

# STATISTICAL DECISION THEORY LINEAR MODELS AND DECISIONS

(FERGUSON, LUCE & RAIFFA, MOOD, RAO, ROBBINS, HOEL)

SPACE OF DATA COLLECTION STRATEGIES GENERALLY DIFFICULT TO SPECIFY AND TO FORMALLY INCLUDE IN  
 DECISION RULES - OFTEN DETERMINED MORE SUBJECTIVELY BY 'SEPARABLE' CRITERIA  
 OF INFORMATION AND COST (DESIGN, SAMPLE SIZE, SEQUENTIAL)

UTILITY FUNCTIONS VERY DIFFICULT TO SPECIFY

AS LESS IS EXPLICITLY ASSUMED ABOUT UTILITY FUNCTIONS, UTILITY CONSIDERATIONS BECOME  
 INCREASINGLY SUBJECTIVE - THEIR INFLUENCE IS ON THE DETERMINATION OF ACCEPTABLE  
 AND DESIRABLE ERROR PROBABILITIES

CAN SOMETIMES DETERMINE GENERAL BEHAVIOR OF DECISION RULES WITH RESPECT  
 TO CLASSES OF UTILITY FUNCTIONS

ADMISSIBLE DECISION RULES, MINIMAL COMPLETE SETS OF DECISION RULES

A PRIMARY DIVISION OF STATISTICAL DECISION THEORY BASED ON NUMBER OF STATES OF NATURE

(NOTE: NOT EXHAUSTIVE, AND COLLAPSES CONSIDERATION OF ACTIONS BACK TO STATES OF NATURE)

A CONTINUUM OF STATES OF NATURE (ESTIMATION)

DECISION RULE CRITERIA (ESTIMATORS)    MEAN SQUARE ERROR    MINIMUM VARIANCE UNBIASED

GENERAL DECISION RULES    MAXIMUM LIKLIHOOD    LEAST SQUARES

TWO STATES OF NATURE (HYPOTHESIS TESTING)

DECISION RULE CRITERIA    NEYMAN-PEARSON

GENERAL DECISION RULE    LIKLIHOOD RATIO