

Final balancing:

The residuals left for final balancing:

It is, in most cases, sufficient to bring column totals for input within a relatively small distance from the target value during manual balancing. Exactly how close will depend on the size of the target value. It is generally recommended, that distances from column-totals to their targets are brought within a value of 5 to 10 m.JD. , but for small targets the distance should also be below 10 % of the target value.

The acceptable distance to targets will, however, also depend on the accuracy of the information provided by primary statistics for the industries in question.

- Known and reliable values from primary statistics should as far as possible be retained during balancing. If such values are excluded from automatic adjustments, only a limited number of inputs may be left available for automatic adjustments. Where this is the case it is advisable to bring total input very close to the target by manual corrections to avoid that automatic adjustments introduces random unwanted changes in the input structure for those products. If necessary, a change in the input-target may be preferred to a solution that would leave the industry with an improbable input structure.
- Where, on the other hand, source data is of a comparatively poor quality or the values known from source data are somewhat lower than the grossed-up values shown as estimated inputs, the feasible solution is to include most of the inputs in automatic adjustment of input totals to their targets. The automatic adjustments will then be distributed over a large number of inputs and the input structure will probably not be changed significantly.

Redistribution of products between industry-inputs and final uses:

In the first phase in the automatic final balancing, it is often appropriate to redistribute products between inputs in a number of industries -and possibly also some final uses – to eliminate residual distances to their column targets. Using the Excel macro system, a tool for redistribution is invoked by pressing the button named “Vertical-horizontal adjustment”. *An explanation on how to use the toolbar-buttons of this system can be found in the document: “Use of buttons.docx”.*

Eliminating a number of distances by an automatic redistribution requires that for those columns included in the redistribution the distances sums up to a value close to zero. It may be difficult to select columns that fulfil this requirement, even after some further manipulation of the affected values. A solution can be to allow a few columns to differ from their targets. The targets of these columns can be (temporarily or permanently) adjusted in a way that will ensure that the remaining differences sum up to zero as required.

- Before invoking the automatic adjustment, one should consider which cells on the uses side should be included or excluded from the adjustment. Typically one will open the sheet showing uses at purchasers’ values and mark the relevant areas. This can be done in two ways:
 - When one wish to retain the values of specific cells as predetermined values, the figures within such cells should be shown as italicized. It can be done by changing the font in the worksheet, but it is a good habit to show such values as italics already in the input sheets used to enter the data into

the SUT-framework. The italicized figures will stay italicized when stored, and they will stay that way until they for some reason are changed back to non-italicized numbers. Italicized numbers are never changed automatically!

- However, the common method to delimit the areas to be included in adjustments is the manual selection of the respective areas in the purchasers' price sheet. The selection can be done the usual way by area-selection while pressing the Ctrl-key. When selecting multiple areas, one will probably find it difficult to hit all the chosen areas one at a time without hitting a wrong cell now and then. An easier method is to mark all cells that should be included by a common colour. This colouring can be edited until it is found to be satisfactory. Then one of the coloured cells should be selected and the third button named "Select cells marked with colour" in the same toolbar should be pressed. This will select all cells with the same colour.

Adjustment of margins, net taxes on products and VAT to their targets.

Target values for trade and transport margins are determined by the production of trade and transport services that are not distributed as use in basic prices. Targets for taxes less subsidies on products and for VAT are based on figures from the accounts of general government. The values in the margin-, tax- and VAT- layers that were a result of the initial calculations did not necessarily add up to the targets for these values even though the distances from actual layer-totals to their targets should preferably have been brought within acceptable limits already at the start of manual balancing.

Margins, net taxes on products and VAT that are calculated automatically by formulas may be distributed by two different methods:

- In a layer where total "supply" is assumed to be known for each product, one can prefer to enter the known values as constants in the "bridge column" and to use formulas that will distribute the value from the bridge column by the uses that receive the product in the purchasers' price layer. Here it is ensured that the values in the layer will always sum up to the layer-target, but the distribution by uses will of course change when manual corrections are made to the purchasers' price layer. This method is particularly relevant for net taxes.
In the Jordanian SUT the method is only used to calculate the distribution of net taxes. One could, alternatively, choose to use this method also for trade- and transport margins, if they can be distributed by products before the start of manual balancing. On the other hand this method will usually be inappropriate for VAT because total VAT for each product is determined by whether the users of the product can deduct ingoing VAT or not. Hence total VAT for a specific product should be allowed to change with the manual redistribution of its value at purchasers' prices.
- The other method is to use formulas based on margin- or tax-percentages that reflect the best possible estimates for each cell in the respective layer. The formulas must ensure that the percentages can be adjusted proportionally by a common correction. As a starting point the percentages should be left with their uncorrected values. The bridge column should contain formulas that calculate the actual sum of uses for each product. In the final balancing the correction should be given a size that will remove the distance between the layer-total and the layer-target.

When, during the balancing process, products are redistributed between uses, the values within each layer will usually fluctuate due to the fact that margin percentages and tax-rates vary between different uses. Hence it would seldom be very useful to try to balance supply and use for margins, taxes or VAT while these corrections are taking place.

It may, however be appropriate to adjust some or all margin percentages/average tax rates before the final adjustments of column totals. If distances from area-totals to their targets have been accumulating during balancing, the observed distances from column-totals to targets may be misleading as they will change by the moment when margins, net-taxes and VAT are finally adjusted.

Within the Excel –framework adjustment to the layer totals can be carried out using a number of “handles”:

- It is possible to adjust the individual average margin- or VAT-percentages used in the calculation for specific products. *These percentages are placed in a column to the right of the column for total use in the sheets where the calculation takes place. For VAT this is the “VATrate” sheet.* This solution is particularly relevant where the sum of wholesale or retail trade margins now differ from good estimates of the margin totals. To the extent that differences can be removed by bringing actual margins closer to their original targets the need for general adjustment to all trade margins may be reduced.
- When the possibilities for correction of margins or VAT for individual products have been explored, it is possible to introduce general adjustments to all cells with margins or VAT (except those that for particular reasons have been fixed as constants). *Such adjustment percentages are placed above the columns with percentages for individual products, in the present Jordanian SUT-workbook in cell “FP5” of the sheets “Wholesale”, “Retail” and “VATrate”.*
- The size of adjustments required to balance supply and use for layers can be determined by a try-and-error guessing procedure. It is, however, easy to find adjustment percentages that completely remove the layer-differences by use of Excel’s goal-seeking facility.
- When it is the purchasers’ price layer that contain constant values, while the lower layers are calculated by formulas, the sequence of adjustments to layer-totals should be:
 1. VAT
 2. When net taxes are balanced automatically by the formulas, there is no need for further balancing of this layer. Otherwise net taxes should be balanced after VAT.
 3. Retail trade margins
 4. Wholesale trade margins

When this is done, balanced basic prices are calculated automatically.
- Further adjustments to column-totals will create new differences between layer-supply and -use that will need to be removed by small changes to the correction percentages. These reappearing differences can usually be reduced to an insignificant size by a few consecutive rounds of column and layer adjustments. In the end remaining insignificant residuals can be eliminated by a few manual adjustments.

Final removal of unwanted differences between column totals and targets:

In practice it is impossible to remove all differences between column totals and their targets and all differences between supply and use for products simultaneously. As it has been mentioned above there are cases where an adjustment of the column target is more appropriate. Even when these targets are modified, it is still necessary to decide on the columns that will need to be fully adjusted to their target and the columns that should be allowed to end up with differences between total and target.

- As targets for intermediate consumption is usually based on comprehensive knowledge on business accounts, government accounts or other reliable sources the differences to these targets should usually

be removed. On the other hand input-targets for some industries are based on less reliable sources and it would seem inappropriate to insist that such target should be binding for the balancing.

- Targets for final use of non-market services are determined by the output of such services. The column-totals are here predetermined and cannot – and should not – be changed during final balancing. If differences should turn up here, they are the result of errors in the calculation of the respective column-targets.
- The values at purchasers' prices in the columns for changes in inventories and exports should as a general rule not participate in the final balancing. Where adjustments to these values seemed well founded they should have been entered as manual corrections at an earlier stage. Trade margins and net taxes may on the other hand contribute to the necessary overall adjustments to these layers as long as their purchasers' price values are untouched.
- Targets for household final consumption and gross fixed capital formation are usually based on comparatively weak source data. The original targets for household consumption are in most cases based on sample HBS-data grossed up to cover all households plus estimated outlays by foreign travelers. Furthermore the HBS may not be completely representative and can typically underestimate consumption of e.g. restaurant services. Targets for GFCF often have bad coverage, specifically of newly started enterprises. It is obvious that column targets should in the end be allowed to deviate from their targets here.

Which totals are usually adjusted to their targets during final balancing?

	Trans.	Industry	Reliability:	Category:
Intermediate consumption:				
Most industries:	2000	-	High	Adjust to target
Construction	2000	45	Uncertain	Allow distance to target
Trade - Land transport	2000	51-60	Uncertain	Allow distance to targets
Real estate services	2000	70	Uncertain	Allow distance to target
Other business services	2000	74	Uncertain	Allow distance to target
Household final consumption:				
Domestic use	3110	-	Uncertain	Allow distance to target
Cons. of resid. househ.in ROW	3110	128	High	Use is predetermined
Cons. of nonres. on dom.territory	3110	129	High	Use is predetermined
Final consumption of NPISH's	3130		High	Use is predetermined
Indiv. consumption of Gen.Gov.	3140	-	High	Uses are predetermined
Collective consumption	3200	-	High	Uses are predetermined
Gross Fixed Capital formation	5111-5123		Uncertain	Allow distance to targets
Changes in inventories	5210-5249		?	Uses are predetermined
Acquis.less disp. of valuables	5300		Uncertain	Allow distance to targets
Exports	6000		High	Use is predetermined

Where all products in a column are predetermined the column-total cannot be adjusted to a target that is different from the actual total. In such cases the targets are in practice determined by the column-total. Totals may of cause be adjusted to their targets even where distances are acceptable if there is no need to leave them with a distance. On the other hand it can be necessary to accept distances for some industry inputs if the alternative is destruction of a credible input structure.

To make sure that column totals are adjusted to the targets that are deemed reliable a final vertical adjustment can be performed for these columns. This will necessarily create new differences between supply and use for products that participate in this adjustment. Such differences can finally be removed by a horizontal distribution of the differences over the uses that are not fully adjusted to their targets. It is, however, necessary to take into account whether the final horizontal distribution of each specific product is possible and can take place without introducing significant or incredible disturbances to the structure within the columns that are not adjusted to their targets. To avoid this, the vertical adjustments to targets should be limited to products for which the uses outside the vertically balanced columns have a sufficiently high value.

In the Excel environment this is ensured in the following way:

- The columns that shall be vertically adjusted to their targets are selected. Within these columns the products for which the residuals cannot be distributed on other uses are deselected.
- With the resulting selection a vertical distribution is performed using the tool for automatic balancing (When the button “Vertical/Horizontal adjustment” is pressed, “Vertical” adjustment is selected)
- Now the columns allowed to differ from their targets are selected. If specific values should be kept constant at their present value, they are either marked as predetermined values or they are deselected. It is also appropriate to deselect products that are still fully balanced. With selection of the remaining areas, a horizontal adjustment is performed (When the button “Vertical/Horizontal adjustment” is pressed, “Horizontal” adjustment is selected with a number of iterations sufficient to remove the differences between supply and use)
- It may be necessary to make a new adjustment to margins and/or VAT followed by a new final adjustment. Usually it is however at this stage sufficient to make a few manual adjustments to household consumption and/or GFCF to ensure complete balancing of all layers without creation of new differences to column-targets within the industries that are completely adjusted to their targets.