

# Procurement Risk Management as an Assumption of Sustainability in Industrial Enterprise

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**Abstract:** One of the assumptions of economic sustainability in industrial enterprises is the effective management of material resources necessary to produce their own goods. Procurement risks can seriously threaten the sustainability of production. The aim of this contribution is, through the qualitative and quantitative data analysis, to point out the importance of procurement risk management in the procurement process and also to show the most commonly perceived risks in a period of uncertainty.

**Keywords:** procurement risk management, sustainability, industrial enterprise

**JEL Classification:** L21, L25, M11

## 1 Introduction

Nowadays, we are increasingly faced with the demand for sustainable, continuous production and the creation of multiple added value. This can be fulfilled under the assumption of elimination of risks related to all activities of the industrial enterprise.

Hong, Lee, and Zhang (2018) mention that in general, there are five main risks that occur in procurement process which are demand fluctuation, vague price information, unreliable yield uncertain lead time and disruption risks. Other researchers such as Kita divides procurement risks into risks associated with the relationships with suppliers, risks associated with position of customer in the purchasing market, legislative risks, and image risks (Kita, 2017). If the industrial enterprise is not able to find the required material items on the domestic market, it must purchase abroad. In addition to the procurement or transaction risks already mentioned, there are additional ones related to differences in the economic and legal environment, less availability of information, greater geographical distance, or language and cultural barriers. Ružeková and Pavelka (2023) divide them into three groups: territorial risks, market risks and commercial risks.

PRM (Procurement risk management) is the management of procurement risk through reducing the exposure and uncertainty in price, lead time and demand to ensure continue flow of supply (material, skills, capabilities, facilities) with minimum disruption (Hong, Lee, Zhang, 2018). Pajonk considers procurement risk management to be a summary of the activities and tools used in the entire procurement process, which lead to the prevention of risk but also to the reduction of the level of risk and its impacts (Pajonk, 2024).

There are multiple strategies and instruments of procurement risk management such as supplier diversification, backup sourcing with information updating, integrated sourcing and production decision making or hedging strategy. Constantino and Pellegrino (2023) devoted their research to choosing a procurement strategy from single, dual, or multiple sourcing options. Xing and others (2022) focused on operational and financial hedging and their combination, which produced a synergistic effect.

A financial and economic crisis will significantly change the views of risk management not only within SMEs but also in large companies. Companies of all sizes are now taking an initiative-taking approach to risk management, seeking to centralize risk management and develop integrated management systems (Dvorsky et al. 2021). Corporate sustainability of a company is its ability to identify ESG risks and other types of risks, manage them in the short term, and create conditions for corporate sustainable development (CSD) by maintaining and building up the resource potential, using natural assets, and implementing circular and CSR strategies that reflect the interests of the company's stakeholders and are adapted to the environment in which the company operates (Blinova, Ponomarenko, Knysh, 2022). At the production network level, in promising cases, companies may try to approach to waste streams instead of primary input reserves while implementing a production unit or designing a production network/industrial cluster. Companies may even produce higher amounts of main outputs than the market demand to satisfy the waste demand of another company. Then,

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cooperation becomes more critical particularly in collaborative demand forecasting, trust-development, and design issues (Yazan, Fraccascia, 2020).

## 2 Methods

Industrial market is characterized by a high heterogeneity therefore we conducted qualitative and also quantitative research. In order to examine relationship between procurement risk and sustainability in detail, we conducted semi-structured interviews. Among five respondents were purchasers and managing directors of industrial companies. We investigated how big was the value of purchased materials. Our interviews focused on identifying all types of procurement risks, their factors, and impacts on industrial enterprises. The aim of quantitative research conducted in sixty-seven engineering companies was find out the most perceived risks in a period of uncertainty. The results of qualitative and quantitative research lead to proving the need of procurement risk management as an assumption of sustainability in industrial enterprises.

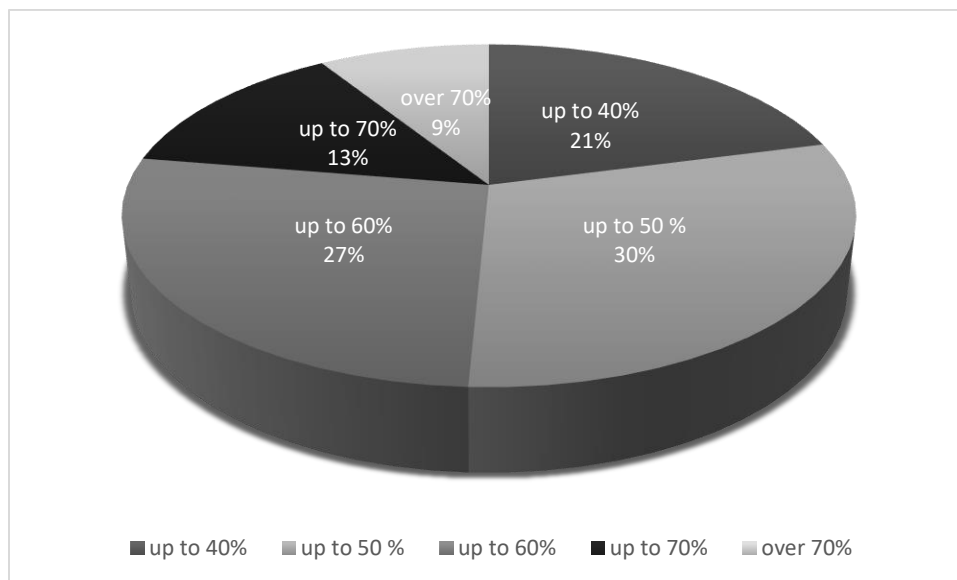
## 3 Research results

The results of qualitative and quantitative research can be summarized in two areas: importance of procurement in industrial enterprise and procurement risks and their impact on sustainability of industrial enterprise.

### 3.1 Importance of procurement in industrial enterprise

Depending on the industry and the production process, the value of the purchase can range from 40% to 80% of the value of the manufactured product. The purchase represents certain costs that enterprise must consider when is creating the price of the final product. While the procurement of material constitutes the largest value of the final product in an engineering company, the labour costs are low. Vice-versa, in the services, the largest cost item is not the purchased products, but the salary of the employees. What value of the final product in the engineering industry is represented by the purchase of products and services necessary for its production is shown in Figure 1 The value of the purchased material in the value of the final product.

**Figure 1** The value of the purchased materials in the value of the final product



Source: Own processing

In 79.1% of Slovak engineering companies, the material purchased represents more than 40% of the value of the final product. In almost half of the enterprises (49.2%), procurement of goods and services accounts for more than 50% of the value of the manufactured product. Fourteen enterprises (20.9%) chose the option up to 40% of the value of the final product. The largest representation was made by companies where the purchasing of material was up to 50%. There were twenty enterprises therefore 30%. This is followed by eighteen enterprises (26.9%) in which the purchase represents less

than 60% of the value of the final product. Enterprises with the largest share of purchases make up only 9% of all enterprises surveyed. For procurement risk management, it is essential to know the share of individual purchased products in the company's overall purchase and their importance in the production process.

Effective and sustainable procurement management starts with a detailed description of the purchased product. Respondents from qualitative research were able to generally characterize products in terms of durability, standard or availability on the market. However, the products must be specified in more detail by experts in the field of construction, technology, and quality. Competent co-workers from other departments of industrial enterprise, such as sales, finance, or production departments, can express their views on defining material needs, the method and time of procurement.

The choice of a supplier is conditioned by the technical side of the product, its availability, price, or procurement costs and communication. A company providing a service in the field of technical production preparation perceives two views of its product, depending on the stage of the product life cycle of its customer. In the case of the product development phase, the customer is aware of the importance of this service provided, but it is interested in the price. If the customer - industrial enterprise has already started production without consultation and generates defective products, what is reducing the sustainability of production, his priority becomes solving his problem as quickly as possible.

### 3.2 Procurement risks and their impact on sustainability of industrial enterprise

The industrial enterprise purchasing a large number of goods needed for production, therefore company entering a large number of different interorganizational relationships perceives multiple risks from the supplier as well as the customer. These are risks related to the delivery itself, the relationship with the supplier or the market situation. A small business with basic supplier relations sees risks related to the transaction, namely commodity risks and risks of the availability of the required products on the market. Companies buying or selling outside the Slovak Republic, in the case of payment in another currency consider exchange rate loss as the biggest risk. They identified the difference in technical standards used in different countries as important. As shown in Table 1 we can classify the risks into several groups according to their originator or what they concern.

**Table 1** Classification of the procurement risks in the industrial enterprise

Classification of the procurement risks in the industrial enterprise	
Group of risks	
Merchandise risks	Delayed delivery
	Incomplete delivery
	Damaged delivery
	Insufficient quality
	Shipping risks
Technical risks	Non-compliance with technical standards
	Changes in customer requirements
Availability risks	Absence of the supplier's productions capacity
	Loss of the supplier
	Production delay
Financial risks	Price volatility
	Inflation
Foreign trade risks	Exchange rate risks
	Difference in technical standards
Risks of default	Cancelled delivery
Risks of addiction	Supplier dependency
	Loss of know-how

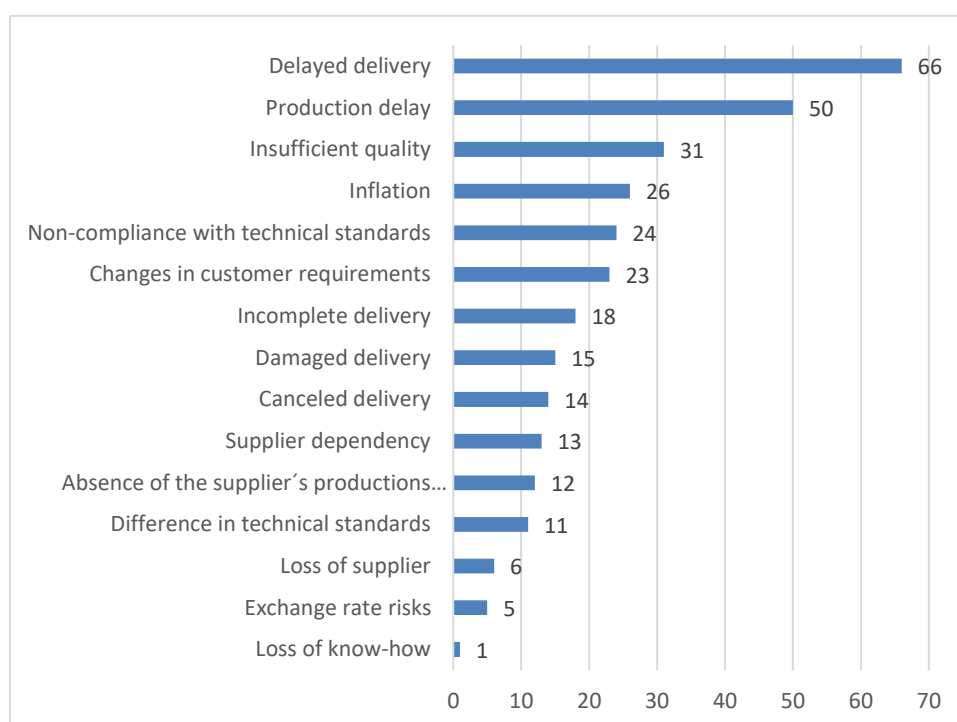
Source: Own processing

The qualitative research further shows that suppliers perceive technical and merchandise risks, whether their product will meet the customer's requirements and whether it will be compatible with other products entering the customer's production process. They consider failure to pay or delay in payment for the completed delivery. Failure to take over delivery to the customer, dependence on the customer and competition are other factors that suppliers point to.

Most of the mentioned risks are transactional risks. These include commodity or merchandise risks, technical risks, availability risks, financial risks, and foreign trade risks. As relational risks, we can refer to risks of non-fulfilment of obligations and risks of dependence, both on the customer's side and on the supplier's side.

In quantitative research we wanted to know from the interviewed enterprises what risks they encounter most often when procuring products and services necessary to ensure production. Figure 2 shows the perception of procurement risks on Slovak industrial market.

**Figure 2** The perception of procurement risks



Source: Own processing

Delayed delivery is considered the most common risk by the enterprises. The number of sixty-six companies expressed their opinion which represents 98.5%. Delayed delivery is related to delayed production, which is considered a risk by 74.6% of respondents. This is followed by insufficient quality, an increase in the price level, non-compliance with technical standards, changes in technical requirements by the customer, incomplete delivery, damaged delivery, cancellation of delivery, dependence on the supplier, the absence of the supplier's production capacity, differences in technical standards when purchasing from abroad, loss of the supplier, exchange rate risks when buying from abroad. The least common is the risk of losing know-how.

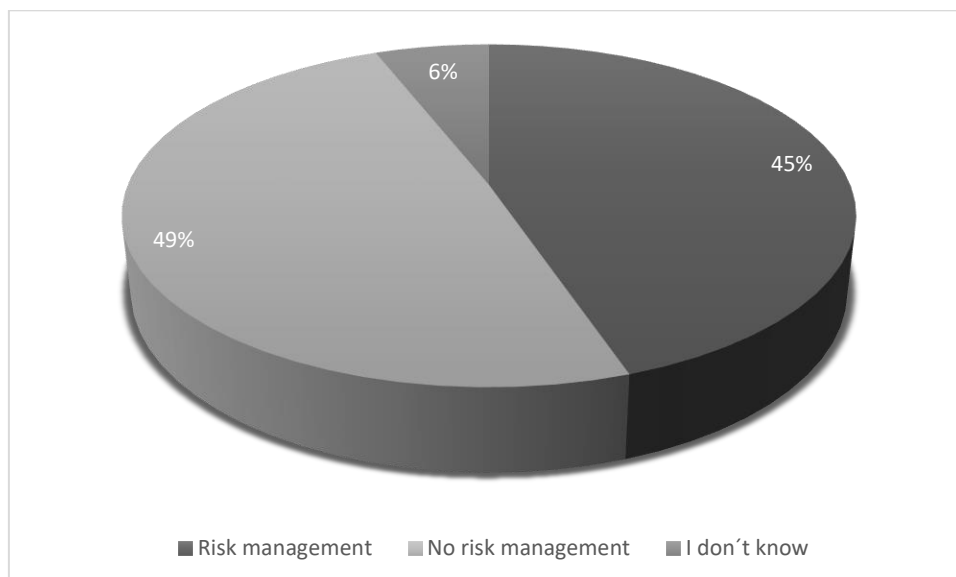
The impact of certain risky situations related to the purchase of products needed for production can mean for the industrial enterprise a deterioration of the conditions of the production process, in the extreme case even the loss of a customer due to failure to fulfil its obligations. In the event of non-fulfilment of the customer's obligation to pay for the delivery, the supplier's company is threatened with secondary insolvency, which may lead, for example, to non-payment of wages to its employees and endangering sustainability of production.

Representatives of the customer's and supplier's companies on the industrial market were able to determine the causes of risky situations. Like the factors of choosing an interorganizational relationship, the causes of risks or we can divide the factors of their perception into several groups. First of all, it is the nature of the product in question, its availability and the overall situation on the suppliers' market, the customer's ability to correctly define the need and the supplier's

ability to find the right solution to the customer's problem. A particularly key factor is the importance of the purchased product for the customer and the value of the order for the supplier. Last but not least is the financial situation of both partners and the competition on the supplier market. The quantitative research shows the following. As the causes of the risk in the purchasing of products and services, enterprises cited unreliability of suppliers, lack of suppliers, insufficient production capacity of the supplier, poor financial discipline, insufficient know-how of the supplier and poor production quality.

The existence of risk management in a company is related to the perception of risk. In the case of micro-enterprises, this perception is influenced by the production process, the procedures for procurement of the necessary material, the wide availability of the required products, which are often standard, and the simple business relationships into which the enterprises enter. The large enterprises are aware of the existence of risks and the possible effects of unwanted situations. Customers do not attach much importance to risk assessment despite being aware of the possible impact of risky situations. In the case of supplier organizations, there is an assessment of the risk relating to the customer's obligations. Risk management is often focused only on internal activities related to the production process, and the management of external risks remains neglected. As we can see in Figure 3 risk management was declared in thirty enterprises, which represents 45%. We noted its absence in thirty-three enterprises. Respondents from four companies could not comment on this question, or they did not know about it.

**Figure 3** Risk management



Source: Own processing

The elimination of risks in industrial enterprises where there is no risk management, consists in verifying information and constant communication with the supplier or customers. These are often cases where trust plays a key role. A company that has risk management applied in all business activities, including procurement, production, and sales, uses contractual instruments in its relationship with customers, such as a framework agreement or general conditions of purchase or sale. When managing risks, he is also helped by checking the customer's financial situation and constant communication with the customer.

#### 4 Conclusions

The purchase of products and services for a manufacturing enterprise represents 40-80% of the total value of the manufactured product. While in the past the role of buyers was cost reduction and timely delivery of goods, today purchasing is increasingly considered a strategic function of every manufacturing company, which contributes to the creation of added value of the final product. Purchasing is the real interface between the supplier and the company's internal clients (development, production, quality, sales...). Products and services required for production must meet a number of criteria specified by the purchasing centre. Depending on the industry, these are characters of product (chemical, physical, electrical, optical, mechanical, sensory and others), packaging method, price, delivery time, warranty period, or technical support. To ensure flawless operation in the company, the appearance of risks related to the procurement of products and services must be eliminated to the greatest extent possible. These are risks associated with

the transaction itself, risks resulting from the relationship with the supplier and risks associated with the position of enterprise on the purchase market.

Incorrect decisions of procurement management in conditions of risk largely affect the future of the manufacturing enterprise. Failure to ensure the timely and error-free delivery of products and services necessary for the production of the enterprise can lead to its endangerment. Subsequent failure to deliver products and services to the customer in the required time, quantity, and quality, and thus failure to fulfil one's obligations, will cause dissatisfaction, loss of the customer and, in extreme cases, the collapse of the enterprise. Unfortunately, in most cases, managers take risks without being aware of them, dealing with their level and relying on circumstances that cannot occur. In order to prevent undesirable situations, manufacturing enterprises should focus their attention on risk management. Risk management cannot be understood by the company as a separate part of corporate management, but as part of all internal processes.

The number of procurement risks related to the availability of the material resources can be reduced by using circular economy principles. This is not just about recycling primary materials as we know from the production of steel, glass, paper, or plastics. In terms of sustainability, in the future procurement strategies will be focused on local sourcing or co-procurement. In the context of procurement 4.0, digitalization and AI tools will help purchaser identify risks, analyse them, and make purchasing decision.

## Acknowledgement

This contribution is the partial result of the project VEGA MŠ SR a SAV VEGA 1/0462/23 Cirkulárna ekonomika v kontexte spoločenských požiadaviek a obmedzení trhu (Circular economy in the context of social requirements and market restrictions)

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