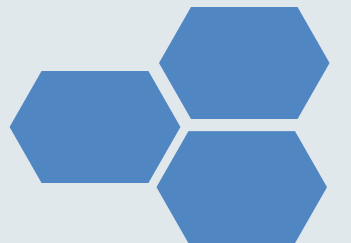# Deriving Financial Aid Optimization Models from Admissions Data
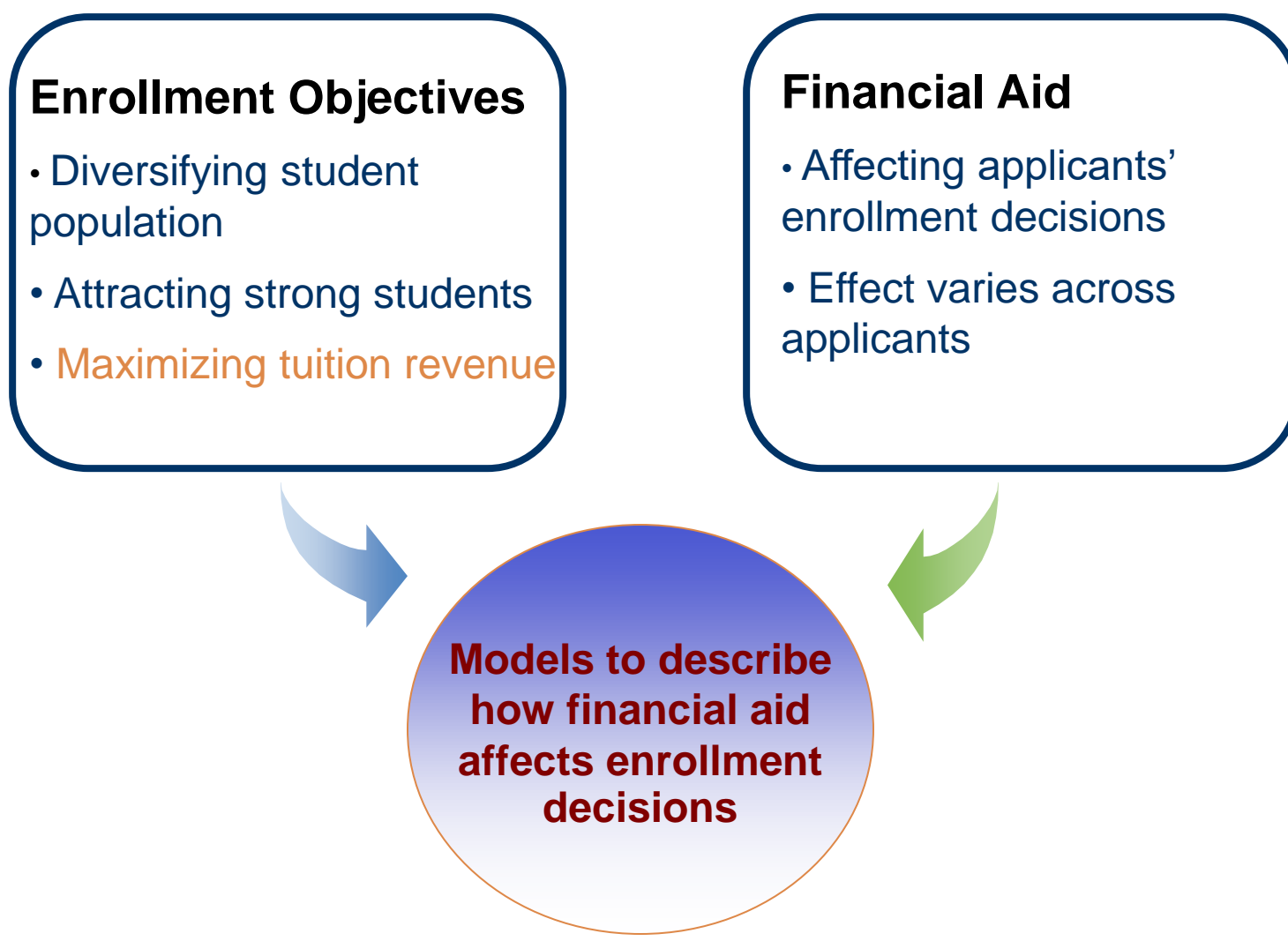
Introduction

Enrollment Objectives

- Diversifying student population

- Attracting strong students

- Maximizing tuition revenue

Financial Aid

- Affecting applicants' enrollment decisions

- Effect varies across applicants

Models to describe how financial aid affects enrollment decisions

Objective

❖ **Provide a principled approach to decide on amount of financial aid to offer**

❖ **Focus on maximizing tuition revenue**

Data preparation

❖ **Dataset**
- Four years graduate admissions at AIT
- Applicants come from 86 countries
- 7788 applicants (1438 enrolled)

❖ **Attributes**
- Original attributes are those taken directly from data
- Derived attributes are those inferred from original data

❖ **Original attributes**
- Age
- Marital Status
- Degree program
- Univ of previous degree
- GPA of previous degree
- Percentage of financial aid

Data preparation

❖ **Derived Attributes**

- GNI
  - Do not have income information of applicants
  - Use World Bank classifications: Low Income (LIC), Middle Income (LMC & UMC) and High Income (NOC & OEC)
  - Indicates the wealth of a country and shows the statistical financial capability of the population

- Previous Institute Rank
  - Evaluate the quality of previous academic program
  - Institute Rank was derived by correlating the previous GPA with that obtained at AIT
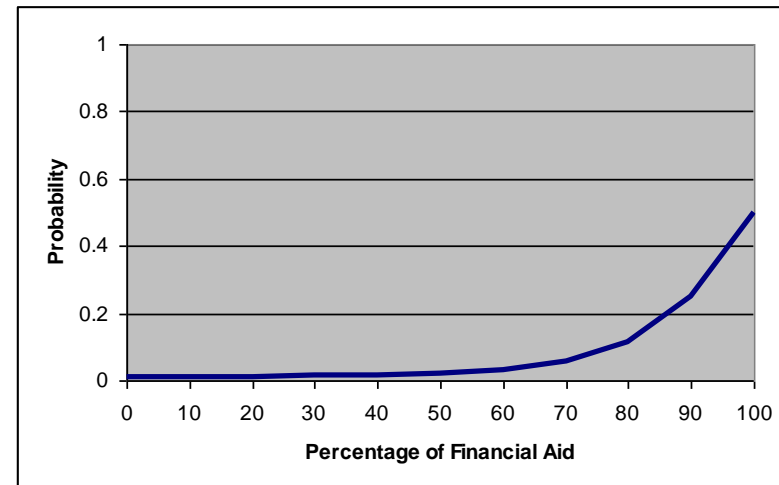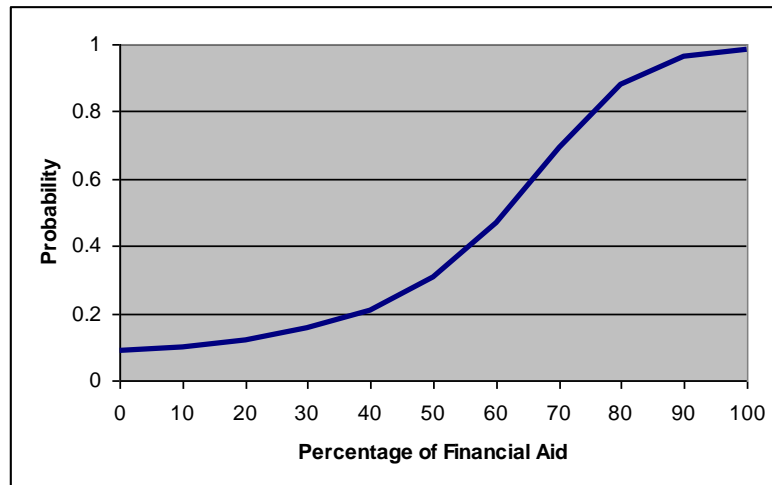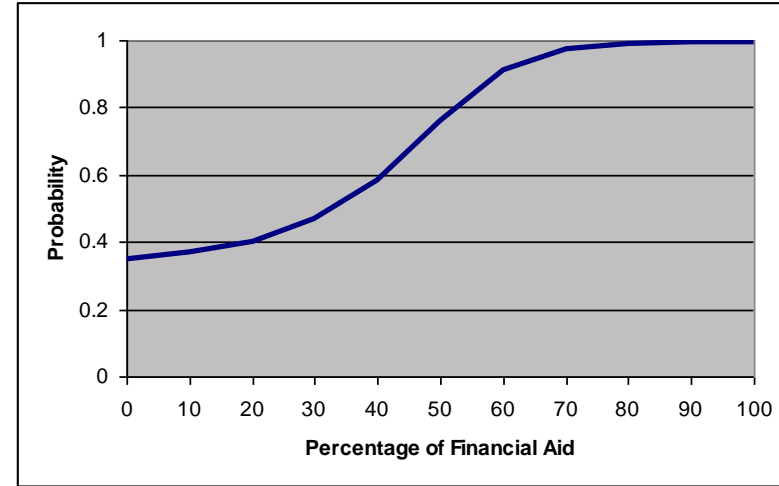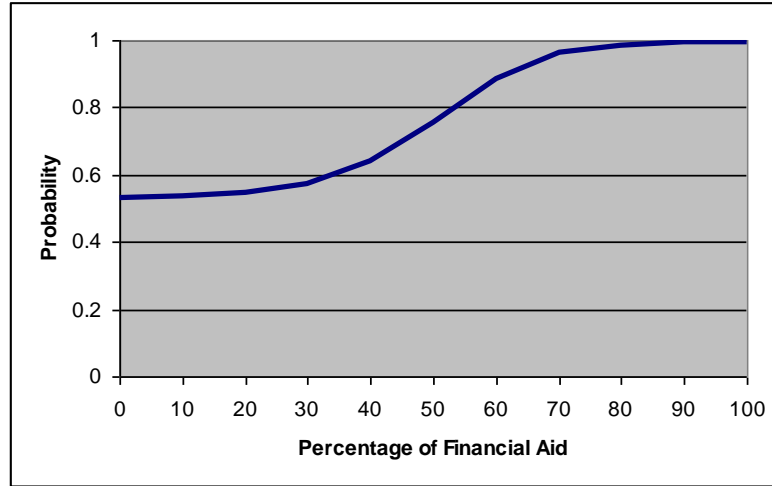 - Institutes are rated on the scale from 0 to 10

Naïve Bayesian model
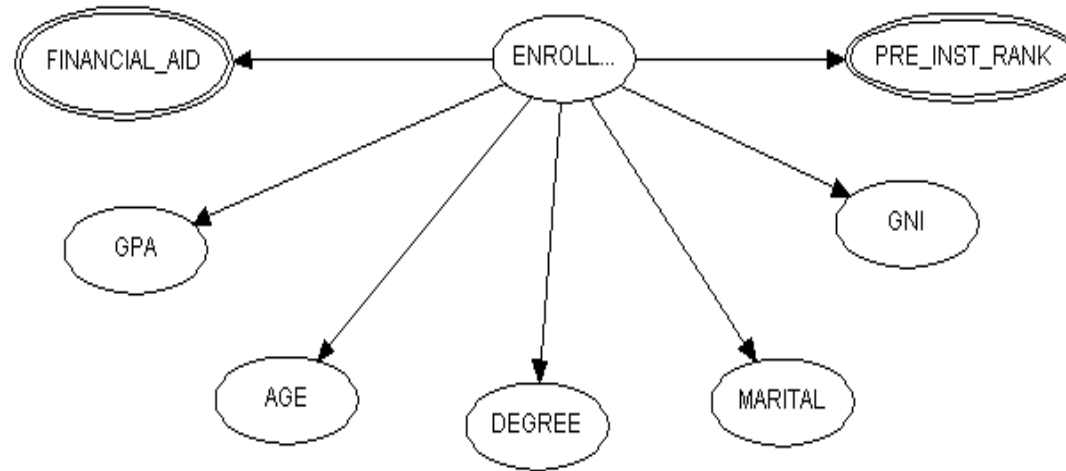
❖ **FINANCIAL_AID, PRE_INST_RANK:** Gaussian variables

❖ **GNI**: Gross National Income (World Bank)

❖ **PRE_INST_RANK**: found by correlating the graduation GPA and entry GPA of students
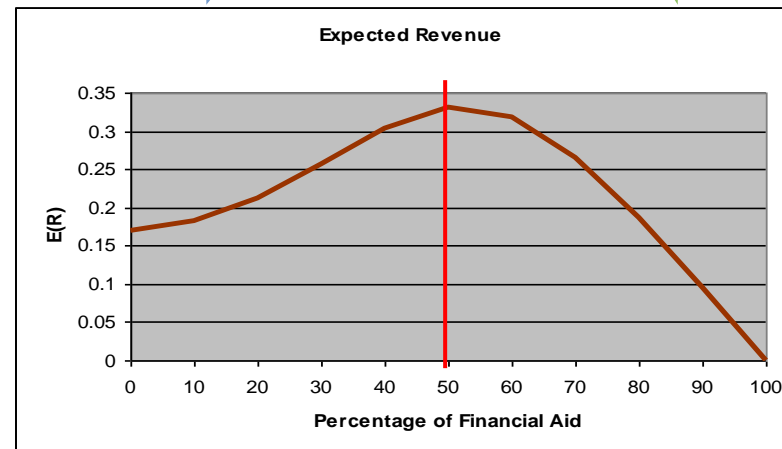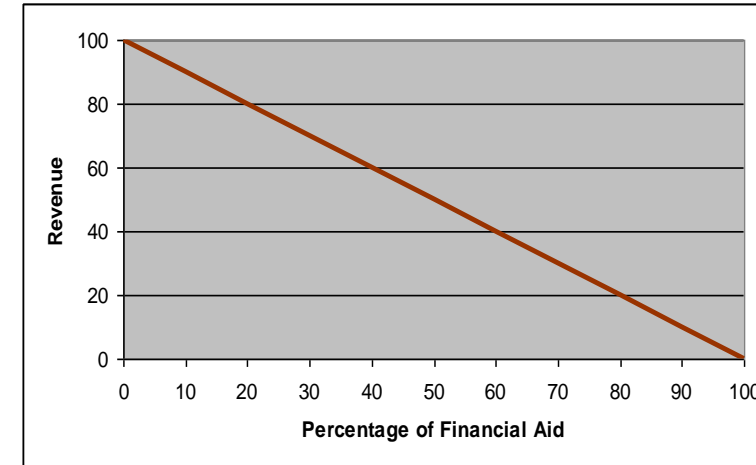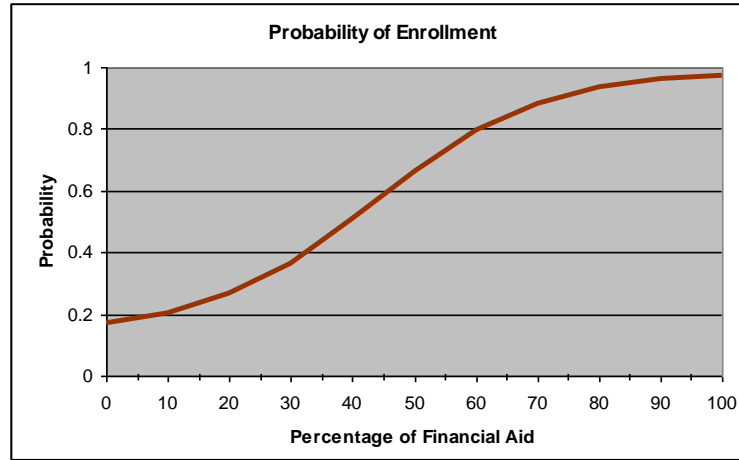
A variety of predicted behaviors

Enrollment prediction evaluation

	Percent Financial Aid Offered										Total
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	
TOTAL NUMBER OF APPLICANTS	264	40	262	81	5	212	13	59	5	0	941
EXPECTED ENROLLMENT	46	4	22	14	2	65	7	52	5	0	217
ACTUAL	64	5	25	15	0	40	6	31	3	0	189

Expected revenue

For each student choose the point that maximizes expected revenue.