

# **INVENTORY ALLOCATION BEHAVIOR OF THE DISTRIBUTOR DURING DEMAND SPIKES AND SUPPLIER DISRUPTIONS**

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Degree of Master of Science

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## **DECLARATION OF ORIGINALITY**

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## **STATEMENT OF THE SUPERVISOR**

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## **ABSTRACT**

Inventory allocation stands as a fundamental operation within any supply chain. Typically, the responsibility of allocating inventory to retailers falls upon the distributor at a distribution center. The literature outlines three primary allocation methods; proportional allocation, linear allocation, and uniform allocation that distributors can employ when distributing inventory to retailers. However, distributors often grapple with determining the optimal allocation method, particularly when there is a mismatch between available supply and requested orders. While existing studies often explore order allocation for suppliers by retailers, there is a scarcity of research on distributor driven order allocation for retailers. This behavioral aspect of inventory allocation decisions remains largely unexplored under different practical scenarios. Specifically, the allocation decisions of a distributor during demand spikes and supplier disruptions have not attracted attention in the extant literature. In our study, we investigate the behavior of distributors across three distinct scenarios: (i) instances of demand spikes, (ii) occurrences of supply disruptions, and (iii) situations where both scenarios coincide. To comprehensively analyze this, we executed a computerized laboratory experiment, recruiting undergraduate students. These participants assumed the role of distributors and were tasked with allocating inventory using one of the three inventory allocation mechanisms. Our findings reveal intriguing insights. We observed that the proportional allocation mechanism emerged as the most effective strategy in scenarios involving demand spikes. Conversely, when faced with supply disruptions, the linear allocation mechanism demonstrated superior performance. Moreover, in scenarios where both demand spikes and supply disruptions intersect, our study suggests that employing the linear allocation mechanism might be the optimal course of action for distributors. Further, our research sheds light on practical recommendations for distributors to navigate and optimize their allocation strategies amidst demand fluctuations and supply disruptions.

**Keywords:** Behavioral Supply Chain Management; Behavioral Operations; Inventory Allocation Decisions; Laboratory Experiments

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# TABLE OF CONTENTS

DECLARATION OF ORIGINALITY .....	iii
COPYRIGHT STATEMENT .....	<b>Error! Bookmark not defined.</b>
STATEMENT OF THE SUPERVISOR.....	iv
ABSTRACT.....	v
ACKNOWLEDGMENTS .....	vi
LIST OF FIGURES .....	x
LIST OF TABLES .....	xi
LIST OF EQUATIONS.....	xii
1 CHAPTER 01: INTRODUCTION.....	1
2 CHAPTER 02: LITERATURE REVIEW .....	4
2.1 Supply Chain Management .....	4
2.2 Behavioral Supply Chain Management.....	4
2.2.1 Individual Decision-Making in SCM.....	6
2.3 Inventory Management .....	7
2.3.1 Inventory Decisions .....	9
2.4 Inventory Allocation.....	10
2.4.1 Demand Spikes .....	13
2.4.2 Supplier Disruptions .....	14
3 CHAPTER 03: METHODOLOGY .....	17
3.1 Feasible Methodologies.....	17
3.1.1 Verbal Protocol Analysis.....	17
3.1.2 Vignette Experiments.....	17
3.1.3 Field Experiments .....	18
3.2 Laboratory Experiments .....	19

3.2.1	Appropriateness and Benefits .....	19
3.2.2	Background and Cover Story .....	20
3.2.3	Treatments in a Laboratory Experiment .....	21
3.2.4	Selecting Participants .....	22
3.2.5	Reward Mechanism and Incentives .....	23
3.2.6	Platforms to Conduct Laboratory Experiments .....	24
3.3	Experimental Design and Development.....	25
3.3.1	Data Feeding to the Experiment.....	25
3.3.2	Main Components .....	27
3.3.3	Incentives for the Laboratory Experiment .....	31
3.4	Procedure and Sequence.....	32
3.4.1	Random Allocation of Participants .....	33
3.4.2	Sequence of the Laboratory Experiment.....	34
4	CHAPTER 04: RESULTS AND ANALYSIS .....	36
4.1	Treatment checks.....	36
4.1.1	Sample Size Selection.....	36
4.1.2	Subject-Treatment Randomization.....	36
4.1.3	Power Analysis.....	36
4.1.4	Experimental Design Checks .....	37
4.1.5	Comprehension Check and Hawthorne Check .....	37
4.1.6	Demand Checks .....	38
4.2	Sample .....	38
4.3	Demographic Information Analysis .....	38
4.4	Effect of Demand Spikes.....	39
4.5	Effect of Supplier Disruptions.....	41
4.6	Effect of Demand Spikes and Supplier Disruptions.....	42



4.7	Deviations from Theoretical Allocation Quantities.....	44
5	CHAPTER 05: DISCUSSION .....	48
5.1	Findings.....	48
5.2	Practical Implications .....	52
6	CHAPTER 06: CONCLUSION .....	54
6.1	Summary of Findings .....	54
6.2	Limitations and Future Directions.....	55
7	BIBLIOGRAPHY .....	57
8	APPENDIX .....	64
8.1	Appendix A: Cover Story .....	64
8.2	Appendix B: Explanation of Allocation Mechanisms.....	66
8.3	Appendix C: Incentive Calculation Mechanism .....	66
8.4	Appendix D: Sequence of the Experiment.....	67
8.5	Appendix E: Feedback Survey .....	71

## LIST OF FIGURES

Figure 1: Task Description Panel .....	27
Figure 2: Main Experiment Panel .....	29
Figure 3: Basic Info Panel.....	30
Figure 4: Feedback Survey Panel .....	30
Figure 5: Sequence of the Laboratory Experiment .....	34
Figure 6: Power Analysis .....	37
Figure 7: Use of Allocation Mechanisms in the DST Condition .....	39
Figure 8: MAPE of the DST Condition .....	40
Figure 9: Use of Allocation Mechanisms in the SDT Condition .....	41
Figure 10: MAPE of the SDT Condition .....	42
Figure 11: Use of Allocation Mechanisms in the BET Condition .....	43
Figure 12: MAPE of the BET Condition .....	44
Figure 13: Percentages of Deviations from Theoretical Allocation Quantities .....	45
Figure 14: Magnitude of Deviations from Theoretical Allocation Quantities .....	46

## LIST OF TABLES

Table 1: Allocation Mechanisms.....	12
Table 2: Changing the Data Sequence .....	26
Table 3: Information of Treatments .....	28
Table 4: Point Allocation based on the MAPE. ....	32
Table 5: Random Allocation of Participants .....	33
Table 6: Number of Observations of Each Condition.....	36
Table 7: Gender Distribution Based on Conditions .....	38
Table 8: P value comparison of the Kruskal Wallis test.....	39
Table 9: Matching Findings with Research Questions.....	54

## **LIST OF EQUATIONS**

Equation 1: MAPE Calculation .....	31
Equation 2: Financial Incentive Calculation.....	32