

- Question 1

1 point

How Did I Do?

The numbers used in the Trust Funds Model from this lesson are, of course, just estimates. Let's investigate what happens if these estimates are off by 10%. To do so, answer the following questions:

Using a starting value of \$3 trillion in the trust funds in 2032, with an annual rate of decline of 8.7%, how much money will be in the funds in 2040?

Round to the nearest billion.

\$ billion

- Question 2

2 points

How Did I Do?

Suppose that the funds do not reach \$3 trillion by the year 2032, but instead only get to 10% less than \$3 trillion. In the questions below, consider how this new starting value affects the estimated value of the funds in 2040.

Make sure that you fill in each answer area before checking "How Did I Do?".

a. What is the new estimated value of the trust funds in 2040?

Round to the nearest billion.

\$ billion

b. Complete the following sentence to compare this result to your calculation in OCE Question 1.

Round to the nearest whole percent.

"With a starting value 10% less than \$3 trillion, the estimated value in 2040 is % less than the estimated value in 2040 with a starting value of \$3 trillion."

- Question 3

2 points

Let us assume an original starting value of \$3 trillion in 2032, but that the actual rate of decline after 2032 was 10% greater than the 8.7% rate. (Notice that this refers to a 10% relative increase over the 8.7% rate of decline that was originally estimated in the lesson, and not an absolute increase of 10 percentage points.) In the questions below, consider

- Question 3

2 points

How Did I Do?

Let us assume an original starting value of \$3 trillion in 2032, but that the actual rate of decline after 2032 was 10% greater than the 8.7% rate. (Notice that this refers to a 10% relative increase over the 8.7% rate of decline that was originally estimated in the lesson, and not an absolute increase of 10 percentage points.) In the questions below, consider how this would affect the estimated value of the funds in 2040?

Make sure that you fill in each answer area before checking "How Did I Do?"

a. What is the new estimated value of the trust funds in 2040?

Round to the nearest billion.

\$ billion

b. Complete this sentence to compare this result to your calculation in Question 1 above.

Round to the nearest whole percent.

"The estimated value in 2040 after a yearly decline of 9.57% is % less than the estimated value in 2040 after a yearly decline of 8.7%."

- Question 4

1 point

How Did I Do?

Now let us assume the starting value of the funds was 10% less and the rate of decline was 10% greater than was estimated in the lesson. What is the estimated value of the trust funds in 2040?

Round to the nearest billion.

\$ billion

- Question 5

3 points

How Did I Do?

Read the following article. Use the quantitative information in the article to answer the questions below.

Berlin Owes Mittenwalde, Small German Town, Trillions On 450-Year-Old Loan[†]

(Reporting by Sophie Duvernoy, editing by Paul Casciato)

BERLIN, July 18 (Reuters) - The sleepy hamlet of Mittenwalde in eastern Germany could become one of the richest towns in the world if Berlin were to repay its outstanding debt that dates back to 1562. A certificate of debt, found in a regional archive, attests that Mittenwalde lent Berlin 400 guilders on May 28 1562, to be repaid with six percent interest

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BERLIN, July 18 (Reuters) - The sleepy hamlet of Mittenwalde in eastern Germany could become one of the richest towns in the world if Berlin were to repay it an outstanding debt that dates back to 1562. A certificate of debt, found in a regional archive, attests that Mittenwalde lent Berlin 400 guilders on May 28 1562, to be repaid with six percent interest per year.

According to Radio Berlin Brandenburg (RBB), the debt would amount to 11, 200 guilders today, which is roughly equivalent to 112 million euros (\$136.79 million). Adjusting for compound interest and inflation, the total debt now lies in the trillions, by RBB's estimates.

Town historian Vera Schmidt found the centuries-old debt slip in the archive, where it had been filed in 1963. Though the seal is missing from the document, Schmidt told Reuters that she was certain the slip was still valid. "In 1893 there was a debate in which the document was examined and the writing was determined to be authentic," Schmidt said.

Schmidt and Mittenwalde's Mayor Uwe Pfeiffer have tried to ask Berlin for their money back. Such requests have been made every 50 years or so since 1820 but always to no avail. Reclaiming the debt would bring significant riches to Mittenwalde, a seat of power in the middle ages, which now has a population of just 8, 800. Red brick fragments of medieval fortifications still dot the leafy town centre.

The town's Romanesque church was once the provost seat for Paul Gerhardt, one of Germany's most prolific hymn writers. Gerhardt, who lived there briefly in the 17th century, is the only noted Mittenwalde resident to date.

Schmidt and Pfeiffer met with Berlin's finance senator Ulrich Nussbaum, who ceremonially handed them a historical guilder from 1539. The guilder was put in a temporary display at the Mittenwalde museum. "This case shows that debts always catch up with you, no matter how old they are," Nussbaum told the Berliner Zeitung paper.

The debt-laden German capital would have difficulty meeting Mittenwalde's demands anyway. According to a report released by the senate finance administration in June 2012, Berlin is already close to 63 billion euros in the red.

Note: \$1 = 0.8188 euros.

Make sure that you fill in each answer area before checking "How Did I Do?".

- a. Using information in the first paragraph of the article, create a model for the value of the loan over time, using simple interest, in guilders. Use A for the value of the loan and t for the number of years since the loan begin.

Hint: The value of loan is the principal (or amount) of the loan plus any interest earned, or $A = P + I$. Also recall the simple interest formula is $I = Prt$, where I is the interest earned, P is the principal (or amount) of the loan, r is the annual interest rate in decimal form, and t is the number of years.



- b. Create a model for the value of the loan using compound interest, compounded annually, in guilders.



- c. Using these models, critique the accuracy of the quantitative information in the second paragraph of the article.

$\frac{A}{B}$

Ω

Σ

Equation Editor

A

A_x

I_x

B

I

U

S

x_2

x^2

Styles

Font

Size

Words: 0