RISK AS A CHANGE FACTOR AFFECTING ECONOMIC EFFICIENCY OF A SUPPLY CHAIN
RYZYKO JAKO CZĘŚĆ FUNKCJI ZMIANY WPŁYWAJĄCE DO EKONOMICZNEJ WYDAJNOŚCI ŁAŃCUCHA DOSTAWCZEGO

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Abstract: Risk is a very important problem for an effective supply chain management with regard to both its customers and participants in the various phases of its functioning. Considerate identification of risk areas in a supply chain and assessment of their scale has a huge influence on its processes. Risk assessed that way is at the same time a guarantee of economic profitability within the functioning of a supply chain. The skills to manage risk in a supply chain with regard to the creation of added value have a significant impact on the achievement of its objective at optimal and economically justified costs.

Streszczenie: Ryzyko jest bardzo ważnym problemem dla skutecznego zarządzania łańcuchem dostaw w odniesieniu zarówno do klientów, jak i uczestników różnych faz jego funkcjonowania. Rozważyć identyfikację obszarów ryzyka w łańcuchu dostaw, a ocena ich skali ma ogromny wpływ na jego procesy. Ryzyko oceniane w ten sposób jest jednocześnie gwarancją rentowności ekonomicznej w ramach funkcjonowania łańcucha dostaw. Umiejętności zarządzania ryzykiem w łańcuchu dostaw w odniesieniu do tworzenia wartości dodanej mają znaczący wpływ na osiągnięcie jego celu w optymalnych i ekonomicznie uzasadnionych kosztach.

Key words risk, factors of risk , category of risk, sources of risk, risk management.
Słowa kluczowe: ryzyko, czynniki ryzyka, kategorie ryzyka, źródła ryzyka, zarządzanie ryzykiem.

1. THE CONCEPT OF RISK

Risk lies in the sphere of interest of many scientific disciplines and as such is defined differently within each of them. Risk is therefore defined as :

- an event of a higher degree of probability in the case of which there is sufficient amount of information to estimate both a company and consequences of that event;
- a probability of an occurrence of an event which is perceived as adverse as well as an estimation of expected losses in the event of its occurring; which is presented by the following formula:

risk = probability of an accident / incident x consequences measured in losses of material / human character

- a category of volatility of the real rate of return on investment around the expected rate of return, even if that rate of return is positive
- the possibility for negative or positive consequences of future events with a known probability and strength of impact.

Risk is present in all spheres of human activity, that is when people are not able to control or accurately predict their future. It is worth noting that man as an element of an organization is the most important – in the most general sense – or indeed virtually the only source of risk.

It should be particularly clear that risk: concerns any organization or accompanies an action or an omission of an action or comes from the environment or the inside of an organization or includes negative actions and their consequences as well as missed opportunities or lost profits.

2. THE SIGNIFICANCE OF RISK IN A SUPPLY CHAIN

The risk of a supply chain should be understood as a probability of adopting a wrong strategy, wrong decisions or lack of optimal configuration of a logistics system in relation to, for example, the number of links in a chain, the accessability of key transport hubs, number and type of distribution channels. The measure of risk vulnerability of a supply chain is its sensitivity to threats occurring inside the organizations which are its part as well as occurring between them. The sources of risk in supply chains are: ***processes*** in the supply chain, ***suppliers*** (eg. a breach of a contract, unsatisfactory quality of goods, lack of timeliness), ***customers*** (eg. changes of requirements for customer service), ***service providers*** (eg. disadvantageous contracts with logistic operators, low level of service), ***competitors*** (eg. competition in the industry, competition in the provision of services on the common market). Risk in relation to the main processes in a supply chain on the basis of an example of risk groups that include suppliers, customers and internal supply chain is graphically presented in the table below.

The most common sources of risk in a supply chain are those elements of its surroundings or its interior which may bring about losses or benefits. Further, the types of risk usually take their names from its source, for example, the legal environment of a supply chain is a source of risk defined as legal risk (or legislative).

It is reasonable to consider risk in a supply chain as resulting from interdependencies between its participants, for example, concerning the character, scope, relationship, base,

cooperation within warehousing services, that is resulting from the type and complexity of their relationships. There are also risks whose source is a widely understood process of cooperation among the companies involved in a supply chain, which can be described as a realization of material, information and financial flow between parties involved.

From the perspective of implementation of logistic processes in a supply chain these as follows are examples of such a risk:

- human, organizational and technological risk - HOT
- regulatory, infrastructural and political - RIP

The risk from the HOT group is the one usually directly responsible for the occurrence of crises in organizations. They correspond with the intra-organizational risk in the case of both individual organizations and entire supply chains.

The risk from the RIP group acts as an accelerator of crises directly affecting their occurrence. They correspond with the macro-economic risks that may exist in the external environment of an organization in the case of both individual organizations and entire supply chains.

The identification of risk in a supply chain becomes much more complicated if sources of risk, and more specifically its causes, were linked with its consequences. Therefore a single effect of risk may have several causes. Furthermore, one cause of risk may lead to the appearance of various types of risks and their various consequences. Complication of these relationships can cause, for example, an inappropriate distribution of risk burden between the individual members (participants) of a supply chain.

Summing up, it should be emphasized that a full identification of risks in a supply chain must include the identification of their sources, types (including the determination of the probability of their actual appearance and the strength of their impact on a supply chain), and a presentation of their consequences.

3. RISK FACTORS IN THE FLOW OF GOODS IN A SUPPLY CHAIN

The globalization of the economy, new information technologies and rapid development of transportation create enormous opportunities for entrepreneurs. Geographical distance does not constitute a substantial obstacle in the selection of suppliers, production sites and sales markets. Business partners can communicate with one another and overcome all barriers of

distance by means of new IT solutions. And easy access to various modern means of transport improves and accelerates the process of distribution.

The market faces enhanced requirements from customers who are looking for varied products of highest quality and delivered on time as well as at the lowest possible price. These requirements lead to a search for new solutions owing to which meeting customers' needs would be less expensive on the one hand and viable and profitable for manufacturers on the other one. No wonder therefore that more and more businesses decide to participate in supply chains.

There are many threats connected with the processes of the flow of goods in supply chains. In order to determine the degree of danger of a particular threat it should be examined how its occurrence will affect the flow of goods in a supply chain. According to the author of this article the identification of risk factors in relation to the flow of goods in a supply chain should include:

- safety of a delivery of goods;
- process of a flow of goods between the participants in a supply chain;
- directions of actions that minimize the probability of risk occurrence.

In the supply chains operating in a global environment a very long duration of transport often increases the likelihood of any kinds of problems. For the flow goods happens in a changing environment and with the aid of diversified infrastructure (eg. loading terminals, ports, logistic centers) and means of transportation. Hazards most commonly occur during the movement of goods between the particular links of a supply chain. This particularly takes place during the processes of transport and handling of goods carried out by service providers.

The process of the flow of goods is vulnerable to sudden changes in the environment, which can seriously affect the efficiency of a supply chain. Its fragility results from the vulnerability of its processes to the occurrence of unexpected disturbances in the environment in which they are carried out. The direct consequences of this event may be, for instance, a delay of a delivery or a lack thereof at all. They lead to the formation of disturbances and their spreading along a supply chain. The disturbances may take the form of delays and stoppages in the execution of, for example, production or distribution processes. During identification of risks, it is important to recognize the greatest possible number of them as well as to determine the degree of vulnerability concerning the process of the flows of goods upon their occurrence. Participants in this process should identify the direct causes of

disruptive events and be aware of the need to eliminate them. During the identification of risks and their places it should be assessed which of the links in a structure of a supply chain, viewed from the perspective of a process of goods flows, are connected with the lowest level of security. This then will allow to determine the sources and number of potential threats with the highest probability of occurrence or with the greatest impact on the entire process of a flow of goods.

Each participant of a supply chain should plan and conduct activities at the tactical and operational levels, which would be related to the identification of a risk of adverse events. The sources of risk in the flow of goods in a supply chain, according to the author, should be most frequently expected in:

- execution of activities carried out by means of equipment and machines used, for example, for transport and handling of goods;
- the technical state of equipment; for example, a lack of a current technical inspection or regular maintenance can potentially become a source of technical failures;
- failures of equipment used for data processing and storage as well as communication with business partners; for example, they may add up to the loss of possibility to control processes as well as loss of data about current orders or inventory status;
- lack of knowledge and skills with employees; for example, incompetent and unprofessional execution of receiving orders, planning and conducting of distribution or even inappropriate packing, labeling and preparation of goods for dispatch;
- computer frauds committed by disloyal employees and third parties in terms, for example, of unauthorized way of acquiring and transmitting of information or destroying or changing the contents of a crucial piece of information;
- terrorist attacks whose consequences are serious for companies and their business partners; for example, as a result of such an attack there can occur many disruptions in the flow of goods, as production should be halted (or reduced) due to the fact that transport of necessary supplies has not arrived, being stopped at the border of a country or in a sea port;
- fires, for example, of warehouses or production halls;
- all kinds of natural disasters, which, for example, will hamper or diminish road, sea, rail or air transport;

Goods during a flow between supply chain participants, a dispatcher and a recipient, often travels very long distances. This fact increases the number of factors affecting the flow

and therefore increasing the risk of disruption of the continuity of the flow. During their transport goods are handled by employees from various companies. They can also insufficiently prepare goods for shipment and thus contribute to their damage (eg. in loading spots).

Technically flawed transport units or incompetent employees (eg. drivers) are the risk of traffic accidents, which can result in damage or total destruction of goods.

The process of goods transport is also affected by random situations, especially related to natural phenomena. Events of such a character can be constituted by:

- strong winds and low temperatures, which can delay or halt flights, departures of ships, icing of runways, difficult flight conditions;
- long periods of high temperatures which may adversely affect the transport of some sensitive goods and reduce the intensity of road transport;
- floods that can cause flooding of transport routes or of warehouses.

The identification of risk factors for the flow of goods in a supply chain should be the basis for identifying and taking action aimed to minimize the probability of their occurrence. They should be above all focused on prevention of activities aimed to reduce the likelihood of such adverse situations, at least to an acceptable level of risk.

Prevention activities may include: staff training, regular maintenance of equipment and machines, ongoing analysis of the conditions of transport services in terms of both the means of transport themselves and the goods, further, the use of advanced information technology or implementation of these same IT systems by business partners. A reasonable way to reduce risk is to take preventive measures aimed at prudent and sound management of a flow of goods and a subsequent decision concerning with how many and with which suppliers to cooperate. Dependence on a single source of supplies is connected with a risk, for example, of an unfulfilled distribution or production order, that is when a delivery will not reach the recipient. An important strategic decision is also to determine the size of inventory maintained by all participants in a supply chain. To reduce the level of risk in the flow of goods can be also influenced by the implementation of management systems for: quality, environment, health and safety, information security. They help limit the level of risk, the source of which is (or may be) associated with each participant in a supply chain. The security management system of a supply chain in turn increases the safety of processes taking place in the whole of a particular chain.

Any adverse event in the flow of goods can be associated with an occurrence of certain losses. Their size is surely affected by the preparation of a supply chain participants for an occurrence of an adverse situation (sometimes a single event can trigger off a variety of consequences). Writing ***scenarios of events*** can be very helpful in this regard. They can be implemented at the moment of an adverse event happening or for an identification of related cause-and-effect relationships. In this regard it is important to know how long a given participant in a supply chain is going to feel the effects of such an event and how long they are able to function under critical conditions. It is also important to determine the probability of an occurrence of a given event and the size of the losses associated with it.

At each time in the event of an adverse situation it is very important to prepare ***an emergency plan.*** The introduction of contingency plans is an action connected with a mitigation of the negative effects of risk. They concern, among other things, a responsibility of people for particular actions and a sequence of their execution in the event of a disruptive situation. To enhance the security of measures undertaken by employees in the event of adverse events then providing of training is particularly important. This should enable gaining knowledge of how to properly do one's job as well as how to behave in the case of an occurrence or prediction of adverse events.

Not all risks in the flow of goods in a supply chain are possible to predict and eliminate. These include particularly threats coming from, for example, natural disasters or terrorist attacks. In that case it is extremely important to introduce emergency procedures and make use of property insurance.

4. SOURCES AND CATEGORIES OF RISK IN THE MANAGEMENT OF A SUPPLY CHAIN

Modern supply chain networks are becoming more and more sensitive, because the vulnerability of a supply chain to disruptions is on the increase. Hence the significance of the risk issue in a supply chain network is also on the increase. Among the primary reasons for such situations are: the search for competitive advantage in the area of supply chains (for example, searching for reserves by means of outsourcing), technological change - risks associated with new technologies (eg. e-economy, new banking technologies), globalization (eg. additional risks associated with businesses going beyond their national borders, supranational organisations, cooperation within global networks).

The aim of companies that form supply chain networks is a reduction of risk and improvement of their competitiveness. Operating within a supply chain leads to new

problems, often on a company-wide scale. Risk associated with them may relate to some barriers facing the setting up of such networks, the resilience of networks to changes (eg. new technologies, new links). Beside the increasing requirements for activities related to communication and cooperation within networks attention should be also paid to matters related with trust within a partnership and the technologies that are used.

Modern economy witnesses a network of overlapping horizontal and vertical business relationships, which generates a number of new forms of cooperation among companies. Importance has also been gained by outsourcing and companies joining within networks. Relationships with suppliers have also gained significance. The increasing division of responsibilities and dynamic nature of relationships require an evaluation of relationships in a special way, since risks connected with cooperation do not depend only on the goals and tasks of just one company.

Sources of risk in a supply chain can be classified as a risk of the very supply chain. They pertain to: cooperation between partners in a supply chain or a risk from the environment arising from the interaction between a supply chain and the environment.

Analyses of a supply network viewed from the perspective of a relationship focus on building and managing relationships. There are four levels of analysis of the sources of risk in supply chains:

- Level 1 - value stream, product or process;
- Level 2 - Assets and infrastructural overlapping;
- Level 3 - organizations and inter-organizational relationships;
- Level 4 - the external environment.

Attention should be especially paid to level 3, where a supply chain is recognized as a network through which there is a flow of physical goods and information. The links are constituted by organizations (commercial ones from the public sector) holding and managing assets and infrastructure. Connections (ties), however, are market relations and interactions associated with an organization's strength and position.

One can also analyze sources of risk in supply chains classifying their relationships according to: market exchange, a strategic partnership, a “captured” supplier or a “captured” customer. The relations of a “captured” supplier and “captured” customer vary according to the specific character of an investment made into a particular relationship (which concerns both the supplier and customer). These relationships are also prone to risk. If both parties have a vast contribution in their relationship they become dependent on each other, and

although the high level of trust resulting from such a situation has some advantages, risk here can appear as an inefficient relationship. However, too large investments in some relationships may not bring the desired fruit, although they give huge benefits, but nevertheless require large investment. One should also have in mind the hidden costs of becoming engaged in a particular relationship and a risk of losing of the value of the invested share and contribution made.

In the analysis of the sources of risk in supply chains the transaction cost theory may also be of some help. It explains the relationships in supply chains. The main sources of risk in the context of a network established on the basis of the theory of transaction costs can be:

- ***"hold-up" risk*** – which is connected with the specific character of activities, eg. having specific assets increases the uncertainty and danger of opportunism for the relationships in a supply chain;
- ***Risk of "inefficiency"*** – which is connected with market competitiveness, eg. an increase in complementary competencies on the market helps increase the number of potential customers or suppliers and at the same time reduces the risk connected with transaction accounts;
- ***The "spillover" or "appropriability" risk*** – which is about the nature of knowledge, eg. an increase in skills of acquisition and usage of knowledge on the market decreases risk connected with outsourcing;
- ***Time risk – which pertains to a time horizon,*** eg. an increase in the difference between the planning horizons of a supplier / recipient brings about a higher risk in their relationship.

The above sources of risk viewed from the perspective of the theory of transaction costs can be linked with relationships in networks with a certain deviation from the strategic and non-strategic risk in relation to the supplier and recipient. They are also related to their position on the market and the amount of their contribution into their networks, which depends on the specific requirements of a given investment. Because of the importance of risk to a supply network it is legitimate to refer to risk categories.

Findings based on research carried out in companies show that supply chains may suffer from the following risk categories:

- ***Risk of refraining*** from making sovereign decisions by partners in a network within the area of cooperative activities;

- ***Risk of a conflict*** connected with an execution of the key objectives of a network. It is important that economically justified behaviour should be beneficial for and addressed participants of a whole of a network and the objectives should be freely accepted;
- ***Risk of a loss of flexibility*** which depends on the strength of connections between network partners;
- ***the risk of a loss of usefulness*** which depends on the strength of connections between network partners;
- ***risk of cultural differences*** between participants, which is not conducive to building an atmosphere of trust in a network.

Taking decisions concerning the management strategies in supply chains can be affected by the following risk categories :

- ***risk of disruptions*** **–** for example, operating with the JiT system increases risk and its importance;
- ***risk of escalation of prices*** **–** which is based on taking advantage by the supplier of the fact that they are the sole supplier of goods and may raise the price of the goods;
- ***risk of planning and inventory*** **–** for example, the omission of the fact of an entry of new technology onto the market and therefore the changes in demand resulting from this can become a cause of a lack of a reaction early enough;
- ***risk related to quality*** **–** for example in a partnership relationship in a network the parties deal with both obtaining benefits and suffering negative consequences of obtaining access to technology; for example, customers can through having a better access to the technological knowledge of their partners become engaged in the development of new technologies;
- ***risk concerning an access to technology*** **–** for example the relationship with one provider guarantees a better quality product (service) than contacting many suppliers;
- ***risk of a provider's opportunism*** **–** specifies that all transactions in networks bring in the risk of opportunism, for example a reduction of their number should automatically lead to a reduction this kind of risk that results from them. A partnership may, but as well may not, be a good way to manage the risk of opportunism.

5. RISK MANAGEMENT IN A SUPPLY CHAIN

Risk management is a system of methods and measures whose aim is to lower the impact of risk on the functioning of a business entity and hence undertaking optimal and economically viable decisions.

Learning in detail of the nature and extent of a potential risk enables a timely choice of actions to prevent or minimize its impact and consequences. Risk management can also be defined as the process of identification, evaluation, management and control of potential events or situations leading to a reasonable assurance that the objectives of an organization will be met .

The concept of risk management is also defined as a decision-making process in support of achieving planned economic, social or political objectives in an optimal and cost-efficient way by means of procedures that enable a total elimination or reduction to an acceptable level of all risks that threaten the achievement of that objective. The concept should be of purposeful character, that is the activities in question should not be undertaken just very much from time to time but be systematic and long-term.

Risk management as a method of control of uncertainty should be used in supply chains, since it enables :

- improving the efficiency and efficacy in the execution of targets;
- control of risks throughout a supply chain and its processes;
- identification of significant risks and their reduction to an acceptable level through an appropriate functional and institutional internal control system;
- Preparation of an integrated strategy of risk management.

Risk management in a supply chain also requires the development of procedures that are a systematization of the actions executed as well as requires documentation of decisions made and preservation of clear controlling paths. This enables due diligence standard within risk identification, analysis and management. The introduction of a comprehensive approach to risk management of processes executed in a supply chain will allow to:

- identify a possibility of improving logistics processes and reducing their costs;
- determination of the direction of changes and assessment of the expected effects upon the level of strategic supply chain management.

As for the organizations cooperating in a supply chain, risk management systems implemented by them should be integrated with a process of supply chain management. And further while managing risk in a supply chain the following principles should be followed :

- risk management in a supply chain requires close cooperation between its participants;
- an identification of risk preceding the management of it should be conducted in a continuous manner by all the participants of a supply chain;
- what carries a basic significance for the functioning of a supply chain is an open communication between its participants, concerning the identification of risks;
- while carrying activities in a supply chain one should always take into account the types of risk, which may affect each participant of that chain;
- risk in a supply chain should be managed in an effective manner;
- risk which cannot be avoided or eliminated must remain under constant control by "decision makers" of a particular supply chain.

Furthermore therefore, risk analysis in a process of risk management in a supply chain should include three stages :

- ***risk identification*** - identification of possible risks, their causes and effects;
- ***measuring (assessment) of risk*** – determination of the probability for particular types of risk, description and quantification of risk;
- ***evaluation of risk*** – defining of a meaning and acceptability of risk for players in a supply chain who are under its influence; determination of the acceptability of risk and a summary and comparison of positive and negative effects of risk occurrence.

For the management of risk in a supply chain it becomes increasingly important to maintain partner relationships with the participants of a supply chain. Their shared commitment to problem solving and a sense of responsibility for quality and continuity of supplying goods to the end customer. As a rule a close cooperation undergoing a transformation into a mutually beneficial partnership applies to key suppliers and customers. It is important to try to define processes and introduce partner relationships among all links, because the robustness of a chain is determined by the weakest link .

Furthermore, identification and evaluation of processes regarding the creation and execution of added value is crucial in designing an integrated system of risk management in a supply chain. This process also requires integration of projects implemented under a total management of logistic processes. From this point of view the issue of minimizing risks boils

down primarily to a determination of the most probable places of their occurrence, consequences and probabilities of their occurrence as well as their connection with the creation and execution of added value.

A successful implementation of these rules requires a control of hazards through an appropriate risk management system enabling the identification of significant negative factors and their elimination or reducing them to an acceptable level. A method of an identification of risk groups which takes into account the level of development and supplying an added value is presented in Table 1.

Risk management in a supply chain certainly will not make all threats disappear. However, it can contribute to :

- working out common and transparent evaluation criteria, a possibility for comparison and skills of dealing with risks that pertain to completely different areas of a supply chain;
- defining of simple interactions between the effectiveness of risk management and the achievement of the objectives by all participants of a supply chain;
- a strong enhancement of chances to "get up" after negative results of a risk that has occurred, the restoration of operational resources and ability to generate profits.

Effective risk management in a supply chain requires knowledge about the particular risks and how they function. This is a basic condition for effective risk management and ensures that all links in a supply chain might enjoy the security and stability needed to achieve their objectives.

Table 1. Risks of logistic processes in a supply chain and creating the added value

NAME OF PROCESS IN CREATING ADDED VALUE	**TYPES OF LOGISTIC PROCESSES**	**IDENTIFICATION OF RISK GROUPS**
Processes directly generating the added value - core processes	Execution of customers' orders	• failure to meet lead times • a decline in number of orders, • a flaw in the contract execution
	Execution of a logistics customer service	• imperfections of solutions • failure of equipment, • lack of experience
	Offering extra value for the customer	• changes in value.
	Minimizing of costs leading to a reduction in the price of a product and services offer	• quality deterioration • loss of some key customers.
	Goods-in reception and shipment of products including transport, (un-)loading, storage, packing and labeling	• failure to meet lead time, • a decline in orders, • lack of integration between the processes of production, distribution and transport
	Providing the required level of logistics customer service	• inadequate level of service, • customer service process is not sufficiently customer-oriented, violation of contract clauses by forwarders or logistic operators, etc., • failure to meet technical standards by suppliers, • problematic materials quality control system, • problems with supply deliveries.
Processes indirectly generating the added value - ancillary processes	Analysis and forecast of market logistics situations	• inefficient system of logistic information
	Identification of customers' preferences and expectations in the aspect of logistics	• problem of identifying key customers or groups of customers in field of logistics service, • inaccurate prediction of customer needs,
	Identification of logistic market segments	• inaccurate matching of logistic services with a segment, • lack of integration of all activities related to a particular segment of logistics
	Preparation and development of logistic strategies	• an error of a choice of a distribution channels management strategy, • too long time for an

NAME OF PROCESS IN CREATING ADDED VALUE	TYPES OF LOGISTIC PROCESSES	IDENTIFICATION OF RISK GROUPS
		emergence of a new product.
	Quality assurance of process services	• inappropriate level of services rendered
	Quality assurance of purchasing processes and product sales	• incorrect assessment of quality of materials. • incorrect evaluation of suppliers, • incorrect choice of suppliers, • faulty controlling assessment of the quality of finished products .
	Controlling the flow of products through the development of processes of transport, (un-) loading, storage, packing and labeling of goods	• lack of internal and external integration of supply chain management.
	Issuing instructions regarding execution of orders	• too long a time for passing on information, • illegibility of information, • incorrect interpretation of instructions.
	Identification of targets and development of assumptions for an implementation of the logistics customer service	• partners' too weak ability to respond to unexpected orders (low flexibility, too slow adaptation to requirements).
Processes relatively related to the creation of added value - complementary processes	Securing the capacity and potential to create an added value	• lack of innovative solutions, • lack of implementation of a strategy or plans, • Limiting oneself to proclamation of slogans - no implementation, • impact of promotions and advertising
	Research and development of logistics infrastructure	• changes of the terms of deliveries • bad planning of production, • lack of flexibility in the production process
	Development of information and IT technology	• lack or insufficient flow of information on demand from POSs and from key customers • inappropriate methods of demand planning, problems with

NAME OF PROCESS IN CREATING ADDED VALUE	TYPES OF LOGISTIC PROCESSES	IDENTIFICATION OF RISK GROUPS
		an information flow
	Shaping, maintaining relations with the environment	• imbalance between customers' expectations and the possibilities of all the supply chain links, lack of understanding for market needs • lack of integration with customers, • variability of demand, relations with customers, • competitive forces on the market, potential of the market
	Waste management, packagings and unrecoverably damaged products.	• lack of regulation for waste recycling, • insufficient ecological awareness, • lack of system for the collection of hazardous waste, • lack of landfills that meet legal requirements, • lack of selective waste collection.
	Securing the sales and turnover execution	• errors in planning of material supply, • holding idle inventory.
	Securing the financial aspects of logistics (dealing with customer accounts)	• error in estimating the profitability of a customer, • too high maintenance costs, • volatility of prices of materials, • underestimation for cost predictions.

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