

COVID-19: RISKS AND VULNERABILITY OF SUPPLY CHAIN – AN INTRODUCTION

A note by Professor Daniel Ekwall, Sweden

Department of Business Administration and Textile Management

Faculty of Textiles, Engineering and Business (including The Swedish School of Textiles)

E-mail: Daniel.Ekwall@hb.se



TEXTILHÖGSKOLAN
HÖGSKOLAN I BORÅS

Date of issue: 16 April 2020

**) This presentation can be freely disseminated If cited or re-used, please, provide the appropriate references to the original sources!*

BACKGROUND - RISK MANAGEMENT

- Risk and risk management receiving a lot of attention in the context of logistics and supply chain management
- Risk management includes a basic understanding of risk with a ranking system because not all risk types are equally hazardous for an organization or society
- Any particular type of loss should be conceptualized as the probability of the loss multiplied by the impact
- Risk can be visualised using a two dimensional model based on the probability or frequency of a certain hazard's occurrence and the value or impact of that occurrence, a.k.a. the risk matrix

THE CONCEPT OF RISK

Risk = Probability x Consequence

- A measure of the potential for loss as a combination of the likelihood (events/year) of undesired event and the consequences (effects/event) of the event
- Is normally presented as a risk cost
- Rare events are normally considered more difficult to estimate correctly
- Risk management is a prioritization process
- Different policies (insurance, contracts etc.) can cause a distortion in the perception of risk between actors

BLACK SWANS AND DRAGON KINGS

Both terms describe extreme risk events* and can be used synonymously but stresses different elements in the different extreme events :

Black swan: Stresses on the unpredictability as there are "no similar previous" event that can serve as guides to the current one

Dragon king: Stresses on the different mechanisms such as positive feedback, tipping points, bifurcations, and phase transitions, that tend to occur in nonlinear and complex systems, and serve to amplify Dragon King events to extreme levels

In the case of COVID-19, black swan is maybe a better metaphor

***) especially on the impact side of risk**

SUPPLY CHAIN VULNERABILITY

“the vulnerability of supply chain is the ”existence of random disturbances that lead to deviation in the supply chain of components and materials from normal, expected or planned schedule or activities, all of which have negative effects or consequences.”

The disturbance in the flow of goods can be:

Deliberate or accidental

Legal or illegal

Direct or time-delayed



SECURING THE FLOW OF GOODS

- Aims to achieve "business as usual" at all times.
- The reasons for the interruption in the flow of goods can be:
Legal, Illegal, intentional, unintentional, embargos

Ex: Strikes, Theft, Sabotage/Masking, accidents, sanctions
- Smuggling is an illegal and intentional act that is not to disrupt the flow of goods, but to exploit it.

FRAME OF REFERENCE

- Relative riskiness as some risk sources pose a higher/larger risk for a certain actor in the supply chain
- Risk management can be seen as a prioritization process in which the risks with the greatest total cost is handled first etc.
- A higher impact is normally more serious than a higher possibility
- In practice, different insurance policies are also used in order to handle the financial impact from a cargo theft incident – the impact side in reality is more complex than it appears at first

SUPPLY CHAIN RISK MANAGEMENT

Supply chain risks include the following:

- Increased use of outsourcing of manufacturing and R&D to suppliers;
- Globalization of supply chains;
- Reduction of supplier base;
- More intertwined and integrated processes between companies;
- Reduced buffers, e.g. inventory and lead time;
- Increased demand for on-time deliveries in shorter time windows, and shorter lead times;
- Shorter product life cycles and compressed time-to-market;
- Fast and heavy ramp-up of demand early in product life cycles;
- Capacity limitation of key components.

CASES OF POSSIBLE THEFT OF HEALTH CARE EQUIPMENT IN THE WAKE OF COVID-19 IN MARCH-APRIL 2020

- ✓ Germany accused USA for stealing or redirecting products on the way to Germany: Berlin's Minister of the Interior Andreas Geisel said the incident was "modern piracy"
- ✓ By the end of March 2020, around 6 million face masks were to go to Germany without a trace in Kenya, according the German newspaper Der Spiegel
- ✓ When a plane with face masks was to take off from China to France, a group of American businessmen threw themselves onto the runway. They offered substantially better pay than the French and bought the whole cargo - with cash.
 - *Maybe not theft but unorthodox business behavior*
- ✓ At the beginning of April, France seized four million face masks, manufactured by the Swedish company Mölnlycke, which was going to Italy and Spain. The incident occurred after France imposed an export ban on protective equipment. Following criticism from the EU, the country lifted its restrictions.

REDUCING RISKS AND VULNERABILITY IN SUPPLY CHAINS

- Understand the true demand (including the black market) for the products
- Understand the supply network (including shipping routes) from the rock to the grave
- Understand your business partners and their effect of your ability to performance
- Expect changes in the business environment
- Apply the right security level at each location, based on local threat level (which may changes quickly)
- Apply the right level of safety stock at the right location
- Learn from history and previous events but prepare for new versions of similar events
- Prepare by complying with regulatory demands from authorities
- Employ and empower the right people to handle future risks and crises for the own organization

REFERENCES AND SUGGESTED READING

- Bernstein, P. (1996) *Against the Gods: The Remarkable Story of Risk*, Wiley, Chichester.
- Ekwall, D. and Lantz, B. (2018) "The Use of Violence in Cargo Theft – A Supply Chain Disruption Case". *Journal of Transportation Security*, Vol. 11, No. 1-2, pp 3-21
- Ekwall, D. and Bruls, H. and Wyer, D. (2016) "Theft of pharmaceuticals during transport in Europe". *Journal of Transportation Security*, 9, 1, 1–16
- Ekwall, D. (2009) *Managing the Risk for Antagonistic Threats against the Transport network*, Division of Logistics and Transportation, Chalmers University of Technology: Göteborg. (PhD. thesis)
- Manuj, I. and Mentzer, J.T. (2008) "Global supply chain risk management strategies". *International Journal of Physical Distribution & Logistics Management*, Vol. 38, No. 3, pp. 192-223
- Norrman, A and Jansson, U. (2004) "Ericsson's Proactive Supply Chain Risk Management approach After a Serious Supplier Accident", *International Journal of Physical Distribution and Logistics Management*, Vol. 34, No.5, pp.434-456
- Sornette, D.(2009) *Dragon-Kings, Black Swans and the Prediction of Crises*, *International Journal of Terraspace Science and Engineering* 1(3), 1-17 (2009)
- Svensson, G. (2002) "A conceptual framework of vulnerability in firms' inbound and outbound logistics flows", *International journal of physical distribution & logistics management*, Vol. 32, No. 2, pp. 110-34.
- Taleb, N. N. (2010) *The Black Swan: the impact of the highly improbable (2nd ed.)*. London: Penguin
- Torstensson, H. and Ekwall, D. (2018), "International regulations for seaports in the Baltic Sea Region". *PUBLICATIONS OF THE HAZARD PROJECT 25:2018*