

# **Practice of Supply Chain Disruption Risk Management**

**Ufuk Bilsel**

**Symposium in Honour of Dr. Ravindran**

**Bangalore, 13 March 2015**

# About the presenter – Ufuk Bilsel

**2009 – PhD in Industrial and Manufacturing Engineering and Operations Research, Penn State**

- Dissertation title: *Disruption and Operational Risk Quantification and Mitigation Models for Outsourcing Operations*

**Since late 2011 – Management consultant with The Boston Consulting Group, İstanbul Office**

# Objectives of the session

**Discuss the significance of supply chain disruptions**

**Present an overview of the current state of the art in disruption management research**

**Discuss the current state of the practice**

**Share perspectives on gaps between academia and practice and suggest means of reconciliation**

# Agenda

**Significance of supply chain disruptions**

State of the art in academic research

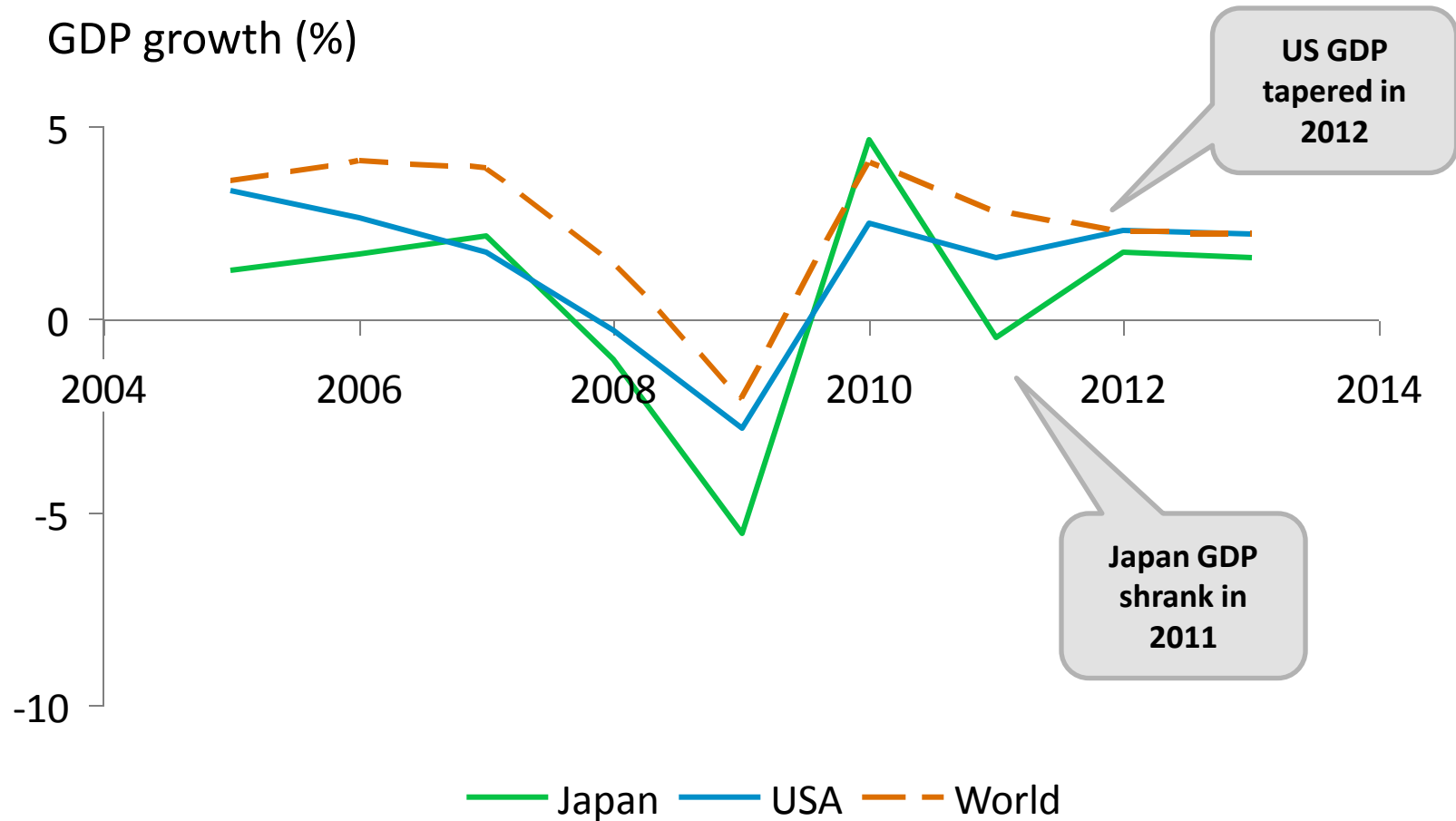
Current state in practice

Bridging the gap

# Disruptions have been a major impediment to supply chain operations

<b>Event</b>	<b>Year</b>	<b>Location</b>	<b>Impact</b>
<b>Tohoku Earthquake</b>	<b>2011</b>	<b>Japan</b>	<b>Affected 10% of global output</b>
<b>Hurricane Sandy</b>	<b>2012</b>	<b>USA</b>	<b>&gt; \$70B</b>
<b>South Asia Floods</b>	<b>2012</b>	<b>Thailand</b>	<b>Declined Thailand's GDP growth by 1.6pp</b>

# Evidence of disruptions is present in GDP trend



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# Academic research on supply chain disruptions in three phases

	Conceptual	Pure analytical	Applied analytical
Common traits	Introduce concept of supply chain disruptions	Mathematical and statistical theoretical	Balance between theoretical contribution and application
	Emphasize effects	Emphasis on theoretical development	Emphasis on practical insights
	Paves way for analytical models	Arguably limited real applications	Scalable to real supply chains
Examples	Zsidisin et al. (2004)	Tomlin (2006)	?
	Hendricks and Singhal (2005)	Bilsel and Ravindran (2012)	
	Kleidorfer and Saad (2006)	Ivanov et al. (2014)	



# Five dimensions of disruptions commonly studies

<b>Impact</b>	<b>Financial and non financial loss due to a disruptive event</b>
<b>Occurrence</b>	<b>Frequency of a disruptive event</b>
<b>Ripple effect</b>	<b>Propagation of a disruption along the supply chain nodes</b>
<b>Detectability</b>	<b>Possibility to notice a disruption at a given node of a supply chain</b>
<b>Recovery</b>	<b>Time it takes to return to "business as usual" after a supply chain disruption</b>

**Academia developed analytical models addressing each dimension**

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# Non academic community recognizes the significance of supply chain disruptions

BCG – 2011

Allianz – 2012

WEF – 2013

bcg.perspectives  
BY THE BOSTON CONSULTING GROUP

## AFTER JAPAN'S EARTHQUAKE

RETHINKING THE SUPPLY CHAIN

By Mark Freedman, Satoshi Komiya, Joe Mangat, Pierre Mercier, and Naoki Shigetake

**J**APAN'S DEVASTATING EARTHQUAKE WILL AFFECT global supply chains. Companies need to get used to such disruptions, however. According to a recent study, the number of weather-related natural disasters has steadily increased over the last 30 years—from fewer than 400 events in 1980 to more than 1,000 by 2008. Moreover, growing protectionism—for example, stringent export tariffs—has added to the uncertainty. And after years of falling trade barriers, mature and emerging economies alike are retrenching as they struggle to recover from the Great Recession. Therefore, as global business expands, the odds of supply chains being affected—either directly or indirectly—by a major or minor disruption, grow exponentially.

To protect themselves, companies must reevaluate the way they source their raw materials and products. In this article—the latest in a series about the impact of the Higashi-Nihon earthquake on Japan and the global community—we look at how companies can do so by managing the uncertainty and making their supply chains more flexible and dynamic.

### Disrupting Supply Chains

Much has been written about the ripple effects of Japan's earthquake on global supply chains, particularly in the consumer electronics and auto industries. But other sectors have been affected as well. For instance, seafood supplies from the country's fishing industry could be interrupted for a year or more, and markets in South Korea set off a buying frenzy over Japanese diapers, fearing that their favorite brands may soon be unavailable. And while many medical-device plants were temporarily closed, those that remained open had some customers requesting evidence that products were free of radiation. Some analysts predict that as much as 5 to 10 percent of global output in 2011 will be affected in some way by Japan's disaster.

Companies in Japan are showing remarkable resilience in the face of such disruptions, in part because of their well-devel-

For more on this topic, go to [bcgperspectives.com](http://bcgperspectives.com)

Allianz Global Corporate & Specialty

## Managing disruptions

Supply chain risk: an insurer's perspective

Allianz

WORLD ECONOMIC FORUM  
COMMITTED TO IMPROVING THE STATE OF THE WORLD

Industry Agenda

## Building Resilience in Supply Chains

An Initiative of the Risk Response Network  
In collaboration with Accenture

January 2013

# ...but, more action is required from the private sector

**Increase visibility over the supply chain**

**Identify key suppliers and take actions to protect them against disruptions**

**Create risk maps to identify weak areas**

**Insure riskier parts of the supply chain**

**Invest in buffers (e.g. backup suppliers, inventory)**

**Invest in flexibility (e.g. modular platforms, flexible machinery)**

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# Practice of disruption management requires collaboration of 3 parties with differing agendas

**Business**

**Top line and bottom line maximization, generally over budget periods**

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**Academia**

**Priority to advance in theoretical research**

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**Global  
organizations**

**Lobby with business community and government to shape policy making**

# Each party should play their role achieve SUCCESS

## **Business**

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- **Continuously challenge the academic community by communicating real problems**
- **Allow data sharing**
- **Allocate funds into academic projects to maintain support**

## **Academia**

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- **Push implementation of the models that have been proposed**
- **Increase effort to create more application oriented models**
- **Use real data to illustrate potential**
- **Demonstrate concepts using small models, but discuss scalability**
- **Emphasize top line and bottom line impact of reducing disruptions**

## **Global organizations**

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- **Continue to act as platforms to bring academia and industry together**
- **Facilitate project funding**

# Concluding remarks

**Disruptions have been a major impediment to supply chain operations**

**Academia is in an advance phase of research, but there is need to branch out towards application**

**Global business community recognizes the significance of disruptions, but there is need for wider scale action**

**Three parties, business, academia and global organizations, should act together to implement solutions to mitigate supply chain disruptions**



Thank you