SUPPLY CHAIN RISK MANAGEMENT IN FUNCTION OF INCREASING ITS RESISTANCE

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WHY SUPPLY CHAIN RISK MANAGEMENT?

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Previous research

Results of research ***Business Continuity Institute*** from 2011 are:

- 85% of analyzed sample experienced at least one disruption

"The vulnerability of the supply chain risk comes from within and outside the supply chain" M. Christopher

- Disruptions in supply chain have "domino effect" on all or great number of partners - The earthquakes and tsunami experienced in Japan and New Zealand in 2011, affected 20% of responding organizations, headquartered in 18 different countries and across 12 different industry sectors

Subject, main aim and hypothesis of PhD thesis

Subject of PhD thesis is: ***issue of supply chain risk management and achieving an adequate level of supply chain resistance.***

The main aim is: ***evaluating options for managing within supply chain risks, as well as defining of recommendations to overcome or minimize the negative effects caused by unexpected situations.***

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- Supply chain resistance determines the ability to eliminate and minimize unexpected events.
- Supply chain resistance determines his future development.
- Complexity (globalization) and efficiency (outsourcing) of supply chain are key drivers of supply chain disruptions
- Consequences of unexpected factors in the supply chain have a "domino" effect.
- Performance between supply chains which implement preventive actions for mitigate the disruptions and those who implement reactive actions are different.
- The contribution of large companies to supply chain risk management is more significant than the contribution of small and medium-sized partners.
- Probability of internal risks in supply chain is higher than external risks.

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- Small and medium enterprises are the drivers of the many disruptions in the supply chain.
- Small and medium enterprises use reactive techniques (actions) to mitigate disruptions in supply chain.

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Small and medium enterprises and supply chain risks

Frinch (2004) – large companies are increasing their exposure to risk including small and medium enterprises in supply chain. The reason for that are limited resources of SMEs. However, the author points out that the presence of SMEs in the supply chain inevitably

Thun J. H., Druke M., Hoenig D. (2011) – point out that with great number of small and medium enterprises supply chain becoming more complex (for example, automotive industry)

Zwibler F., Hermann M. (2012) – small and medium enterprises are drivers of many risks in supply chain, and they don't posses enough experience and ability for mitigate or eliminate unexpected situation

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Empirical analysis of supply chain risk in automotive industry in Germany

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Thun J. H., Druke M., Hoenig D. (2011) – 67 enterprises of automotive industry

Research questions:

Are SMEs in supply chain more vulnerable than larger companies?

Who are risk drivers in supply chain?

Which actions SMEs use for facing to risks?

Authors approved that exposure to risks of SMEs is 3.47 (mean value) and large companies is 3.10. This mean that SME's are more vulnerable than large companies.

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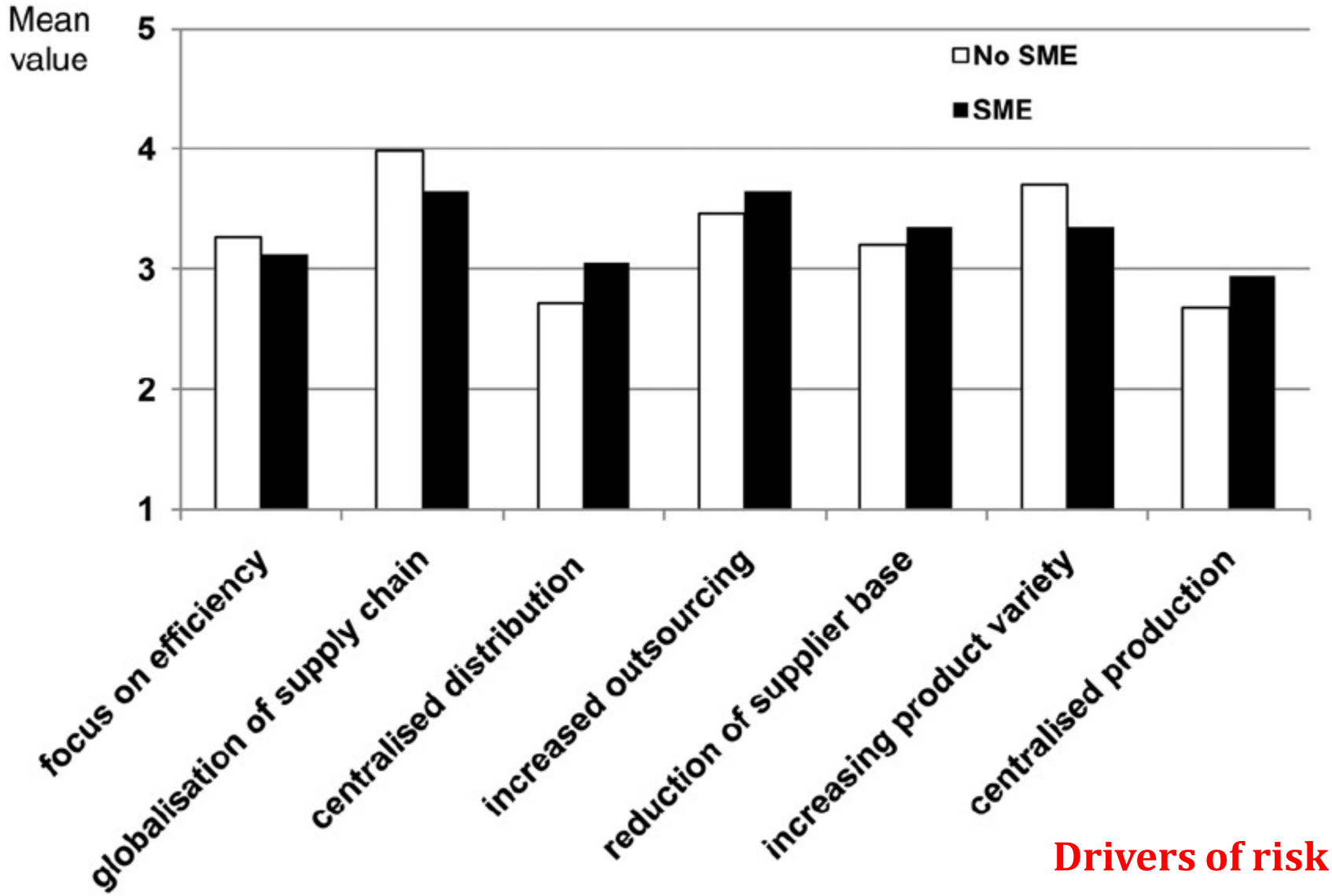
Research Result

Figure show that SMEs are vulnerable, but they are not strongly affected with risks than large companies.



Drivers of risk

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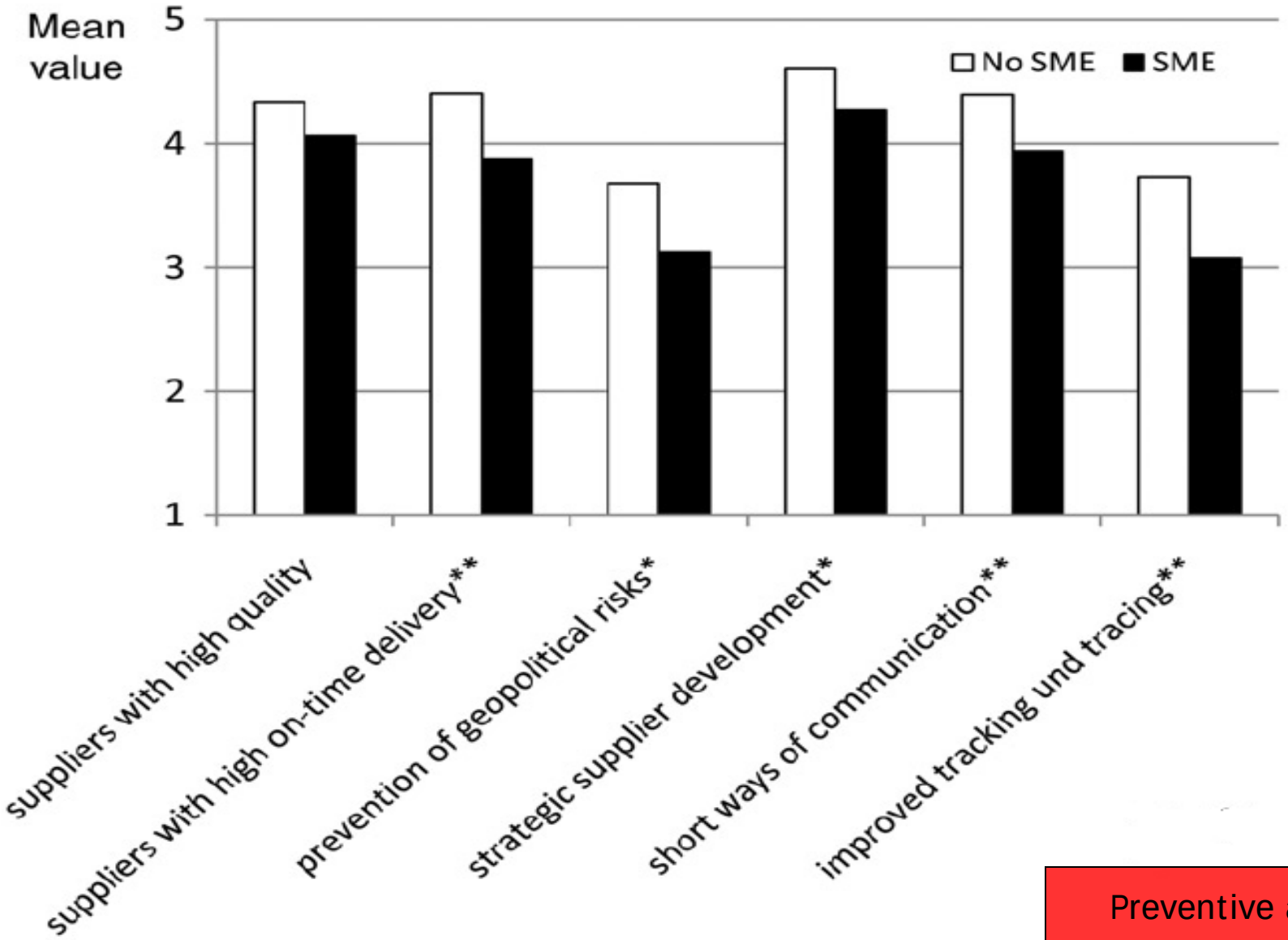
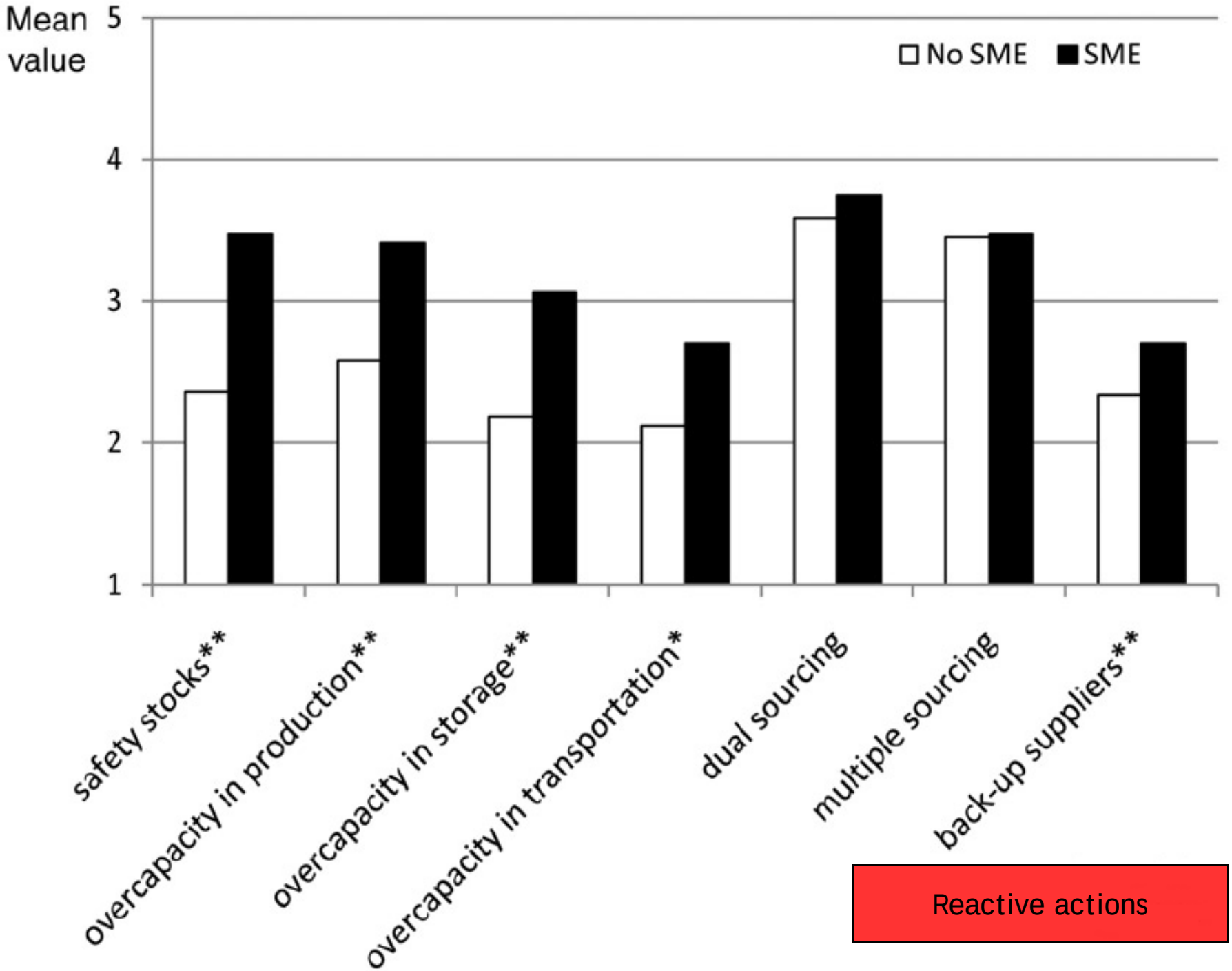
Results of the analysis instruments for risk management of the supply chain show that SMEs use reactive instruments, while the large companies are using proactive (preventive) instruments.



Preventive actions


Mean value
5
4
3
2
1
No SME
SME
safety stocks**
overcapacity in production**
overcapacity in storage**
overcapacity in transportation*
dual sourcing
multiple sourcing
back-up suppliers**
Reactive actions

AC Serbia

Empirical analysis of supply chain risk in automotive industry in Serbia (automotive cluster)

Serbian Automotive Cluster

» New movement from Serbia

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Serbian Automotive Cluster has 50 members and 15 support and partner institutions, and 24 small and medium enterprises.

Mean value for assertion – For every enterprise is important to posses sector for analyzing and evaluating risks – is 4.13.

SMEs know importance of supply chain risk management.

Problem is in fact that just 27% of SMEs in automotive cluster posses sector or function in their organizational structure.

Number of disruptions in the past year:

- Without disruptions (27%),
- 1-5 (33%),
- 6-10 (27%), and
- More than 10 (13%).

The most frequent causes for disruption are: poor quality (3.67), delays in delivery (3.53), political instability, wars, strikes (3.33), problem with electric lack (3.27), inefficiency of supplier (3.27), errors and delays of firm's business process (3.27), financial instability of suppliers (3.27)

Exposure to internal risks (companies' risks) - 73% of all SMEs in cluster

Exposure to internal supply chain risks or external companies' risks – 63% of all SMEs in cluster

Exposure to external supply chain risks – 63% of all SMEs in cluster

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By the average scores on the list of risk management actions are reactive actions: Ensure continuity of supply, Insurance of vehicles and facilities, Supply from a great number of sources, Requiring from suppliers to immediately report all disorders, Belief that the capacity of suppliers may to meet unforeseen increases in demand

Average score of all reactive actions is 2.68 and 2.29 preventive actions

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STRUCTURE OF PHD THESIS

I CHAPTER: Significance and characteristics of the global supply chain functioning

1 Development of competitive advantage through inter-organizational networking

1.1. Creating opportunities and challenges through collaborative innovation

1.2. Creating opportunities and challenges through quality partnerships

1.3. Creating opportunities and challenges through the creation of value

2 Trends in the development of global supply chains

3 Key performance indicators of the supply chain

II CHAPTER: Vulnerability of global supply chains

1 Understanding of the risks and uncertainties in global supply chains

2 Significance of analysis interruptions' factors

3 Identifying sources of global supply chains vulnerability and disruption

3.1. Sources of interruption within the organization

3.2. Sources of interruption within flow materials management and physical distribution flow

3.3 Source of interruption within external environment of the supply chain

III CHAPTER: Supply Chain Resistance

1 Sustainability performance of the supply chain through establishing its resistance
2 Security of global supply chains - ISO 28000
3 Development of resistant supply chain
    3.1. Principles of development resistant supply chain
    3.2. Supply chain re-engineering
    3.3. Development collaborative relationships between supply chain partners
    3.4. Agile supply chain
    3.5. Creating a culture of risk management through supply chain

IV CHAPTER: Managing of disruptions' factors in supply chain

1 Analyzing of factor disruption in supply chain
2 Assessment of critical factors disruption
3 Techniques of managing disruptions' factors
    2.1. Proactive techniques
    2.2. Reactive techniques
3 Monitoring and improvement of techniques for mitigating the effects of disruption in supply chain
4 Defining strategies for managing risks in the supply chain

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V CHAPTER: Research Methodology

1 The purpose of the research
2 Research questions
3 Defining research sample
4 Procedure and methods of research
5 Collection and processing of data

VI CHAPTER: Analysis and interpretation of supply chain resistance in Serbia

1 The function of small and medium enterprises in supply chain risk management
2 Analysis of supply chain vulnerability in Serbia
2.1. Defining sources of supply chain disruption in Serbia
2.2. Short-term and long-term consequences of disruption on supply chains in Serbia
3 Define guidelines for adequate managing by factors of vulnerability in Serbia
3.1. Options for increasing supply chain resistance in Serbia
3.2. The expected results of increasing supply chain resistance in Serbia

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EXPECTED RESULTS FROM THE PHD THESIS

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- The concept of supply chain will be promoted as the basis for achieving business performance,
- It will be removed doubts regarding of understanding terms as agility, strength, flexibility and resilience of the supply chain,
- Identify all the factors that can disrupt the supply chain , as well as those factors that are critical in terms of supply chain disruptions in the territory of Serbia,
- Identification adequate techniques for risk management of supply chain,
- Empirical research will identify the position of small and medium-sized enterprises and large corporations in terms of risk management of the supply chain,
- Definition certain guidelines for increasing the resilience of the supply chain in Serbia,
- Definition recommendations and guidelines that will facilitate managers to manage interruptions and disruptions in supply chains.

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THANK YOU FOR YOUR ATTENTION