

Contents

Preface	V
Abstract	VII
Contents	IX
1 Introduction	1
1.1 Problem Definition	1
1.2 Research Questions	4
1.3 Methodology	5
1.4 Outline	6
2 Literature Review	9
2.1 JIT Goals	9
2.1.1 Hierarchical Production Planning Models	9
2.1.2 Utilisation in Production Planning	12
2.1.3 Impact of JIT Activities on Performance	12
2.2 Capacity Setting Methods	14
2.3 Conwip	16
2.4 Dispatching and Production Lead Time	19
3 Utilisation Concept	23
3.1 Seven Zeros	23
3.2 Model	25
3.2.1 Utilisation	27
3.2.2 JIT Intensity	30
3.3 Discussion	31
3.3.1 Long Term Level	31
3.3.2 Medium Term Level	32
3.3.3 Short Term Level	32
3.4 Concluding Remarks	35
4 Capacity Setting Methods	37
4.1 Introductory Remarks	37
4.2 Model Framework	38
4.3 Model	40
4.3.1 Approximation of the Demanded Capacity (Step 1)	42
4.3.2 Setting the Unbounded Provided Capacity (Step 2) . .	47
4.3.3 Capacity Account (Step 3)	49

4.4	Multi-Machine Concept	50
4.5	Simulation Study	52
4.6	Results	55
4.6.1	Evaluation of Best Method Combination	55
4.6.2	Result comparison	56
4.6.3	Scenario Discussion of the Best Methods	58
4.7	Extension	60
4.7.1	Assumptions	62
4.7.2	Model Development	62
4.7.3	Production Lead Time Approximation	64
4.7.4	FGI and Backorder Calculation	66
4.7.5	Service Level Calculation	68
4.7.6	Numerical Examples	69
4.8	Concluding Remarks	70
4.9	Appendix	72
5	Conwip	87
5.1	Model Description	88
5.1.1	Production System	88
5.1.2	Production Planning and Control Applying Conwip	88
5.1.3	Simulation Model	90
5.1.4	Simulation Study	91
5.2	Results	93
5.2.1	Discussion of WAW and Wipcap	93
5.2.2	Wipcap Method Comparison	95
5.3	Concluding Remarks	97
5.4	Appendix Conwip	97
6	Dispatching Rules	109
6.1	Model Framework	109
6.2	Simulation Study	113
6.3	Concluding Remarks	117
7	Conclusions	121
	Bibliography	123