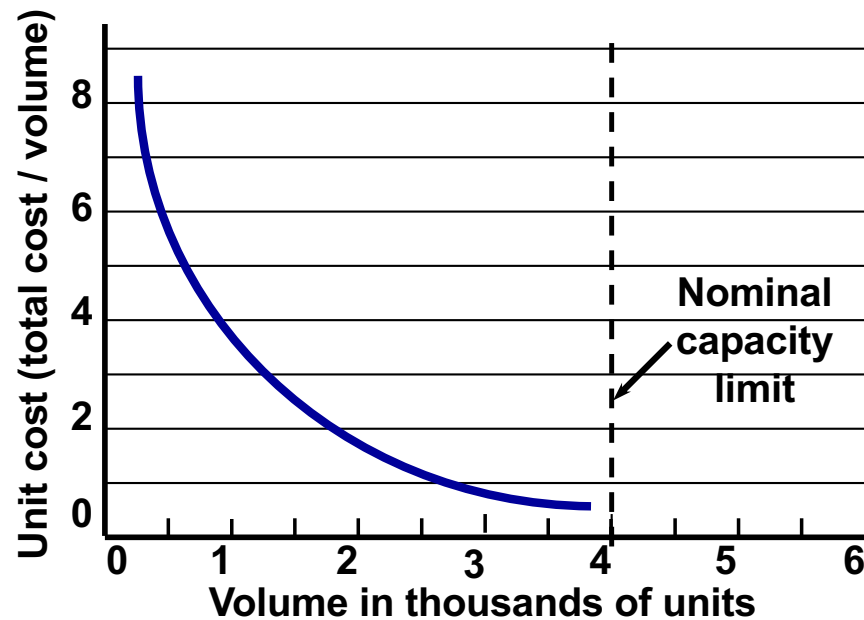
Key issues (not complete list)

- Lead Time to complete the change
- Flexibility to change
- Economies of scale
- Forecast of demand trend
- Forecasts uncertainty (fulfillment/demand)
- Competitors' behaviour
- Requested service level / customers' behaviour

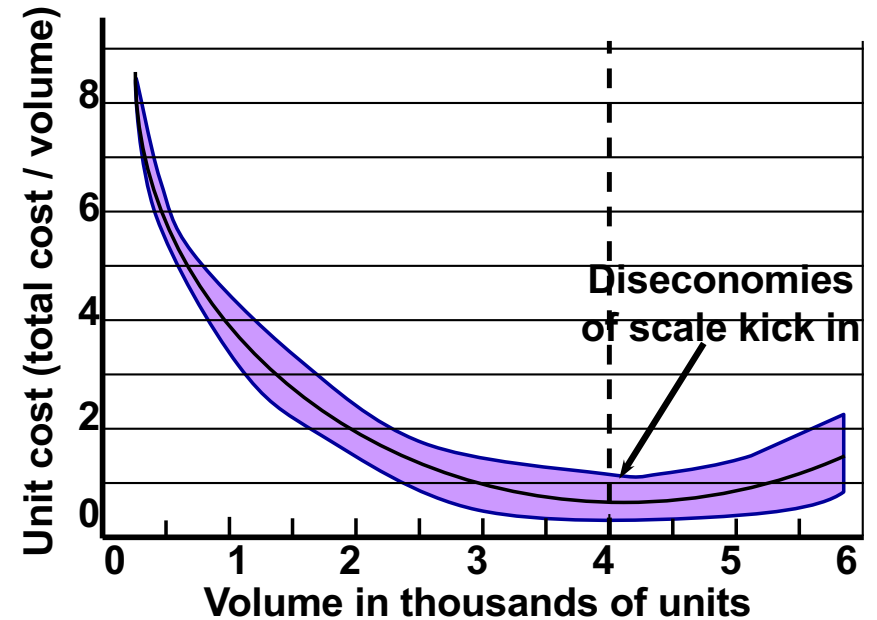


Some factors influencing the overall level of capacity

Consider economies of scale



(a)



(b)

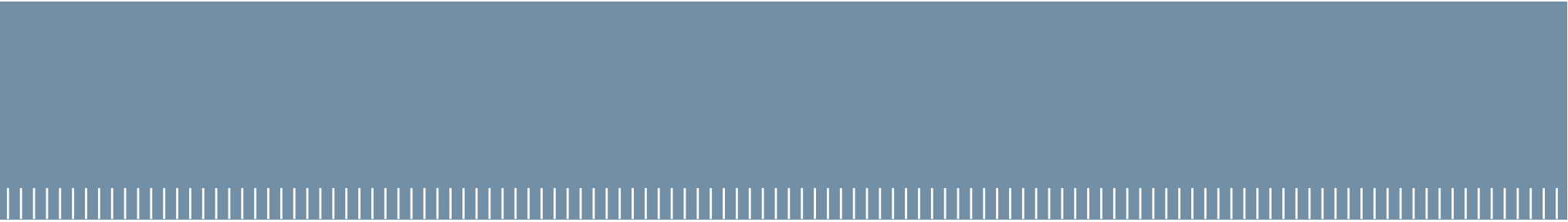
Unit cost curve

Consider risks

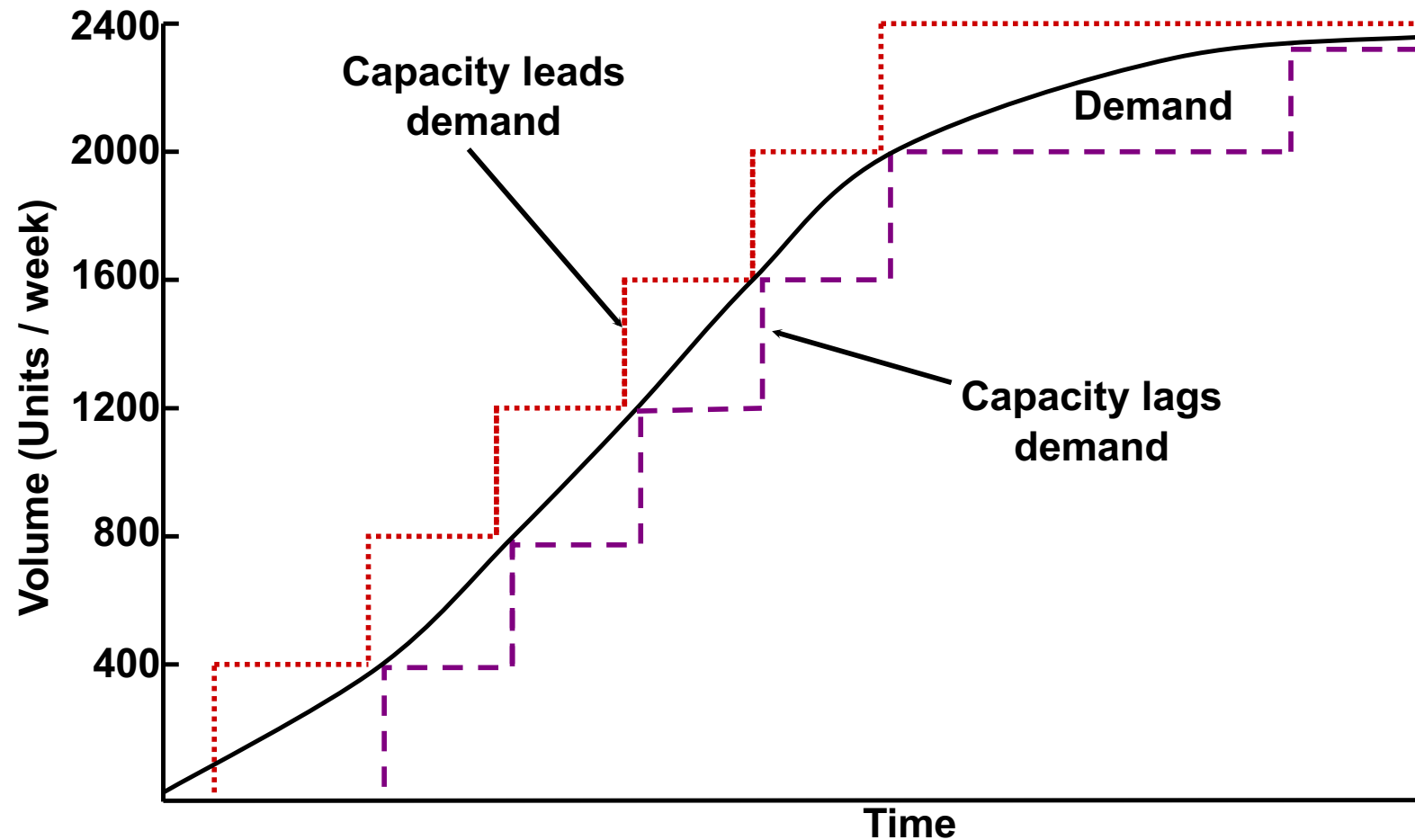
- All values are estimates
- Getting more precise data is a cost and sometimes it is even impossible
- Sensitive analysis helps in identifying key elements
- A certain degree of uncertainty is unavoidable, it is therefore necessary to be prepared for it
- Data are not only estimates, but they can be influenced (e.g. sales forecast depend ALSO on marketing actions)
- Passions is a key element for success

Consider transient

- It is impossible to get all benefits from the beginning
- Performances during the transient period can be permanently disrupted
- It may require a long time to make conditions changing
- In case there are not the right conditions, it may be better to postpone change
- A Work Breakdown Structure and a project planning allow to anticipate (and avoid) problems

- 
- Timing of change
 - Magnitude of change

Leading and lagging strategies



Capacity leading and capacity lagging strategies

PROs

- Always spare capacity for opportunities
- Faster response time
- Better delivery reliability
- Lower impact of uncertainty and unforeseen events
- Lower impact from underestimating demand

CONs

- Higher production unit cost
- Outbound cash flow
- Higher impact from overestimating demand

Lagging

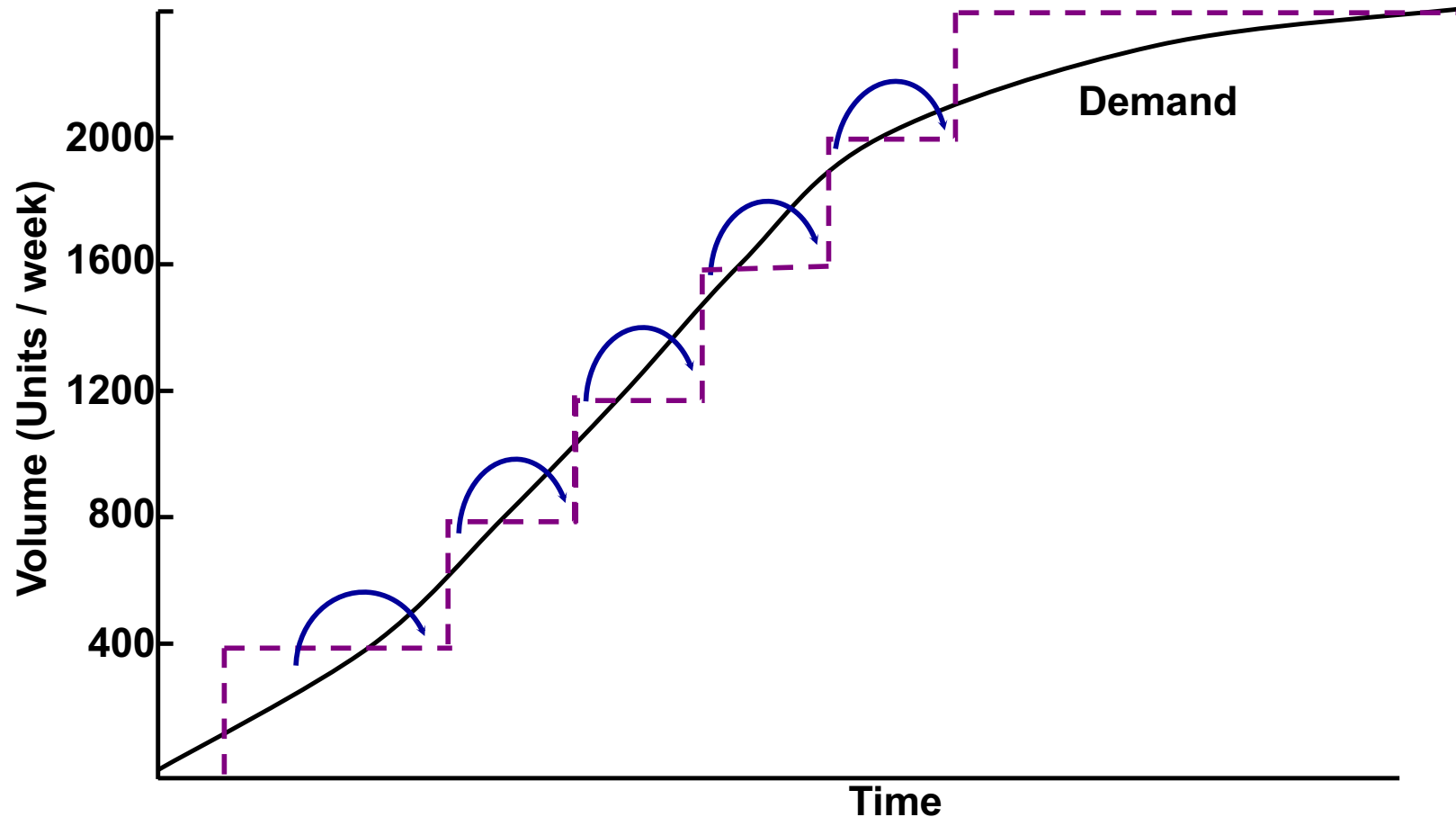
PROs

- High plant utilisation
- Low production cost
- Lower impact from overestimating demand

CONs

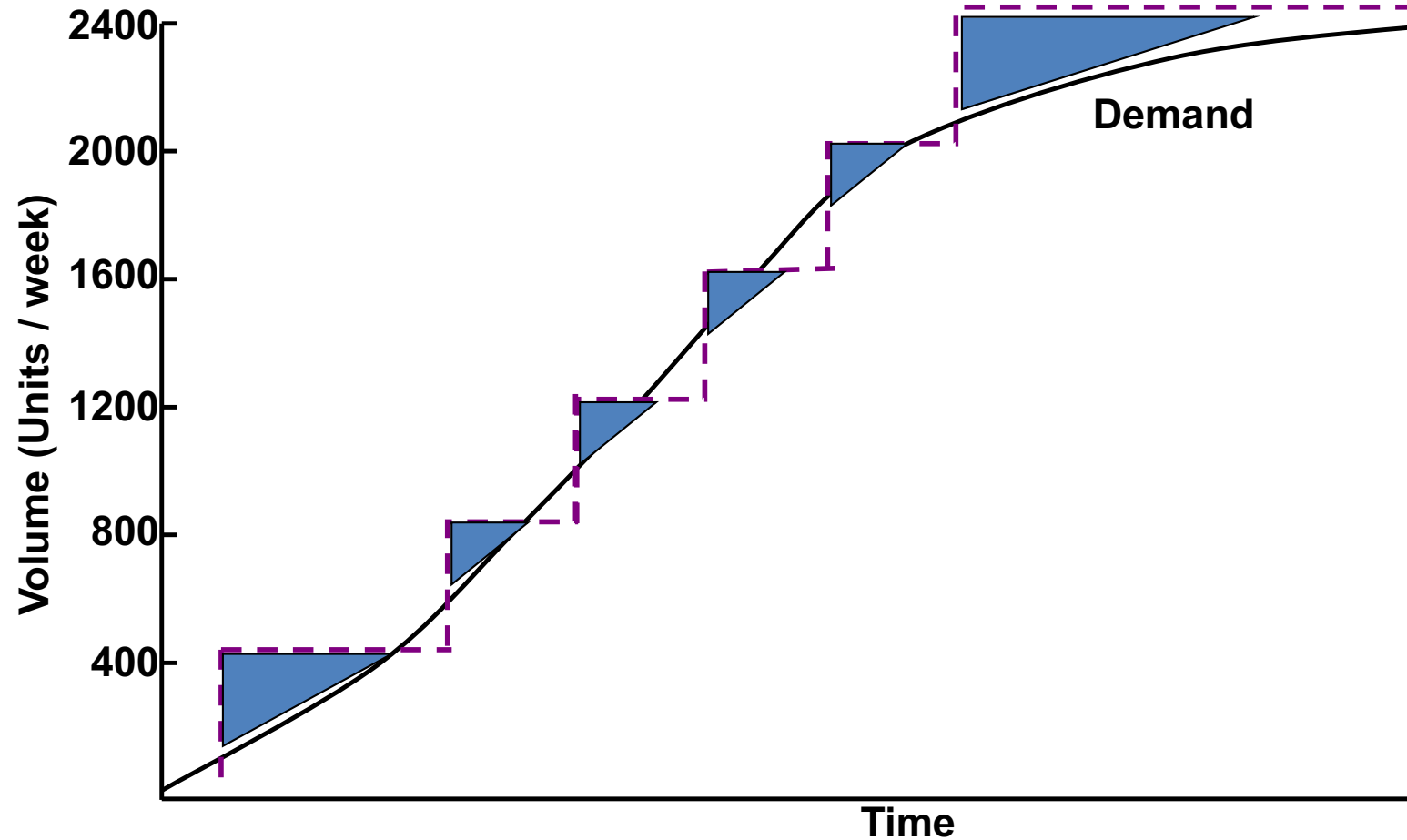
- Longer response rate
- Lower delivery reliability
- Higher impact from overestimating demand

Smoothing



Smoothing with inventory means using the excess capacity of one period to produce inventory which can be used to supply the under capacity period

Filling products



In some cases, it's possible to use the plant for other productions

Filling products

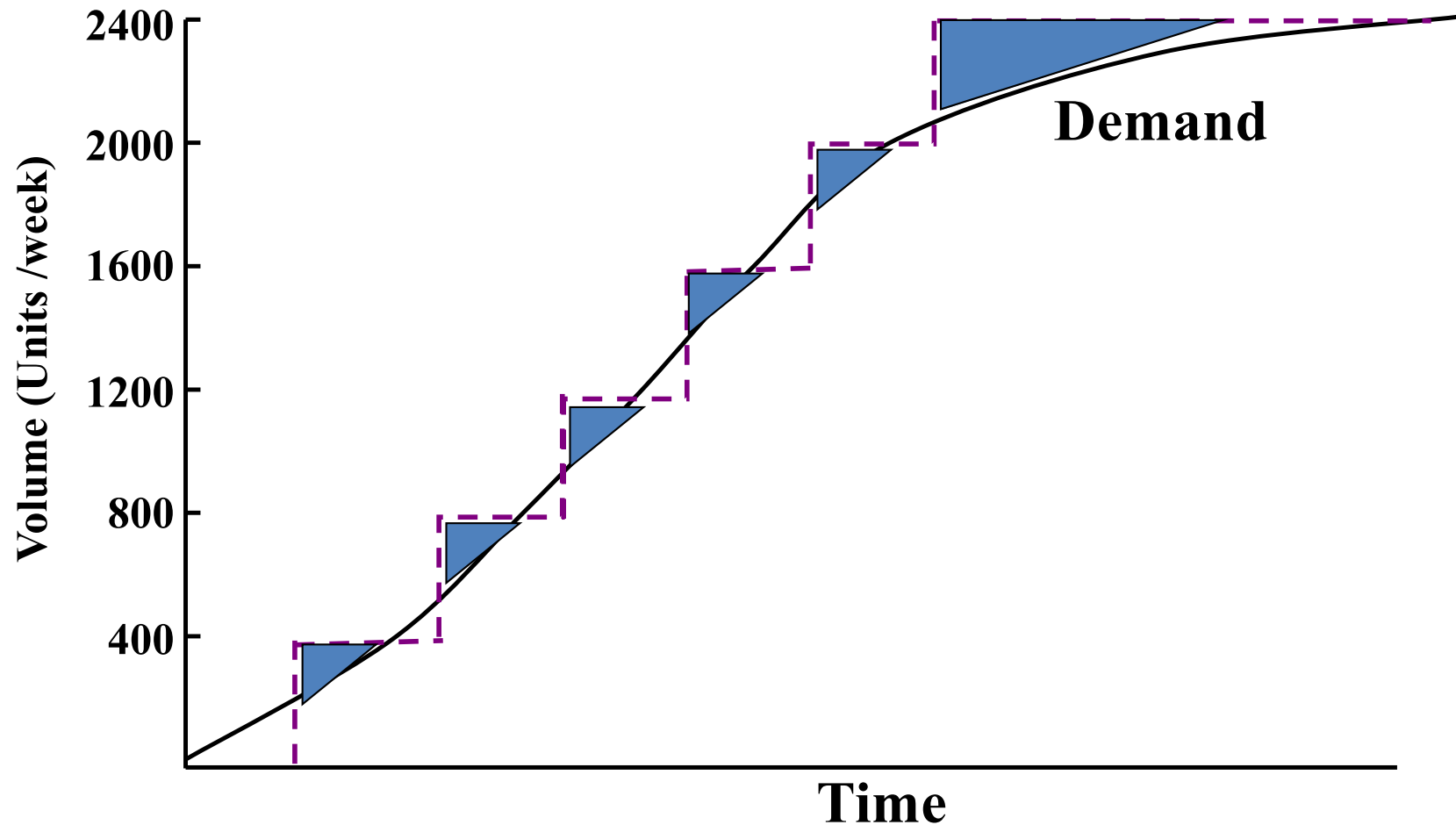
Using filling products is like **modifying the demand**.

It means that:

- It is possible to influence demand
- Not all the products are the same
- It is useful to identify which product has to be sacrificed if capacity is not enough

OP CASE

Additional market? YES if it is a Filling product



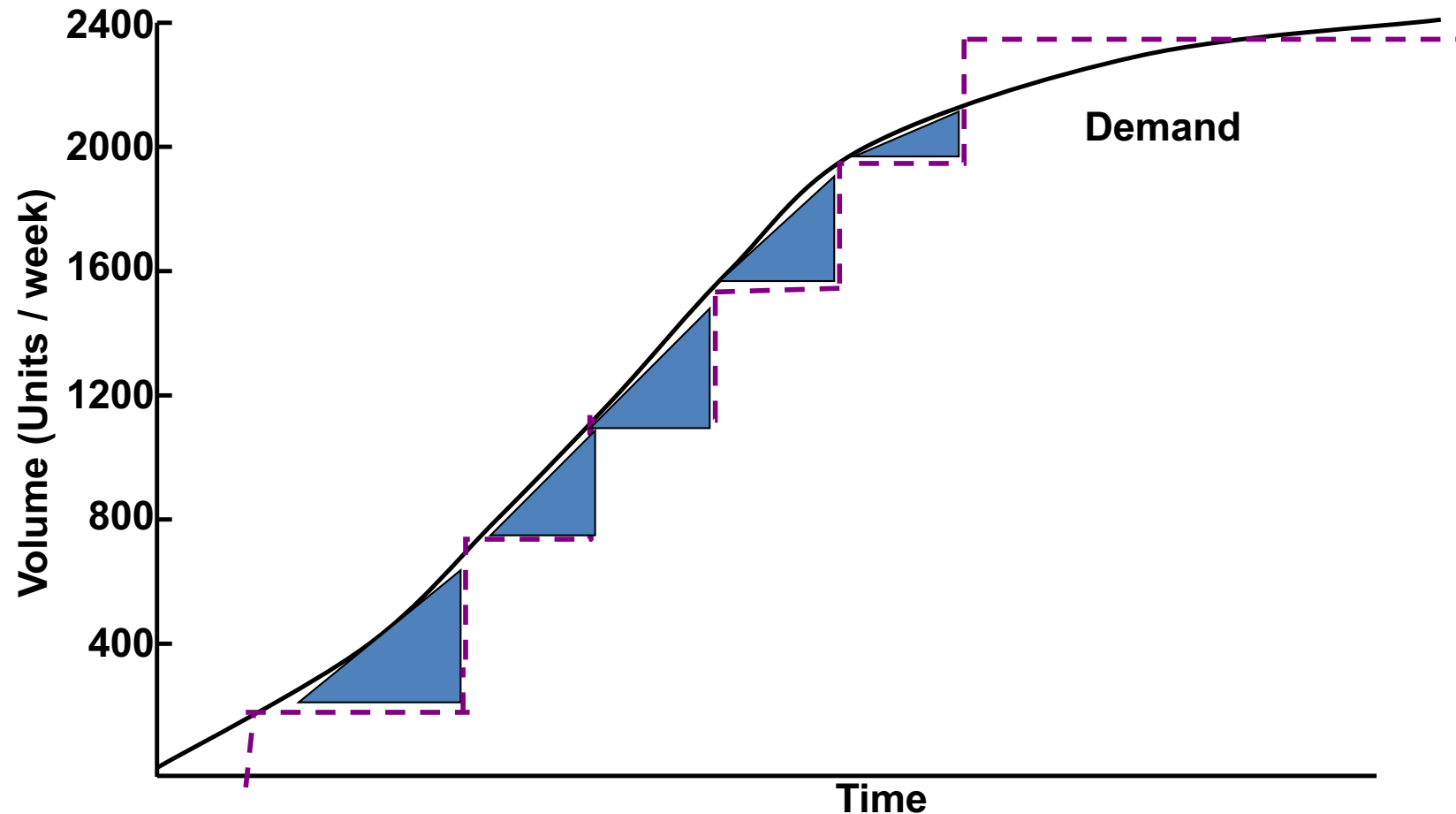
OP CASE: Filling product

Additional margin

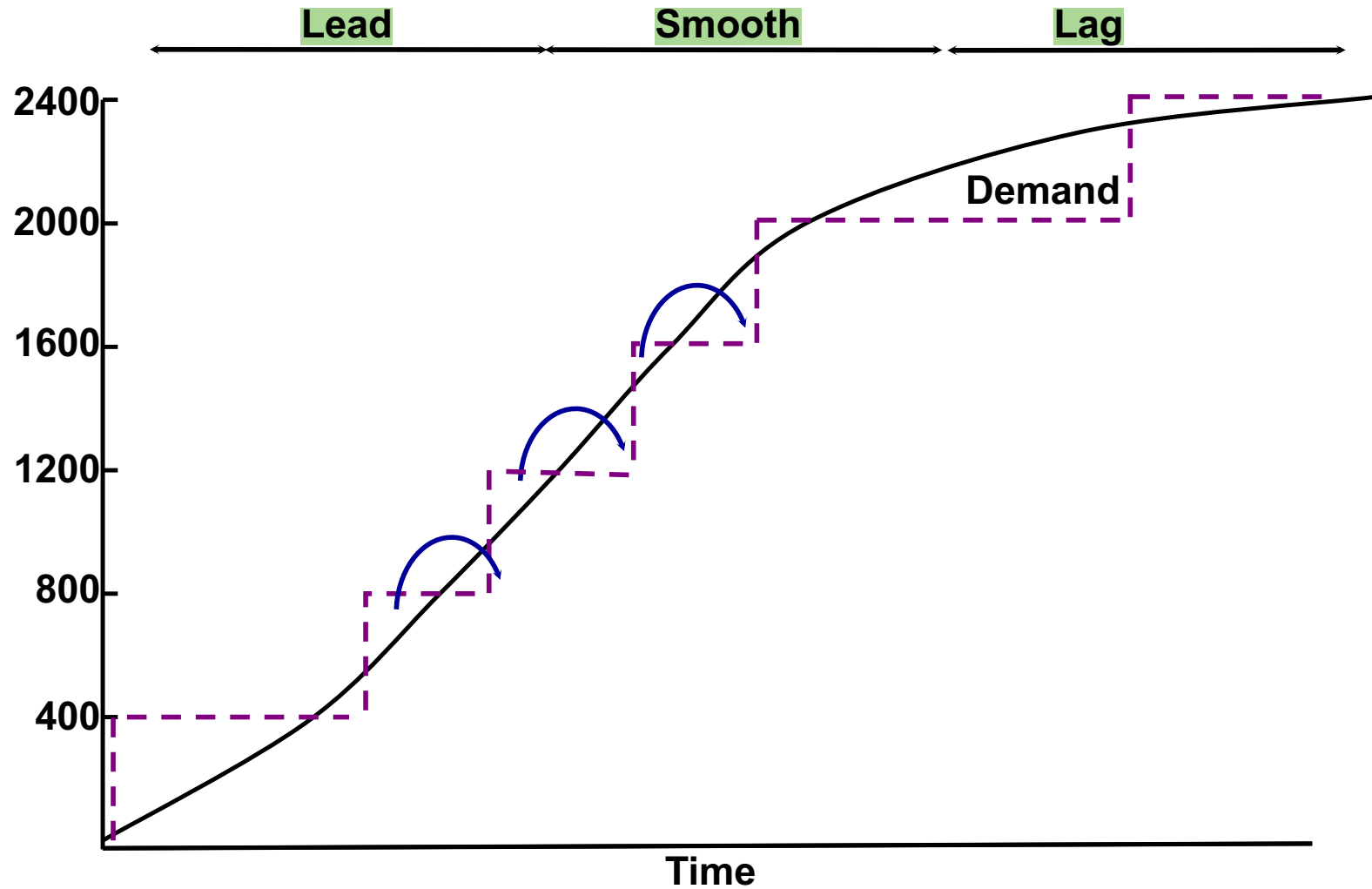
Not competing with the existing ones

Utilisation of the plant, from the existing products perspective would remain 60%

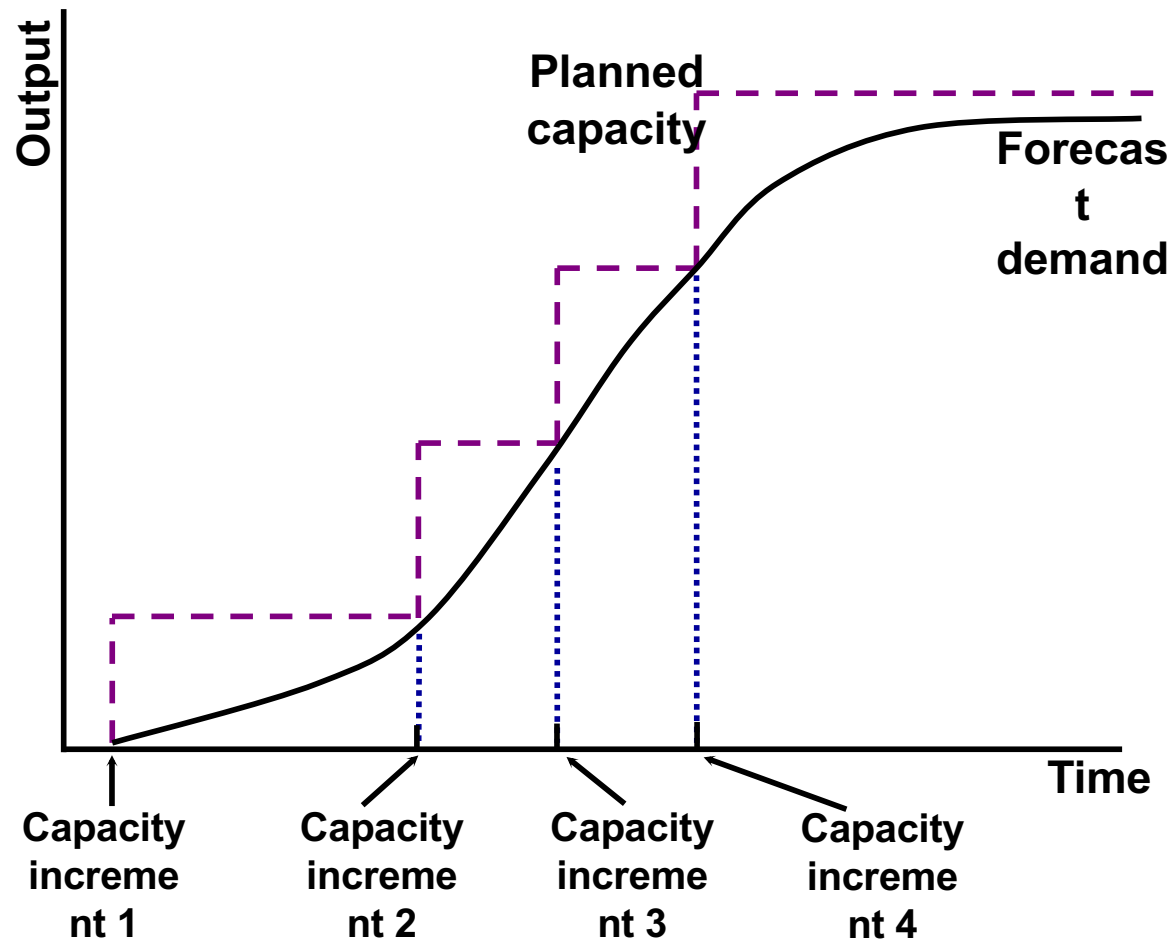
Outsourcing



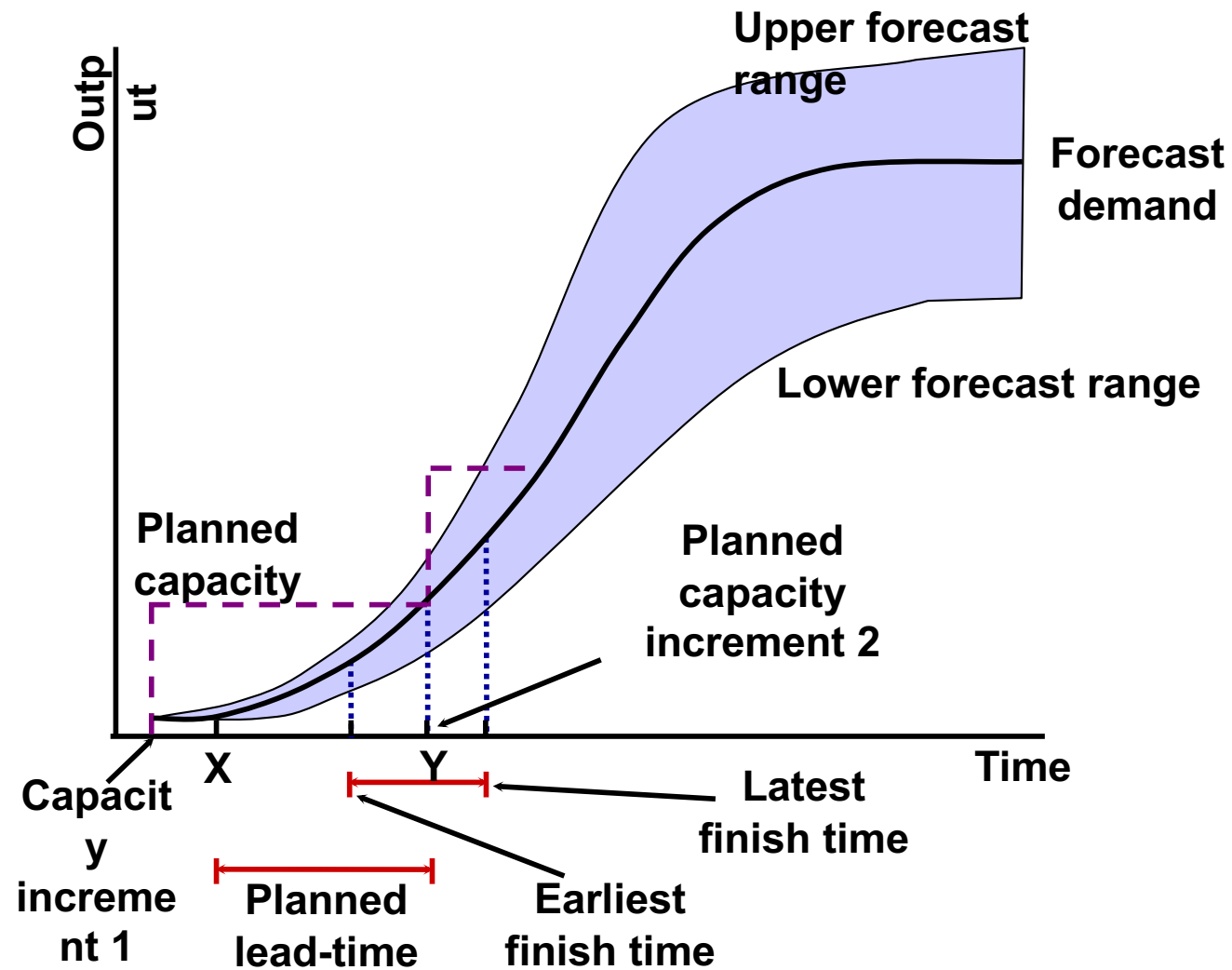
In some cases, it's possible to use external supplier to balance capacity and demand

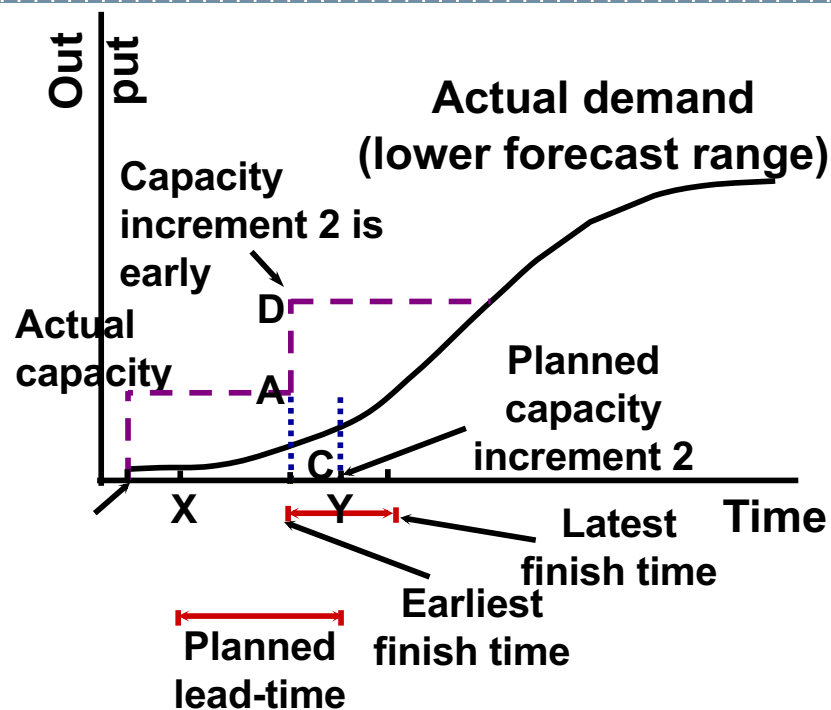


The life cycle effect on capacity strategies

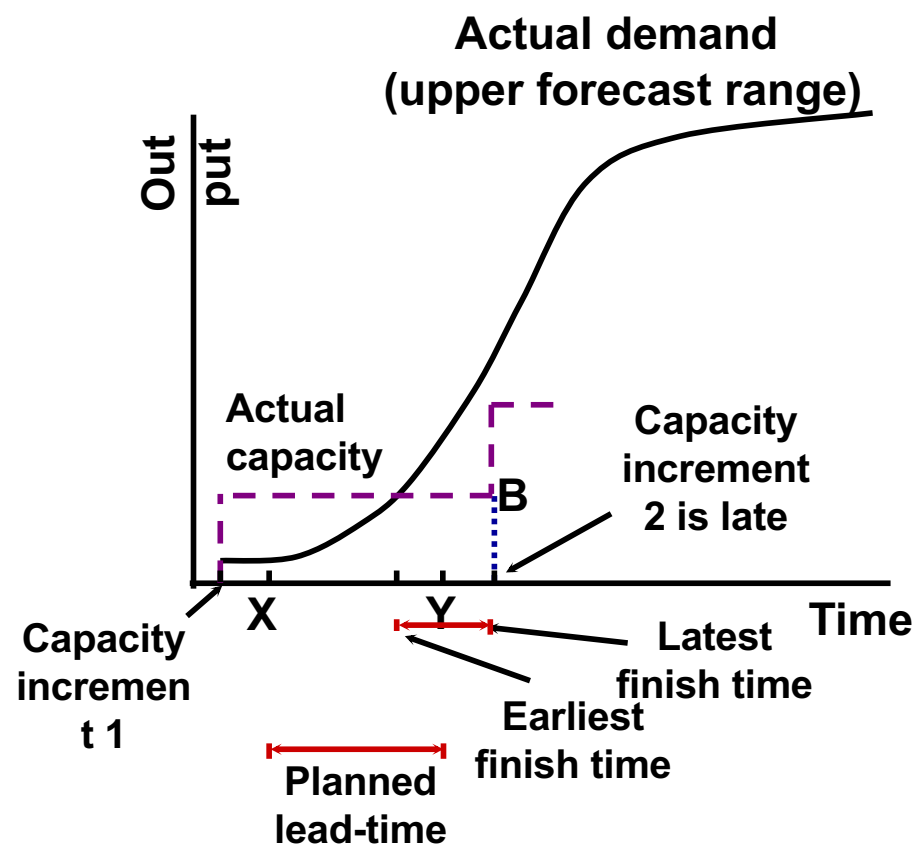


Capacity planning with certain forecasts and capacity introduction





(a) Capacity on stream early but demand on lower boundary of forecast



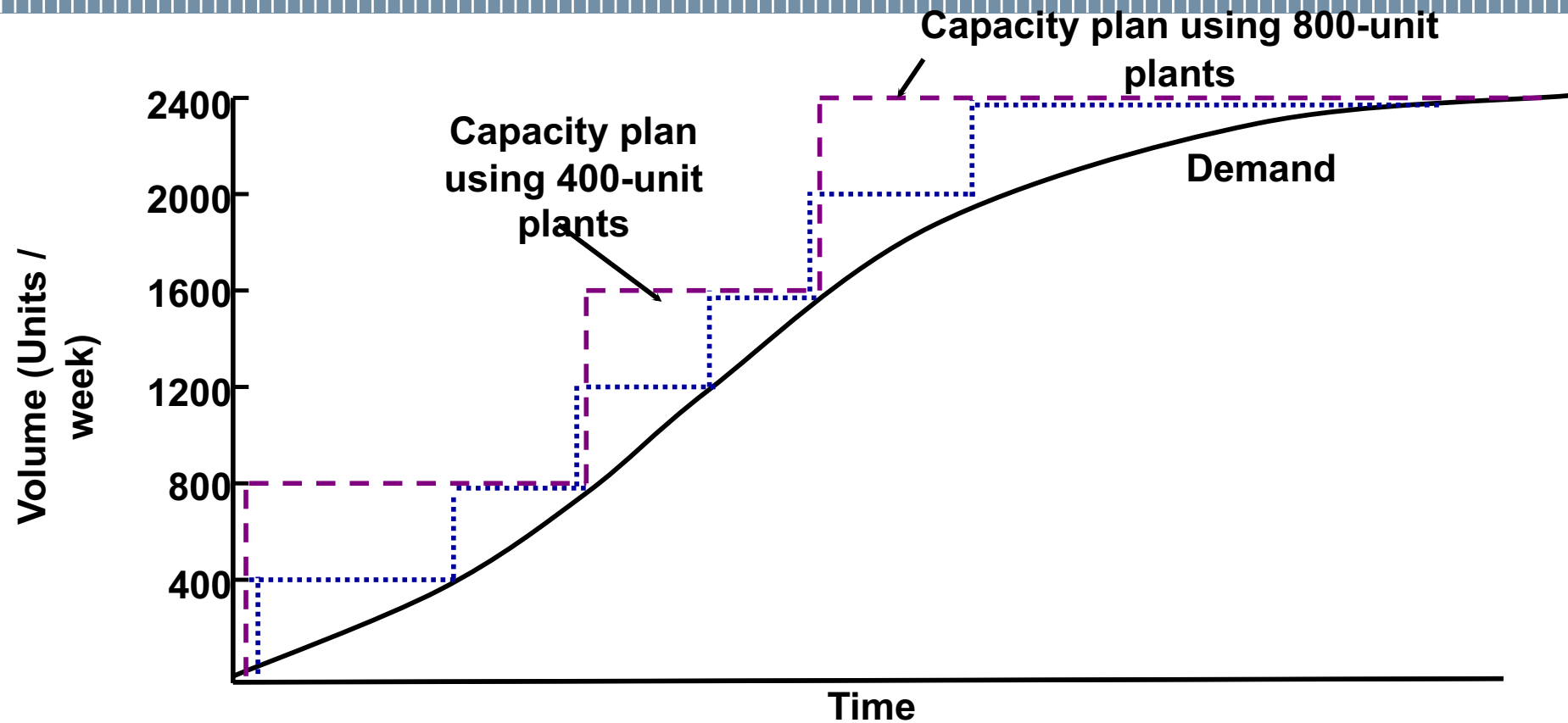
(b) Capacity on stream late and demand on upper boundary of forecast

Scenario analysis

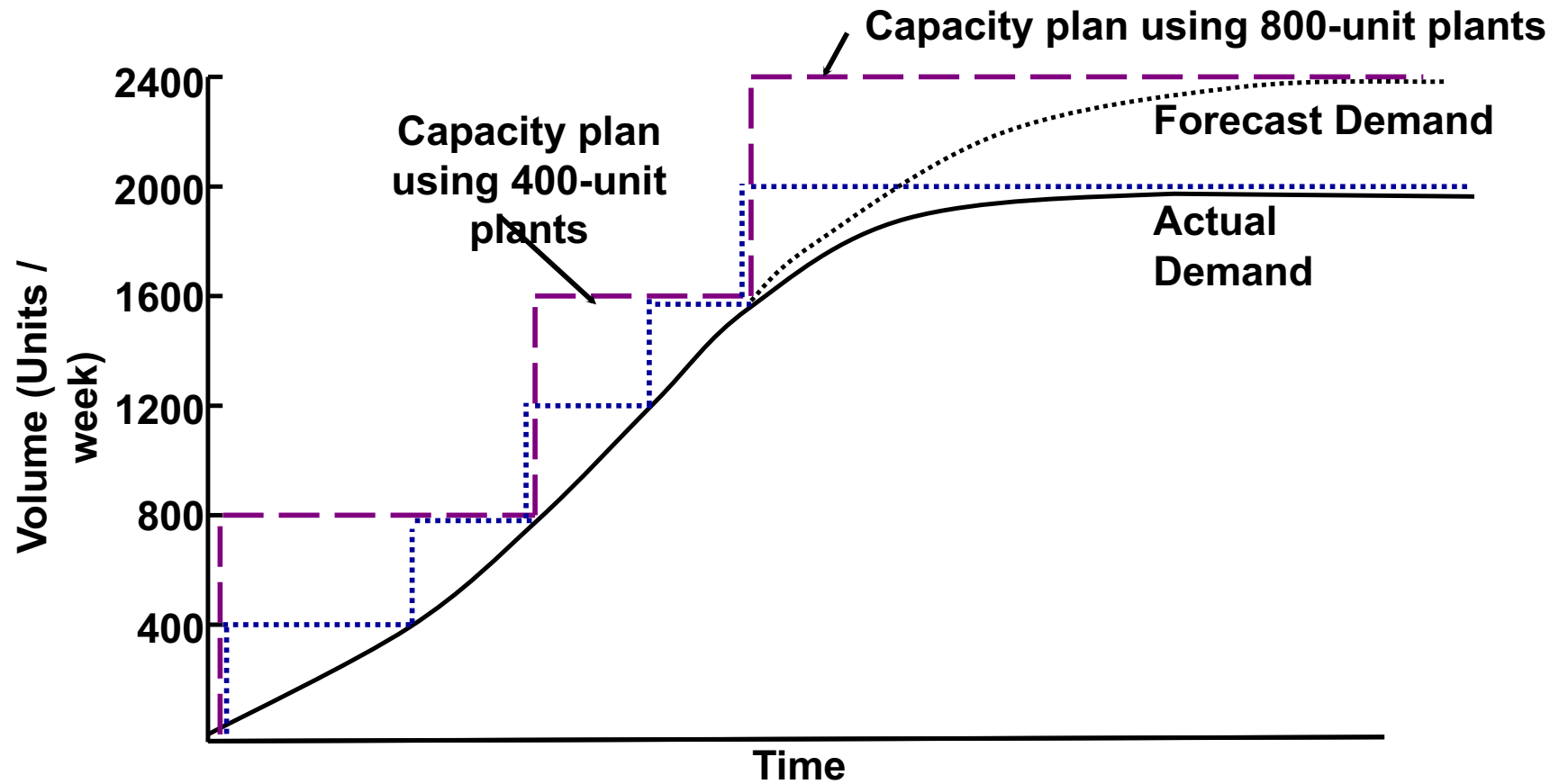
- To hasten possible constraints/opportunity
- To prepare countermeasure
- To limit the impact of unforeseeable events
- To prepare a faster, more efficient and more effective response

They have a cost=> *no risk no gain*

Size of increase



Capacity plans for meeting demand using either 800 or 400 unit capacity plants



Smaller scale capacity increments allow the capacity plan to be adjusted to accommodate changes in demand

Size of increase: elements to consider

- Economies of scale
- Demand uncertainty (which stage along the life-cycle)
- Financing availability
- Over/underutilisation costs
- Outsourcing possibility



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