Background Information

The United States’ federal debt is an increasingly growing and well-known issue. Every year when governmental expenditures exceed revenues, the debt is increased. On the occasions where there is a surplus (revenues exceed expenditures), the debt can be reduced.

For many years, the federal government has operated at a deficit. As the population ages and the Baby Boomer generation prepares to retire, there are questions about whether the federal deficits and debt are sustainable.

Problem Statement

In this assignment, students will explore data about the US national debt to discover trends and make estimates about the future of the federal debt.

Instructions

IMPORTANT: Complete the steps below in the order they are given. Completing the steps out of order may complicate the assignment or result in an incorrect result.

1. Download and extract the provided Data Files ZIP file. It contains the following files for use in this assignment:
   a. finances.csv – Statistics on federal revenue and debt from 1940 to 2016 [1].

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal Year</td>
<td>Number</td>
<td>Fiscal year of the data.</td>
</tr>
<tr>
<td>Debt</td>
<td>Currency</td>
<td>Amount of the federal debt.</td>
</tr>
<tr>
<td>Tax Revenue</td>
<td>Currency</td>
<td>Amount of income the federal government received from taxes for the specified year.</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>Currency</td>
<td>Total amount of income the federal government received for the specified year.</td>
</tr>
<tr>
<td>Interest Expenditures</td>
<td>Currency</td>
<td>Amount of money spent paying interest on the federal debt.</td>
</tr>
<tr>
<td>Total Expenditures</td>
<td>Currency</td>
<td>Total amount of money the federal government spent for the specified year.</td>
</tr>
</tbody>
</table>

2. Begin by creating a new Microsoft Excel workbook named lastnameFirstname_hw3_fbp.xlsx.

3. We must adjust the sheets in our workbook.
   a. Rename Sheet1 to Finances.
   b. Add a new sheet named Scenarios.
   c. Add a new sheet named Analysis Questions.
4. Import the following item into the workbook:
   a. `finances.csv` file – Import starting in cell A3 of the *Finances* sheet. The file is comma-delimited and has headers.

5. We wish to apply formatting to the *Finances* sheet.
   a. Create a table based on cells A3 through F80 using a style of your choice. The table has headers.

   The table will overlap external data ranges. Convert the selection to a table and remove all external connections.

   b. For the table, turn on the *First Column* option.

   c. Enter text in the cells as indicated below:
      i. A1: Federal Budget and Debt
      d. Merge (but not center) cells A1 through F1.
      e. Apply the *Heading 1* cell style to cell A1.
      f. Format the cells as indicated below:
         i. B4 through F80: currency with no decimal places

6. To better understand our data, we wish to create a PivotTable.
   a. Create a new PivotTable based on the data in cells A3 through F80 of the *Finances* sheet. Place the PivotTable on a new sheet named *Finances PivotTable*.

   b. On the PivotTable, do the following:
      i. Add the fiscal year as a *Rows* field.
      ii. Add the debt, tax revenue, total revenue, interest expenditures, and total expenditures as *Values* fields.

   c. We need to perform formatting on our PivotTable.
      i. Group the fiscal years into sets of 4 starting at 1940.
      ii. Summarize the debt, tax revenue, total revenue, interest expenditures, and total expenditures figures by averaging them.
      iii. Format the cells as indicated below:

         (1) *Average of Debt*, *Average of Tax Revenue*, *Average of Total Revenue*, *Average of Interest Expenditures*, and *Average of Total Expenditures* fields: currency with no decimal places
7. We also wish to apply formatting to the *Scenarios* sheet.
   
a. Enter text in the cells as indicated below:
   
i. **A1**: Budget Scenarios  
   
   ii. **A3**: Scenario  
   
   iii. **B5**: Annual Growth Rate  
   
   iv. **C5**: 2013–2016  
   
   v. **D5**: 2017–2020  
   
   vi. **E5**: 2021–2024  
   
   vii. **F5**: 2025–2028  
   
   viii. **G5**: 2029–2032  
   
   ix. **H5**: 2033–2036  
   
   x. **I5**: 2037–2040  
   
   xi. **J5**: 2041–2044  
   
   xii. **K5**: 2045–2048  
   
   xiii. **A6**: Total Revenue  
   
   xiv. **B6**: 4%  
   
   xv. **C6**: $3,095,495,000,000  
   
   xvi. **A7**: Total Expenditures  
   
   xvii. **B7**: 4%  
   
   xviii. **C7**: $3,650,090,000,000  
   
   xix. **A8**: Surplus  
   
   b. Merge (but not center) cells **A1** through **K1**.  
   
   c. Apply the *Heading 1* cell style to cell **A1**.  
   
   d. Apply background fill colors to the cells as indicated below:  
      
i. **A5** through **K5**: Blue, Accent 1, Lighter 40%  
   
      ii. **A8** through **K8**: White, Background 1, 25% Darker  
   
   e. Format the cells as indicated below:  
      
i. **B6** through **B7**: percentage with 2 decimal places  
   
      ii. **C6** through **K8**: currency with no decimal places  
   
   f. AutoFit the width of columns **A** through **B**. Set the width of columns **C** through **K** to 20 (1.72”).
8. On the Scenarios sheet, we wish to calculate information about possible revenue and expenses in the future.
   a. We wish to compute the surplus for each period. Enter the formulas in the cells as indicated below.
      i. C8: =C6-C7
      ii. C8 through K8: AutoFill the formula from cell C8.
   b. We want to estimate future budget scenarios.
      i. Enter the formula into the cell indicated below.

      **HINT:** To avoid errors, copy-and-paste the provided formula.

      (1) D6: =C6*(1+B6)^4

      ii. We must adjust the future values formula so its cell references are correct when the formula is copied.

      In cell D6, modify the cell references so they are column-absolute mixed or relative references as indicated:

      =C6*(1+B6)^4

      iii. We will now AutoFill the modified formula. Enter the formula into the cells as indicated below.

      (1) D6 through K7: AutoFill the formula from cell D6.

9. We will now evaluate two different scenarios for growth of the revenue and expenditures.
   a. The first scenario involves a 4% annual increase for each figure, which approximates the average CPI rate from 1940 to 2016.
      i. Enter text in the cells as indicated below:

      (1) A3: 4% Increase
      (2) B7: 4.00%

      ii. There is nothing to do for this step. Please proceed to the next step.
iii. Using Scenario Manager, create a new scenario named 4% Increase. Have the scenario work by changing the values of cells A3 and B7 to the values they contain now.

b. For the second scenario, we would like to achieve a balanced budget in the period 2045-2048 by controlling the growth of expenditures. We will assume that revenue will continue to increase at an annual rate of 4%.
   i. Enter text in the cells as indicated below:
      (1) **A3**: Controlled Expenditures
      (2) **B7**: 4.00%
   
      ii. Use Goal Seek to find an annual expenditures growth rate to achieve a surplus of $0 in cell K8. Have Goal Seek change the value of cell B7 until it locates the correct value.

      **HINT**: You may have run Goal Seek multiple times for it to find the correct growth rate to yield a $0 surplus.

   iii. Using Scenario Manager, create a scenario named Balanced Budget. Have the scenario work by changing the values of cells A3 and B7 to the values they contain now.

10. We need to set up the *Analysis Questions* sheet so that it can store responses to the analysis questions.
   a. Enter text in the cells as indicated below:
      i. **A1**: Question Number
      ii. **B1**: Response
   
      b. Bold the contents of row 1.
   
      c. AutoFit the width of column A. Set the width of column B to 100 (8.39”).
   
      d. Set the height for rows 2 through 5 to 110 (1.53”).
   
      e. Change the vertical alignment setting for columns A and B so that text is displayed at the top of each row.
   
      f. Turn on text wrapping for column B.

11. Starting in row 2 of the *Analysis Questions* sheet, answer four of the five analysis questions below. Respond to one question per row.
   a. The federal debt grew sharply in the 1940s, late 1970s, and 1980s. List a reason for the increase in each period.

   b. Why may it be harder to balance the budget (where revenue is at least equal to expenditures) if there is a large federal debt?
c. There have been proposals to require the federal government to have a balanced budget (where revenue is at least equal to expenditures). Name one positive benefit and one negative drawback of requiring balanced budgets.

d. From 2005-2016, the federal debt increased at an annual rate of 8.61% but interest expenditures only increased by 3.21% annually. How is this possible?

e. From 1940 to 2016, total revenue declined 13 times. Yet, total expenditures dropped only 3 times. Why is it difficult to cut government expenditures to match reduced revenue?

Grading Rubric

This assignment is worth 50 points. It will be graded by your instructor using this rubric, with partial credit awarded as appropriate:

<table>
<thead>
<tr>
<th>Steps 3a-c</th>
<th>1 points total</th>
<th>Steps 8a-b</th>
<th>6 points total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 4</td>
<td>2 points</td>
<td>Steps 9a-b</td>
<td>10 points total</td>
</tr>
<tr>
<td>Steps 5a-g</td>
<td>4 points total</td>
<td>Steps 10a-f</td>
<td>3 points total</td>
</tr>
<tr>
<td>Steps 6a-c</td>
<td>10 points total</td>
<td>Steps 11a-e (pick 4 of 5)</td>
<td>2.5 points each</td>
</tr>
<tr>
<td>Steps 7a-f</td>
<td>4 points total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The analysis questions in Steps 11a-e will be evaluated using this rubric:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Meets Requirements (1.25 points)</th>
<th>Does Not Meet Requirements (0 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer is reasonable.</td>
<td>Answer addresses the question prompt and is factually correct or a reasonable interpretation of available data.</td>
<td>Answer does not address the question prompt, is factually incorrect, or is an unreasonable interpretation of available data.</td>
</tr>
<tr>
<td>Answer is supported.</td>
<td>Logical rationale is provided to support the given answer.</td>
<td>Logical rationale is not provided to support the given answer.</td>
</tr>
</tbody>
</table>

References