

SAM jobs

The interactive tool shows the variation in the number of jobs (total in the economy and for each sector or aggregate) generated by an exogenous demand shock due to changes in external trade, investment and/or public expenditure. For simplicity, it is assumed that all the shocks are allocated in the final value (purchaser's prices) of the exogenous demand of the corresponding commodity.

Data and methodology

The application is based on the Social Accounting Matrices (SAMs). The detailed process of elaboration and estimation of these SAMs can be consulted in corresponding report.

Jobs multipliers are calculated starting from the following equilibrium equation:

$$\mathbf{x} = \mathbf{Ax} + \mathbf{y} \leftrightarrow \mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{y} = \mathbf{My}$$

where \mathbf{x} is the vector of total gross output and \mathbf{y} is the vector of final demand variables where a shock can be introduced. \mathbf{A} is the matrix of total coefficients in the SAM framework where each representative element i,j shows the share of payments $x_{i,j}$ of a sector j in another sector i on the total expenditures of sector j (x_j). \mathbf{M} is the matrix of SAM accounting multipliers and each element $m_{i,j}$ shows the variation in output of account i generated by an unitary increase in exogenous final demand of account j . To obtain employment multipliers, a vector \mathbf{e} that contains the ratios of the number of jobs per output value is required. The diagonal version of \mathbf{e} , matrix \mathbf{E} , is multiplied by the part of the multiplicative decomposition called \mathbf{Ma} , which incorporates the rows corresponding to the productive accounts. The expression of the employment multiplier, \mathbf{Me} , is given as:

$$\mathbf{Me} = \mathbf{E Ma}$$

Each element i,j in \mathbf{Me} is the increment in the number of jobs of the account i generated by an unitary increase in exogenous final demand¹ of account j .

¹ For example, if the employment multiplier value of commodity A on activity B is 3.1, this indicates that an increase in exports of A of one million units in SAM base year would generate 3.1 jobs in activity B.

How to use the tool

The tool provides the number of jobs generated by an exogenous final demand shock for selected commodities. This includes direct and indirect (i.e., after feedback) effects. The shock can be introduced as a percentage increase/decrease in the initial value of final demand or as an increase/decrease in absolute value (different units of currency, depending on country or zone) in final demand. Shocks can be introduced in several sectors at the same time as the effects are independent of each other. Although the demand shock may refer to trade, investment or public expenditure, for the sake of simplicity, the shocks in percentage form are calculated, taking as a reference, the value of exports in SAM base year. Results show the variation in the number of jobs for each of the sectors of activity concerned and the aggregate variation (total jobs, jobs in the main productive sector of the commodity, jobs in the other sectors).

Main caveats

The results are subject to several assumptions and do not take into account variations in other socio-economic variables. Therefore, results should not be taken as an accurate forecast of job creation due to external shocks but as an indicator of which commodities have the highest employment potential and in which sectors.

First, the limitations inherent in the use of linear multi-sectoral models (in this case linear multipliers) instead of nonlinear models should be considered. Among them, constant (fixed) prices and fixed technology production functions (Leontief type) are strong assumptions that simplify the application and make the understanding of results coming from this tool intuitive, but is somewhat restrictive compared with real world economic systems.

The second main caveat refers to the benchmark year. The Employment/Output ratios used in this tool to obtain Employment Multipliers are estimated for the benchmark year of each SAM and the introduction of shocks simulations based on a different point in time does not take into account the changes on commodity prices, nor variations in labour productivity. Both effects can impact significantly on the final size of the employment multipliers (even if results remain unchanged from a qualitative point of view). This is an area which requires further research.