Contents

	Preface	vii
1. Int	roduction and Motivation	1
1.1	Motivation	1
1.2	Principles of comparison	4
1.3	Description and summarization	6
1.4	Graphical measures and methods	7
1.5	Numerical summary measures	8
1.6	Limitations	9
1.7	Organization of book	10
	Background material	12
	Computational issues	13
	Exercises	13
2. The Relative Distribution		15
2.1	Basic Distributional Concepts	15
2.2	The Relative Distribution	20
2.3	Using a known reference distribution	25
2.4	History and Previous Literature	28
	Background material	34
	Computational issues	35
	Exercises	36
3. Lo	cation, Spread and Shape Decomposition	37
3.1	Decomposing the Relative Distribution	40
3.2	Location and Spread Decompositions	41
	Exercises	43
4. Ap	plication: The Earnings Distribution 1967–1997	45
4.1	Background	45
4.2	Data	46
4.3	Findings	48
	Exercises	55

5.	\mathbf{Su}	mmary Measures	57
	5.1	Motivation	57
	5.2	Measuring Distributional Divergence	58
	5.3	Two Measures of Distributional Divergence	60
	5.4	Effect summary statistics	61
	5.5	Measures Motivated by Hypothesis Testing	62
	5.6	Measuring Distributional Polarization	63
		Background material	67
		Exercises	67
6.	Ar	oplication: Earnings by Race and Sex: 1967–1997	69
	6.1	Introduction	69
	6.2	Data	70
	6.3	Findings	70
	6.3	Discussion	79
7.	Ad	ljustment for Covariates	81
	7.1	Construction of Composition–adjusted Distributions	82
	7.2	Comparison of Composition-adjusted Distributions	84
	7.3	Further decomposition by Location/Shape	86
	7.4	Adjusting for Multiple Covariates	86
		Exercises	90
8.	Ap	oplication: Comparing Wage Mobility in two Eras	91
	8.1	Data	91
	8.2	Location and Shape Decompositions	95
	8.3	Covariate Decompositions	97
	8.4	Discrete Level Contrasts	100
	8.5	Appendix: Estimation of Permanent Wages and Wage C	$\mathrm{Growth}105$
		Exercises	106
9.	In	ference for the Relative Distribution	107
	9.1	Estimation when the Reference Distribution is Known	108
	9.2	Estimation when both Distributions are unknown	126
	9.3	Estimation for a Pooled Reference Group	135
	9.4	Estimation when the Data are Censored	138
	9.5	Estimation when the Data are Weighted	139
	9.6	Confidence Intervals and Confidence Bands	140
		Background material	142
		Computational issues	144
		Exercises	144

10. In	ference for Summary Measures	147
10.1	Inference for Two Measures of Distributional difference	147
10.2	Measures Motivated by Hypothesis Testing	148
10.3	Inference for the Median Relative Polarization	152
10.4	Computing Standard Errors	156
10.5	Statistical properties of estimates of the upper and lower i	ndices157
10.6	Tests of significance and multiple comparisons	159
10.7	Bootstrap Confidence Intervals and Achieved Significance	e Level158
	Background material	162
	Exercises	162
11. Tl	ne Relative Distribution for Discrete Data	163
11.1	The Discrete Relative Distribution	163
11.2	Application: Men's and Women's Hours Worked	165
11.3	Inference when the Reference Distribution is Known	168
11.4	Inference for the Discrete Relative Distribution	170
11.5	Group-Level Information	172
11.6	Inference for the Relative Polarization Indices	173
	Background material	177
	Exercises	177
10 1		
12. Aj	oplication to Measuring Changes in Hours Worked	179
12. Aj	oplication to Measuring Changes in Hours Worked Background	179 179
12. Aj	oplication to Measuring Changes in Hours Worked Background Data	179 179 181
12. Aj	oplication to Measuring Changes in Hours Worked Background Data Findings	179 179 181 183
12. Aj	pplication to Measuring Changes in Hours Worked Background Data Findings Discussion	179 179 181 183 189
12. Aj 13. Qi	Deplication to Measuring Changes in Hours Worked Background Data Findings Discussion	 179 179 181 183 189 191
12. A) 13. Qu 13.1	Deplication to Measuring Changes in Hours Worked Background Data Findings Discussion uantile Regression Estimation of Quantiles	 179 179 181 183 189 191
12. A) 13. Q 13.1 13.2	Deplication to Measuring Changes in Hours Worked Background Data Findings Discussion uantile Regression Estimation of Quantiles Motivation for Quantile Regression	179 179 181 183 189 191 191 196
12. A	Deplication to Measuring Changes in Hours Worked Background Data Findings Discussion uantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression	179 179 181 183 189 191 196 199
12. A) 13. Q 13.1 13.2 13.3 13.4	poplication to Measuring Changes in Hours Worked Background Data Findings Discussion nantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression Non-parametric Quantile Regression	179 179 181 183 189 191 196 199 202
12. A] 13. Q <i>13.1</i> <i>13.2</i> <i>13.3</i> <i>13.4</i>	poplication to Measuring Changes in Hours Worked Background Data Findings Discussion nantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression Non-parametric Quantile Regression Background material	179 179 181 183 189 191 196 199 202 204
12. A	plication to Measuring Changes in Hours Worked Background Data Findings Discussion nantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression Non-parametric Quantile Regression Background material Exercises	 179 179 181 183 189 191 196 199 202 204 205
 12. A) 13. Q) 13.1 13.2 13.3 13.4 14. A)	poplication to Measuring Changes in Hours Worked Background Data Findings Discussion nantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression Non-parametric Quantile Regression Background material Exercises	 179 179 181 183 189 191 196 199 202 204 205 207
 12. A) 13. Q 13.1 13.2 13.3 13.4 14. A) 14. A) 14.1 	plication to Measuring Changes in Hours Worked Background Data Findings Discussion nantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression Non-parametric Quantile Regression Background material Exercises halysis of Factorial Designs Motivation	 179 179 181 183 189 191 196 199 202 204 205 207
 12. A) 13. Q 13.1 13.2 13.3 13.4 14. A) 14.1 14.2 	oplication to Measuring Changes in Hours Worked BackgroundDataFindingsDiscussion nantile Regression Estimation of QuantilesMotivation for Quantile RegressionLinear Quantile RegressionNon-parametric Quantile RegressionBackground materialExercises halysis of Factorial Designs MotivationOne-way Designs	 179 179 181 183 189 191 196 199 202 204 205 207 207 208
 12. A) 13. Q 13.1 13.2 13.3 13.4 14. A) 14.1 14.2 14.3 	 bplication to Measuring Changes in Hours Worked Background Data Findings Discussion nantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression Non-parametric Quantile Regression Background material Exercises nalysis of Factorial Designs Motivation One-way Designs Two-way Designs	 179 179 181 183 189 191 196 199 202 204 205 207 208 210
 12. A) 13. Q 13.1 13.2 13.3 13.4 14. An 14.1 14.2 14.3 14.4 	oplication to Measuring Changes in Hours Worked BackgroundDataFindingsDiscussion nantile Regression Estimation of QuantilesMotivation for Quantile RegressionLinear Quantile RegressionNon-parametric Quantile RegressionBackground materialExercises nalysis of Factorial Designs MotivationOne-way DesignsTwo-way DesignsAnalysis of Covariance	 179 179 181 183 189 191 196 199 202 204 205 207 208 210 212
 12. A) 13. Q 13.1 13.2 13.3 13.4 14. A) 14.1 14.2 14.3 14.4 	pplication to Measuring Changes in Hours Worked Background Data Findings Discussion nantile Regression Estimation of Quantiles Motivation for Quantile Regression Linear Quantile Regression Non-parametric Quantile Regression Background material Exercises Motivation One-way Designs Two-way Designs Analysis of Covariance Background material	 179 179 181 183 189 191 196 199 202 204 205 207 208 210 212 210

xiii

xiv Contents

Appendices		213
A.	Descriptions of the Data Sets	213
В.	More on Computational Issues	213
C.	Proof of Results in Chapter 9	214
D.	Proof of Results in Chapter 10	221
E.	Properties of the Quasi-random data under Equality	225
References		
Author Index		
Subject Index		