

## SUMMARY

# THE MODEL OF SUPPLY CHAIN RESILIENCE AND STEEL PRODUCTS' FLOW SECURITY MANAGEMENT

mgr inż. MATEUSZ ZACZYK

The dissertation was aimed at developing a model of supply chain resilience and steel products' flow security management. As a result of the research procedure presented in the dissertation, its main goal was accomplished, as well as a number of theoretical, cognitive and utilitarian goals. The presented dissertation consists of three main parts. The first one contains a description of the main objective and specific objectives of the work, the second part is characterized by a theoretical and cognitive character, while the third one is characterized by an empirical character.

The theoretical-cognitive part consists of three chapters on the following issues:

- characteristics of approaches to supply chain theory in the subject literature and approaches to the issue of material flow within the supply chain,
- characteristics of the supply chain resistance construct, taking into account its sensitivity and dependability of order fulfillment,
- issues of managing the materials' flow in the supply chain in the context of their security.

Reflections on the issues outlined above, based on a critical analysis of the literature, have contributed to the elimination of the cognitive gap in the material flow safety construct's conceptualisation, and to the systematization of building and strengthening the resilience of supply chains theory, understood in the context of their ability to shape resilience. An in-depth analysis of literature has enabled the construction of an original research model which was a map of activities aimed at achieving the main goal of the dissertation and verification of the research hypotheses. The research model assumed the existence of three research hypotheses consisting of seven partial hypotheses, as well as an indication of the places of hypotheses' verification in the research procedure. The literature analysis also allowed the construction of a procedure to conduct empirical research leading to the elimination of the gap in management sciences, which is to determine the relationship between the resilience of the supply chain, the security of material flow within it and the dependability of order fulfillment.

In the course of the research process, a set of steel products supply chains' attributes and a set of its coordinators' attributes were identified. Next, on the basis of conducted expert studies, the vulnerability level of the analyzed structures was assessed, including the key elements affecting this level. The next stage of the research procedure was the development of an original construct for disturbances affecting the level of supply chain resilience and threats that jeopardize the security of material flow measurement. The construct created as part of this stage was used to carry out the so-called "Diary research", which led to the indication of two, not identical collections: disturbances and threats, in which, however, disturbances affecting the safety of material flow and threats affecting the resistance of the supply chain can be found.

The fourth stage of the research procedure consisted analyzing the impact of supply chain resilience and material flow security management on the dependability of deliveries. In order to

achieve this, an assessment of the resilience management process was carried out in three considered supply chains using a survey form based on elements of the SCRAM tool. This assessment used the existence of thirteen abilities to build resilience and led to the indication of their resilience level, as well as to identify key abilities affecting resilience development. The level of resilience was also indicated by calculating indexes based on the number and degree of disturbance effects observed during the "diary research". Next, the process of managing material flow security was carried out using the next questionnaire form, which indicated the level of implementation and the significance of the twelve previously identified activities aimed at strengthening material flow security. In order to characterize the impact of resilience and security management on the dependability of deliveries, an assessment of the dependability of supply performance by three considered supply chains was carried out in two ways. The first of these was the analysis of indicators of completed deliveries' timeliness, completeness and certainty. The second one - conducting a study using the CSI method reflecting the degree of customer satisfaction from the level of delivery through individual supply chains.

Then, a correlation analysis was carried out: between the actions of supply chain's participants aimed at strengthening its resilience and the level of orders' dependability, between the number of disturbances observed and the level of dependability, between actions aimed at strengthening the security of the analyzed entities and the level of dependability and between the number of observed threats and the level of dependability .

The above-described stages have led to a conceptualization of the supply chain resilience and steel products' flow security management model, the nature of which is theoretical and explanatory. The conceptualization of the aforementioned model enabled the original solution of the research problem indicated at the beginning of this dissertation in the form of defining the relationship between the supply chain resilience, the security of material flow within it and the dependability of order fulfillment, which was a gap in management sciences. The final conclusions also indicate further gaps within the discipline that constitute a future scientific challenge for the author of the dissertation.

Zacryk Mateusz