Revenue Forecasting and the Guaranteed Tuition Plan:

A New Challenge for the Institutional Research Practitioner

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You might be here because you…

- Are responsible for enrollment monitoring or enrollment forecasting at your institution.
- Have been asked or assigned to assist the budget office or planning office with revenue or enrollment forecasting.
- Want to learn a granular method by which to conduct revenue forecasting.
- See the potential for increased partnership and collaboration between the Institutional Research Office and other campus departments.

We will discuss…

- Motivation for the Study
- Literature Review
- Constraints and Issues
- The Issue Conceptually
- Methodology
- Results
- Implications to Policy
- Conclusion and Recommendations
- Questions and Comments

Motivation for the Study

- Declining state appropriations to public higher education have led to more emphasis being placed on tuition and other institutional revenue sources.

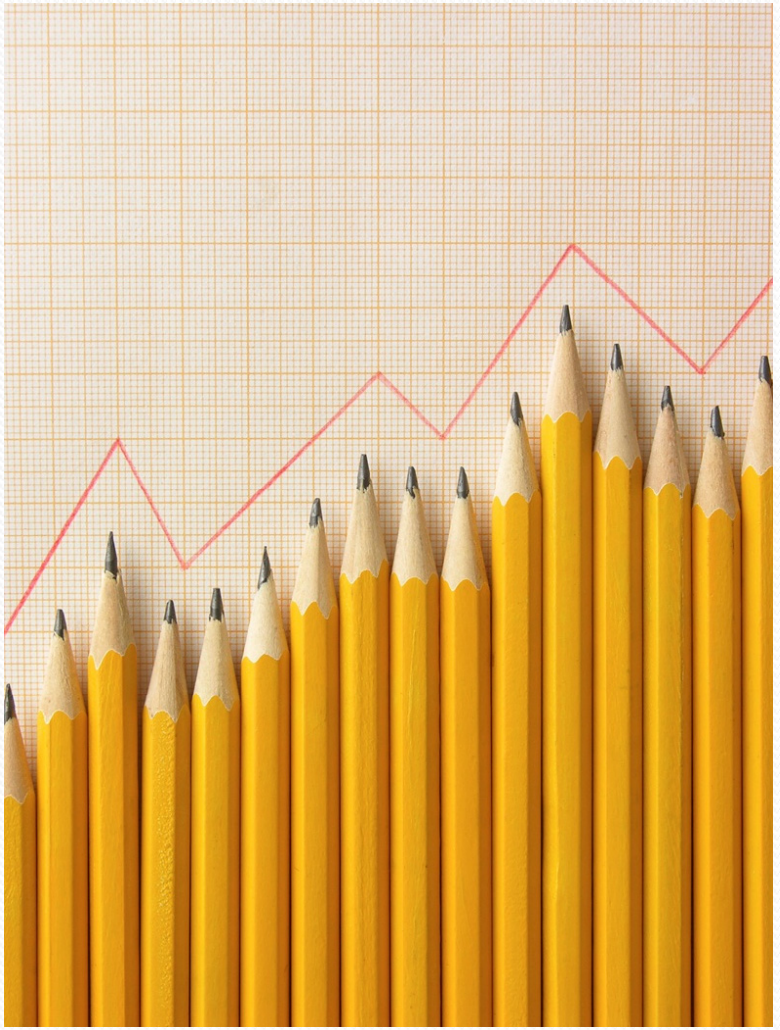
- An opportunity to collaborate arose between the Institutional Research Office, Financial Services Office, and Information Technology Division.

Motivation for the Study

- Institution sought to replace an antiquated method for forecasting student tuition revenue for fiscal year budget requests.
  - Spurred largely by the establishment of a Guaranteed Tuition Plan (GTP).

Brief Literature Review

- Welsh, Nunez, and Petrosko (2006) identified strategic planning as an important area which coupled with forecasting.
- Zuniga (1997) promoted enrollment forecasts and enrollment management as tools for tuition setting and budget forecasts.
- Caruthers and Wentworth (1997) considered enrollment to be the most influential variable when determining revenue forecasts.



Brief Literature Review

- Brinkman and McIntyre (1997) shared three enrollment forecasting models: quantitative realm, curve-fitting techniques (trend analyses), and causal (explanatory, structural, econometric).
- Day (1997) stated that institutions have statistically predicted enrollment using historical student unit record data.
- Bivin and Rooney (1999) discussed the difficulty of credit hours forecasting.

Building the Budget

HIGH Risk for Unbalanced Budget

Expenditure$ Revenue$

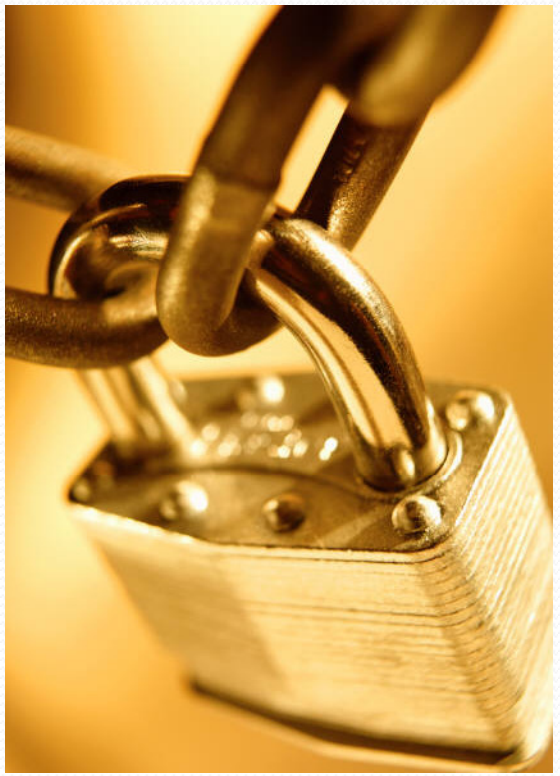
LOW Risk for Unbalanced Budget

Constraints and Issues

- The state governing board sets tuition and fees for the entire system.
- In Fall 2006, the governing board instituted a Guaranteed Tuition Plan (GTP) for new undergraduate students only. An institution which previously billed at four principal rate combinations (instate UG/GR and out-of-state UG/GR) must now recode and have every freshman class at different rates and frozen for four years.
- Institutional student fees and service fees were not locked.

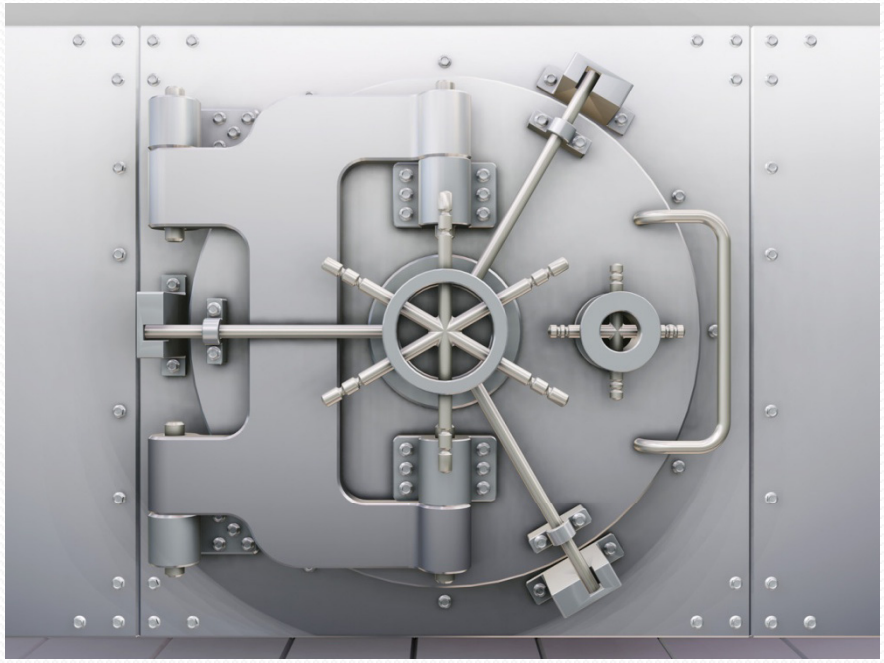
Guaranteed Tuition Plan

- Essentially a promise by the postsecondary institution to the enrolling student. The student is guaranteed to be charged a set amount of tuition for a specified period of time, popularly for the first four years of undergraduate study (FinAid.org, 2009).



Guaranteed Tuition Plan

- Goals:
  - Provide high degree of predictability for parents and students when planning college finances
  - Encourage students to complete their degrees in a specified time frame
  - Maintain affordability and access to public higher education
- Pros and cons of fixed tuition.



The Issue Conceptually…

- Need to forecast tuition revenue for the upcoming fiscal year.
- Forecast needs to account for (2004 – current term):
  - Four different GTP rates and rates for students not on a GTP
  - Undergraduate and Graduate tuition rates
  - In-state and out-of-state tuition rates
  - Full- and part-time students

The Issue Conceptually…

- … and the GTP has been in existence for only four years (not enough data to predict the rate at which students in the first GTP will return).

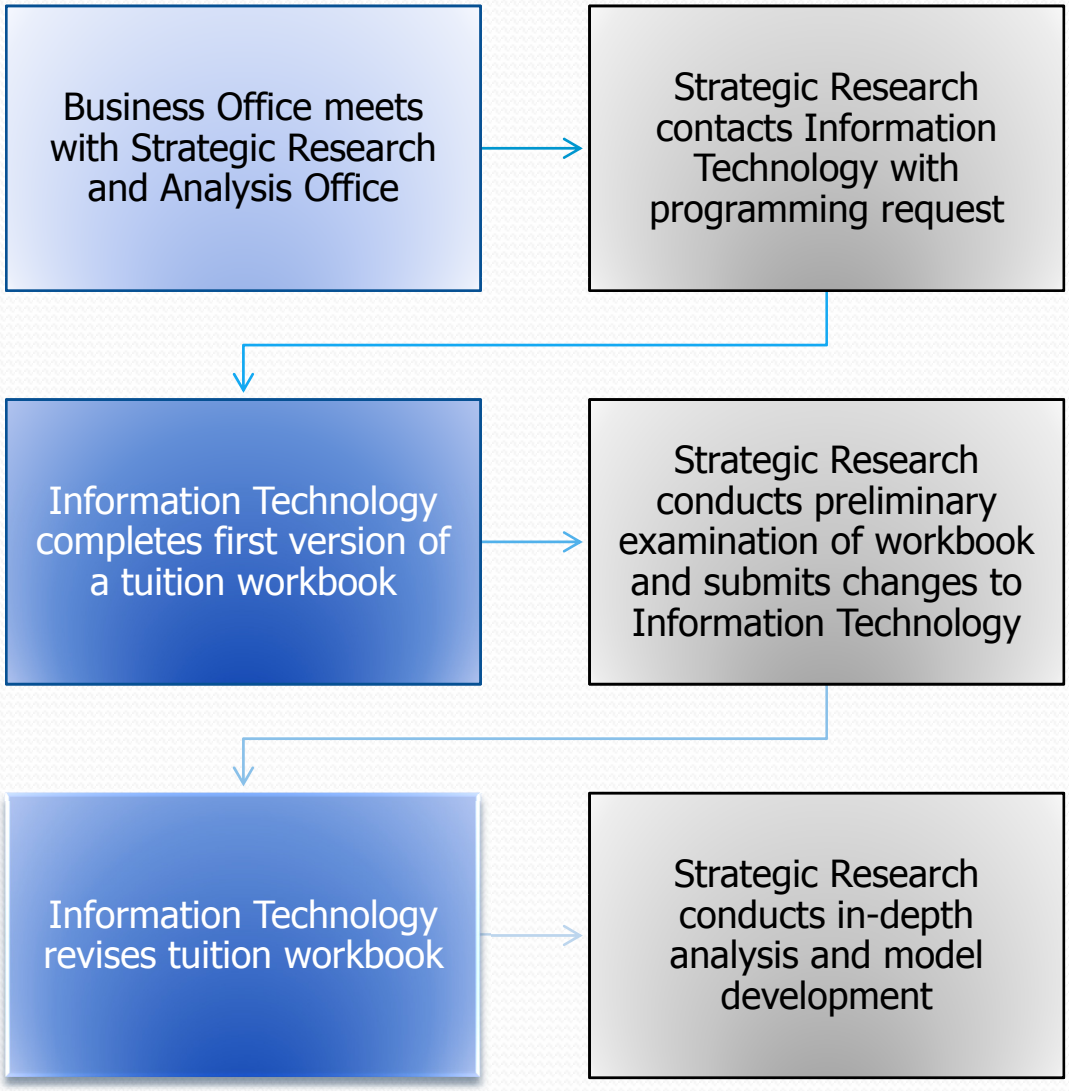
The Issue Conceptually…

Surveys are expensive,

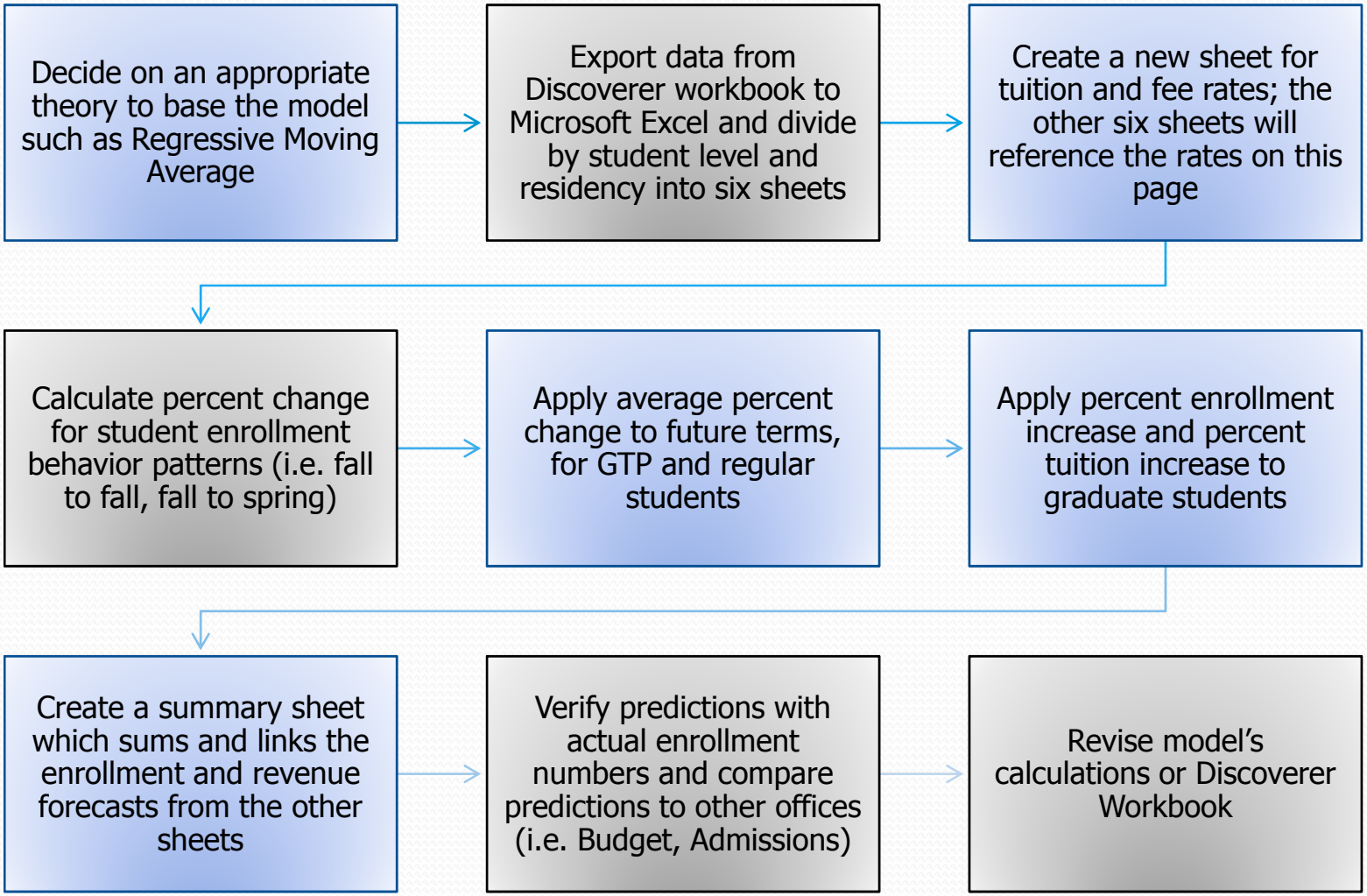
Data are cheap!

- We could survey students (too expensive and too much time).
- We could "pretend" that the GTP was in existence beginning in Fall 2004 – resulting in enough years of data to predict.
  - Assumes that students on the GTP act similar to students not on GTP.

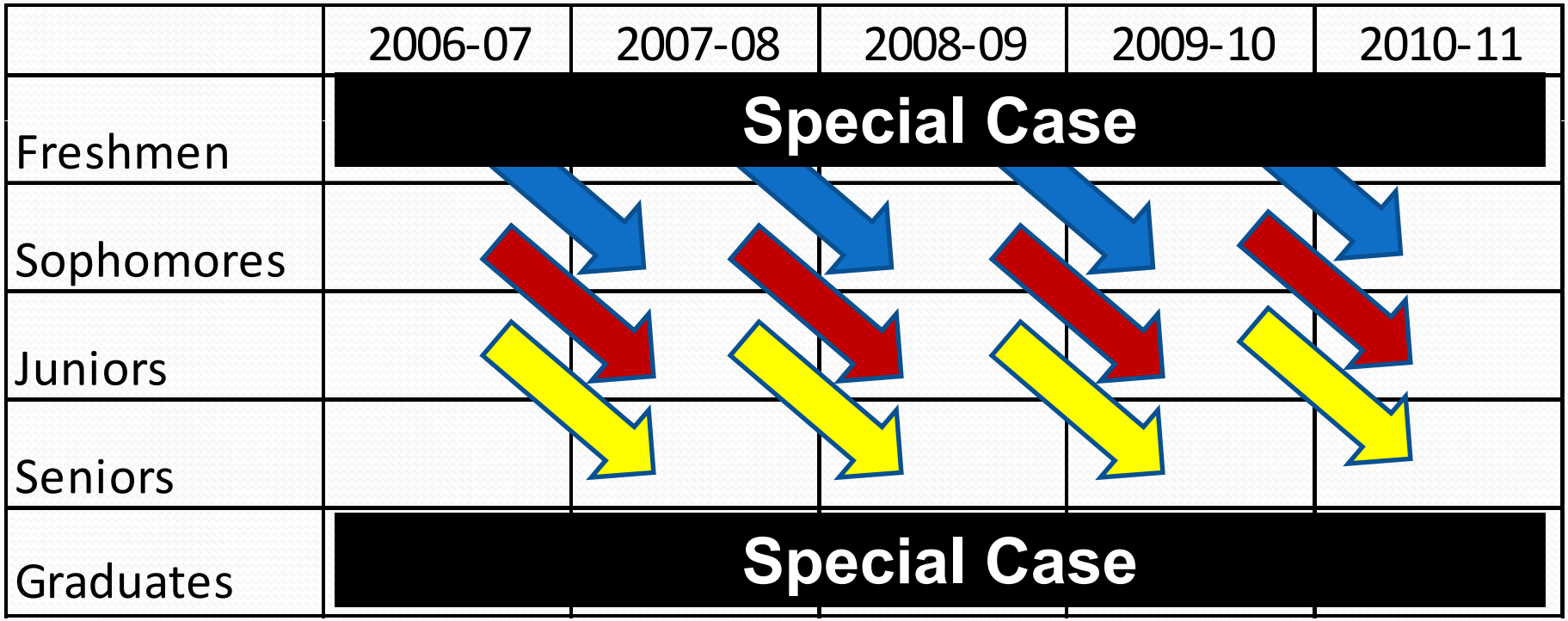
Multiple Office Participation



Analysis Process



Regressive Moving Average (RMA)



Methodology

- Requested the Information Technology division develop a Business Intelligence Discoverer workbook to retrieve historical student enrollment and credit hour data from the student information system.
  The following fields, by term, were retrieved:
  - Number of full-time students
  - Number of part-time students
  - Number of part-time credit hours
  - In-state or out-of-state status
  - Student level (doctoral student, graduate student or undergraduate student)

Methodology

- Students were tracked as a cohort based upon their first matriculation term.

Page Items: In/Out State: In-State | Withdrawn_Ind: <All>

		200402								200405				
		Spring 2004								Summer 2004				
		New				Returning				New				Returni
		REGULAR				REGULAR				REGULAR				REGUL
		Full-Time		Part-Time		Full-Time		Part-Time		Full-Time		Part-Time		Full-Tin
		Hrs	Students	Hrs	Students	Hrs	Students	Hrs	Students	Hrs	Students	Hrs	Students	Hrs
000000	Pre 2004	0	0	0	0	0	0	0	0	0	0	0	0	
200402	Spring 2004	0	361	1,500	209	0	0	0	0	0	0	0	0	
200405	Summer 2004	0	0	0	0	0	25	1,485	227	0	15	1,386	257	
200408	Fall 2004	0	0	0	0	0	275	905	126	0	0	0	0	
200502	Spring 2005	0	0	0	0	0	235	773	110	0	0	0	0	
200505	Summer 2005	0	0	0	0	0	11	928	158	0	0	0	0	
200508	Fall 2005	0	0	0	0	0	168	719	97	0	0	0	0	
200602	Spring 2006	0	0	0	0	0	161	477	70	0	0	0	0	
200605	Summer 2006	0	0	0	0	0	8	507	86	0	0	0	0	
200608	Fall 2006	0	0	0	0	0	103	283	39	0	0	0	0	
200702	Spring 2007	0	0	0	0	0	80	250	33	0	0	0	0	
200705	Summer 2007	0	0	0	0	0	8	233	41	0	0	0	0	
200708	Fall 2007	0	0	0	0	0	52	235	33	0	0	0	0	
200802	Spring 2008	0	0	0	0	0	38	165	21	0	0	0	0	
200805	Summer 2008	0	0	0	0	0	3	114	24	0	0	0	0	

Tuition_Analysis_Old | Fee_Analysis_Old | Tuition_Analysis | Fee_Analysis

- Data was exported to Microsoft Excel for further manipulation.
- A sheet with static tuition rates was created for cells to reference.

	A	B	C	D	E
1	entered before 200608 IS tuition rate (f/t)	1,439.00	actual for FY09		
2	entered before 200608 IS tuition rate (hr)	120.00	actual for FY09		
3	FY07 (200608-201005) IS tuition rate (f/t)	1,280.00	actual		
4	FY07 (200608-201005) IS tuition rate (/hr)	107.00	actual		
5	FY08 (200708-201105) IS tuition rate (f/t)	1,479.00	actual	15.55%	
6	FY08 (200708-201105) IS tuition rate (/hr)	124.00	actual	15.89%	
7	FY09 (200808-201205) IS tuition rate (f/t)	1,598.00	actual	8.05%	
8	FY09 (200808-201205) IS tuition rate (/hr)	134.00	actual	8.06%	
9	FY10 (200908-201305) IS tuition rate (f/t)	1,725.84	forecasted	at 8%	
10	FY10 (200908-201305) IS tuition rate (/hr)	144.72	forecasted	at 8%	
11	FY11 (201008-201405) IS tuition rate (f/t)	1,863.91	forecasted	at 8%	
12	FY11 (201008-201405) IS tuition rate (/hr)	156.30	forecasted	at 8%	
13	entered before 200608 IS tuition rate (f/t)	1,482.17	forecasted for FY10 @3%		
14	entered before 200608 IS tuition rate (hr)	123.60	forecasted for FY10 @3%		
15	entered before 200608 IS tuition rate (f/t)	1,526.64	forecasted for FY11 @3%		
16	entered before 200608 IS tuition rate (hr)	127.31	forecasted for FY11 @3%		
17					
18	entered before 200608 OOS tuition rate (f/t)	5,754.00	actual for FY09		
19	entered before 200608 OOS tuition rate (hr)	480.00	actual for FY09		
20	FY07 (200608-201005) OOS tuition rate (f/t)	5,121.00	actual		
21	FY07 (200608-201005) OOS tuition rate (/hr)	427.00	actual		
22	FY08 (200708-201105) OOS tuition rate (f/t)	5,915.00	actual	15.50%	
23	FY08 (200708-201105) OOS tuition rate (/hr)	493.00	actual	15.46%	
24	FY09 (200808-201205) OOS tuition rate (f/t)	6,389.00	actual	8.01%	
25	FY09 (200808-201205) OOS tuition rate (/hr)	533.00	actual	8.11%	
26	FY10 (200908-201305) OOS tuition rate (f/t)	6,900.12	forecasted	at 8%	
27	FY10 (200908-201305) OOS tuition rate (/hr)	575.64	forecasted	at 8%	
28	FY11 (201008-201405) OOS tuition rate (f/t)	7,452.13	forecasted	at 8%	
29	FY11 (201008-201405) OOS tuition rate (/hr)	621.69	forecasted	at 8%	
30	entered before 200608 OOS tuition rate (f/t)	5,926.62	forecasted for FY10 @3%		

GS OOS tuition 200402-201105 | DS OOS tuition 200402-201105 | Reg a

- The percent change was calculated for student enrollment behavior (i.e. 1st Fall to 2nd Fall to 3rd Fall).

	A	B	C	AZ	BA	BB	BC	BD	BE	BF	BG
2											
3			Matric_Ter	200508							
4			Matric_Ter	Fall 2005							
5			Entry_Typ	New				Returning			
6			Student_T	REGULAR				REGULAR			
7			Ft_Pt	Full-Time		Part-Time		Full-Time		Part-Time	
8				Hrs	Students	Hrs	Students	Hrs	Students	Hrs	Students
9	Current Term Code	Current Term									
12	200405	Summer 2004		0	0	0	0	0	0	0	0
13	200408	Fall 2004		0	0	0	0	0	0	0	0
14	200502	Spring 2005		0	0	0	0	0	0	0	0
15	200505	Summer 2005		0	0	0	0	0	0	0	0
16	200508	Fall 2005		0	2322	1302	186	0	0	0	0
17	200602	Spring 2006		0	0	0	0	0	2080	1460	187
18	200605	Summer 2006		0	0	0	0	0	42	3026	596
19	200608	Fall 2006		0	0	0	0	0	1632	1301	154
20	200702	Spring 2007		0	0	0	0	0	1482	1473	178
21	200705	Summer 2007		0	0	0	0	0	36	4020	758
22	200708	Fall 2007		0	0	0	0	0	1193	1276	159
23	200802	Spring 2008		0	0	0	0	0	1096	1037	136
24	200805	Summer 2008		0	0	0	0	0	52	3350	596
25	200808	Fall 2008		0	0	0	0	0	933	811	103
26	200902	Spring 2009 (% loss 1 spr.)							-0.1042205	0.1213518	0.005376
27	200902	Spring 2009 (# change)							-250.11557	-312.1458	-40.6341
28	200902	Spring 2009 (forecast)							**845.88443**	**724.85415**	**95.36585**
29	200902	Spring 2009 (pre. spr. % chg.)							-0.2282076	-0.301009	-0.29878
30	200905	Summer 2009 (% loss 1 sum.)							-0.9819121	1.3241167	2.204301
31	200905	Summer 2009 (# change)							-3	-1337.424	-236.29
32	200905	Summer 2009 (forecast)							**49**	**2012.5761**	**359.7097**
33	200905	Summer 2009 (pre. su. % chg.							-0.0576923	-0.399231	-0.39646

- Performed enrollment and revenue forecast for in-state graduate students based on expected enrollment and tuition increase percentage.

	A	B	C	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL
6			Stude											
7			Ft_Pt	Part-Time										
8				Hrs	Students	students		hours		p/t students		students	hours	p/t
9	Current_Te	Current_Term				full time	% change	part time	% change	per	% change	full time	part time	students
10	000000	Pre 2004		0	0	actual	term to term	actual	term to term	term	per term	forecasted	forecasted	forecasted
11	200402	Spring 2004		0	0	372		5391		1066				
12	200405	Summer 2004		0	0	308		3908		813				
16	200508	Fall 2005		0	0	341	-0.0783784	3904	0.0655022	812	0.0343949			
17	200602	Spring 2006		0	0	368	0.2266667	3684	-0.054415	768	-0.090047			
18	200605	Summer 2006		0	0	238	0.1840796	2936	-0.019044	628	-0.007899			
19	200608	Fall 2006		0	0	399	0.170088	3474	-0.110143	721	-0.112069			
20	200702	Spring 2007		0	0	366	-0.0054348	3609	-0.020358	717	-0.066406			
21	200705	Summer 2007		0	0	281	0.1806723	3087	0.0514305	641	0.0207006			
22	200708	Fall 2007		0	0	487	0.2205514	3711	0.0682211	738	0.0235784			
23	200802	Spring 2008		0	0	491	0.3415301	4094	0.1343863	807	0.125523			
24	200805	Summer 2008		0	0	363	0.2918149	3468	0.1234208	710	0.1076443			
25	200808	Fall 2008		1088	192	536	0.100616	4392	0.1835085	839	0.1368564			
26	200902	Spring 2009										536.32096	3871.1832	798.6797
27	200905	Summer 2009										391.05665	3400.0894	738.5056
28	200908	Fall 2009										591.32552	4619.383	856.3591
29	201002	Spring 2010										585.82521	3660.4932	750.9215
30	201005	Summer 2010										421.28183	3333.5087	768.1556
31	201008	Fall 2010										652.36169	4858.538	874.0773
32	201102	Spring 2011										639.89886	3461.27	706.019
33	201105	Summer 2011										453.84315	3268.2317	798.996
34														
35										FY09 GS IS tuition		2727735.88	1819470.52	
36										FY10 GS IS tuition		3068862.63	1866038.67	
37										FY11 GS IS tuition		3452950.80	1917825.21	
38														

Results

- Each sheet individually calculated revenue based on enrollment, and those sheets are linked the revenue and enrollment forecasts on a cover sheet.

	A	B	C	D	E	F	G	H	I	J
1	Student Fees Forecast Summary									
2		200808	200902	200905	200908	201002	201005	201008	201102	201105
3	IS US Students (f/t)	8281	8037.367	370.5499051	8371.218582	8621.108	410.626	8777.084	9113.306	467.4895
4	IS GS Students (f/t)	536	536.321	391.056653	591.3255171	585.8252	421.2818	652.3617	639.8989	453.8432
5	IS DS Students (f/t)	9	14.66667	2.666666667	11.33333333	14.66667	2.666667	11.33333	14.66667	2.666667
6	OOS US Students (f/t)	113	151.9057	69.39020245	195.9255413	255.1473	116.3606	202.5002	248.844	162.2626
7	OOS GS Students (f/t)	30	21.33333	14.33333333	22.33333333	21.33333	14.33333	22.33333	21.33333	14.33333
8	OOS DS Students (f/t)	2	1	0	1	0	0	1	0	0
9	IS US hours	9473	10226.73	18084.06366	9395.730642	10126.66	15678.29	9923.766	11164.77	16419.98
10	IS GS hours	4392	3871.183	3400.089425	4619.382953	3660.493	3333.509	4858.538	3461.27	3268.232
11	IS DS hours	405	179.3333	108.3333333	275	179.3333	108.3333	275	179.3333	108.3333
12	OOS US hours	136	271.6026	379.5212002	216.6727964	413.3011	409.3069	212.9152	413.2674	432.008
13	OOS GS hours	173	103.6667	108.3333333	115.6666667	103.6667	108.3333	115.6667	103.6667	108.3333
14	OOS DS hours	60	0	9	54	0	4.5	54	0	2.25
18		$13,731,375.46			$14,286,183.92			$15,132,064.30		
19		FY 2009 fee revenue			FY 2010 fee revenue			FY 2011 fee revenue		
20										
21	Tuition Forecast Summary			less 5.30% (error & waivers)	revised forecast					
22	FY 2009 IS & OOS (all levels)	$36,591,580.10		1,939,353.75	**$34,652,226.35**					
23	FY 2010 IS & OOS (all levels)	$40,186,581.22		2,129,888.80	**$38,056,692.41**					
24	FY 2011 IS & OOS (all levels)	$45,802,742.00		2,427,545.33	**$43,375,196.67**					
25										

Verification- Fall 2008

- After the Fall 2008 late registration period, the workbook was updated and actual enrollment numbers were imported into the spreadsheet.
- We discovered the model overestimated the revenue forecast when compared to actual tuition received. The comparison of projected tuition revenue to actual revenue resulted in a discrepancy of 5.30%.

Verification- Fall 2008

- Errors are caused by:
  - Students on out-of-state tuition waivers.
  - Some premium or consortia programs have a tuition differential which were not accounted for in the model.
  - Students were miscoded at time of admission.

Verification – Spring 2009

- In Spring 2009, the tuition workbook was again updated. Verification of the model's performance for enrollment forecasting was examined.
  - For in-state undergraduates who were in the Fall 2008 cohort and returned Spring 2009, the following comparison was made:

Category of Student	Projected by Model	Actual	Difference
GTP	2,288	2,286	2
Non-GTP	205	197	8

  - For in-state undergraduates who were new in Spring 2009, the following comparison was made:

Category of Student	Projected by Model	Actual	Difference
GTP	353	366	13
Non-GTP	134	146	12

What Actually Occurred?

- In November 2008, the time arrived to submit the Fiscal Year 2010 budget request. Staff members from the Strategic Research and Analysis Office, the Budget Office, and Admissions Office met to compare enrollment forecasts.

Implications to Policy

- The general forecasting model can be tailored to work at public or private institutions with or without fixed tuition plans.
- Since completing the revised model, the state governing board has abandoned the Guaranteed Tuition Plan for new students, effective Fall 2009.
- Tuition rates for Fall 2009 were frozen, an unanticipated decision which changed all tuition revenue forecasts.

New Tuition Differential

- A new component was added to the institution's revenue forecasting need. A tuition billing change was approved by the state governing board, effective Fall 2009.
- Students previously paid a flat tuition rate for 12+ credit hours but will now pay for up to 15 credits.

New Tuition Differential

- A change will be requested to modify the workbook to accommodate the new tuition differential, yet in the meantime, an analysis was performed of the billable credit hour differential (12 to 15) to ascertain new FY2010 tuition revenue potential.

New Tuition Differential

- Student enrollment data from Fall 2002 to Spring 2009 was examined by term to ascertain average course load per student.

	Undergraduate				Graduate				Doctoral			
Term	Avg. Attempted Hrs. (≤12 credits)	Students	Avg. Attempted Hrs. (≥13 credits)	Students	Avg. Attempted Hrs. (≤12 credits)	Students	Avg. Attempted Hrs. (≥13 credits)	Students	Avg. Attempted Hrs. (≤12 credits)	Students	Avg. Attempted Hrs. (≥13 credits)	Students
Fall 2002	9.46	3726	15.02	4766	6.00	1248	14.58	90	3.98	70	0.00	0
Spring 2003	9.28	3796	15.08	4332	6.02	1370	14.74	71	4.11	67	0.00	0
Summer 2003	5.81	3865	15.24	158	5.85	1170	13.87	56	4.71	42	0.00	0
Fall 2003	9.44	4050	14.85	4956	6.21	1373	14.34	89	5.54	79	0.00	0
Spring 2004	9.36	3851	15.05	4698	6.16	1339	14.29	85	5.81	87	0.00	0
Fall 2008	10.14	3793	14.88	6104	6.79	1339	14.33	106	4.79	144	15.00	1
Spring 2009	10.00	3811	15.15	5646	6.93	1386	14.45	103	4.89	133	0.00	0
Fall Average	9.79	3909	14.90	5437	6.36	1174	14.29	105	4.76	89	2.14	0.14
Spring Average	9.63	3796	15.10	5023	6.47	1206	14.43	83	4.78	92	0.00	0
Summer Average	5.79	3905	14.99	181.8	5.93	918.3	13.85	67	5.44	45	0.00	0
New Revenue for FY2010	$		3,088,999.45		$		65,912.86		$		36.86	
$3,154,949.16	For those undergraduate students registering for 13+ credit hours (10,642 avg./yr.), they enroll typically for 15 hours. This creates an additional 3 billable hours x 75% variance x $129 hourly rate (FF4, reg.)				For those graduate students registering for 13+ credit hours (255 avg./yr.), they enroll typically for 14 hours. This creates an additional 2 billable hours x 75% variance x $172 hourly rate				For those doctoral students registering for 13+ credit hours (0.14 avg./yr.), they enroll typically for 15 hours. This creates an additional 3 billable hours x 75% variance x $172 hourly rate			
New Revenue for FY2010	$		1,760,729.68		$		42,266.62		$		23.63	
$1,803,019.94												

Conclusion and Recommendations

- Revenue forecasting is one complex area where an institutional research officer and a business officer can partner to greatly benefit the institution as a whole. This partnership can expand to include the Admissions Office and Information Technology.
- This relatively simple model was expanded to be a tool for forecasting not only revenue but enrollment.

Thank You

Questions and Comments

This PowerPoint presentation can be downloaded at
http://www.valdosta.edu/sra/presentations.shtml

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