

Contents

List of figures	x
List of tables	xii
List of abbreviations	xiii
1 Introduction	1
2 Addressing heterogeneity versus functional flexibility in store sales models: A brand-level approach	13
2.1 Introduction	13
2.1.1 Modeling heterogeneity	14
2.1.2 Functional flexibility	16
2.1.3 Objectives of this study	17
2.2 Methodology	19
2.2.1 Parametric models	19
2.2.1.1 Specification	19
2.2.1.2 Estimation	23
2.2.2 Semiparametric model	24
2.3 Empirical application	26
2.3.1 Data	26
2.3.2 Specification of cross-item price effects	27
2.3.3 Estimation and model performance	28
2.3.4 Results	31
2.3.4.1 Comparison of parametric models	31
2.3.4.2 Comparison of parametric and semiparametric models	41
2.4 Summary and discussion	48

3	Addressing store-level heterogeneity <i>and</i> functional flexibility in store sales models: A look on sales predictions and pricing implications	55
3.1	Introduction	55
3.2	Methodology	58
3.2.1	Hierarchical Bayesian semiparametric model	58
3.2.2	Prior assumptions and model estimation	59
3.3	Empirical application	59
3.3.1	Data and variable specification	59
3.3.2	Benchmark models	60
3.3.3	Model performance	61
3.3.4	Results	64
3.3.4.1	Predictive performance	64
3.3.4.2	Estimated price elasticities	65
3.3.4.3	Estimated price effects	67
3.3.4.4	Profit and pricing implications	72
3.4	Summary and discussion	79
4	A comparison of semiparametric and heterogeneous store sales models for category-level profit maximization	83
4.1	Introduction	83
4.2	Methodology	87
4.2.1	Modeling sales response	87
4.2.1.1	The general heterogeneity SUR model	87
4.2.1.2	The semiparametric SUR model	90
4.2.2	Optimal category pricing	92
4.3	Empirical application	95
4.3.1	Data and variable specification	95
4.3.2	Benchmark models and model performance	98
4.3.3	Results	98
4.3.3.1	Estimation results	98
4.3.3.2	Optimization results	106
4.4	Summary and discussion	114
5	Concluding discussion	119
5.1	Summary of results	119

5.2	Managerial implications	121
5.3	Limitations and outlook	122
A	Estimation details	127
A.1	Heterogeneity model	127
A.1.1	The marginal model	127
A.1.2	Prior specifications	128
A.1.3	Bayesian inference	128
A.1.4	Computation of the model likelihood	130
A.2	Semiparametric model	130
A.2.1	The model	130
A.2.2	Prior specifications	131
A.2.3	Bayesian Inference	132
A.3	Hierarchical Bayesian semiparametric model	133
A.3.1	The model	133
A.3.2	Prior specifications	134
A.3.3	Bayesian inference	135
A.4	General heterogeneity SUR model	136
A.4.1	The marginal model	136
A.4.2	Prior specifications	136
A.4.3	Bayesian inference	136
A.4.4	Derivation of steps 4 (a2) and (b)	138
A.5	Semiparametric SUR model	140
A.5.1	Prior specifications	140
A.5.2	Bayesian inference	140
B	Optimization details	141
	Bibliography	143