









PRINCIPLES FOR PROJECTING ENROLLMENT OF UNDERGRADUATE STUDENTS

(HOW TO BUILD AN ENROLLMENT MODEL A SLICE AT A TIME)

Consuelo B. Boronat, PhD
Analysis & Information Management
Florida International University
January 2016



Project Enrollment Using Retention Data

Creating a multi-year enrollment projection model for scenario testing is like building a layer cake.

Use retention and persistence rates (“retention”) to project enrollment
scenario-testing relies on a good projection of continuing enrollment



Key ideas:

Most students are continuing students.

Use recent retention rates to project how many students will continue into future years

Project how many students will remain enrolled for each of your important subtypes (e.g., FTIC in-state)



Recipe overview

Prepare historical data

Calculate retention rates

Create scenario-testing spreadsheet

Prepare historical data

Data file: one row per student per year

Create pivot table showing headcount by Admit Term (Rows) and Academic Year (columns) for a subgroup of interest (e.g., FTIC, FL Resident)

Data Structure/Excel File Fields

Student ID (one row for each Fall term a student was retained)

Most Recent Admission Year & Term (2011_Spring, 2011_Fall, etc.)

Type of Student at Most Recent Adm (FTIC, AA Transfer, etc.)

All terms in which student was enrolled, each on a different row (e.g., Fall 2010, Fall 2011, Fall 2012)

Academic Year for the previous variable (e.g., 2010-11, 2011-12, 2012-13)

Any other variables of interest (e.g., FL Resident/NonResident; Gender)

Data Structure Example

	DATE_REC	FILE_REC	TERM_ID	TERM_	ACAD_YR	FL_RESIDENCY
	T_ADM	NT_ADM	TERM_ID	DESC	ACAD_YR	FL_RESIDENCY
3569	201208	FTIC	201208	Fall 2012	2012-2013	Florida Resident
3569	201208	FTIC	201308	Fall 2013	2013-2014	Florida Resident
3569	201208	FTIC	201408	Fall 2014	2014-2015	Florida Resident
3569	201208	FTIC	201508	Fall 2015	2015-2016	Florida Resident
3022	201001	FTIC	201008	Fall 2010	2010-2011	Florida Resident
7480	201408	FTIC	201408	Fall 2014	2014-2015	Non-Florida Resident
3975	200705	FTIC	201008	Fall 2010	2010-2011	Florida Resident
3975	200705	FTIC	201108	Fall 2011	2011-2012	Florida Resident
7280	201008	FTIC	201008	Fall 2010	2010-2011	Florida Resident
7280	201008	FTIC	201108	Fall 2011	2011-2012	Florida Resident
7280	201008	FTIC	201208	Fall 2012	2012-2013	Florida Resident
7280	201008	FTIC	201308	Fall 2013	2013-2014	Florida Resident
7280	201008	FTIC	201408	Fall 2014	2014-2015	Florida Resident

Headcounts
 Most
 recent
 admission
 term and
 academic
 year for a
 subgroup

TYPE_RECNT_ADM		FTIC				
FL_RESIDENCY		Florida Resident				
Recent Adm Term	Academic Year					
	2010- 2011	2011- 2012	2012- 2013	2013- 2014	2014- 2015	2015- 2016
201408					2924	2555
201405					1121	906
201401					214	137
201308				2853	2374	1976
201305				1522	1230	990
201301				262	167	112
201208			2602	2141	1803	1459
201205			1705	1381	1152	977
201201			207	136	92	67
201108		2590	2119	1758	1448	700
201105		1885	1497	1246	1078	621
201101		319	234	175	130	65
201008	2364	1925	1594	1357	762	237
201005	1630	1291	1096	945	577	205

calculate retention rates

Calculate retention rates, using each preceding year as the base.

To check data, organize retention rates by Year to which they apply (Year 1-2, Year 2-3, etc.). Graph data to check for consistency.

Year	Academic Year						Percentage Retained from Year to Next Year						Description
	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015		
08					2924	2555		= 2555/2924 -->			0.874	Yr 1-2 Fall Admits	
05					1121	906					0.808	Yr 1-2 Summer Admits	
01					214	137					0.640	Yr 1-2 Spring Admits	
08				2853	2374	1976				0.832	0.832	Yr 2-3 Fall Admits	
05				1522	1230	990				0.808	0.805	Yr 2-3 Summer Admits	
01				262	167	112				0.637	0.671	Yr 2-3 Spring Admits	
08			2602	2141	1803	1459			0.823	0.842	0.809	Yr 3-4 Fall Admits	
05			1705	1381	1152	977			0.810	0.834	0.848	Yr 3-4 Summer Admits	
01			207	136	92	67			0.657	0.676	0.728	Yr 3-4 Spring Admits	
08		2590	2119	1758	1448	700		0.818	0.830	0.824	0.483	Yr 4-5 Fall Admits	
05		1885	1497	1246	1078	621		0.794	0.832	0.865	0.576	Yr 4-5 Summer Admits	
01		319	234	175	130	65		0.734	0.748	0.743	0.500	Yr 4-5 Spring Admits	
08	2364	1925	1594	1357	762	237	0.814	0.828	0.851	0.562	0.311	Yr 5-6 Fall Admits	
05	1630	1291	1096	945	577	205	0.792	0.849	0.862	0.611	0.355	Yr 5-6 Summer Admits	
01	192	122	85	55	31	12	0.635	0.697	0.647	0.564	0.387	Yr 5-6 Spring Admits	

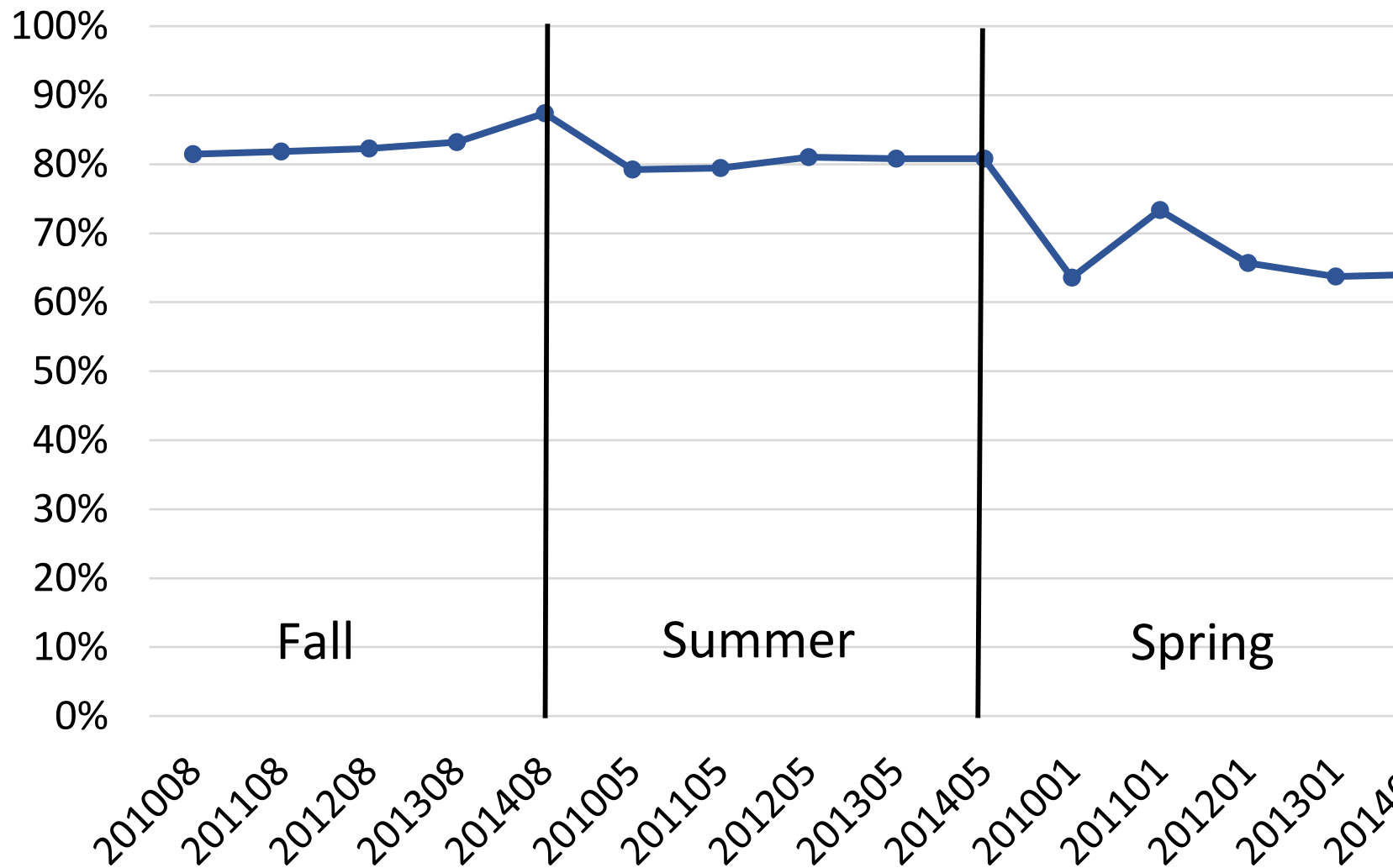


ft data to match
 umn headings:
 Retained for Year 1-2,
 ar 2-3, Year 3-4, etc.

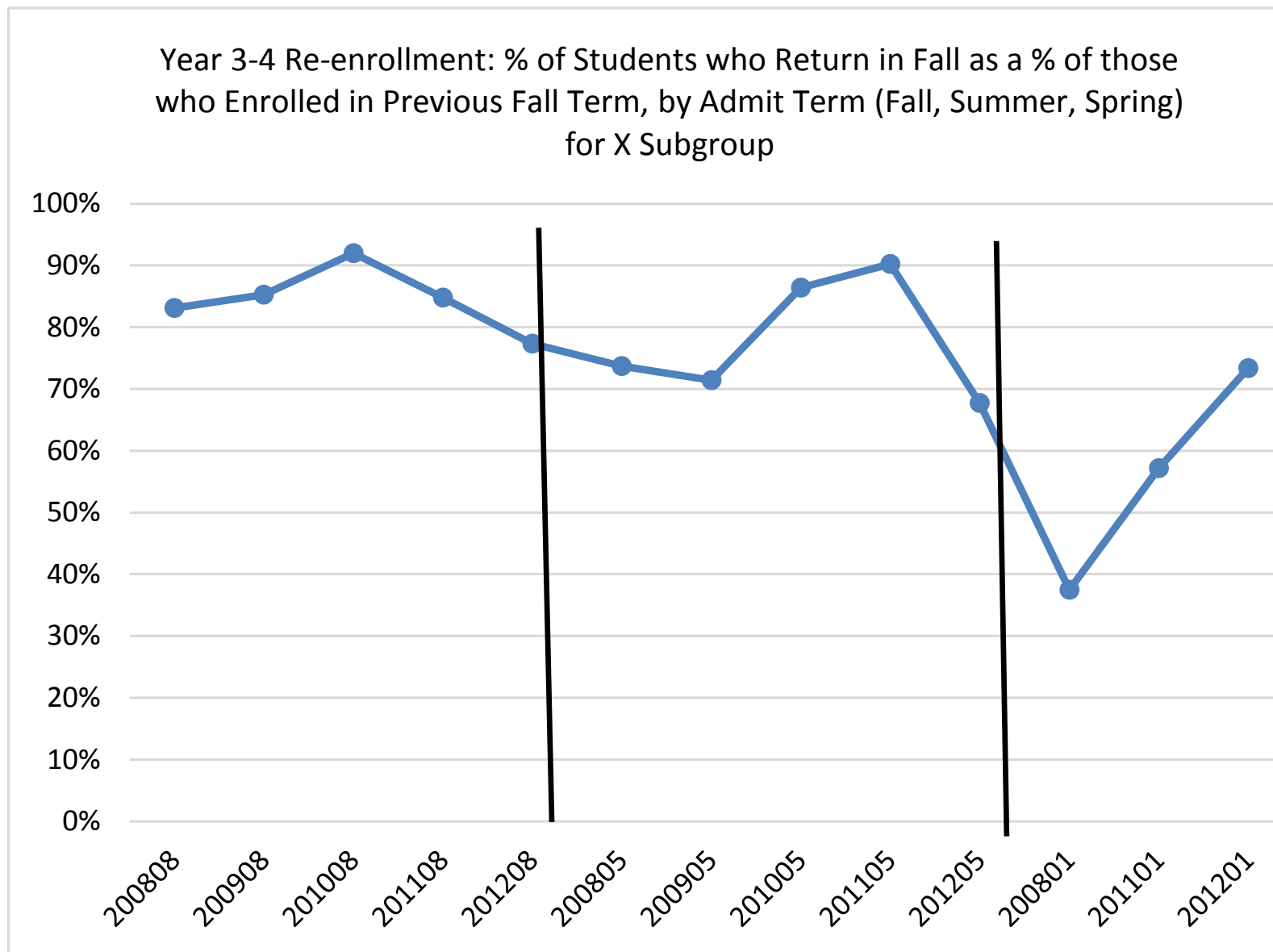
Admit Yr/ Term	Admit Term	Yr 1-2	Yr 2-3	Yr 3-4
201408	1-Fall	0.874		
201405	2-Sum	0.808		
201401	3-Spr	0.640		
201308	1-Fall	0.832	0.832	
201305	2-Sum	0.808	0.805	
201301	3-Spr	0.637	0.671	
201208	1-Fall	0.823	0.842	0.809
201205	2-Sum	0.810	0.834	0.848
201201	3-Spr	0.657	0.676	0.728
201108	1-Fall	0.818	0.830	0.824
201105	2-Sum	0.794	0.832	0.865
201101	3-Spr	0.734	0.748	0.743
201008	1-Fall	0.814	0.828	0.851
201005	2-Sum	0.792	0.849	0.862
201001	3-Spr	0.635	0.697	0.647

Check rates
consistency

Year 1-2 Retention by Admit Term (Fall, Summer, Spring)
for 2010-14 FTIC FL Resident Admits



Small subgroups can show significant instability in rates



Projected Retention & Re-enrollment Rates for Continuing FTICs by Admit Term

Group	Recent Adm Term	Projected Rate, Fall 2016	Source of projected re-enrollment rate (admit term)
FL Resident	201508	0.874	Fall Admits' Yr 1-2 retention rate (Fall 2014)
FL Resident	201505	0.808	Summer admits' Yr 1-2 re-enrollment rate (Sum 2014)
FL Resident	201501	0.640	Spring admits' Yr 1-2 re-enrollment rate (Spr 2014)
FL Resident	201408	0.832	Fall Admits' Yr 2-3 re-enrollment rate (Fall 2013)
FL Resident	201405	0.805	Summer Admits' Yr 2-3 re-enrollment rate (Sum 2013)
FL Resident	201401	0.671	Spring Admits' Yr 2-3 re-enrollment rate (Spring 2013)
FL Resident	201308	0.809	Fall Admits' Yr 3-4 re-enrollment rate (Fall 2012)
FL Resident	201305	0.848	Summer Admits' Yr 3-4 re-enrollment rate (Sum 2012)
FL Resident	201301	0.728	Spring Admits' Yr 3-4 re-enrollment rate (Spring 2012)
FL Resident	201208	0.483	Fall Admits' Yr 4-5 re-enrollment rate (Fall 2011)

create scenario-testing spreadsheet

Gather
retention
rates and
current year
counts by
subgroup and
year

Adm Type	Reside	Term	% Retain/ Enroll	Adm Term	Actual 2015- 2016
FTIC	FL Res	Fall Adm, Yr 1-2	0.874	201508	2808
FTIC	FL Res	Sum Adm, Yr 1-2	0.808	201505	1345
FTIC	FL Res	Spr Adm, Yr 1-2	0.640	201501	364
FTIC	FL Res	Fall Adm, Yr 2-3	0.832	201408	2555
FTIC	FL Res	Sum Adm, Yr 2-3	0.805	201405	906
FTIC	FL Res	Spr Adm, Yr 2-3	0.671	201401	137
FTIC	FL Res	Fall Adm, Yr 3-4	0.809	201308	1976
FTIC	FL Res	Sum Adm, Yr 3-4	0.848	201305	990
FTIC	FL Res	Spr Adm, Yr 3-4	0.728	201301	112
FTIC	FL Res	Fall Adm, Yr 4-5	0.483	201208	1459
FTIC	FL Res	Sum Adm, Yr 4-5	0.576	201205	977
...
FTIC	Remaining .006%		0.006		92.5
FTIC	FL Res	Subtotal			15876

Multiply
 by #
 rolled to
 next
 r
 ections



Adm Type	Reside	Term	% Retain/ Reenroll	Adm Term	2015- 2016	Proj 2016- 2017
FTIC	FL Res	Fall Adm, Yr 1-2	0.874	201508	2808	2453.6
FTIC	FL Res	Sum Adm, Yr 1-2	0.808	201505	1345	1087.0
FTIC	FL Res	Spr Adm, Yr 1-2	0.640	201501	364	233.0
FTIC	FL Res	Fall Adm, Yr 2-3	0.832	201408	2555	2126.7
FTIC	FL Res	Sum Adm, Yr 2-3	0.805	201405	906	729.2
FTIC	FL Res	Spr Adm, Yr 2-3	0.671	201401	137	91.9
FTIC	FL Res	Fall Adm, Yr 3-4	0.809	201308	1976	1599.0
FTIC	FL Res	Sum Adm, Yr 3-4	0.848	201305	990	839.6
FTIC	FL Res	Spr Adm, Yr 3-4	0.728	201301	112	81.6
FTIC	FL Res	Fall Adm, Yr 4-5	0.483	201208	1459	705.3
FTIC	FL Res	Sum Adm, Yr 4-5	0.576	201205	977	562.8
...
FTIC	Remaining .006%		0.006		92.5	66.1
FTIC	FL Res	Subtotal			15876	11356.7

Projecting
 next one
 year: Multiply
 projected
 counts by
 their
 retention rate
 the next
 year.

Adm Type	Residency	Term	% Retain/ Reenroll	Adm Term	2015- 2016	Proj 2016- 2017	Pr 2017- 2018
FTIC	FL Reside	Fall Adm, Yr 1-2	0.874	201508	2808	2453.6	2453
FTIC	FL Reside	Sum Adm, Yr 1-2	0.808	201505	1345	1087.0	1087
FTIC	FL Reside	Spr Adm, Yr 1-2	0.640	201501	364	233.0	233
FTIC	FL Reside	Fall Adm, Yr 2-3	0.832	201408	2555	2126.7	2042
FTIC	FL Reside	Sum Adm, Yr 2-3	0.805	201405	906	729.2	874
FTIC	FL Reside	Spr Adm, Yr 2-3	0.671	201401	137	91.9	156
FTIC	FL Reside	Fall Adm, Yr 3-4	0.809	201308	1976	1599.0	1720
FTIC	FL Reside	Sum Adm, Yr 3-4	0.848	201305	990	839.6	618
FTIC	FL Reside	Spr Adm, Yr 3-4	0.728	201301	112	81.6	66
FTIC	FL Reside	Fall Adm, Yr 4-5	0.483	201208	1459	705.3	773
FTIC	FL Reside	Sum Adm, Yr 4-5	0.576	201205	977	562.8	483
FTIC	Remaining .006%		0.006		92.5	66.1	66
FTIC	FL Reside	Subtotal			15876	11356.7	11342



d in new
 dents by
 e in top
 es. See
 nges in
 jected
 ollments.
 anges
 cade
 ough later
 rs.

						# of New FL Res FTICs:		
						FL Resident	2016-17	2017-
						Fall	2808	28
						Summer	1345	13
						Spring	364	3
							4517	45
Adm Type	Residency	Term	% Retain/ Reenroll	Adm Term	2015- 2016	Proj 2016- 2017	Pr 201	
FTIC	FL Reside	Fall Adm, Yr 1-2	0.874	201508	2808	2453.6	2453	
FTIC	FL Reside	Sum Adm, Yr 1-2	0.808	201505	1345	1087.0	1087	
FTIC	FL Reside	Spr Adm, Yr 1-2	0.640	201501	364	233.0	233	
FTIC	FL Reside	Fall Adm, Yr 2-3	0.832	201408	2555	2126.7	2042	
FTIC	FL Reside	Sum Adm, Yr 2-3	0.805	201405	906	729.2	874	
FTIC	FL Reside	Spr Adm, Yr 2-3	0.671	201401	137	91.9	156	

up
rs to

ected
dcount

Type	Residency	New/Cont	Actual 2015- 2016	Proj 2016- 2017	2017- 2018
FTIC	FL Resident	New	0	4517	4
FTIC	FL Resident	Continuing	15876	11357	11
FTIC	Nonresident	New			
FTIC	Nonresident	Continuing			
AA Transfer	FL Resident	New			
AA Transfer	FL Resident	Continuing			
AA Transfer	Nonresident	New			
AA Transfer	Nonresident	Continuing			
Other Transfer	FL Resident	New			
Other Transfer	FL Resident	Continuing			
Total Undergrad					



reate scenario-testing spreadsheet

Multiply retention rates by subgroups to get next year projections.

Multiply retention rates by projected number of students to get projections for subsequent years.

Repeat process for each other subgroup/student category.

Add in cells in which users can enter potential numbers of new students by subgroup.

ecipe

- . Create data structure/Excel file format
- . Tabulate headcounts by subgroup
- . Calculate retention/persistence rates by subgroup
- . Check rates to make sure they are good (no bad eggs)
- . Multiply retention rates by existing headcount to get next year projections.
- . Multiply next year projections by appropriate rates to get later year projections.
- . Repeat this process for each subgroup.
- . Let user enter numbers of new students, by subgroup, to run scenario-tests on the impact of different types of new students on enrollment headcounts.

principles for projecting enrollment

Continuing students are the largest factor in enrollment counts, so focus on projecting their retention.

Identify and calculate retention rates on the most relevant variables for your school.

Calculate retention rates as a percentage of the number of students in a subgroup who were enrolled in the previous year, not off the base cohort.

Questions?