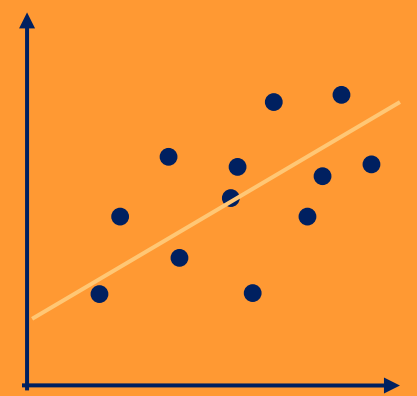
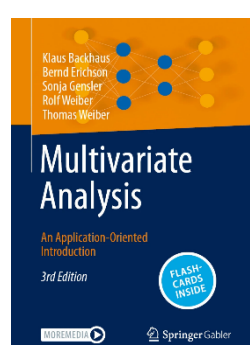


LINEAR REGRESSION ANALYSIS



MAIN RESEARCH QUESTION	HOW STRONG IS THE RELATIONSHIP BETWEEN THE INDEPENDENT VARIABLES AND THE DEPENDENT VARIABLE?
EXAMPLE	HOW DOES THE SALES VOLUME OF A PRODUCT DEPEND ON PRICE, ADVERTISING, AND INCOME?
TYPE OF ANALYSIS	STRUCTURE-TESTING METHOD
MEASUREMENT LEVEL	
DEPENDENT VARIABLE	METRIC (ONE VARIABLE)
INDEPENDENT VARIABLES	METRIC OR CATEGORICAL (BY USE OF DUMMY VARIABLES)
RECOMMENDATIONS	<ul style="list-style-type: none">BEFORE RUNNING THE ANALYSIS, CONSIDER WHAT RESULTS YOU ARE EXPECTING (STATE HYPOTHESES), AND WHETHER THE DATA ARE SUITABLE FOR THE ANALYSIS.START WITH VISUALIZING THE BY SCATTERPLOTS. CHECK WHETHER POSITIVE OR NEGATIVE RELATIONSHIPS BETWEEN ANY TWO VARIABLES EXIST AND IF THEY ARE LINEAR.FIRST RUN A SIMPLE MODEL AND THEN START ADDING MORE INDEPENDENT VARIABLES TO CHECK WHETHER CHANGES IN REGRESSION PARAMETERS OCCUR (I.E., SIGN AND SIGNIFICANCE).A MODEL SHOULD ALWAYS BE AS SIMPLE AS POSSIBLE, BUT AS COMPLEX AS NECESSARY (<i>PRINCIPLE OF PARSIMONY</i>).CHECK YOUR MODEL BY PLOTTING THE RESIDUALS (E. G., AGAINST THE FITTED Y-VALUES: <i>TUKEY-ANSCOMBE PLOT</i>). ARE THERE ANY CONSPICUOUS PATTERNS CAUSED, FOR EXAMPLE, BY NON-LINEARITY OR INFLUENTIAL OUTLIERS.TAKE GREAT CARE WHEN CLAIMING CAUSALITY FROM YOUR REGRESSION RESULTS. THINK OF POSSIBLE TRAPS IN REGRESSION ANALYSIS LIKE <i>OMITTED VARIABLES, LURKING VARIABLES, REGRESSION FALLACY, OR MULTICOLLINEARITY</i>.
KEYWORDS	AUTOCORRELATION, BETA COEFFICIENTS, CAUSALITY, COEFFICIENT OF DETERMINATION COEFFICIENT (R-SQUARE), DURBIN-WATSON TEST, GOLDFELD-QUANDT TEST, HETEROSCEDASTICITY, MULTICOLLINEARITY, OMITTED VARIABLE, OUTLIERS, PARSIMONY, P-P PLOT, PREDICTION ERROR, Q-Q PLOT, BETA COEFFICIENT, REGRESSION TO THE MEAN, TIME-SERIES DATA, TOLERANCE, VARIANCE INFLATION FACTOR



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MULTIVARIATE ANALYSIS – AN APPLICATION-ORIENTED INTRODUCTION, SPRINGER: BERLIN

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