

Documentation for BLS

Employment Requirements and Total Requirements Tables

Prepared in the
BUREAU of LABOR STATISTICS
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Introduction

Requirements tables allow researchers to estimate the economic repercussions resulting from a change in demand. Direct impacts occur in the industry in which the purchase is made. For example, if one wanted to measure the impact of purchasing one million dollars of motor vehicles, the direct impact will be in the motor vehicle industry. But many indirect purchases go into supporting the manufacturing of the vehicles. For instance, the automobile industry will need to purchase steel from the steel industry as an input into its production process. Therefore, the buying of an automobile benefits both the automotive and steel industries, and many other industries. The requirements tables estimate the effects of the entire production process including all inputs, direct and indirect, used in making the product or service.

The Employment Projections Program at the Bureau of Labor Statistics estimates both the Employment Requirements and Total Requirements. Like the rest of the Employment Projections Program's input-output data, these tables rely heavily on publications by the Bureau of Economic Analysis (BEA). The BEA data, however, does not include any employment measures. Therefore, BEA input-output data is either aggregated or disaggregated by BLS, depending on whether the data is from a BEA benchmark year or not, to a sectoring plan that is consistent with employment estimates as published by BLS projections program. Consequently, in addition to the I-O tables released by BEA, BLS includes employment requirements tables by applying an employment-output ratio to the total requirements tables.

Tables are provided for annual historical years as published in our latest projections release, currently 1997 through 2022, in both nominal (current) and chain weighted real 2012 dollars.

Interpreting the Requirements Tables

The total requirements table shows total production required directly and indirectly for each industry on the columns when 1 million dollars of that industry's primary commodity production is purchased as final demand. The cell in the table where industry is the same as commodity, the diagonal on the matrix, shows direct requirements. Indirect requirements are represented by all non-diagonal elements for each column and are commodity inputs from production processes of other industries.

Similarly, the values, measured in thousands, in each cell of an industry's column in the employment requirements table show employment supported directly and indirectly per \$1 million of sales of that industry's commodity output to final users.

BLS publishes only domestic total requirements table. To arrive at domestic estimates, BLS starts with the Use table and factors out imports. This process is done by finding the import ratio, imports as a share of commodity output less imports less exports. This ratio is then applied to the intermediates part of the Use table. The final demand vector is adjusted to offset the change to intermediates, so commodity output is unchanged. Once the domestic Use table is ready, the total requirements table is estimated.

The domestic adjusted total requirements (and accordingly domestic employment requirements) allow researchers to use a vector of final demand purchases to study the impacts of an alternative final demand scenario. Without making the domestic adjustment, the economic impact is overstated. For this reason, BLS chooses only to publish the domestic adjusted tables.

Employment in each table is based on a count of jobs and is not based on a full-time equivalent basis. The job count includes wage and salaried workers as well as self-employed workers. All data are rounded up to eight decimal places. Therefore, they may not add exactly to their totals due to rounding error.

The input-output tables, and thus the requirements tables, are based on the 2022 North American Industry Classification System (NAICS). The BLS industry sectoring plan in the file called "SectorPlan30.xlsx" shows the NAICS content of each BLS sector whether viewed as an industry or commodity.

Input Data Requirements

When calculating an impact analysis study, a vector of final demand measured in producer's values is required as an input. Sales must be valued at the site of production (producers' values) and exclude transportation costs as well as retail and wholesale values. For relationships of purchaser's value to production value, see final demand data files located in the zip folder at <https://www.bls.gov/emp/data/input-output-matrix.htm>. All columns that sum to zero are used to move data from purchaser to a producer value concept.

Assumptions

In using the requirements tables for impact analysis studies, consider the assumptions embedded in such exercise. First, each requirements table implicitly assumes a constant production function, a unique set of inputs for each commodity demanded. The labor to capital ratio remains unchanged.

Moreover, requirements tables do not allow for economies of scale. The ratio of inputs to outputs is held constant with a new vector of demand. While making more of a

product may require an increased level of investment in equipment, capital is assumed a sunk cost of production.

Finally, in making the import adjustment as described earlier, all inputs are assumed to be consumed within U.S. boundaries and not re-exported in the BLS requirements tables.

In estimating the real, constant dollar, requirements tables, an additional assumption is made. To remove the effects of relative price changes over time, BLS reprices the input-output tables to real prices. Because deflators for each cell in the input-output table are not available, each row of the table is deflated with a single commodity deflator. This process may lead to some distortions of the data to the extent that a commodity is priced differently to different users.

The employment data used to generate these requirements tables is consistent with that published by the Employment Projections Program. For further information on employment industries, see the BLS Handbook of Methods, Employment Projections: Calculations, [Calculation : Handbook of Methods: U.S. Bureau of Labor Statistics \(bls.gov\)](https://www.bls.gov/handbook/methods/employment-projections-calculations/).

Requirements tables do not account for induced effects. For example, when purchasing the previously mentioned one million dollars of motor vehicles, workers in automobile industry, steel industry, and other indirectly supported industries will bring home wages, of which a portion will be used to make purchases further supporting the economy. These induced impacts are not accounted for using the requirements tables.

Accessing Files

All data files are contained in folders. Data are rounded to eight decimal places. Each table is in a comma separated values (CSV) file, which can be readily converted to spreadsheet use. The first row and the first column contain the industry sector number, which can be used in conjunction with the SectorPlan.xlsx file to obtain sector titles.

Sectoring plan file:

The sectoring plan file, "SectorPlan30.xlsx", is included within the ZIP files. The sectoring plan files are needed to understand the data files because the data files have no labels or codes to signify columns and rows. Both columns and rows map to the single "SectorPlan30.xlsx" file. Please note: this file also contains summary sector codes and titles that DO NOT appear in the employment requirements tables.

Data Folders:

Note: The data folders contain one CSV file for each year of history. The CSV data has no row or column labels. The sectoring plan file shown above includes the column/row labels necessary to understand the data.

Nominal_DOMEmpReq	- 1997 through 2022 historical nominal dollar based domestic employment requirements tables
Real_DOMEmpReq	- 1997 through 2022 historical chain weighted real 2012 constant dollar based domestic employment requirements tables
Nominal_DOMTotReq	- 1997 through 2022 historical nominal dollar based domestic total requirements tables
Real_DOMTotReq	- 1997 through 2022 historical chain weighted real 2012 constant dollar based domestic employment requirements tables

For further information on general input-output methodology and the BLS projections, please see:

The BLS handbook of Methods: Employment Projections:

<https://www.bls.gov/opub/hom/emp/>

Streitwieser. Mary L. "A Primer on BEA's Industry Accounts" by BEA Briefing, June 2009. https://apps.bea.gov/scb/pdf/2009/06%20June/0609_indyaccts_primer_a.pdf