Using Math to Study the CSU Budget Crisis:

Why Are YOU Paying Higher Fees?

Background

Many CSUN students are upset because they are being asked to pay higher fees for fewer classes. They feel that they are getting less for more. This U100 exercise examines how changes in enrollment and fees affect the revenue used to operate the California State University (CSU) system.

The complete CSU budget is quite complex. It totals over $4.2 billion and supports 46,000 employees (faculty and staff) and about 400,000 students at 23 campuses. Many different sources of revenue help fund the CSU. These include student fees and general fund money as well as smaller sources such as continuing education, lottery money, grants, funds from auxiliaries, and recently, federal stimulus money. Student fees come to the CSU from enrolled CSU students. General fund money comes to the CSU from the state of California which collects the money from income taxes, sales taxes, corporate taxes, and other taxes.

CSU Total Revenue: A Math Formula

Total revenue = fee revenue + general fund revenue + smaller sources of funds. At present, around 95% of CSU revenue comes from student fees and general fund money, so to simplify our arithmetic, we will ignore the smaller funding sources. The simplified total revenue will be called $T$, and we can write the formula for CSU total revenue like this:

$$T = F + G$$

($T =$ Total revenue simplified; $F =$ Fee revenue; $G =$ General fund revenue)
Discussing Enrollment: FTE vs. Headcount

To make comparisons easier between institutions, enrollment is usually given in terms of full time equivalent (FTE) students rather than in terms of headcount. An academic load of 15 units per semester generates one FTE undergraduate student, and an academic load of 12 units generates one FTE graduate student. We will therefore talk about enrollment in terms of FTE in this exercise.

Fee Revenue: Another Math Formula

The average student fee per FTE (averaged for graduates and undergraduates) is $4290. We can write the total fee revenue using a formula like this:

\[ F = f \times e \]

Fee revenue = fee per FTE * enrolled FTEs

In this formula, \( \times \) denotes multiplication and \( e \) stands for enrollment or the total number of FTE students.

> Take a break here: did you know that in the CSU, one third of your fees go back to student financial aid?

General Fund Revenue: Your Third Formula

California provides general funds to the CSU based on enrollment:

\[ G = g \times e \]

General fund revenue = general fund per FTE * enrollment

> Take another break: did you know that the funded cost of instruction per FTE is at least $11,858 per FTE? Grab a calculator: what percent of the average cost $11,858 is covered by the average student fee $4290?
The Problem

Here's the problem. The CSU has a big deficit, roughly $1 billion. As a result of the deficit, CSU employees have had to take furloughs (unpaid days away from work). Many CSU employees face layoffs, and students have had fewer classes to choose from. This situation may not improve for awhile: California is expected to have a $19-21 billion deficit this year. While California is hoping for a bailout from the federal government, it will not be enough to make up the state’s entire deficit because the bailout will likely be less than $7 billion.

CSU Chancellor Charles Reed ordered a 10% decrease in CSU enrollment in order to pressure the state into giving the CSU more general funds from tax money this year. (His point was to show that without the extra money, we couldn’t afford to teach all those students.) In November 2009, the CSU Board of Trustees and the Chancellor asked the state to give us $884 million extra funding in our 2009 general fund appropriation to make up for past shortfalls. It appears that the CSU will receive less than $300 million.

Glossary of all the variables and formulas so far:

- \( T \) = total revenue
- \( e \) = enrollment
- \( T(e) \) = total revenue as a function of enrollment (more students bring in more $)
- \( \text{FTE} \) = full time equivalent student (how we count enrollment)
- \( f \) = fee/FTE--what the average CSU student pays in fees
- \( F = f \times e \) is total fee revenue
- \( g \) = general fund/FTE (what the state pays per student)
- \( G = g \times e \) is the total general fund revenue

Questions: Let's explore the following questions. You may need a calculator.
1. Write an equation that represents the relationship between total revenue and the fee per FTE, general fund per FTE, and enrollment (in FTE) using the variables T, f, g, and e.

2a. Suppose CSUN enrollment is 28,000 FTE, fee per FTE is $4290 and general fund per FTE is $7568. Use your equation from question 1 to find the total revenue. Then calculate the effect (in $) of cutting enrollment by 5%, 10%, 15%.

<table>
<thead>
<tr>
<th>Revenue, no enrollment cut</th>
<th>Compute</th>
<th>New revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>5% enrollment cut</td>
<td>(f+g)*.95 e</td>
<td></td>
</tr>
<tr>
<td>10% enrollment cut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% enrollment cut</td>
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</tbody>
</table>

2b. What is the difference between the total revenue with no enrollment cut and 5%, 10%, 15% cuts calculated above in (2a)?

<table>
<thead>
<tr>
<th>Enrollment Cuts</th>
<th>Compute</th>
<th>Decrease in Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>No cut</td>
<td>T(e)- T(e) =</td>
<td>No change</td>
</tr>
<tr>
<td>5% enrollment cut</td>
<td>T(e)-T(.95e)=</td>
<td>$16,601,200</td>
</tr>
<tr>
<td>10% enrollment cut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15% enrollment cut</td>
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</tbody>
</table>
2c. Could a 10% fee increase make up for the money lost by a 5% decrease in enrollment?

2d. What size fee increase would be needed to offset the Chancellor’s 10% decrease in enrollment? Use the total revenue $T$ that you found in question 2a; Keep $g = 7,568$ but set the new enrollment at 90% of 28,000 FTE.

2e. Next, find the fee increase required to offset a 10% decrease general fund per FTE and a 10% cut in enrollment. We are still assuming that we need the Total revenue, $T = 332,024,000$, to run the university.

3. The CSU estimates the cost of instruction at roughly $13,000 per FTE. However, the amount funded is $11,858. Assume enrollment is 28,000 FTE at CSUN. What is the shortfall in revenue?

4a. Look up the CSUN general fund budget for 2009-10 by visiting http://www-admn.csun.edu/budget/ Look at the bottom line. What is the total source of revenue?

4b. Compare with the total expenditures listed in 2008-09 WASC report http://irqry.csun.edu:8080/openweb/wasc/main/frame.jsp?a=6 Click on data element 6.2b Education and General Expenditures at Cal State Northridge by Category and Fiscal Year
4c. Find the difference between total sources of revenue and expenditures

Note: fees were increased 32% in the summer of 2009. Those increases were included in the exercise.

Sources:

http://www.csun.edu/academic.affairs/

CSU budget pages http://www.calstate.edu/Budget/

CSUN budget pages http://www-admn.csun.edu/budget/