Exercise 4: The *BenCalc* function

Implementing a reform using *BenCalc*

# Objectives

* Use the *BenCalc* function to add a supplement to child benefit worth up to £30 per week payable to benefit units with at least two dependent children to the 2026 tax and benefit system for the UK. The supplement should be withdrawn until it is exhausted at the rate of £1 per week for each £10 of employment earnings per week, on any employment earnings in excess of £20,000 per year.
* Analyse effects of the reform.

# Directions

We will implement the new reform by extending child benefit and use the Statistics Presenter to analyse the associated effects.

* Open UKMOD and access the UK policy descriptions.
* Copy the *UK\_2026* system and call the copy *UK\_2026\_ex4*.
* Open the child benefit policy (*bch\_uk*).
* Append a new *BenCalc* function to the *bch\_uk* policy.
  + Use the default parameters provided for *BenCalc* to add a supplementary benefit worth £30 per week for all benefit units with at least two dependent children (mirroring the policy considered in Exercise 3).
  + Add *Withdraw* parameters to the new *BenCalc* function to allow for means-testing of the supplementary benefit.
* Save the model changes.
* Run both *UK\_2026* and *UK\_2026\_ex4*.
* Use the Statistics Presenter’s *Baseline/Reform* template to analyse the distributional effects.

Exercise 4: The *BenCalc* function

Step-by-step solutions and further information

# Step 1: Add a new system

*This step is the same as for Exercise 1 – see the notes to that exercise for extended details.*

* Open the UK model, by clicking on the UK country flag.
* To work more easily with the *UK\_2026* system, limit the display by right-clicking on the system name (*UK\_2026*), selecting *move to hidden system box* and then selecting *all systems but selected*.
* Right-click the system heading (*UK\_2026*) and select the option *copy/paste system*, entering the new system name *UK\_2026\_ex4*.
* Access the search and replace tool by pressing Ctrl+F to find the policy *bch\_uk*.

# Step 2: Implement the desired reform

*NOTE: You should analyse the existing description of policy bch\_uk before attempting to alter it.*

We will append the supplementary benefit to the existing code. We will do this in two stages. The first will involve replicating the reform we considered in Exercise 3 using the default parameter set of the *BenCalc* function, rather than the *Elig* and *ArithOp* functions. In the second stage we will extend the *BenCalc* function to allow for the means-test to which the supplementary benefit is subject.

## Adding the *BenCalc* function

* Right-click on the *BenCalc* function in the *bch\_uk* policy.
* Select the option *Add Function After*.
* Select the function *BenCalc*.

Figure 1: Adding the BenCalc function

A screenshot of a computer

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* Set the new *BenCalc* function to “on” in the *UK\_2026\_ex4* system.
* Set the parameter *Comp\_Cond* to *nDepChildrenInTU >* 1 in the *UK\_2026\_ex4* system.
  + This limits evaluation to units with at least 2 dependent children.
* Set the parameter *Comp\_perTU* to 30#w in the *UK\_2026\_ex4* system.
* Change *Output\_Var* of the new *BenCalc* function to *Output\_Add\_Var* by clicking on it and selecting “OK” in the resulting pop-up window.
* Set the *Output\_Add\_Var* of the new *BenCalc* function to *bch\_s* in the *UK\_2026\_ex4* system.
* Set the *TAX\_UNIT* of the new *BenCalc* function to *tu\_bu\_uk* in the *UK\_2026\_ex4* system.

Up to this point, we have re-created the reform considered in Exercise 3, but using the *BenCalc* function in place of the *Elig* and *ArithOp* functions.

Figure 2: Filling in the default parameters of the BenCalc function

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## Extending the *BenCalc* function to reflect means-testing

* Right-click on the function or a parameter name of the new function *BenCalc* and select *Show Add Parameter Form*.
  + The *Add Parameter* form can also be accessed via the keyboard shortcut Ctrl+A
* In the *Add Parameters* form select the parameters *Withdraw\_Base, Withdraw\_Rate,* and *Withdraw\_Start* and click the *Add* button.

Figure 3: Adding BenCalc parameters to control means-testing

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* Set *Withdraw\_Base* parameter to *yem* in the *UK\_2026\_ex4* system.
* Set *Withdraw\_Rate* parameter to 0.1.
* Set *Withdraw\_Start* parameter to 20000#y
  + #y denotes per year.
  + TIP: You can quickly access the help menu for any term in the policy spine by selecting the term and pressing F5.

Figure 4: The completed BenCalc function

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*Recall that it does not matter where the above parameters appear within the BenCalc function.*

# Step 3: Run the model and analyse the output

*This step is similar to Exercise 2 – see the notes to that exercise for extended details.*

* Save the model.
* Run the model for the two systems of interest (*UK\_2026* and *UK\_2026\_ex4*).
  + Remember to change the Dataset to *training\_data*.
* Start the Statistics Presenter and select the Baseline/Reform template.
* Select output data to assume for the *baseline* and *alternative* scenarios.
* Inspect the results.

Figure 5: Inspect the results

A screenshot of a computer screen

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