



THE DOMINO EFFECT - DISRUPTIONS IN SUPPLY CHAINS

Grażyna Wieteska

University of Lodz, Lodz, Poland

ABSTRACT. Background: This paper is devoted to the issue of the spread of disturbances along processes in supply chains. Today, in a turbulent global environment, companies are exposed to an increasing number of internal and external risks. The adverse events may sometimes bring serious negative consequences and cause a domino effect of disruptions in the supply chain. In the context of business continuity and risk management concepts, it is interesting to observe what the direction (up or/and down supply chain) of disruptions and the sequence of disrupted processes is during a crisis situations.

Methods: The conducted research was designed twofold. First, a systematic literature review of the domino effect in supply chains was conducted. Here, the desk research method was used. During the second stage, a survey was performed among 202 large manufacturing companies operating in Poland. The quantitative phase of the research used the Computer Assisted Telephone Interview (CATI) method. The sampling mainly used the "Rzeczpospolita" newspaper database "500 List".

Results: Data are gathered in several tables. The results supported the answering of four research questions. These concerned the most seriously disturbed processes in the supply chains of the researched companies in the last three years, the spread of disruptions along supply chain processes, process disruptions affecting clients and suppliers, and types of risks seriously disrupting supply chain processes. The processes were identified using GSCF model.

Conclusions: A domino effect of disturbances occurred in 95% of researched supply chains, with each supply chain process having the possibility of becoming its epicentre. However, according to the researched companies, the production process was the most common site of serious disruption in the last three years, and most likely to interfere with other processes. Disturbances spread multidirectional along supply chains. The uncertainty of the external environment is the most problematic to manage, because a macro environment that negatively affected a company was the most common risk, disrupting supply chains and, particularly, supply logistics. Disruptions of purchasing and supplier relationship management affect the processes of suppliers and clients in the most serious way.

Key words: domino effect, disruption, risk, supply chain.

INTRODUCTION

Today, due to the various international crises (e.g. financial, migration, political), the issue of supply chain risk and continuity management is a prevalent subject in scientific papers. The literature review shows that the papers examine the issue of supply chain crisis in terms of its source, scale and stage [Natarajarathinam 2009]. Supply chain disruption is defined as "any occurrence which has negative consequences for regular supply chain operations and hence, causes some

degree of "confusion/disorder" within the supply chain" [Vakharia, Yenipazarli 2008].

There are specific dependencies between companies which may cause the spread of detrimental effects along the supply chain [Svensson 2004] and many papers that present this phenomenon from a first-tier supplier-manufacturer perspective [Sheffi 2001, Chopra and Sodhi, 2004, Hardy 2012]. It would be interesting to know how the particular supply chain processes interact with each other when the disturbance occurs, however this has yet to be researched. That is why the main aim of this

paper is to exam the domino effect of disturbances in terms of a definition of the processes in the supply chain. The article consists of several sections: theoretical, methodology, research results, discussion and conclusions.

A two-phase methodology, based on the qualitative method and a quantitative method survey, was used. In the first part of the research, the desk research method was used and a literature review was conducted. In the second part of the research, a survey was performed.

SUPPLY CHAIN RISK THEORY BACKGROUND

“Supply chain management is the integration of business processes from end user through original suppliers that provides products, services and information that add value for customers” [Cooper, Lambert, Pagh 1997]. This integration determines the strong linkages between the cooperating companies. The highest dependency risk concerns the strategic supplier-buyer relationship [Hallikas et al., 2005], where supply risk can negatively influence the company of a purchaser [Zsidisin et al., 2000]. Moreover, an enterprise needs to deal with demand risk coming from its clients [Sodhi 2005]. It is recognized that a manufacturing company can be disrupted not only by supply risks and demand risks but also by operational (internal) risks and other risks that come from the external business environment, which can also influence business partners [Manuj, Mentzer 2008]. The supply chain risk issue was presented in the literature from different perspectives, e.g. types of risk [Manuj, Mentzer 2008], risk categories [Chopra, Sodhi, 2004] sources of risk [Johnson 2001], risk areas [Pfohl et al., 2011], factors increasing the size of risk [Svensson 2004, Hallikas et al 2005], risk mitigation methods [Jüttner 2005].

Over the last twenty years, the specific terms connected with supply chain risk management were also explored, like supply chain vulnerability [Svensson 2000, Peck 2005], supply chain agility and robustness [Wieland, Wallenburg 2012, Durach et al.,

2015] or supply chain resilience [Hohenstein et al 2015, Tukamuhabwa et al., 2015, Kamalahmadi, Parast 2016, Wieczerniak, Cyplik, Milczarek, 2017]. This paper concentrates on the issue of the supply chain domino effect, which is related to the occurrence of a specific disruption. A literature review was conducted in this regard and will be presented in the next section.

THE DOMINO EFFECT IN SUPPLY CHAINS – A LITERATURE REVIEW

This part of the research is based on desk research. The research used a literature review methodology, applied following Tranfield et al. [2003]. The review process consisted of the following phases:

- Question formulation;
- Keyword search in two databases;
- Screening (removing duplicates, closer inspection, checking cited articles);
- Analysis of articles.

The main research question was: What is the current understanding on the issue of the supply chain domino effect? In the second phase, the author used the leading providers of research databases, which are EBSCOhost Online Research Databases and Emerald Insight. The two search terms and following restrictions were used in the phase of data bases screening:

- Search term: domino effect or domino phenomenon, a restriction: occurrence in abstract and
- Search term: supply chain, a restriction: occurrence in abstract.
- The number of listed papers was surprisingly low:
- EBSCOhost Online Research Databases – 15 papers,
- Emerald Insight – 2 papers.

The author decided not to omit articles from newspapers because of the meagre amount of research material. Some additional papers were also identified through citation checking. The final output of the screening process reached 16 articles.

Available news items were mainly related to the occurrence of natural disasters and their negative impact, presented mainly as the long-term closure of production plants because of the lack of resources (e.g. electricity, workforce, supply of components). The Japanese earthquake, tsunami and nuclear disaster impact on supply chains [Barlow 2011] the problem with Hepatitis A in agricultural industries was (described by Gordon [2004]) are examples of those described, with one paper referring to the risk of the domino effect in the automotive industry after Brexit [Warburton 2017].

Eleven full research papers were taken into consideration. Jüttner [2005] attests that disruption in one area can often have negative effects in another, whereas Christopher and Holweg [2011] state that disruption in the supply chain can affect interconnected companies in the same network, clearly showing that the domino effect is a result of dependences between supply chain links and processes. Hertz [2006] found that “the overlap between supply chains in terms of actors, resources and activities could seriously delay, hinder and increase costs of the process when changing the degree of integration”. Merz et al. [2011] studied the issue of vulnerability to natural disasters and stated that the domino effect relates to “complex and often globally interlaced supply networks”. Tsung-Kang Chen et al [2014] researched the financial crisis domino effect and observed that “macroeconomic risks of a firm and its customers are significantly and positively related to the firm’s bond yield spreads while those of suppliers have insignificant effects”. Fan and Stevenson [2018] presented a paper on the review of supply chain risk management. They referred to various research papers, including works investigating interdependencies between risks [Kayis and Karningsih 2012, Hachicha, Elmsalmi 2014, Venkatesh et al. 2015, Sarker et al. 2016]. Venkatesh et al. [2015] concluded that “one risk may lead to various other disruptions also causing domino effect”. Sarker et al. [2016] identified a positive dependence (eliminating one risk reduces other risks) and negative dependence between risks (eliminating one risk creates other risks). Andreoni and Miola [2015] stated that “unexpected and

catastrophic events, such as terrorist attacks, local conflicts, earthquakes or financial crashes, can be responsible for disruptions along the production-consumption chain, with domino effects on markets and global supply”.

Based on the literature analysis, the domino effect of disruptions in the supply chain can be defined as “a situation, driven by the supply chain complexity and supplier-client dependencies, in which the effects of risk spread along the value adding processes affecting more than one supply chain link and hindering their performance temporarily”.

METHODOLOGY

The quantitative phase of the research used the Computer Assisted Telephone Interview (CATI) method, which was chosen to ensure data availability. According to the author's experience, in the last ten years, the return percentage of paper questionnaires in postal surveys has drastically decreasing in Poland.

The selection of the sample in the study was deliberate. The researched enterprises were large manufacturing companies (employing 250 or more employees) from various industries, conducting production activity in Poland.

The sampling used the "Rzeczpospolita" newspaper database “500 List” and was also supported by the Bisnode database. The study was preceded by a pilot on the $n = 3$ sample, aimed at checking the adequacy of the research tool and the quality level of the collected data. The questions were designed with the aim of needing to be simple and easy to answer. After the pilot test, the final instrument was developed, with the number of researched companies reaching 202.

Interviews with respondents were carried out from October to December 2016. The large manufacturing companies from “500 List” were chosen to ensure assessment of the most mature companies’ approaches to supply chain management and access to best practices.

To ensure the reliability of answers, the respondents chosen were senior management with key competences in the field of supply chain management and knowledge of risk management. Additionally, the following restrictions were used:

- A minimum three years of job experience in the management of the supply chain in the current place of employment and
- In the last three years the occurrence of some disruptions of the business process in the company of the respondent.

The main part of the questionnaire contained questions about disruptions in the supply chain processes. The researched processes are the eleven processes developed from the framework described in the Global Supply Chain Forum model [Lambert and Cooper 2000]. The research was going expected to answer, among others, the following questions:

1. What supply chain processes are disrupted most often and in the most serious way?
2. How do the most serious disturbances spread out in supply chain with regard to processes?
3. How do the most serious supply chain disturbances affect direct suppliers and clients?

4. What are the main risk categories that disturb supply chain processes most seriously?

Each research question is related to a survey question. These are introduced in the next section. The data are presented in the form of tables and using such values as: the number of indications and the percentage of indications and the rank average.

RESEARCH RESULTS

The gathered data are presented in Tables 1, 2, 3, 4 and 5. Table 1 presents results on the most seriously disrupted processes in supply chains. The respondents were to point out one process from the last three years and, in the further part of the survey, to refer to its specific disruption.

Table 1 presents the data that support the answering of the first research question, Tables 2 and 3 refer to the second research question, Table 4 addresses the third research question, and Table 5 concerns the fourth research question.

Table 1. The most seriously disrupted supply chain processes in the last three years. Percentage of indications [%]

Supply chain process	The most seriously disrupted process in the last 3 years *	Other processes affected during the disruption of the process **
Development and commercialization of products (DEVCOM)	8.42	6.44
Purchasing and supplier relationship management (PURSRM)	7.92	18.81
Supply logistics (SUPLOG)	6.93	23.27
Production (PROD)	31.19	25.25
Logistics of production (LOGPROD)	13.86	27.72
Demand management (DEM)	10.89	19.80
Implementation of business clients' orders, including distribution logistics in the B2B market (IMPLB2B)	5.45	28.22
Implementation of business clients' orders, including distribution logistics in the B2C market (IMPLB2C)	2.48	14.36
Customer service management (CUSTSER)	5.45	17.82
Customer relationship management (CRM)	2.97	14.85
Return management and reverse logistics (RETREV)	4.46	1.49
None	0.00	4.95

* the necessity of indicating one process, ** the possibility of indicating more than one process
 Source: own study

According to the respondents (Table 1), the production process is the most seriously disrupted process (31.19%), while the logistics of production was in second place (13.86%). This is not surprising, due to the fact that the

surveyed companies were manufacturers. The companies pointed out that the disruptions also relate to a large extent to demand management processes (10.89 %). Demand forecasts and sales plans are the main input to production

plans. Their disruption can seriously affect a production company's capabilities. A similar percentage of indicators concerned development and commercialization of products (8.42%) as well as the purchasing and supplier relationship management (7.92%).

The second column in Table 1 presents other processes affected by the considered disruption. It is noticeable that in comparison with the first column, the percentage of indications is definitely higher for individual processes (except for development and commercialization of products and return management and reverse logistics) due to the possibility of indicating more than one answer. Nevertheless, it implies that supply chain disruptions concern not one but several interconnected processes simultaneously.

Here, the researched companies most often pointed to implementation of business clients' orders, including distribution logistics in the B2B market (28.22%). It means that the most serious disruptions indirectly affect order completion timeframe in the company. In

second and third places were: logistics of production (27.72%) and production (25.25%), which are strictly connected with each other and run simultaneously in work centres. Supply logistics (23.27%) and purchasing and supplier relationship management (18.81%) were highlighted often too. Therefore, it can be stressed that disturbances in the supply chain processes have a negative impact not only on customer service but also on the procurement and suppliers' processes.

Tables 2 and 3 present in detail the dependencies between processes in a disruption situation. The first column of Table 2 shows the process disrupted in the most serious way in the last 3 years. This process is the source of domino effect (the "epicentre"). In the other columns there are processes affected by this disturbance. For example, disruptions of the production process most often affect demand management and implementation of B2B clients' orders (25.81%) and logistics of production (17.74%).

Table 2. The spread of the most serious disturbances on individual processes of the supply chain. Percentage of indications [%].

The most seriously disrupted process in the last 3 years * SOURCE OF DOMINO EFFECT	Other processes affected by the most serious disrupted process **										
	DEVCOM	PURSRM	SUPLOG	PROD	LOGPROD	DEM	IMPB2B	IMPB2C	CUSTSER	CRM	RETREV
DEVCOM	-	3.23	12.90	25.81	16.13	6.45	12.90	0.00	6.45	6.45	3.23
PURSRM	0.00	-	15.15	27.27	21.21	9.09	9.09	3.03	6.06	3.03	0.00
SUPLOG	2.94	17.65	-	20.59	14.71	8.82	11.76	2.94	8.82	5.88	2.94
PROD	1.61	3.23	16.13	-	17.74	11.29	25.81	10.48	8.06	4.84	0.00
LOGPROD	5.56	14.81	12.96	20.37	-	16.67	5.56	9.26	7.41	3.70	1.85
DEM	0.00	11.11	11.11	8.33	19.44	-	8.33	11.11	11.11	16.67	0.00
IMPB2B	10.00	10.00	0.00	20.00	10.00	5.00	-	10.00	20.00	15.00	0.00
IMPB2C	0.00	0.00	100.00	0.00	0.00	0.00	0.00	-	0.00	0.00	0.00
CUSTSER	9.52	23.81	4.76	4.76	19.05	14.29	14.29	0.00	-	9.52	0.00
CRM	0.00	0.00	33.33	0.00	33.33	0.00	0.00	0.00	33.33	-	0.00
RETREV	13.04	17.39	4.35	0.00	0.00	13.04	17.39	4.35	13.04	17.39	-

* the necessity of indicating one process, ** the possibility of indicating more than one process
 Source: own study

Table 3 presents the reverse situation: where serious disruptions affect supply chain processes most often. It shows that all processes are disturbed most by the serious disruption of the production process, except

development and commercialization of products, purchasing and supplier relationship management and return management and reverse logistics.

Table 3. The most serious disrupted processes that affect other supply chain processes most often.

Supply chain process (A)	The most serious disrupted process affecting the process A the most often
DEVCOM	LOGPROD, RETREV
PURSRM	LOGPROD
SUPLOG	PROD
PROD	LOGPROD
LOGPROD	PROD
DEM	PROD
IMPB2B	PROD
IMPB2C	PROD
CUSTSER	PROD
CRM	DEM, PROD
RETREV	DEVCOM, SUPLOG, LOGPROD

Source: own study

The supply chain disruptions have a negative impact on both client's (3.16) and supplier's (2.69) processes (Table 4). The most serious consequences for clients bring about the disruptions of purchasing and supplier relationship management (3.50) and demand management (3.45). Similarly, the most threatening to suppliers are the disruptions of purchasing and supplier relationship management (3.44) and supply logistics (3.07).

Table 4. Impact of disruption on the clients' and suppliers' processes. Rank average (5 – the biggest impact, 1 – the smallest impact)

The most seriously disrupted process in the last three years	Impact of process disruption on the clients' processes	Impact of process disruption on the suppliers' processes
DEVCOM	3.35	2.59
PURSRM	3.50	3.44
SUPLOG	2.71	3.07
PROD	3.13	2.42
LOGPROD	3.11	2.82
DEM	3.45	2.86
IMPB2B	3.36	2.64
IMPB2C	2.20	1.40
CUSTSER	3.09	2.36
CRM	3.33	2.50
RETREV	2.78	3.11
Altogether	3.16	2.69

Source: own study

Table 5. The main causes of the most serious disruptions of supply chain processes. Percentage of indications [%].

The most seriously disrupted process in the last three years	The main cause of process disruption				
	Macro environment that negatively affected the company	Macro environment that negatively affected another participant in the supply chain	Operational risk which source was another participant in the supply chain	Operational risk which source was the company	Strategic risk taken by the company
DEVCOM	23.53	5.88	23.53	23.53	23.53
PURSRM	18.75	37.50	25.00	18.75	0.00
SUPLOG	57.14	7.14	28.57	0.00	7.14
PROD	26.98	11.11	22.22	26.98	12.70
LOGPROD	28.57	7.14	39.29	25.00	0.00
DEM	31.82	13.64	22.73	31.82	0.00
IMPB2B	27.27	0.00	36.36	27.27	9.09
IMPB2C	40.00	0.00	20.00	40.00	0.00
CUSTSER	18.18	18.18	45.45	9.09	9.09
CRM	16.67	16.67	33.33	33.33	0.00
RETREV	55.56	11.11	22.22	11.11	0.00
Altogether	29.70	11.88	27.72	23.27	7.43

Source: own study

Supply chains are most seriously affected by the macro environment of the company (29.70%) and an operational risk whose source was another supply chain link (27.72%) (Table 5).

Macro environment that negatively affected the company is the main cause of disruption of supply logistics (57.14%), whereas macro environment that negatively affected another participant in the supply chain is the main cause of disruption of purchasing and supplier

relationship management (37.50%). Operational risk most often hinders customer service management (45.45%) and implementation of business clients' orders, including distribution logistics in the B2C market (40.00%). Strategic risk taken by the company causes the least negative effects, which usually relates to development and commercialization of products (23.53%).

DISCUSSION

This section discusses only the chosen problems from the rich and interesting data provided. A domino effect of disruption failed to occur in the case of 4.95% of the surveyed companies (Table 1). The results confirm that the dependences present in supply chains cause the spread of risk effect between processes and links [Svensson 2004, Jüttner 2005, Venkatesh et al. 2015, Christopher and Holweg 2011] and that disruptions can hinder a company's ability to get finished goods to market [Smith and Fischbacher 2009]. Disruptions of processes influence the relationships with clients (CRM) and suppliers (SRM) indirectly (Table 1).

The research revealed that disruptions of production processes spread both up and down the supply chains (Table 2). Most processes are affected by serious production disruptions (Table 3), which may prove that a disturbance of a key value adding process of a company spreads multidirectional along its internal supply chain. However, it is interesting, that although the production process is disturbed the most often (Table 1), in most cases production problems don't impair the researched companies' relationships with clients (3.23) and suppliers (4.84) (Table 2).

The study also finds that the disruptions of purchasing and supplier relationship management affect the processes of suppliers and clients in the most serious way (Table 4). This supports the observations of Pereira et al. (2014) that "although causes from disruptions may arise from any element of the supply chain, it is observed that supply disruptions are more critical when they occur upstream in the chain (...)"

The study also confirms (Table 5) that supply chains may be disturbed by risks coming from both the external and internal business environment (Manuj and Mentzer 2008). The literature provides many examples of the domino effect of supply chain disruptions caused by risks coming from the external environment [Gordon 2004, Barlow 2011]. This study reveals that supply chains especially suffer from macro environment risks directly affecting the researched company. It confirms that external risks are difficult to manage due to the limited possibility to influence them [Berliński 2000], which is why enterprises believe that the ability to adapt to change is one of the main sources of competitive advantage [Pricewaterhouse Coopers 2009]. Results also show that a macro environment that negatively affects another participant in the supply chain, impacts purchasing and supplier relationship management most often (Table 5). In the literature there are many articles about the external risks that disturb supply continuity, e.g. the terroristic attack in 2001 which caused the temporary closure of borders and a lack of supplies for manufacturing processes in the USA [Sheffi 2001] or the flood in Taiwan in 2011 limiting supplies of hard drives [Hardy 2012].

CONCLUSIONS

The domino effect from disturbances is a common phenomenon in supply chains. The effects of which spread along the processes and supply chain links even in the case of companies regarded as mature in terms of managing supply chains. The results of the study show that each supply chain process can be affected by a serious disruption. However, the production process was the epicentre of the domino effect that most often affected supply chains of the researched companies in the last three years, with external risks being the most problematic to manage.

The serious production problems of the researched companies were overcome relatively quickly. As a consequence, in most cases, they did not affect relationships with suppliers and clients. This observation can be explained twofold. Firstly, the researched

companies implemented supply chain practices that allowed them to deal with the crisis situations rapidly and efficiently. Secondly, the researched companies operate in Poland, where the economy has been growing promisingly for the last few years and has not been generating any serious external risks. It makes Poland a country worth investing in.

There are papers in the literature indicating the phenomenon of the domino effect. However, this paper raises both theoretical and managerial implications, which similar studies on the spread of the disturbances among different supply chain processes have not yet addressed. This paper is a first step to fill this gap. The research results strengthen the need to study the interdependence of processes which affect the way the disruptions spread along the supply chain. Knowledge about this subject is not described sufficiently, yet it would be an important input to the practical guideline for managers in the field of prevention of adverse events and the preparation of business continuity plans.

The study is also burdened with some limitations. Firstly, the analysis of the domino effects in supply chains requires a deeper investigation of the issue of supply chain process mapping. Secondly, the questionnaire only included questions about the impact of the disruption on first-tier suppliers and clients, whereas disruptions can spread beyond direct partners of the company. This means that network complexity needs to be considered as well, which, according to Yang and Yang (2010), can influence supply chain vulnerability.

In addition, it is reasonable to survey the companies in the light of the reoccurrence of exactly the same adverse event. This would ensure similar test conditions and enhance research credibility. Finally, inclusion of questions referring to the business continuity measures, such as recovery time and the scale of the social, economic and environmental consequences of risks are important to include in any future research.

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EFEKT DOMINA - ZAKŁÓCENIA W ŁAŃCUCHACH DOSTAW

STRESZCZENIE. Wstęp: Artykuł poświęcony jest zagadnieniu zakłóceń rozchodzących się wzdłuż łańcuchów dostaw. W dzisiejszym turbulentnym otoczeniu, przedsiębiorstwa narażone są na wzrastającą liczbę wewnętrznych i zewnętrznych zagrożeń. Niepożądane zdarzenia mogą być przyczyną poważnych strat w procesach i powodować efekt domina. W kontekście ciągłości działania i zarządzania ryzykiem, interesujące jest zaobserwowanie jaki kierunek mają najczęstsze zakłócenia (w dół czy w górę łańcucha dostaw) oraz jaka jest sekwencja zakłócanych procesów w łańcuchach dostaw w sytuacji kryzysowej.

Metody: Badanie zaprojektowano dwukierunkowo. W pierwszej kolejności przeprowadzono analizę literatury przedmiotu dotyczącą problematyki efektu domina w łańcuchach dostaw. Wykorzystano w tym celu metodę analizy źródeł wtórnych. W drugim etapie zrealizowano badanie ankietowe, które objęło 202 dużych przedsiębiorstw produkcyjnych funkcjonujących w Polsce. Operat losowania stanowiła baza największych polskich przedsiębiorstw z tzw. Listy 500 według „Rzeczpospolitej” oraz baza Bisnode.

Rezultaty: Zebrane dane zaprezentowane zostały w kilku tabelach. Ich analiza pozwoliła odpowiedzieć na postawione pytania badawcze. Zidentyfikowano najpoważniej zakłócanne procesy łańcuchów dostaw, kierunek rozchodzenia się zakłóceń, wpływ zakłóceń na procesy klientów i dostawców a także rodzaje ryzyka zaburzające poszczególne procesy najpoważniej. Procesy łańcucha dostaw określono wykorzystując model łańcucha dostaw GSCF.

Wnioski: Efekt domina wystąpił w przypadku 95% analizowanych łańcuchów dostaw. Badania pokazują, że każdy proces łańcucha dostaw może stanowić epicentrum negatywnych skutków. Według respondentów, najpoważniejsze zakłócenia w ostatnich trzech latach dotyczyły bezpośrednio procesu produkcji. Zakłócenia te są też najczęściej bezpośrednim źródłem ryzyka dla skutecznego funkcjonowania innych procesów w przedsiębiorstwie. Zakłócenia rozprzestrzeniają się w łańcuchach dostaw wielokierunkowo. Niepewność otoczenia zewnętrznego jest dla firm szczególnie trudna do zarządzania. Zagrożenia pochodzące z makro otoczenia najczęściej bowiem w najpoważniejszy sposób zakłócały procesy badanych przedsiębiorstw, a w szczególności ich logistykę zaopatrzenia. Zakłócenia w zakupach i procesie zarządzania relacjami z dostawcami w najpoważniejszy sposób wpływają na procesy dostawców i klientów.

Słowa kluczowe: efekt domina, zakłócenie, ryzyko, łańcuch dostaw.

DER DOMINOEFFEKT – STÖRUNGEN IN LIEFERKETTEN

ZUSAMMENFASSUNG. Einleitung: Der vorliegende Artikel ist dem Thema der Störungen, die sich entlang der Lieferketten ausbreiten, gewidmet. In dem gegenwärtigen turbulenten Umfeld sind die Unternehmen einer immer wieder steigenden Anzahl von inneren und äußeren Gefahren ausgesetzt. Unerwünschte Ereignisse können die Ursache von ernsthaften Verlusten innerhalb von Prozessen sein und den Dominoeffekt zur Folge haben. Im Kontext der Kontinuität von Aktivitäten und des Risikomanagements ist es interessant, die Ausrichtung der meisten Störungen (abwärts oder aufwärts der Lieferkette) und die Beschaffenheit der Sequenz der gestörten Prozesse innerhalb von Lieferketten in einer kritischen Situation wahrzunehmen.

Methoden: Die Forschungen wurden bidirektional ausgerichtet. Einleitend wurde die Analyse der betreffenden Gegenstandsliteratur in Bezug auf die Schwerpunkte des Dominoeffektes in Lieferketten vorgenommen. Zu diesem Zweck nahm man die Methode der Analyse sekundärer Quellen in Anspruch. In der zweiten Etappe wurden Fragebogen-Untersuchungen, die 202 große Produktionsunternehmen in Polen umfassten, durchgeführt. Die Quellen für die Auslosung der zu beurteilenden Unternehmen stellten die Datenbank der größten polnischen Unternehmen von der sog. Liste 500 laut der Rangliste der Tageszeitung „Rzeczpospolita” und die Datenbank von Bisnode dar.

Ergebnisse: Die gewonnenen Daten wurden in einigen Tabellen projiziert. Deren Analyse ließ die gestellten Forschungsfragen beantworten. Es wurden dabei die am meisten und ernsthaften gestörten Prozesse innerhalb von Lieferketten, die Ausrichtung der Ausbreitung von Störungen, den Einfluss der Störungen auf die Prozesse der Kunden und Empfänger und die Risiken, die die einzelnen Prozesse am ernsthaften stören, identifiziert. Die Lieferketten-Prozesse bestimmte man, indem das Modell der GSCF-Lieferkette in Anspruch genommen wurde.

Fazit: Der Dominoeffekt trat im Falle von 95% analysierten Lieferketten auf. Die Forschungen weisen darauf hin, dass jeder Prozess innerhalb der Lieferkette zu einem Epizentrum negativer Konsequenzen werden kann. Laut der Befragten betrafen die ernsthaftesten Störungen innerhalb von 3 letzten Jahren unmittelbar den Produktionsprozess an. Die Störungen stellen auch die meisten Quellen des Risikos für den effektiven Verlauf anderer Prozesse im Unternehmen dar. Die Störungen breiten sich in den Lieferketten in mehreren Richtungen aus. Die Unsicherheit des äußeren Umfelds lässt sich von den Firmen nur schwer managen. Die aus dem Makro-Umfeld resultierenden Gefahren störten also am stärksten die Prozesse in den untersuchten Unternehmen und insbesondere deren Versorgungslogistik. Denn die Störungen in der Versorgung und im Prozess des lieferantenbezogenen Versorgungskettenmanagements beeinflussen am stärksten die lieferanten- und kundeneigenen Prozesse.

Codewörter: Dominoeffekt, Störung, Risiko, Lieferkette

University of Lodz
Faculty of Management
Department of Logistics
22/26 Matejki street, 90 - 237 Łódź, **Poland**
e-mail: grazyna.wieteska@uni.lodz.pl