

What-If Analysis: Using Decision-Making Tools

Personal Finance: Buying Your First Home

You are considering different options for buying your first home. Using one- and two- variable tables, you will compare how different interest rates and down payments will affect your monthly payment. Afterwards, you will use Goal Seek to work backward to find the maximum loan amount to fit your budget and Scenario Manager to compare results based on changes to home purchase price, down payment, and financing.

One- and Two-Variable Data Tables

You will compare monthly payments, total amounts to repay the loan, and total interest you will pay by varying the interest rates.

1. Enter Substitution Values for a One-Variable Data Table

- a. Open the *exp2010_e06_script_homeloan* workbook and save it as **exp2010_e06_script_solution1**.
- b. Click **cell D4**, type **4%**, and then press **Ctrl+Enter**.
- c. Click **Fill** in the Editing group on the Home tab, and then select **Series**. Click **Columns**.
- d. Delete the existing value in the **Step value box**, and then type **0.25%**. Type **6%** in the **Stop Value box**, and then click **OK**.
- e. Select the **range D4:D12**, and then click **Increase Decimal** twice in the Number group. Save the workbook.

2. Enter Formulas and Complete the Data Table

- a. Click **cell E3**, type **=B12**, and then press **→**; type **=B13** and then press **→**; type **=B14** and then press **Enter**.
- b. Select the **range D3:G12**.
- c. Click the **Data tab**, click **What-If Analysis** in the Data Tools group, and then select **Data Table**. Click in the **Column input cell box**, click **cell B4**, and then click **OK**. Save the workbook.

3. Format the One-Variable Data Table

- a. Select the **range E4:G12**, click the **Home tab**, and then click **Accounting Number Format** in the Number group.
- b. Click **cell D3**, type **APR**, and then press **→**.
- c. Click the **Format Cells Dialog Box Launcher** in the Number group. Select **Custom** in the **Category list**, scroll up through the **Type list**, and then select **General** in the list. Select **General** in the Type box, type **"Payment"**, and then click **OK**.
- d. Repeat and adapt step c using **"Total Repaid"** for **cell F3** and **"Total Interest"** for **cell G3**, making sure not to forget the quotation marks.
- e. Center and bold the **range E3:G3**. Save the workbook.

4. Set Up the Structure for a Two-Variable Data Table

- a. Enter **240000**, **300000**, and **360000** in the **range J3:L3**. Format these values with **Accounting Number Format**. Widen columns J through L.
- b. Click **cell I4**, type **4.5%**, and then press **Ctrl+Enter**.
- c. Click **Fill** in the Editing group, select **Series**, and then click **Columns**. Replace the existing value in the **Step value box** with **0.125%**, type **6.5%** in the **Stop value box**, and then click **OK**.
- d. Format the **range I4:I20** with **Percent Style** with three decimal places.

- e. Click **cell I3**, type **=B12**, and then press **Ctrl+Enter**. Save the workbook.

5. Complete the Two-Variable Data Table

- a. Select the **range I3:L20**. Click the **Data tab**, click **What-If Analysis** in the Data Tools group, and then select **Data Table**.
- b. Click **cell B2** to enter that cell reference in the **Row input cell box**. Click in the **Column input cell box**, click **cell B4**, and then click **OK**.
- c. Click **cell I3**, and then apply a custom number format to display *APR*. Center and bold **cell I3**.
- d. Save the workbook. Keep the workbook onscreen to continue. Otherwise, close the workbook and exit Excel.

Goal Seek and Scenario Manager

Next, you will use goal Seek and Scenario Manger to perform additional what-if analyses with your home loan data.

1. Using Goal Seek

- a. Open the *exp2010_e06_script_solution1* workbook and save it as **exp2010_e06_script_solution2**.
- b. Click the **Data tab**. Click **What-If Analysis** in the Data Tools group, and then select **Goal Seek**.
- c. Click **B12** to enter the cell reference in the **Set cell box**. Click in the **To value box**, and then type **1478**. Click in the **By changing cell box**, and then click **cell B2**.
- d. Click **OK**, and then click **OK** to accept the solution and to close the Goal Seek Status dialog box.
To achieve a monthly payment of \$1,478, the purchase price would be \$253,620.72 instead of \$300,000, assuming the interest rate and the number of payments remain the same.
- e. Save the workbook.

2. Create a Scenario

- a. Click the **Data tab**, if necessary, click **What-If Analysis** in the Data Tools group, and then select **Scenario Manager**. Click **Add**.
- b. Select any content in the **Scenario name box**, and then type **Best-Case Scenario**. Delete the contents in the **Changing cells box**, and then select the **range B2:B5**. Edit the **Comment box**, if needed, to display your name and the date the scenario is created. Click **OK**.
- c. Type **300000** in the **\$B\$2 box**, and then press **Tab** twice to accept the current down payment of *20000*. Type **4.5%** in the **\$B\$4 box**. Click **OK**, and then click **Close**. Save the workbook.

3. Create Additional Scenarios

- a. Click **What-if Analysis** in the Data Tools group, and then select **Scenario Manager**.
- b. Click **Add**, type **Worst-Case Scenario**, and then click **OK**.
- c. Type the following values in the respective changing cells boxes:

Changing Cell Box	Value
\$B\$2	300000
\$B\$3	25000
\$B\$4	6.5%
\$B\$5	20

- d. Click **Add**. Type **Most-Likely Scenario** and click **OK** in the Add Scenario dialog box. Type the following values in the respective changing cells boxes:

Changing Cell Box	Value
\$B\$2	275000
\$B\$3	19000
\$B\$4	4.75%
\$B\$5	20

- e. Click **OK**. Click **Close** to close the Scenario manager dialog box. Save the workbook.

4. Generate and Format a Summary Report

- Click **What-If Analysis** in the Data tools group, and then select **Scenario Manager**. Click **Summary**.
- Select the **range B12:B14** to enter it in the **Result cells box**, and then click **OK**. Excel generates a new worksheet named *Scenario Summary*.
- On the new Scenario Summary sheet, delete the following: Column A, Row 1, the Current Values column, and the **range A13:A15** (the notes).
- Enter descriptive labels in the following cells:
 - **Cost of Home** in cell **A5**
 - **Down Payment** in cell **A6**
 - **APR** in cell **A7**
 - **Years** in cell **A8**
 - **Monthly Payment** in cell **A10**
 - **Total to Repay Loan** in cell **A121**
 - **Total Interest Paid** in cell **A12**
- Delete Column B, and then increase the width of column A.
The Best-Case Scenario provides the lowest monthly payment.
- Save the workbook. Keep the workbook onscreen to continue. Otherwise, close the workbook and exit Excel.