

# **Managing the Supply Chain in an Age of Complexity and Uncertainty**

Emeritus Professor Martin Christopher  
Cranfield School of Management  
Cranfield University  
Cranfield  
Bedford MK43 0AL  
United Kingdom

Tel : 44 (0)1234 751122      Fax : 44 (0)1234 721225  
E-mail : [m.g.christopher@cranfield.ac.uk](mailto:m.g.christopher@cranfield.ac.uk)  
[www.martin-christopher.info](http://www.martin-christopher.info)

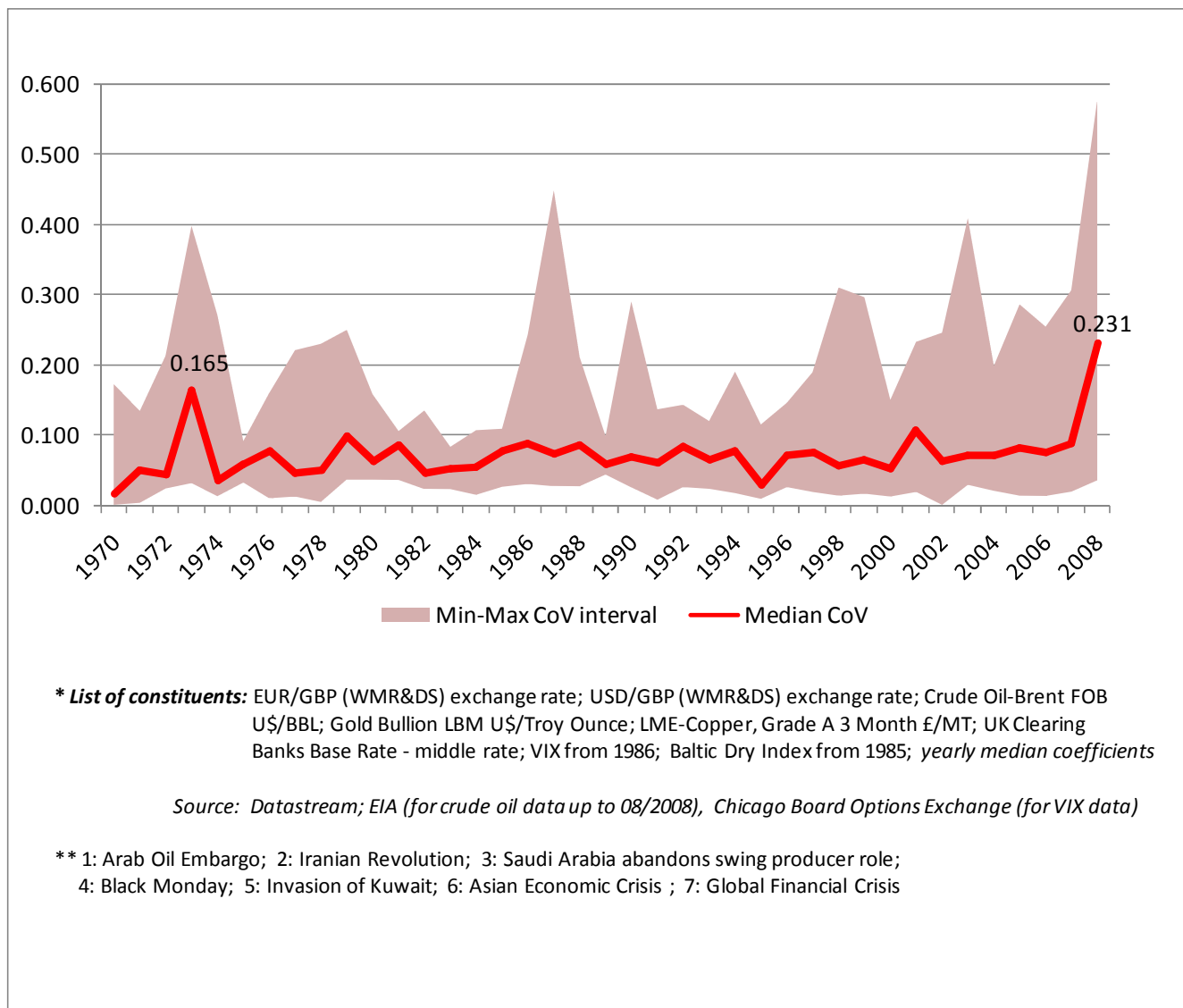
# Agenda

- New competitive realities
- Turbulence and uncertainty become the norm
- Managing complexity across the supply chain
- The sustainability challenge
- Developing the supply chain manager of the future

## New competitive realities

- Input costs are rising but ...
- New sources of low cost competition mean that the pressure on price will continue and ...
- Continued concentration of markets means that bigger, more powerful customers will demand more from their suppliers whilst ...
- Conventional marketing strategies have less effect in a time-sensitive, on-demand world

# The Volatility Index of Key Business Parameters, 1970-2008



## Competing in turbulent markets

- Product and technology life-cycles are shortening
- Competitive pressure forces more frequent product changes
- High levels of variety and product proliferation increase business risk
- Supply chain 'chaos' created through self-imposed actions
- Forecast-based management no longer viable :  
forecast for capacity, execute against demand

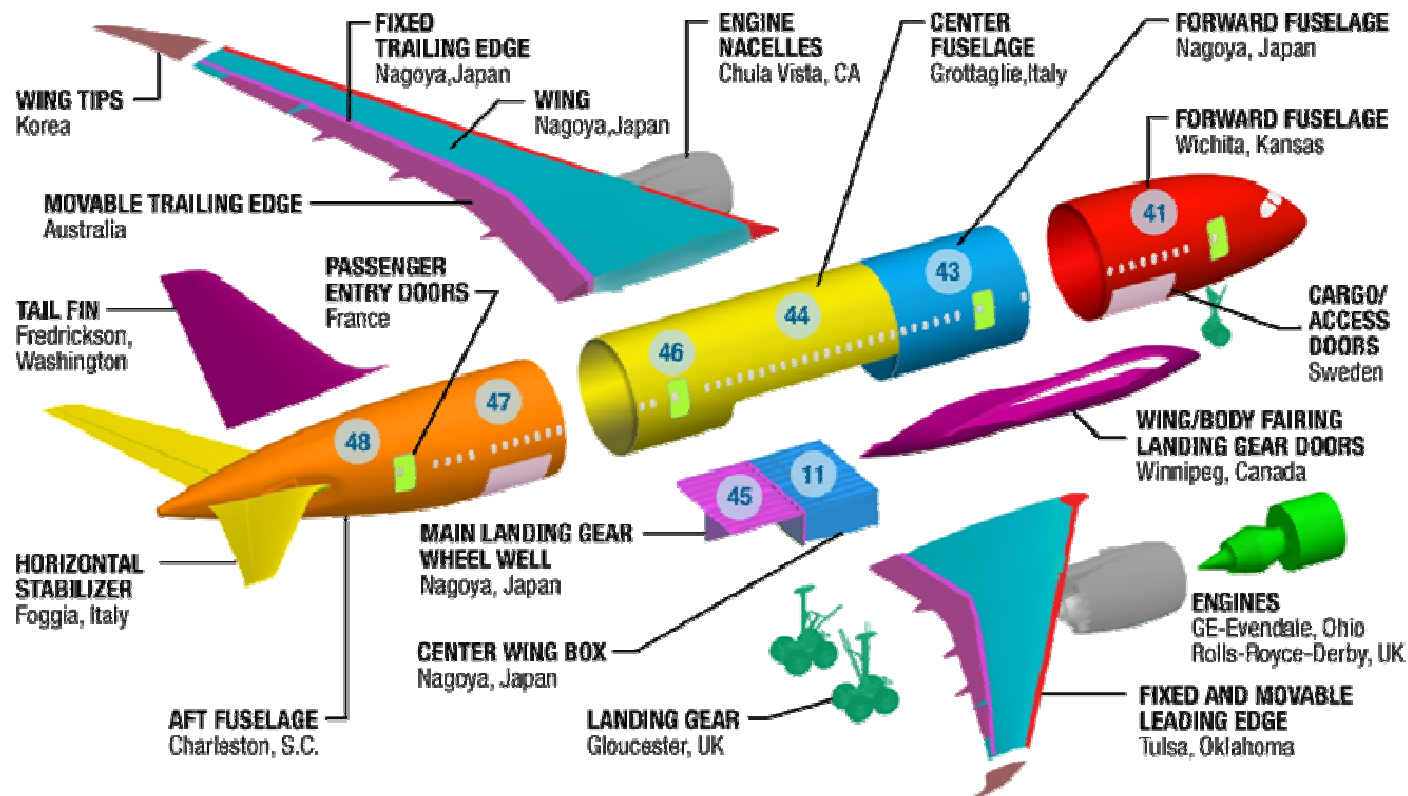
## The rise of demand-driven supply chains

- Because markets have become more turbulent they have become harder to predict.
- As a result there is a growing requirement to move from being forecast-driven to being demand and event-driven.
- This implies a higher levels of responsiveness and agility across the supply chain.

# Complexity in the global supply chain : the Boeing 787

## THE COMPANIES

U.S.	CANADA	AUSTRALIA	JAPAN	KOREA	EUROPE
Boeing	Boeing	Boeing	Kawasaki	KAL-ASD	Messier-Dowty
Spirit	Messier-Dowty		Mitsubishi		Rolls-Royce
Vought			Fuji		Latecoere
GE					Alenia
Goodrich					Saab



## The costs of complexity

Much of the cost in today's supply chains is there because of the continuing increase in their complexity .... it can be argued that perhaps the biggest opportunity for cost reduction lies in reducing that complexity.

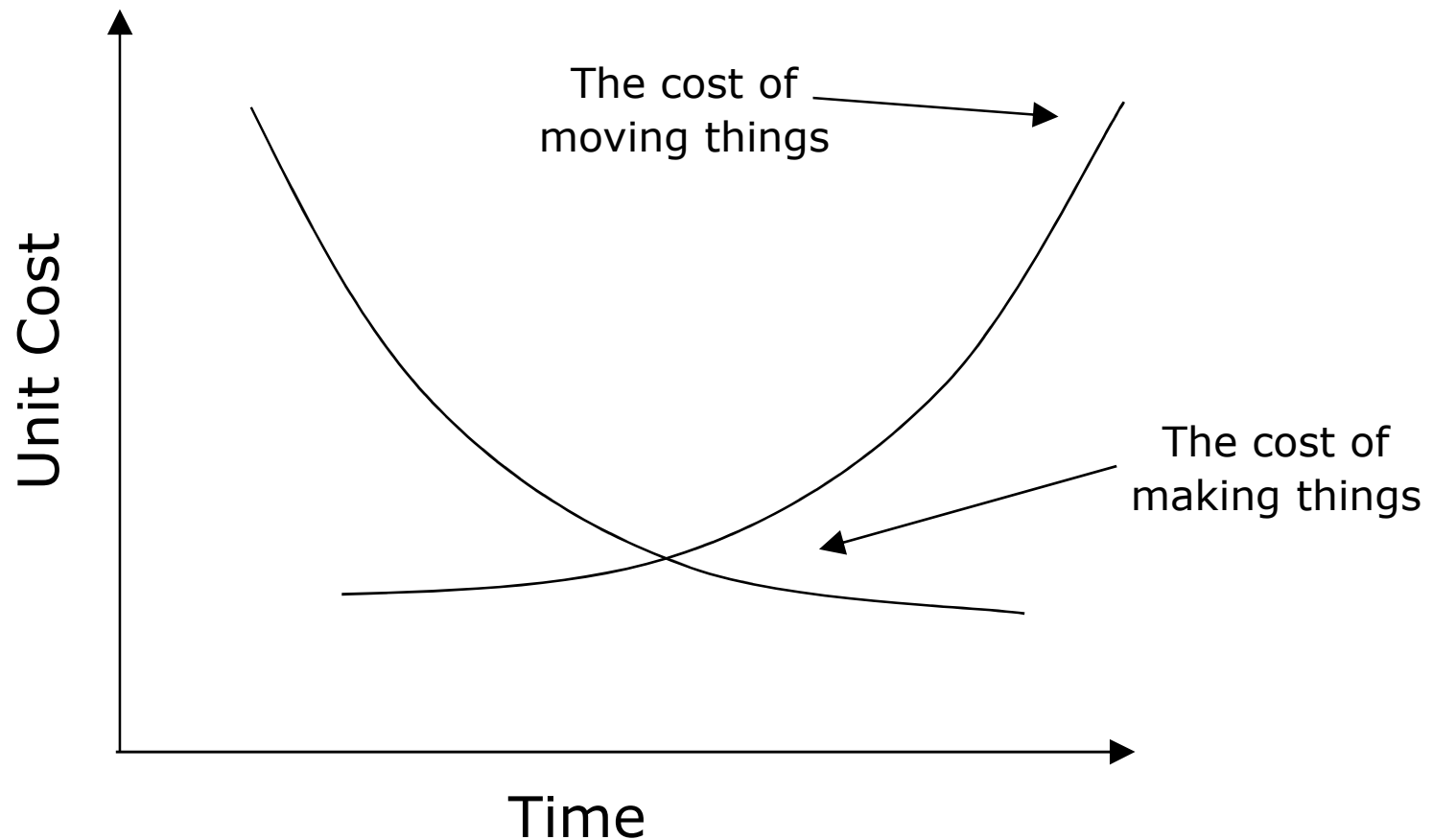
## Seven types of supply chain complexity

- Network complexity e.g. too many nodes and links
- Process complexity e.g. too many steps
- Range complexity e.g. too wide a range
- Product complexity e.g. too many unique components
- Customer complexity e.g. too many service options
- Supplier complexity e.g. too many suppliers
- Organisational complexity e.g. too many levels and 'silos'

## How sustainable are our supply chains?

- The new platform for product lifecycle management : Reduce, Re-use, Re-cycle.
- Understand the resource footprint of supply chains.
- Closed-loop supply chains must become the norm supported by a philosophy of 'Design-for-Sustainability'.

## The balance of costs is changing



The cost of making things is getting less;  
The cost of moving things is getting higher

## Options for reducing the transport intensity of supply chains

- More local for local manufacturing based on 'small footprint manufacturing' practices
- Greater levels of collaborative working and asset sharing to improve transport utilisation
- Leverage economies of scale through bigger vehicles and vessels (e.g. Emma Maersk)
- Utilise postponement techniques to enable low cost country sourcing of 'vanilla' products to be moved in bulk for local finishing
- Re-work network optimisation calculations based on a \$200 barrel of oil cost and realistic carbon cost

# The key business transformations and the implications for management skills

<i>Business transformation</i>	<i>Leading to</i>	<i>Skills required</i>
From supplier-centric to customer-centric	The design of customer-driven supply chains	Market understanding; customer insight
From push to pull	Higher levels of agility and flexibility	Management of complexity and change
From inventory to information	Capturing and sharing information on real demand	Information systems and information technology expertise
From transactions to relationships	Focus on service and responsiveness as the basis for customer retention	Ability to define, measure and manage service requirements by market segment
From 'trucks and sheds' to 'end-to-end' pipeline management	A wider definition of supply chain cost	Understanding of the 'cost-to-serve' and time-based performance indicators
From functions to processes	The creation of cross-functional teams focused on value creation	Specific functional excellence with cross-functional understanding; team working capabilities
From stand-alone competition to network rivalry	More collaborative working with supply chain partners	Relationship management and 'win-win' orientation