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Session 2:
Achieving Supply Chain Fit
35E00750 Logistics Systems and Analytics

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Learning objectives

1. Explain **why** achieving supply chain fit is **critical** to a company's overall success

2. Describe how a company **could achieve** supply chain fit

3. Identify the performance **effect** of supply chain fit

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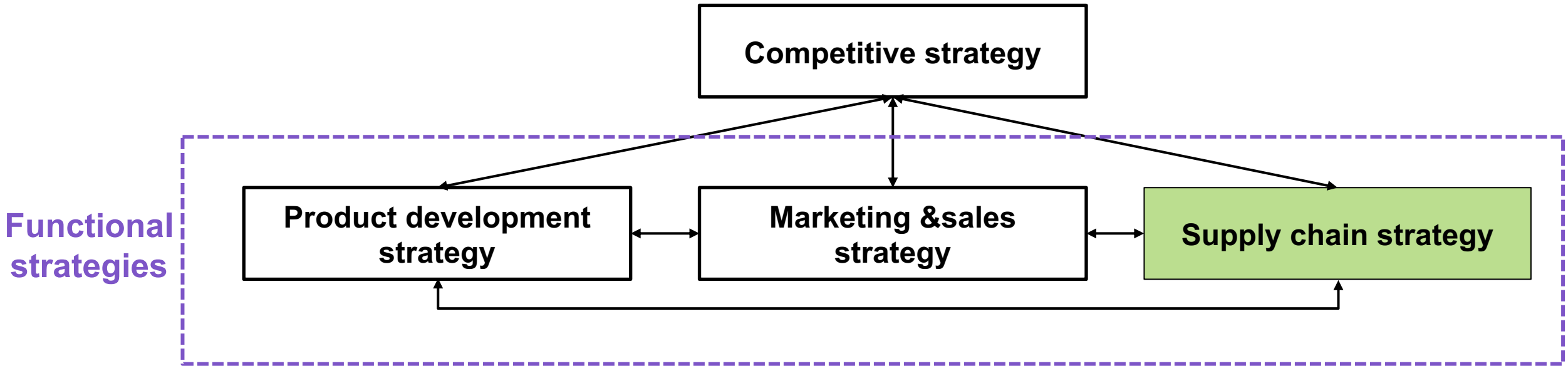
Why is supply chain fit crucial?

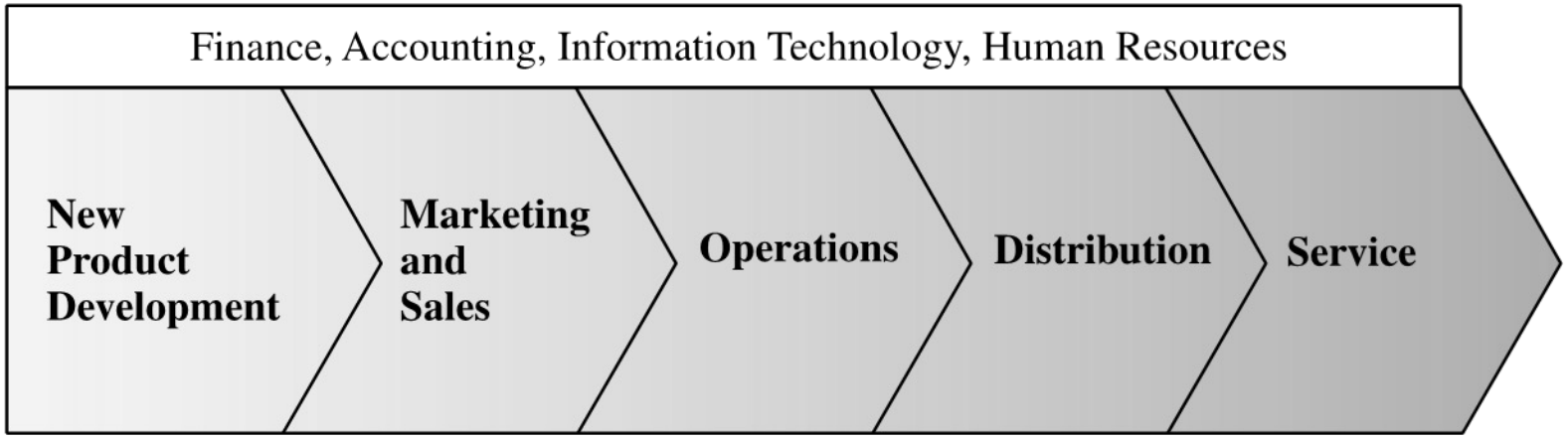
Competitive and supply chain strategies

- **Competitive strategy** defines the set of customer needs a company seeks to satisfy through its products and services
  - Product development strategy specifies the portfolio of new products that the company will try to develop
  - Marketing and sales strategy specifies how the market will be segmented and product positioned, priced, and promoted
  - Supply chain strategy determines the nature of material procurement, transportation of materials, manufacture of product or creation of service, distribution of product, follow-up service, whether processes will be in-house or outsourced
- All functional strategies must support one another and the competitive strategy

Competitive and supply chain strategies



The value chain in a company



The fuzzy front end (FFE), where supplier involvement and innovation are crucial

This is where we focus on throughout the course!

Achieving supply chain fit

- **Supply chain fit –** competitive and supply chain strategies have aligned goals

- For a firm to achieve supply chain fit, it must accomplish the following:
  1. The competitive strategy and all functional strategies must be fit together to form a coordinated overall strategy
  2. The different functions in a company must appropriately structure their processes and resources to be able to execute these strategies successfully
  3. The design of the overall supply chain and the role of each stage must be aligned to support the supply chain strategy

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How is supply chain fit achieved?

Step 1: Understanding the customers and supply chain uncertainty

- **Must identify the needs of the customer segment being served**
  - Seven-Eleven (R-kioski) vs. Sam's Club (Walmart, Prisma)

- **Customer demand from different segments varies along several attributes, as follows.**
  - Quantity of the product needed in each lot
  - Response time customers are willing to tolerate
  - Variety of products needed
  - Service level required
  - Price of the product
  - Desired rate of innovation of the product

Demand and supply uncertainty

- **Demand uncertainty** – uncertainty of customer demand for a product
  - Emergency (high) vs. long—lead time order (low)
  - When service level increases?
  - When channel complexity increases?

- **Supply uncertainty** – uncertainty of supply sources for a product
  - New products (high) vs. mature products (low)
  - When breakdowns occur?
  - Poor quality issues, then?

Impact of customer needs on demand uncertainty

Customer need	Causes demand uncertainty to …

Impact of customer needs on demand uncertainty

Customer need	Causes demand uncertainty to …
Range of quantity required **increases**	**Increase** because a wider range of the quantity required implies greater variance in demand
Lead time **decreases**	**Increase** because there is less time in which to react to orders
Variety of products required **increases**	**Increase** because demand per product becomes less predictable
Required service level **increases**	**Increase** because the firm now has to handle unusual surges in demand
Rate of innovation **increases**	**Increase** because new products tend to have more uncertain demand
Number of channels through which product may be acquired **increases**	**Increase** because the total customer demand per channel becomes less predictable

Relation between demand uncertainty and other attributes

	Low implied uncertainty	High implied uncertainty
Profit margin	Low	High
Average forecast error	10%	40% to 100%
Average stockout rate	1% to 2%	10% to 40%
Average forced season-end markdown	0%	10% to 25%

Product type ➔

Source: Fisher, M. L. (1997). What is the right supply chain for your product?. *Harvard Business Review*, *75*, 105-117.

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Product type	➔	Functional (e.g., table salt)	Innovative (e.g., smartphone)

Source: Fisher, M. L. (1997). What is the right supply chain for your product?. *Harvard Business Review*, *75*, 105-117.

Impact of supply source capability on supply uncertainty

- Also, important to consider uncertainty resulting from supply sources

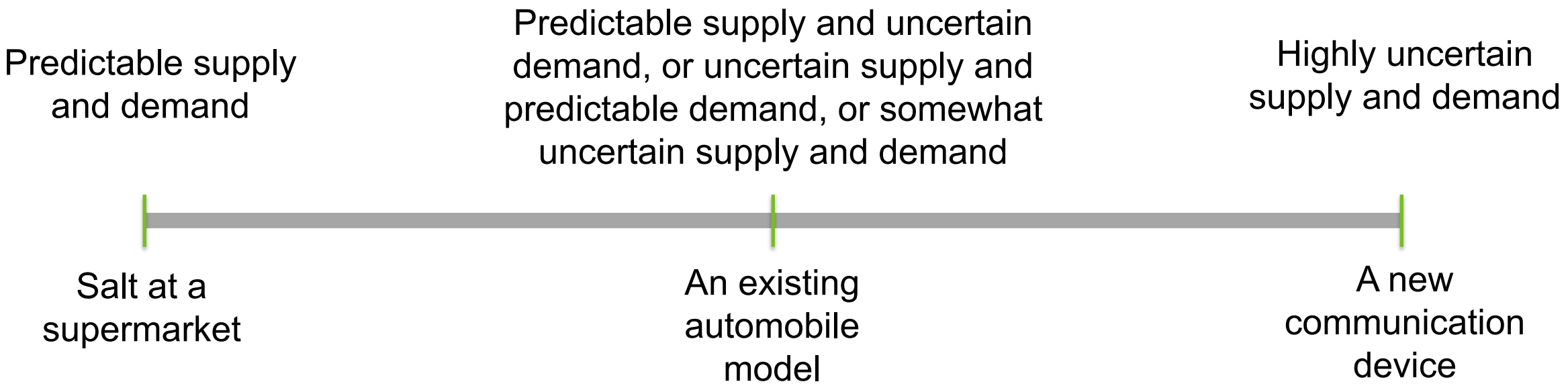
Supply source capability	Causes supply uncertainty to...

Impact of supply source capability on supply uncertainty

- Also, important to consider uncertainty resulting from supply sources

Supply source capability	Causes supply uncertainty to...
Frequent breakdowns	Increase
Unpredictable and low yields	Increase
Poor quality	Increase
Limited supply capacity	Increase
Inflexible supply capacity	Increase
Evolving production process	Increase

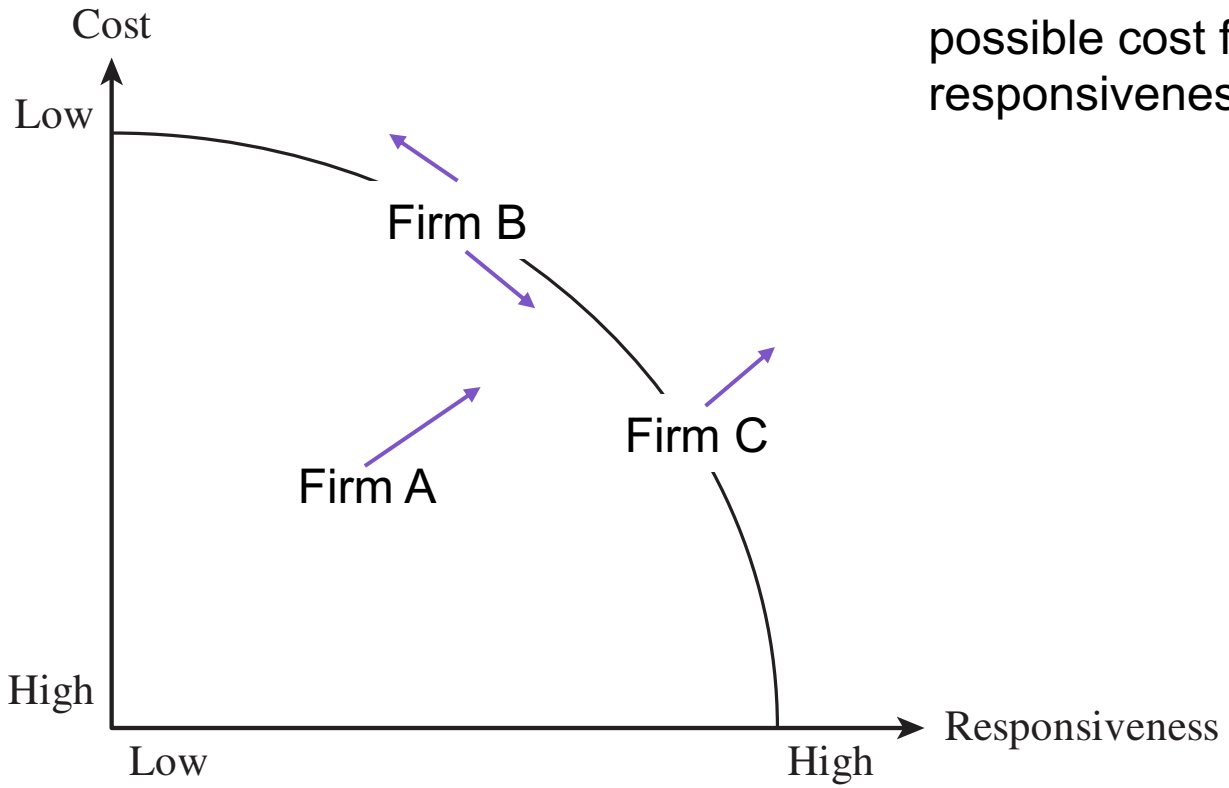
The implied uncertainty (demand and supply) spectrum



Step 2: Understanding the supply chain capabilities

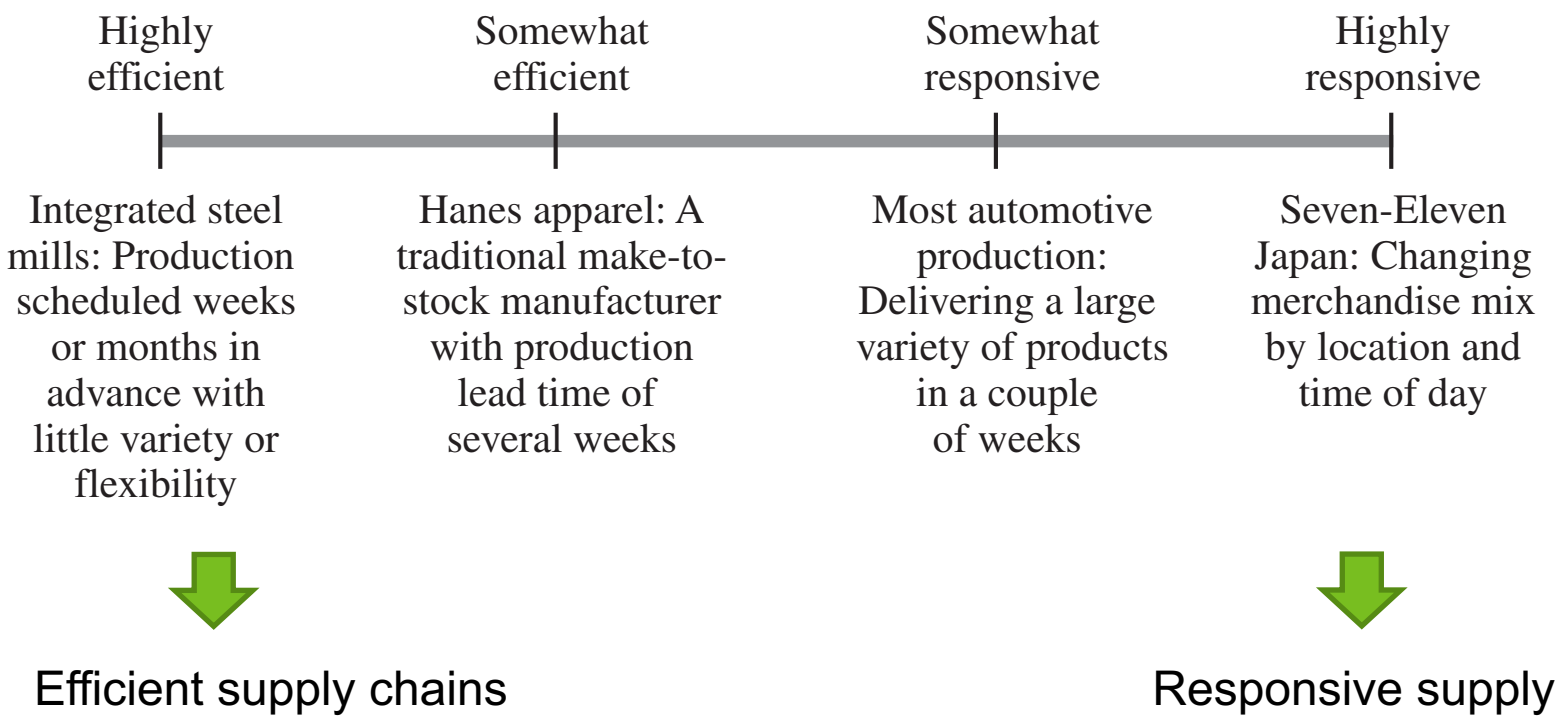
- **How does the firm best meet demand?**
- **Supply chain responsiveness is the ability to**
  - Respond to wide ranges of quantities demanded
  - Meet short lead times
  - Handle a large variety of products
  - Build highly innovative products
  - Meet a high service level
  - Handle supply uncertainty
- **Responsiveness comes at a cost**
- **Supply chain efficiency** is the inverse to the cost of making and delivering the products to the customers

Cost-responsiveness efficient frontier



- The **cost-responsiveness efficient frontier** curve shows the lowest possible cost for a given level of responsiveness

The responsiveness spectrum



Step 3: Achieving supply chain fit

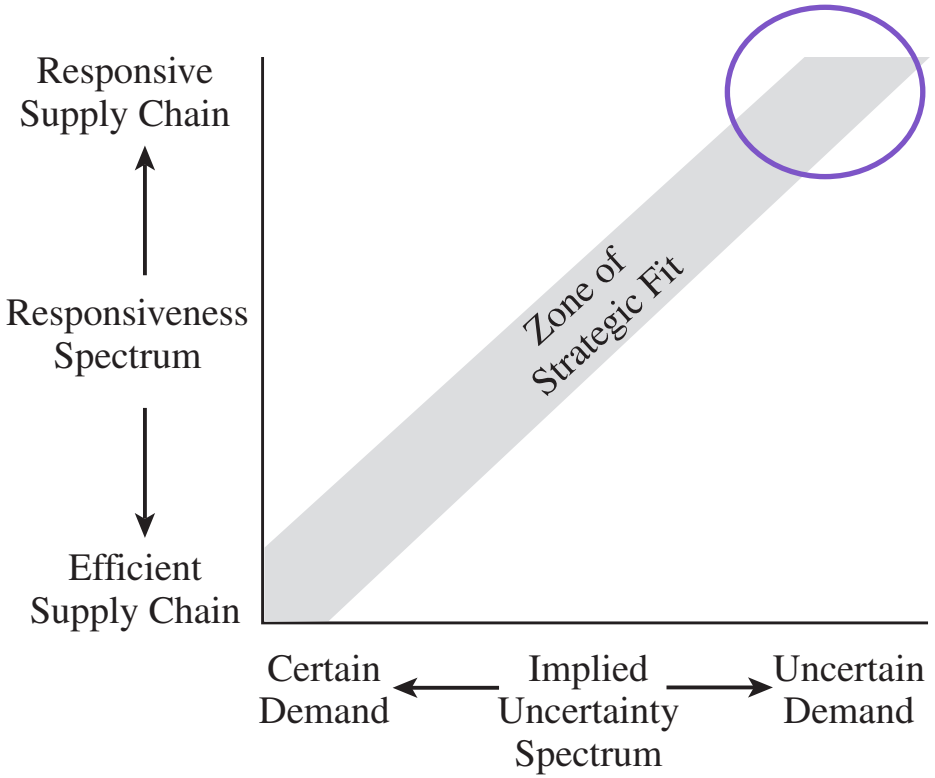
1. Ensure that the degree of supply chain **responsiveness** is consistent with the implied **uncertainty**

2. Assign **roles to different supply chain stages** that ensure the **appropriate level of responsiveness**

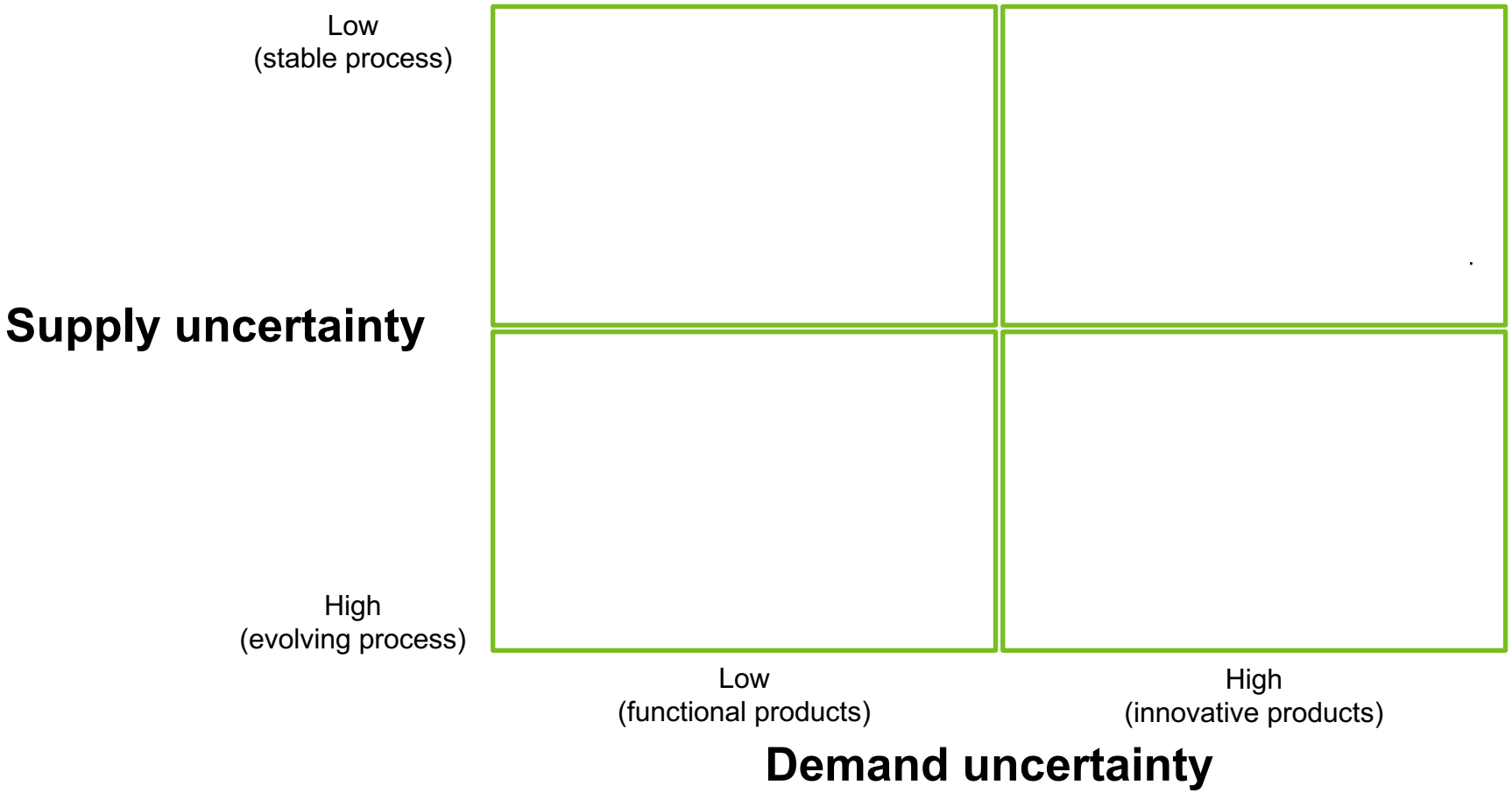
3. Ensure that all functions maintain **consistent strategies** that support the competitive strategy

Zone of supply chain fit (1/2)

- IKEA limits the variety it needs to stock and stocks all components in inventory; replenishment orders are stable
  - IKEA and suppliers?
- England Inc.'s retailers hold little inventory; provides a wide variety of products; and promise quick delivery
  - The retailers and supplier (i.e., England Inc.)?



Zone of supply chain fit (2/2)



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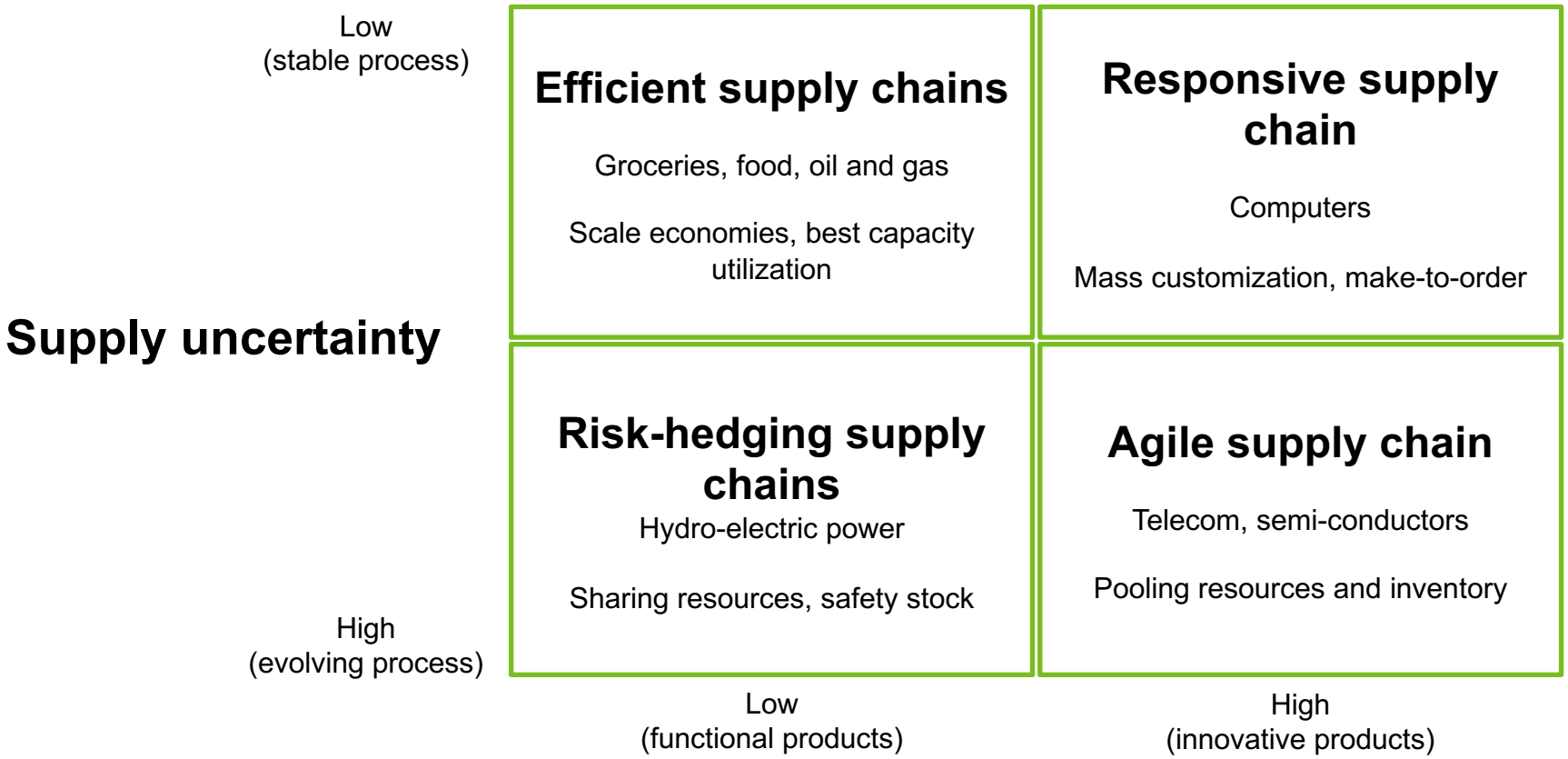
Source: Lee, H. L. (2002). Aligning supply chain strategies with product uncertainties. *California Management Review*, *44*(3), 105-119.

Zone of supply chain fit (2/2)



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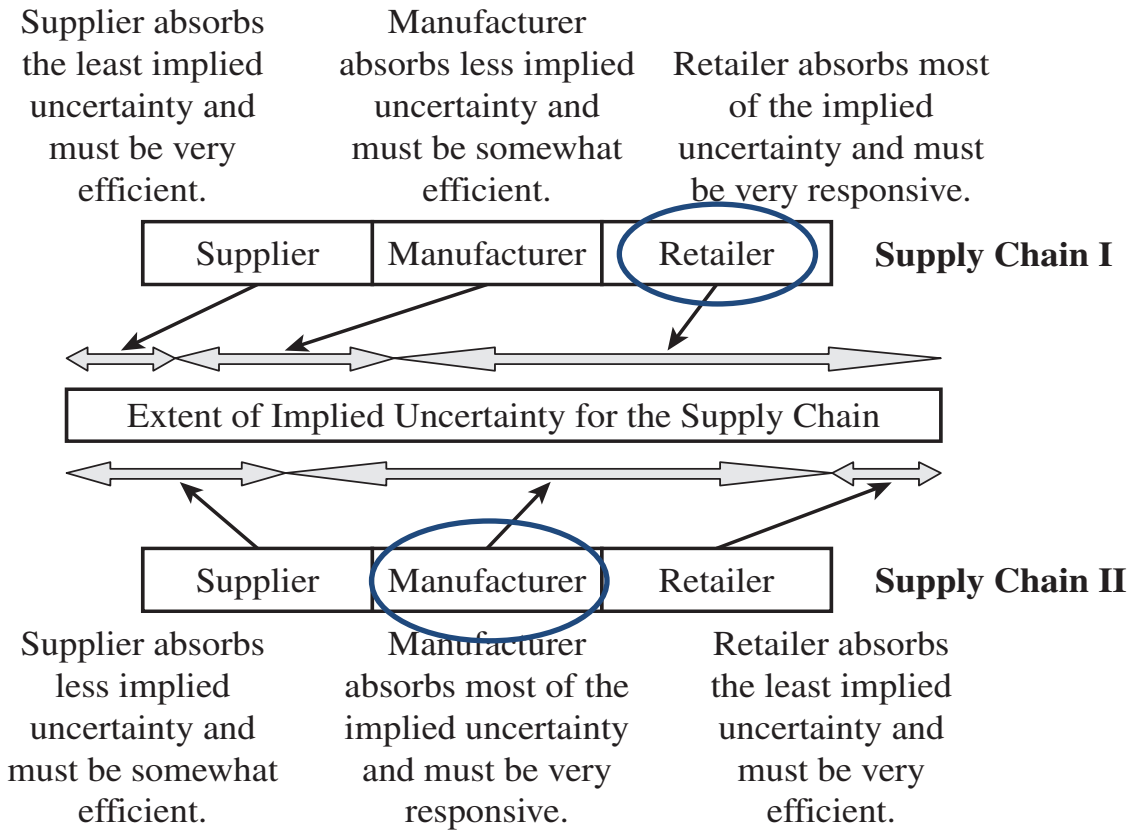
Assign different roles



- **Supply chain I** has a very responsive retailer that absorbs most of the uncertainty, allowing the manufacturer and supplier to be efficient
- **Supply chain II** has a very responsive manufacturer that absorbs most of the uncertainty, thus allowing other stages to focus on efficiency

Efficient and responsive supply chains

Goal / functions	Efficient supply chains	Responsive supply chains
Primary goal		
Product design strategy		
Pricing strategy		
Facility strategy		
Inventory strategy		
Lead-time strategy		
Supplier strategy		

Efficient and responsive supply chains

Goal / functions	Efficient supply chains	Responsive supply chains
Primary goal	Supply demand at the lowest cost	Respond quickly to demand
Product design strategy	Maximize performance at a minimum product cost	Create **modularity** to allow postponement of product differentiation
Pricing strategy	Lower margins because price is a prime customer driver	Higher margins because price is not a prime customer driver
Facility strategy	Lower costs through high utilization	Maintain capacity flexibility to buffer against demand/supply uncertainty
Inventory strategy	Minimize inventory to lower cost	Maintain **buffer inventory** to deal with demand/supply uncertainty
Lead-time strategy	Reduce, but not at the expense of costs	Reduce aggressively, even if the costs are significant
Supplier strategy	Select based on cost and quality	Select based on speed, flexibility, reliability, and quality

Source: Fisher (1997)

Tailoring the supply chain

- **Achieve supply chain fit while serving many customer segments with a variety of products**
  - "One size fits all" supply chain cannot provide supply chain fit

- **Tailoring requires sharing operations for some links and separate operations for other links**
  - For example, all products may be made on the same line in a plant, but products requiring high responsiveness may be shipped using a fast expensive mode of transportation, while products that do not require high responsiveness may be sent by slower and less expensive means

Changes over product life cycle

- **Beginning stages**
  - Demand is very uncertain, and supply may be unpredictable
  - Margins are often high, and time is crucial to gaining sales
  - Product availability is crucial to capturing the market
  - Cost is often a secondary consideration

- **Later stages**
  - Demand has become more certain, and supply is predictable
  - Margins are lower as a result of an increase in competitive pressure
  - Price becomes a significant factor in customer choice

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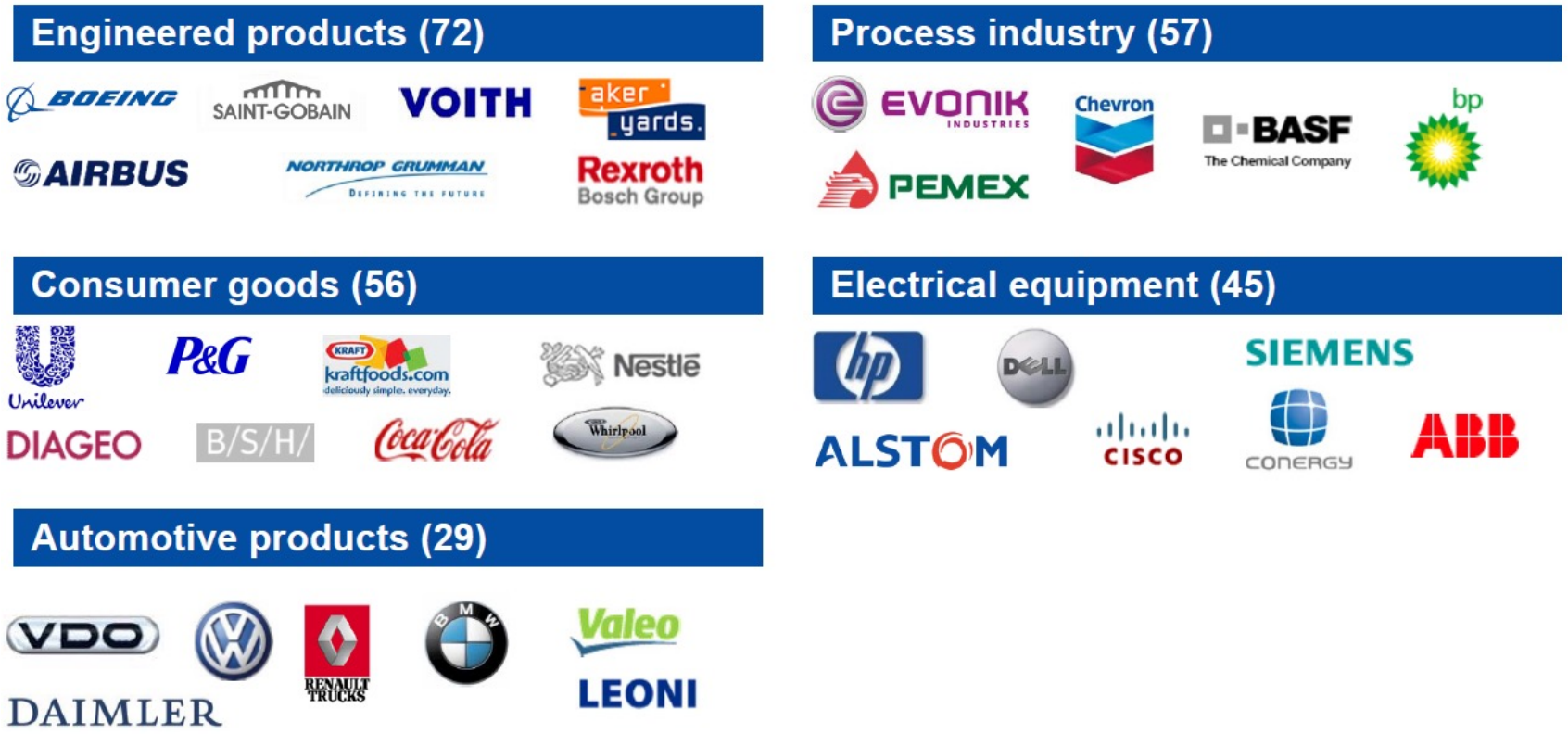
Performance effect of supply chain fit

An empirical investigation

- Primary (survey questionnaire) and secondary (Bloomberg) data yielded a total of 259 firm samples
- Focus on the United States and Western Europe
- Focus on manufacturing industries
- 65% of companies with sales turnover > EUR 1 bn

Source: Wagner, S. M., Grosse-Ruyken, P. T., & Erhun, F. (2012). The link between supply chain fit and financial performance of the firm. *Journal of Operations Management*, *30*(4), 340-353.

Industry segments with blue chips



Source: Wagner et al. (2012)

An empirical investigation - Measures

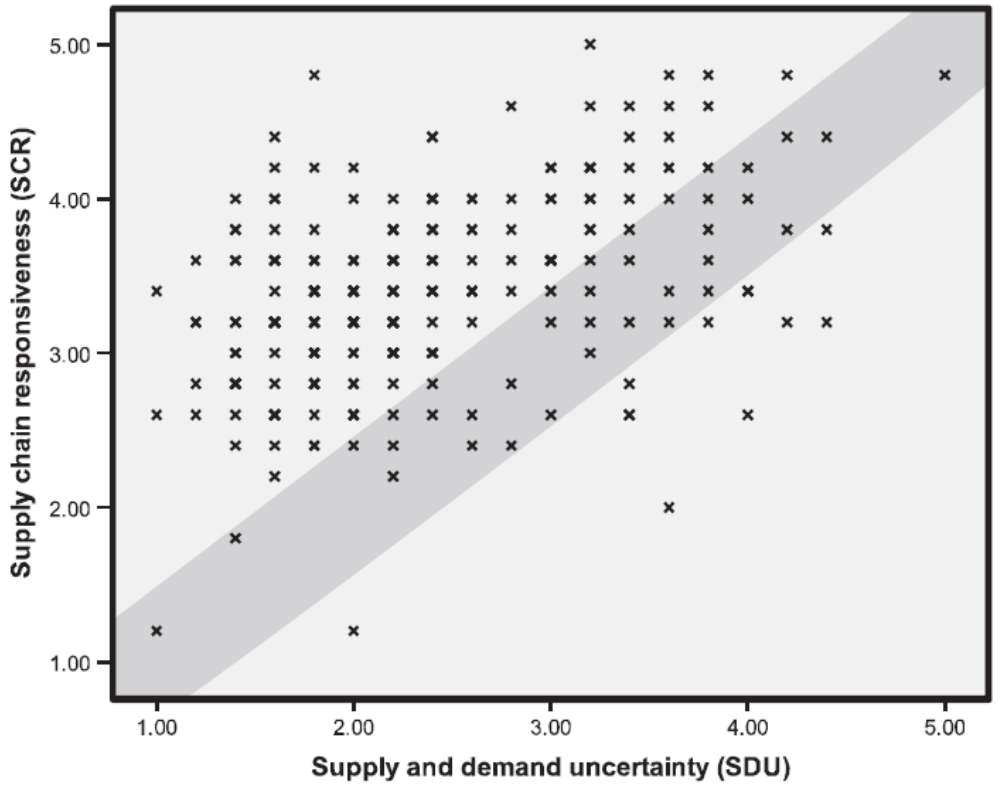
- **Supply chain fit$_i$ (SCF$_i$)** = Supply and demand uncertainty$_i$ – Supply chain responsiveness$_i$
  - The deviation score captures the degree of misfit on a continuum between a total misfit and a perfect fit, where lower (higher) values indicate greater fit (misfit)
- **Measures of *supply and demand uncertainty*** (for example):
  - Average product life-cycle (1: < 6 months – 5: > 5 years)
  - Product variety (1: <20 –5: 1000 or more)
- **Measures of supply chain responsiveness (for example):**
  - Improved delivery reliability (1: not important at all – 5: extremely important)
  - Maintain buffer inventory of parts or finished goods (1: not important at all – 5: extremely important)

Source: Wagner et al. (2012)

An empirical investigation - Results

- $ROA_i = 2.299 + [Controls_i] - 1.268\ SCF_i$, which is significantly different from zero, with an F value of 25.852 and adjusted R^2 of 0.715

- This indicates that the average decrease of 1.268 ROA in % for every additional value of SCF
  - Average %ROA: 6.49
  - Average SCF: 1.06



Source: Wagner et al. (2012)

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Case: Supply Chain Fit

Individual assignment

- **Due in around one week (Sunday, 23:59 midnight #TaylorSwift)**
- **The case description is available on MyCourses**
- **Questions? Concerns?**

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The Fresh Connection

Supply Chain Strategy and Its Strategic Fit

The Fresh Connection (TFC) Assignment

For the TFC assignment, we expect the following

- Before playing the game:
  1. What supply chain strategy do you choose?
     - And why?
  2. How is the supply chain strategy operationalized at each department (sales, purchasing, supply chain management, operations)?
  3. How do you measure the performance of each department? (e.g., KPIs)
- After the game:
  1. How did the strategy turn out?
     - Reflect on what you did well/badly and why? Does your strategy really fit?
     - Was any of your assumptions incorrect?
  2. What could you have done differently?

We'll discuss the importance of measurements in the last lecture

Note: We expected reflections, analyses, and discussions. You should go far beyond providing a decision log

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Thank you!

Questions?

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