UNIVERSITÀ CATTANEO LIUC CASTELLANZA

Facoltà di Ingegneria

Le decisioni di supply chain design

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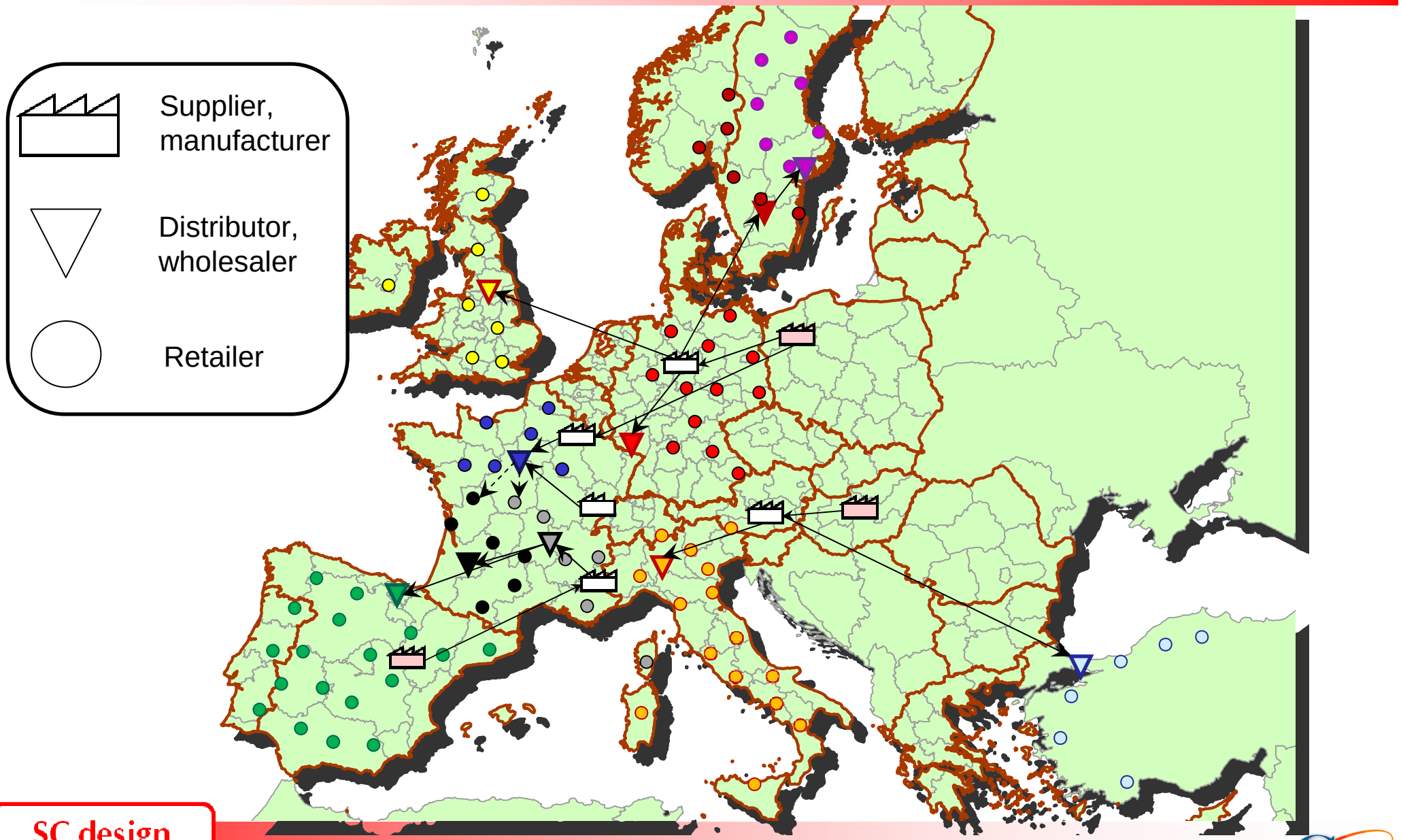
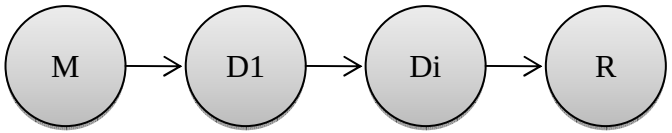
C-log

Centro
di Ricerca
sulla Logistica

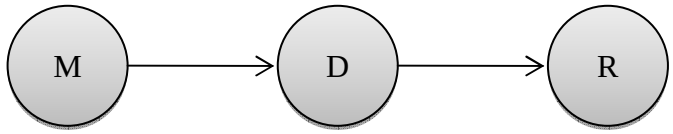
Supply chain topology



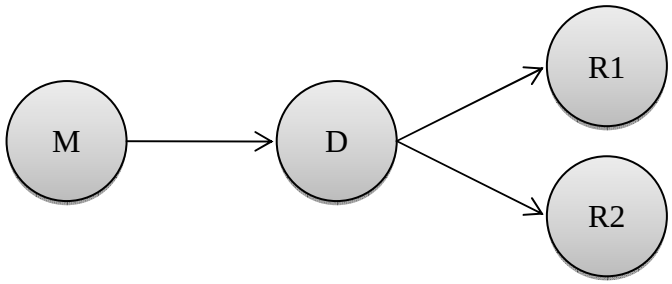
Supply chain decisions



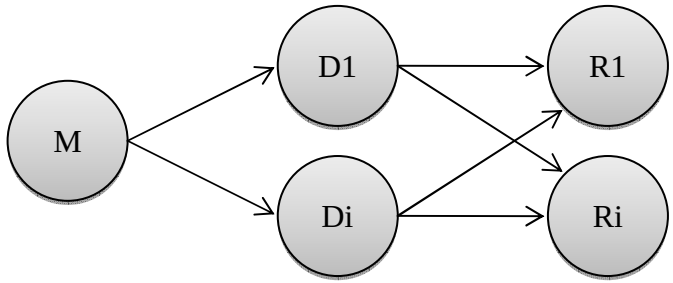
Number of levels (of the logistic network), e.g. a supply chain composed by n retailers and m manufacturers is a two stages supply chain



Distance between nodes



Nodes capacity: this variable represents the decision of supply network design to install a certain production or inventory capacity at a certain node, i.e. how many nodes per level must be activated



Sourcing policy: the number of sources each node will buy from. This means to decide whether to adopt a multiple or a single sourcing strategy

Supply chain design and performance (1/2)

The topic of **performance** measurement has received increasing attention in the management accounting literature as well as in the SCM one (Cousins et al., 2008). Supply chain performances can be classified in efficiency and effectiveness measures (Beamon, 1999).

Efficiency refers to the ability of a SC to maximize the use of internal resources, given the same output. Efficiency measures are therefore related to *costs* (basically **stock levels** and **transportation costs**) (Simchi-Levi et al., 2001).

Effectiveness refer to the ability of a SC to satisfy clients requirements. Effectiveness is measured against **stock-out (or backlog)** occurrences and quantities (Simchi-Levi et al., 2001).

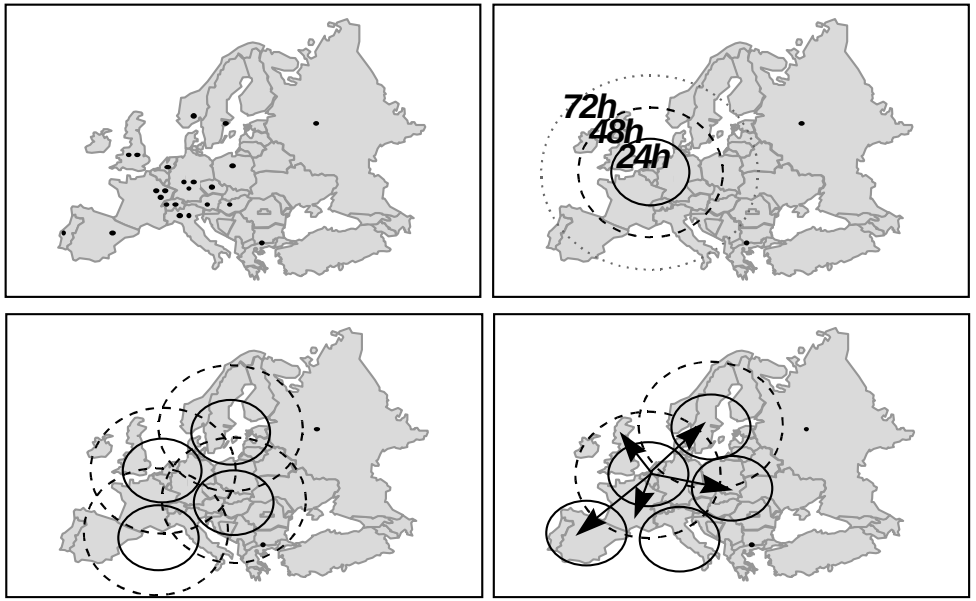
Cousins, P., Lawson, B., Squire, B., (2008) Performance measurement in strategic buyer-supplier relationships: The mediating role of socialization mechanisms, International Journal of Operations & Production Management, Vol. 28, No. 3, pp. 238-258

Beamon, B.M., (1999) Measuring supply chain performances, International journal of Operations and Production Management, Vol. 19, No. 3, pp. 275-292

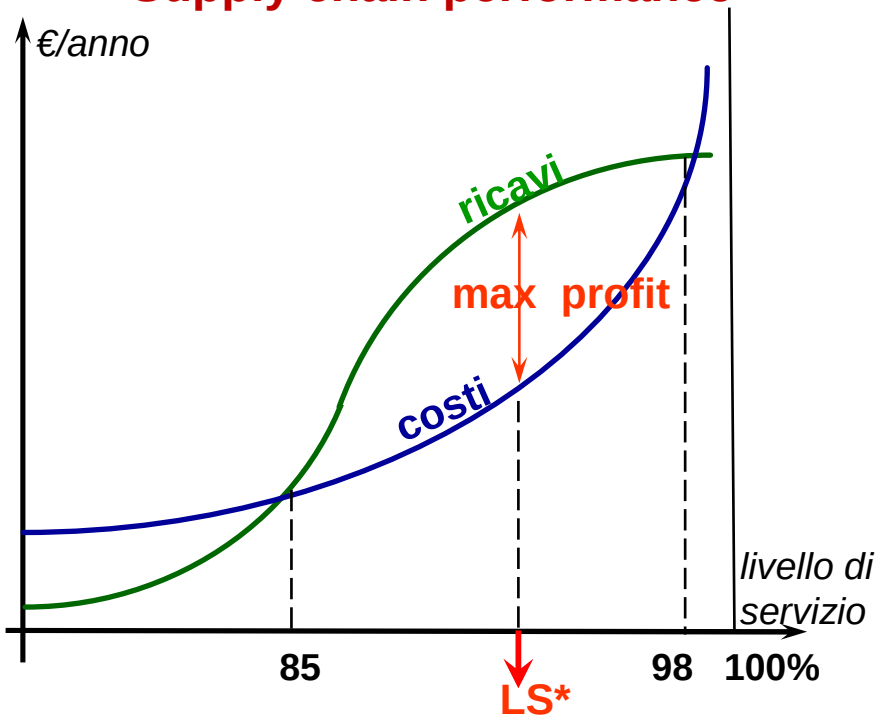
Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E. (2001) Designing and managing the supply chain, McGrow-Hill, Fairfield, Connecticut

Supply chain design and performance (2/2)

Supply chain design decisions



Supply chain performance

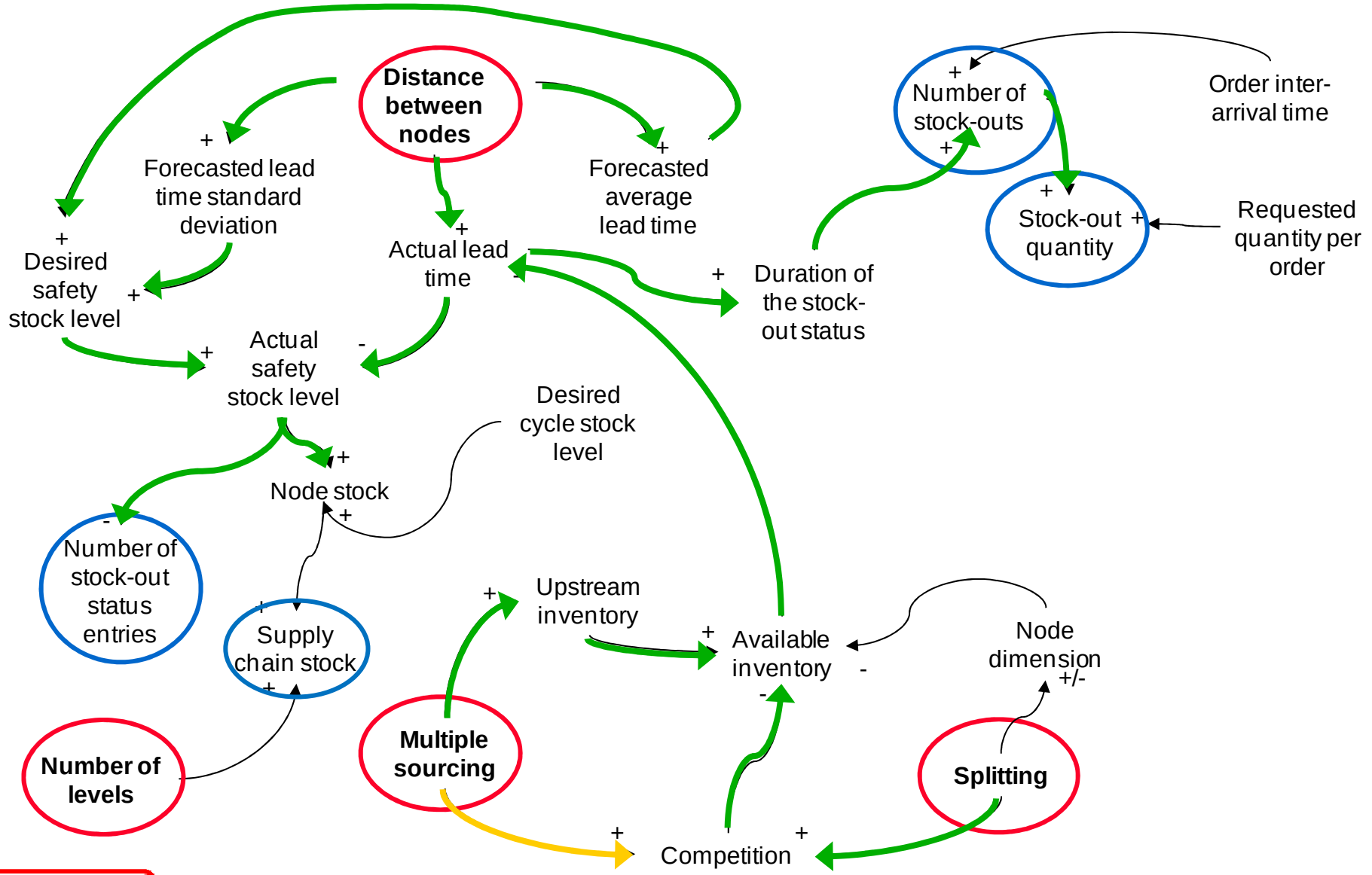


Helbing, D., Lammer, S. (2005) Supply and production networks: from the bullwhip effect to business cycles, in: D. Armbruster, A. S. Mikhailov, K. Kaneko (eds.) "Networks of Interacting Machines: Production Organization in Complex Industrial Systems and Biological Cells", pp. 33-66, World Scientific, Singapore

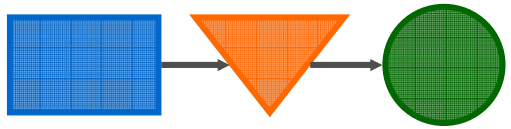
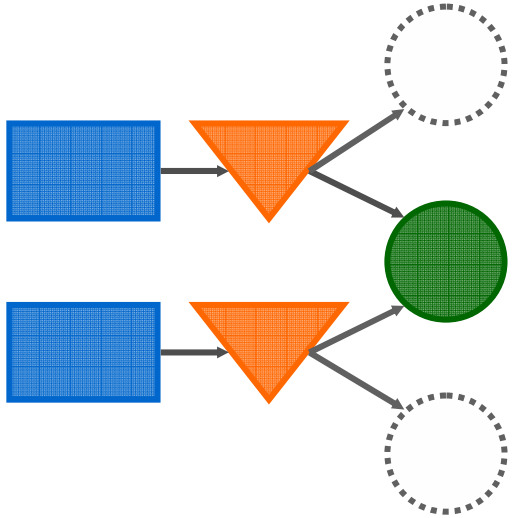
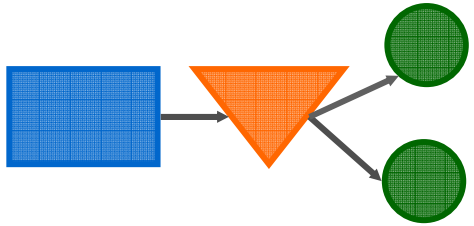
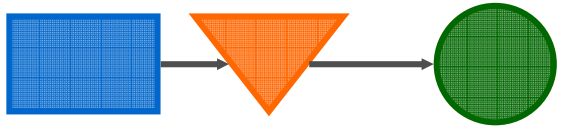
Sezen, B., (2008) Relative effects of design, integration and information sharing on supply chain performance, Supply Chain Management: An International Journal, Vol. 13, No. 3, pp. 233-240

Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E. (2001) Designing and managing the supply chain, McGrow-Hill, Fairfield, Connecticut

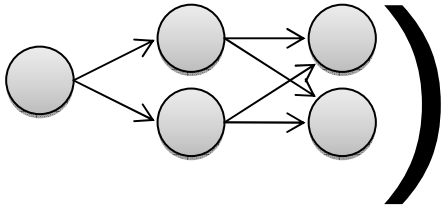
Supply chain design and performance (pull contexts)

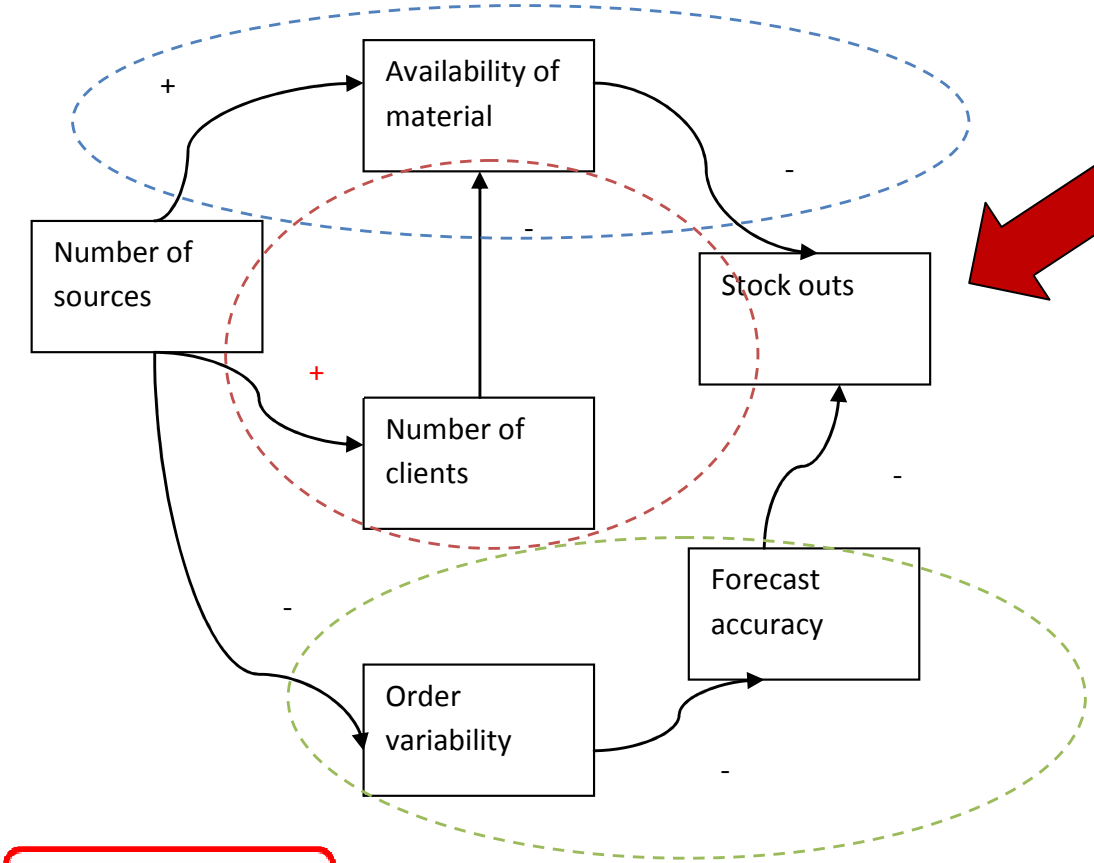


Supply chain design and performance (push contexts) – 1/3

Scenarios		Models	Observed variables	Data analysis
Base case		SIM1	stock-outs and backlogs at the retailer and at the other actors respectively inventory levels of each actor	ANOVA Regression
Multiple sourcing		SIM2 SIM3		
Splitting		SIM5		
Distance between nodes		SIM7		

Supply chain design and performance (push contexts) – 2/3





Somma di SOBG Level	Multiple Sourcing	Totale
1	0	133999
	1	104927
	2	75320
	3	93050
1 Totale		**407296**
2	0	0
	1	153722
	2	147639
	3	205860
2 Totale		**507221**
3	0	0
	1	83
	2	0
	3	0
3 Totale		**83**
(vuoto)	(vuoto)	
(vuoto) Totale		
Totale complessivo		**914600**

Supply chain design and performance (push contexts) – 3/3

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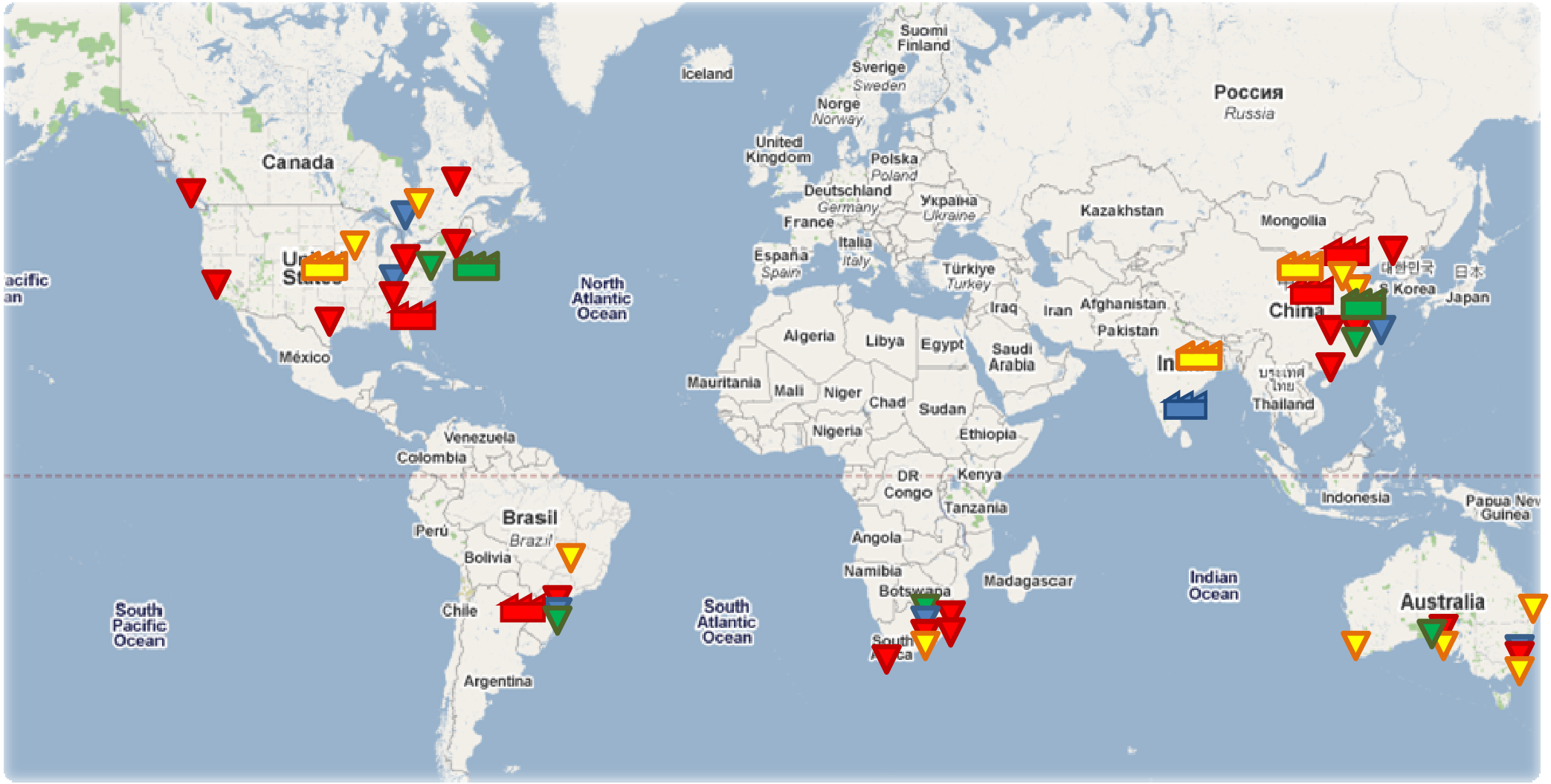
Supply chain design and performance



SC design