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ABSTRACT

This paper consists of a learning unit for college algebra in which the problem presents three different payment plans for a tuition plan to pay for college expenses. The details of each payment plan are presented, each followed by several exercises so that comparisons of the results can be made across payment plans. (MM)

Can you beat the SC Tuition Prepayment Program?

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You have recently earned your bachelors degree from Francis Marion University and wondered about your daughter's college expenses. Right now she is in the 5^{th} grade, but you are already worried about how to finance her college tuition.

You have heard about the South Carolina Tuition Prepayment Program (SCTPP) (www.state.sc.us/tpp), but you wonder if it is all that good of a deal. It allows you to prepay for your daughter's college tuition, which will guarantee payment of tuition for your daughter to attend any South Carolina public 4-year institution for 4 years. The options are as follows:

a. You can pay a one-time lump sum.
b. You can pay 48 fixed monthly payments.
c. You can pay fixed monthly payments until your daughter attends college.

Either of these options will cover her tuition no matter how high the tuition rises before your daughter attends college.

I. The **lump sum payment** for your 5th grader daughter is $15,506. You need to determine if this is a bargain or if you can beat it with another investment.

A. What about depositing the $15,506 into your **money market account** at the SC State Credit Union (www.scscu.com/savings.html)? Currently, your money market account pay 5.84% interest compounded monthly.
1. How much money would you have in your account when your daughter goes to college in 7-1/2 years?

2. Is this enough money for her college tuition? In order to answer this question, you need to estimate the cost of 4 years of your daughter's tuition. Consider the tuition costs per year of SC public 4-year colleges below (www.che400.state.sc.us/web/abstct2000/abd_75.htm).

Public Senior Institutions	**1990-91**	**1991-92**	**1992-93**	**1993-94**	**1994-95**	**1995-96**	**1996-97**	**1997-98**	**1998-99**	**1999-2000**
The Citadel	$2,513	$2,662	$2,949	$3,080	$3,176	$3,275	$3,297	$3,498	$3,631	$3,396
Clemson University	2,470	2,630	2,762	2,954	3,036	3,112	3,112	3,252	3,344	3,470
Coastal Carolina Univ.	1,920	2,020	2,170	2,470	2,710	2,800	2,910	3,100	3,220	3,340
College of Charleston	2,300	2,400	2,650	2,950	3,060	3,090	3,190	3,290	3,390	3,520
Francis Marion Univ.	1,800	2,140	2,440	2,800	2,920	3,010	3,010	3,270	3,350	3,350
Lander University	2,340	2,620	2,920	3,220	3,340	3,400	3,550	3,600	3,700	3,700
S C State University	1,850	2,050	2,200	2,500	2,500	2,550	2,730	2,974	3,184	3,410
USC - Columbia	2,560	2,686	2,818	3,090	3,196	3,280	3,363	3,534	3,530	3,740
USC - Aiken	1,800	1,950	2,120	2,320	2,500	2,578	2,708	2,974	3,018	3,318
USC - Spartanburg	1,920	2,020	2,120	2,320	2,500	2,578	2,708	2,974	3,018	3,360
Winthrop University	2,568	2,826	3,112	3,470	3,620	3,716	3,818	3,918	4,032	4,126
Medical Univ. of S C	1,540	2,033	2,212	2,560	2,819	2,910	3,202	3,648	4,034	4,626

Which tuition should we pick? (Hint: The SCTPP allows your daughter to attend any one of these colleges.)

What are percent increases each year of the tuitions?

What is the average percent increase per year of the tuitions?

Your child is in 5th grade, so she will enter college in 2008. What tuition amount should you be ready to pay for her first year? What about her second year? What about her third year? What about her fourth year?

What is the total cost of tuition for her 4 years?

3. Do you have enough money in your money market account to cover this total amount of tuition?

4. You read the fine print about your money market account; you realize that you only get the interest rate of 5.84% compound monthly once you have $1,000 in the account. Until then, you only get 2.0%. How will this change your total amount?

5. One bad aspect of this method is that the interest on your money market account is reported as income for tax purposes. So, you will have to pay income tax by April of every year at a rate of 15%. Deduct this amount due to taxes from your account. How will this change your final amount?

B. Another investment for college is **Series I savings bonds** offered by the United States Treasury Department (www.savingsbonds.com). They are currently offered at an interest rate of 6.49% (3.40% fixed rate with a 3.04% inflation rate) compounded semiannually. Better yet, in 1990 the Treasury Department began the Education Bond Program that allows interest on the bonds, when used for tuition, to be excluded from taxes. The Series I bonds can be purchased in denominations of $50, $75, $100, $500, $1000, $5000, and $10000 and can earn interest for up to 30 years.

1. Suppose you buy savings bonds with the $15,506. What denominations and quantities of savings bonds would you buy?

2. How much money would you have in savings bonds when your daughter enters college in 7-1/2 years?

3. Do you have enough money to cover the cost of 4 years of tuition? How does this compare with the other total amounts with other investments and/or SCTPP?

4. Once again you read the fine print and realize that you can only buy $30,000 worth of savings bonds each year. How does this change your total amount?

5. Another problem is that you can only redeem the bonds once they are 6 months old. How does this change your purchasing the bonds?

6. Another problem is that you forfeit the last three months of interests on bonds that are redeemed before they are 5 years old. How does this change your total amount?

C. Your South Carolina State Credit Union (www.scscu.com/savings.html) also offers **Certificates of Deposits (CDs)**. The 60+ month CD has an interest rate of 6.25% compounded quarterly.

1. Suppose you purchase a CD using the $15,506. How much money would you have when your daughter goes to college in 7-1/2 years?

2. Do you have enough money to cover the cost of 4 years of tuition? How does this compare with the other investments and/or SCTPP?

3. One bad aspect of this method is that the interest on your CD is reported as income for tax purposes. So, you will have to pay income tax by April of every year at a rate of 15%. Deduct this amount due to taxes from your account. How will this change your final amount?

II. Another option of the SCTPP for 5th graders is start now in November 2000 to make **48 monthly payments** of $376. You need to determine if this is a bargain or if you can beat it with another investment.

A. What about depositing those 48 monthly payments $376 into your **money market account** at the SC State Credit Union (www.scscu.com/savings.html)? Currently, your money market account pay 5.84% interest compounded monthly.

1. How much money would you have in your account when you daughter enters college in 2008?

2. Is this enough money for her college tuition? In order to answer this question, you need to estimate the cost of 4 years of your daughter's tuition. Consider the tuition costs per year of SC public 4-year colleges below (www.che400.state.sc.us/web/abstct2000/abd 75.htm).

Public Senior Institutions	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-2000
The Citadel	$2,513	$2,662	$2,949	$3,080	$3,176	$3,275	$3,297	$3,498	$3,631	$3,396
Clemson University	2,470	2,630	2,762	2,954	3,036	3,112	3,112	3,252	3,344	3,470
Coastal Carolina Univ.	1,920	2,020	2,170	2,470	2,710	2,800	2,910	3,100	3,220	3,340
College of Charleston	2,300	2,400	2,650	2,950	3,060	3,090	3,190	3,290	3,390	3,520
Francis Marion Univ.	1,800	2,140	2,440	2,800	2,920	3,010	3,010	3,270	3,350	3,350
Lander University	2,340	2,620	2,920	3,220	3,340	3,400	3,550	3,600	3,700	3,700
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Medical Univ. of S C	1,540	2,033	2,212	2,560	2,819	2,910	3,202	3,648	4,034	4,626

Which tuition should we pick? (Hint: The SCTPP allows your daughter to attend any one of these colleges.)

What are percent increases each year of the tuitions?

What is the average percent increase per year of the tuitions?

Your child is in 5th grade, so she will enter college in 2008. What tuition amount should you be ready to pay for her first year? What about her second year? What about her third year? What about her fourth year?

What is the total cost of tuition for her 4 years?

3. Do you have enough money in your money market account to cover this total amount of tuition?

4. You read the fine print about your money market account; you realize that you only get the interest rate of 5.84% compound monthly once you have $1,000 in the account. Until then, you only get 2.0%. How will this change your total amount?

5. One bad aspect of this method is that the interest on your money market account is reported as income for tax purposes. So, you will have to pay income tax by April of every year at a rate of 15%. Deduct this amount due to taxes from your account. How will this change your final amount?

B. Another investment for college is **Series I savings bonds** offered by the United States Treasury Department (www.savingsbonds.com). They are currently offered at an interest rate of 6.49% (3.40% fixed rate with a 3.04% inflation rate) compounded semiannually. Better yet, in 1990 the Treasury Department began the Education Bond Program that allows interest on the bonds, when used for tuition, to be excluded from taxes. The Series I bonds can be purchased in denominations of $50, $75, $100, $500, $1000, $5000, and $10000 and can earn interest for up to 30 years.

1. Suppose you buy savings bonds every 6 months. What denominations and quantities of savings bonds could you buy for your $376 monthly payment?

2. How much money would you have in savings bonds after when your daughter enters college in 2008?

3. Do you have enough money to cover the cost of 4 years of tuition? How does this compare with the other total amounts with other investments and/or SCTPP?

4. Once again you read the fine print and realize that you can only buy $30,000 worth of savings bonds each year. How does this change your total amount?

5. Another problem is that you can only redeem the bonds once they are 6 months old. How does this change your purchasing the bonds?

6. Another problem is that you forfeit the last three months of interests on bonds that are redeemed before they are 5 years old. How does this change your total amount?

III. If you start making monthly payments now in November 2000 and continue until your daughter enters college, the SCTPP states that you need to make 89 **monthly payments** of $230. You need to determine if this is a bargain or if you can beat it with another investment.

A. What about depositing those 89 monthly payments $230 into your **money market account** at the SC State Credit Union (www.scscu.com/savings.html)? Currently, your money market account pay 5.84% interest compounded monthly.

1. How much money would you have in your account at the end of the 89 monthly payments?

2. Is this enough money for her college tuition? In order to answer this question, you need to estimate the cost of 4 years of your daughter's tuition. Consider the tuition costs per year of SC public 4-year colleges below (www.che400.state.sc.us/web/abstct2000/abd 75.htm).

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What is the total cost of tuition for her 4 years?

3. Do you have enough money in your money market account to cover this total amount of tuition?

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1. Suppose you buy savings bonds every 6 months. What denominations and quantities of savings bonds could you buy for your $230 month amount?

2. How much money would you have in savings bonds after 89 months?

3. Do you have enough money to cover the cost of 4 years of tuition? How does this compare with the other total amounts with other investments and/or SCTPP?

4. Once again you read the fine print and realize that you can only buy $30,000 worth of savings bonds each year. How does this change your total amount?

5. Another problem is that you can only redeem the bonds once they are 6 months old. How does this change your purchasing the bonds?

6. Another problem is that you forfeit the last three months of interests on bonds that are redeemed before they are 5 years old. How does this change your total amount?

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