11.481J / 1.284J / ESD.192J Analyzing and Accounting for Regional Economic Growth
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Regional Input-Output Models

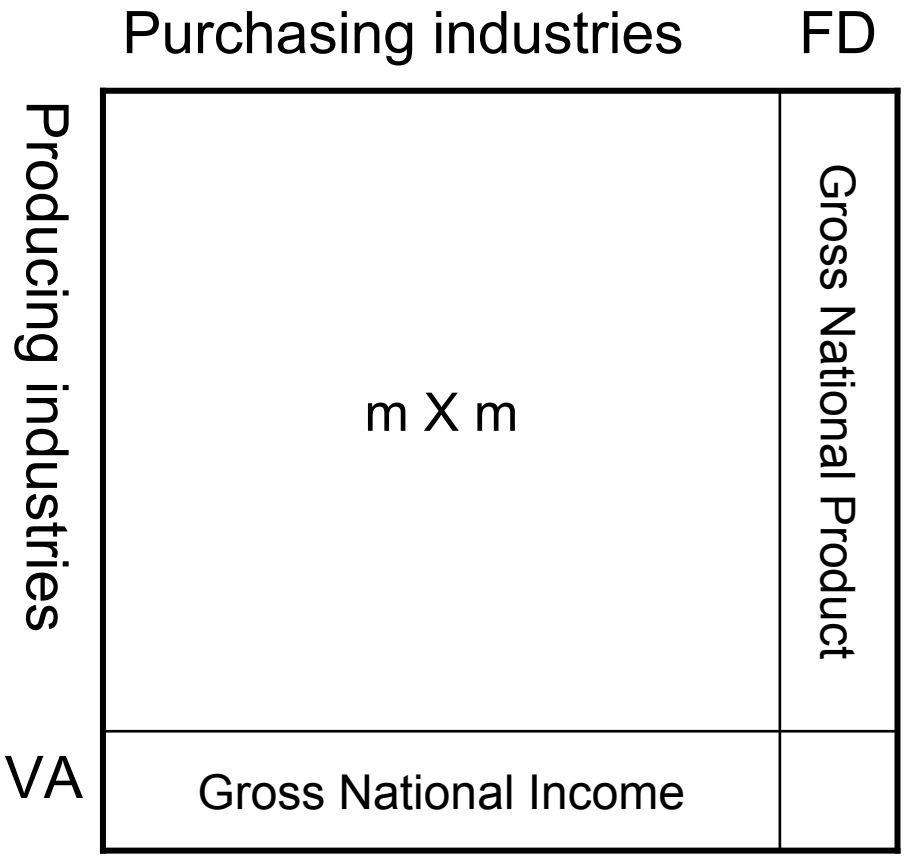
Xin Li

Reference: Karen R. Polenske. 1995. Leontief's Spatial Economic Analyses, *Structural Change and Economic Dynamics 6: 309-318*

Assumptions

- Constant returns to scale
- Homogeneous products with no joint production
- Constant direct input (technology) coefficient
- A demand-driven model

National input-output table

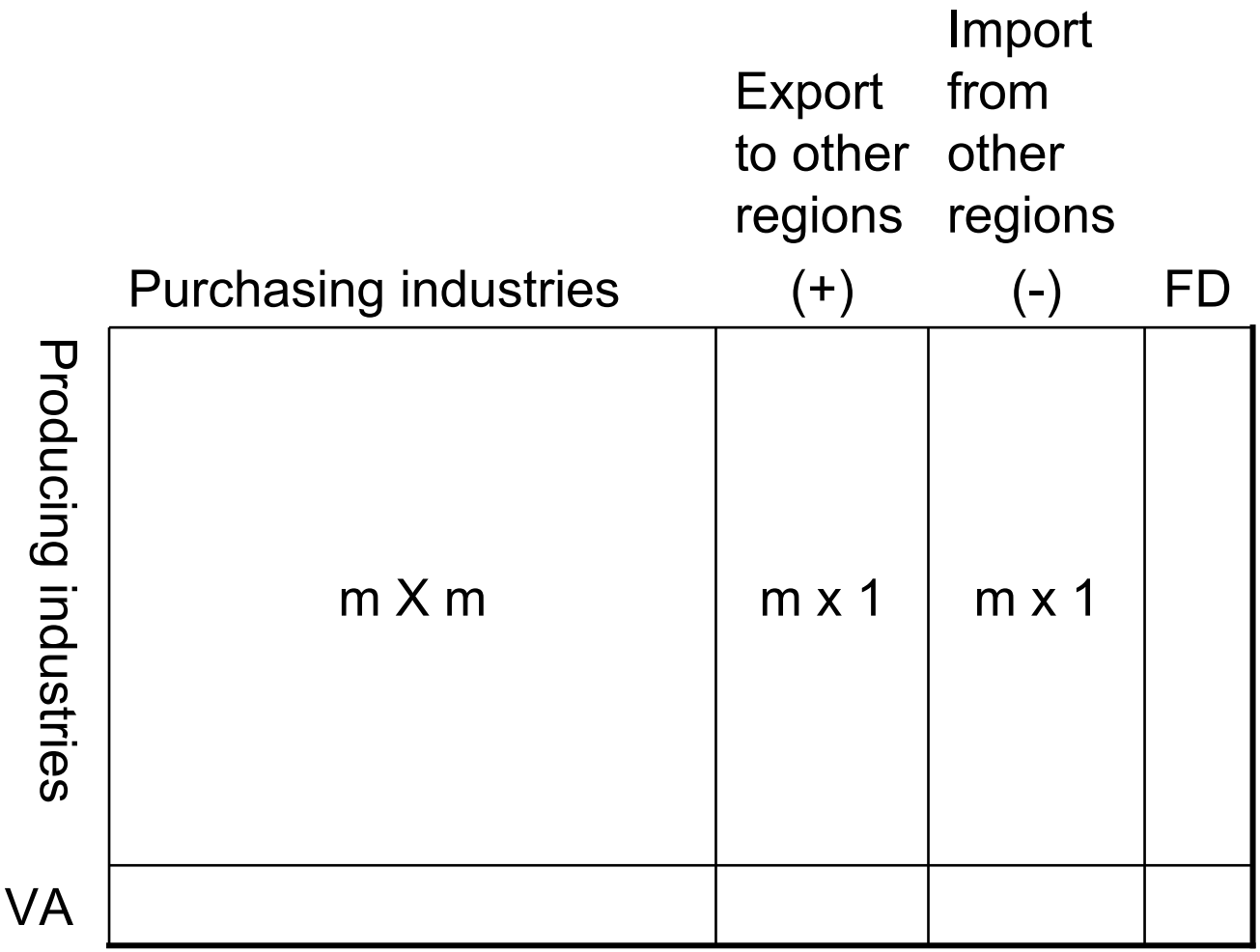


FD= final demands, including
- Personal consumption expenditures
- Gross private capital formation
- Net inventory change
- Net foreign exports
- Federal, state and local gov't purchase

VA= Value added, including
- Wages and salaries
- Rent
- Depreciation
- Taxes etc.

m = number of industries

Balanced Regional Input-Output Tables



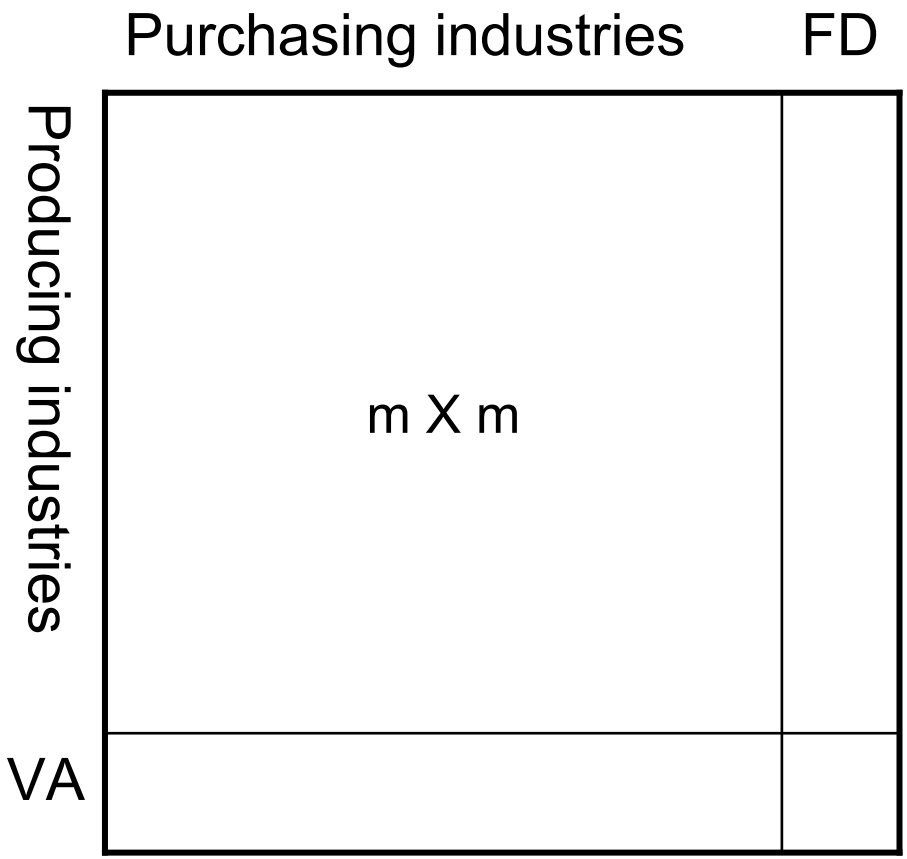
Sum of each row = sum of each column

Assumption: Technology coefficients differ by region

Region 1

m = number of industries

Unbalanced Regional input-output Table

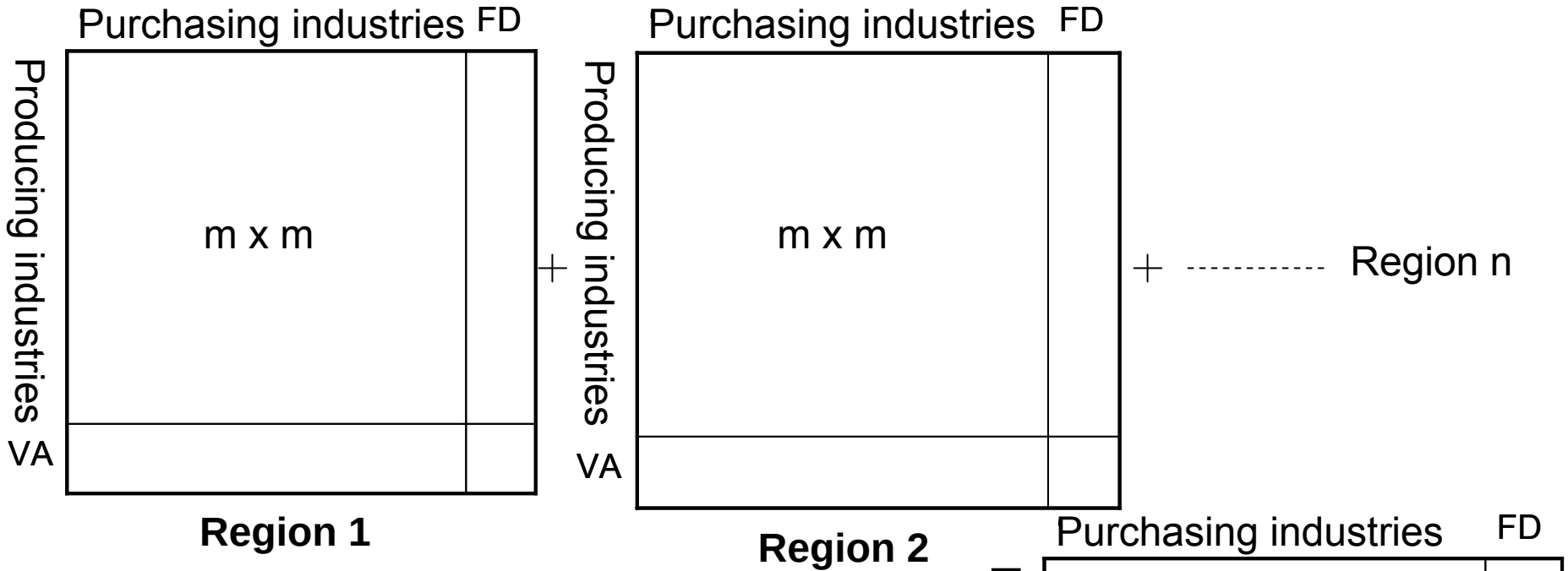


Region 1

- Sum of each row: total consumption only by purchasers within the region.
- Sum of each column: total input requirements of each industry, regardless of the location of production.
- Sum of each row ≠ sum of each column

m = number of industries

Regional Input-Output Tables



- For a regional table, the sums of corresponding rows and columns will not necessarily be equal.
- The difference is attributable to interregional trade.

m = number of industries
n = number of regions

Interregional Input-Output table

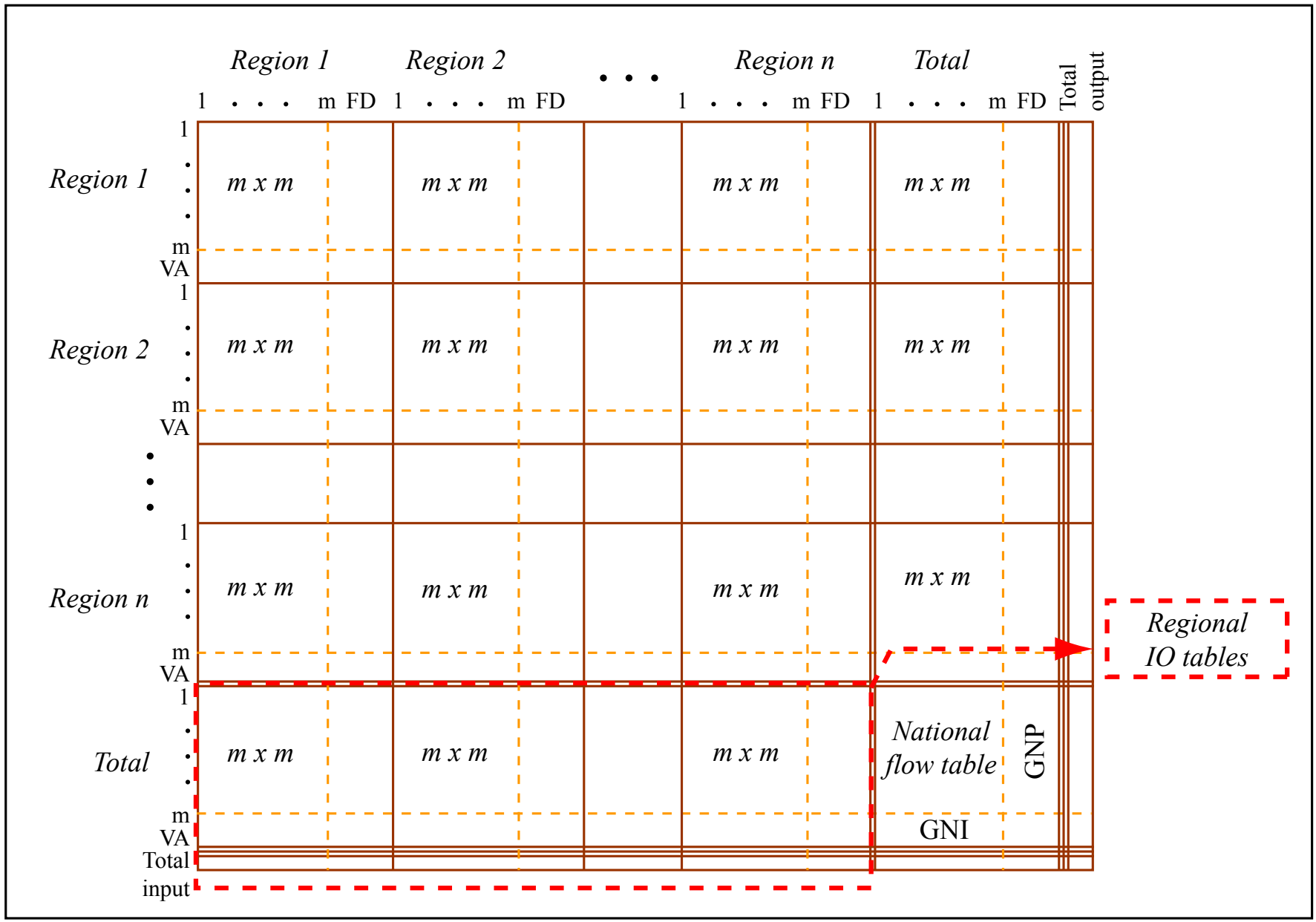
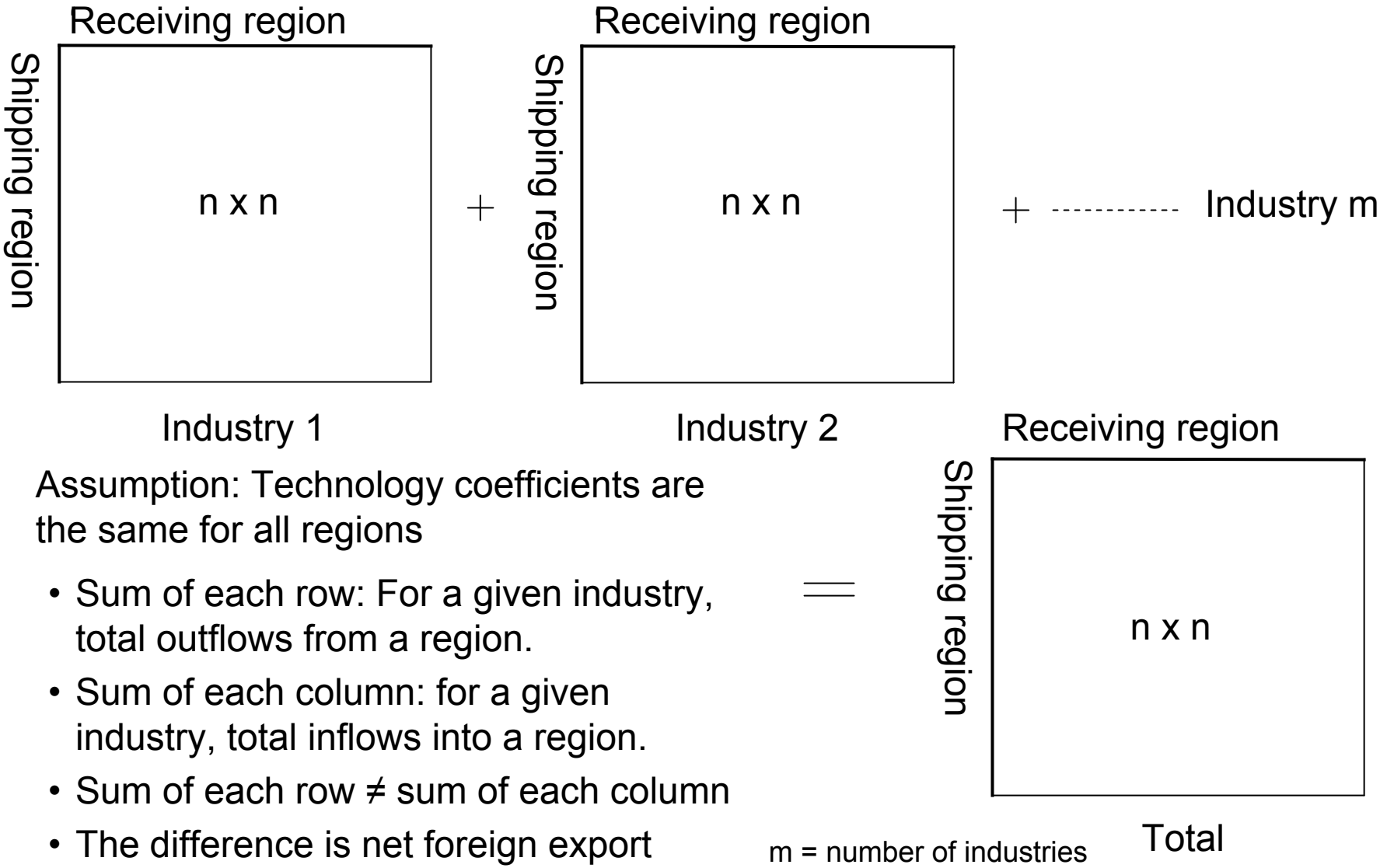


Figure by MIT OpenCourseWare, based on Polenske (1963).

Multiregional input-output tables—trade matrices

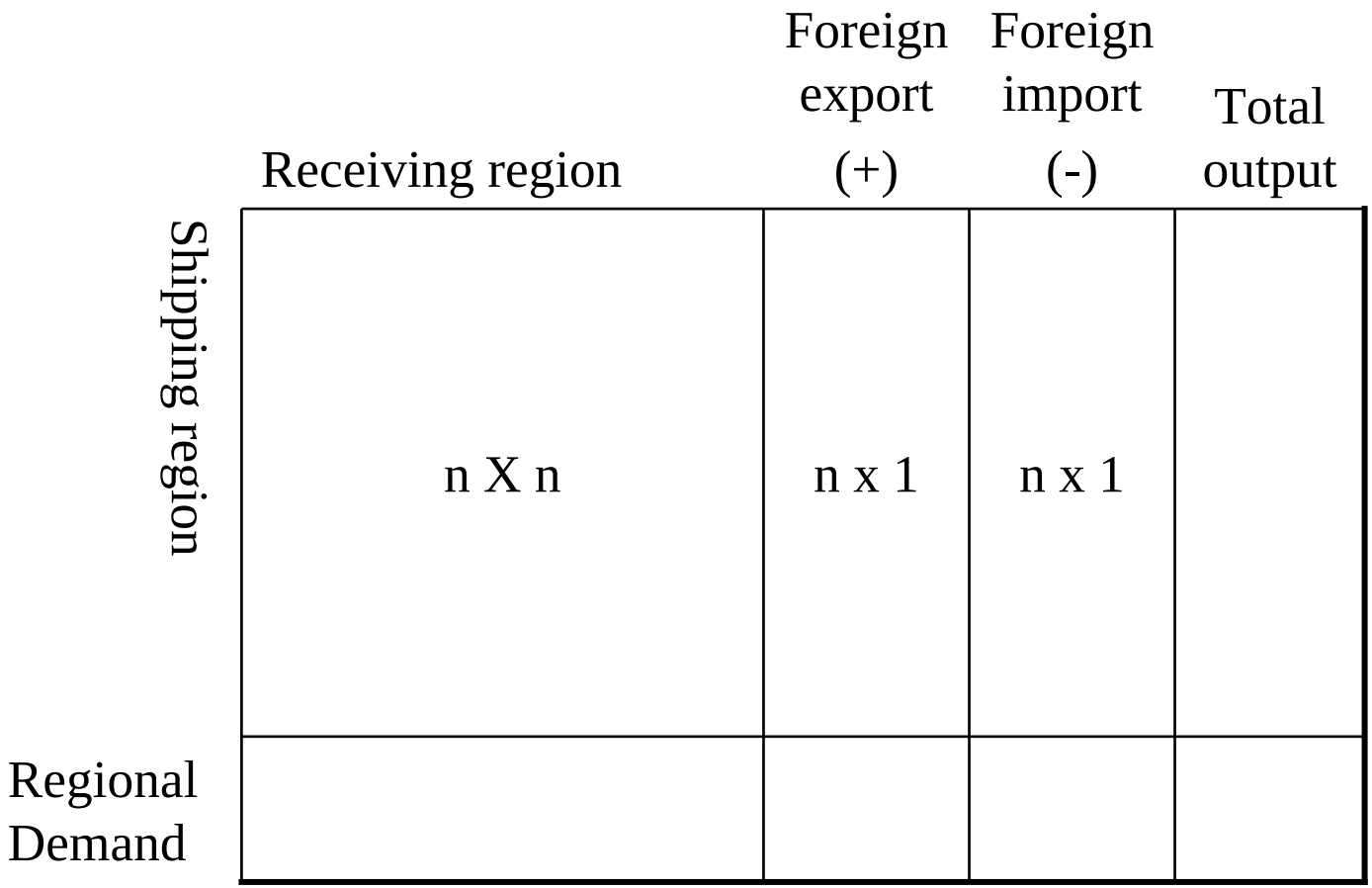


Assumption: Technology coefficients are the same for all regions

- Sum of each row: For a given industry, total outflows from a region.
- Sum of each column: for a given industry, total inflows into a region.
- Sum of each row ≠ sum of each column
- The difference is net foreign export

m = number of industries
n = number of regions

Commodity Flow Table



Industry 1

n = number of regions

Multiregional Input-Output table

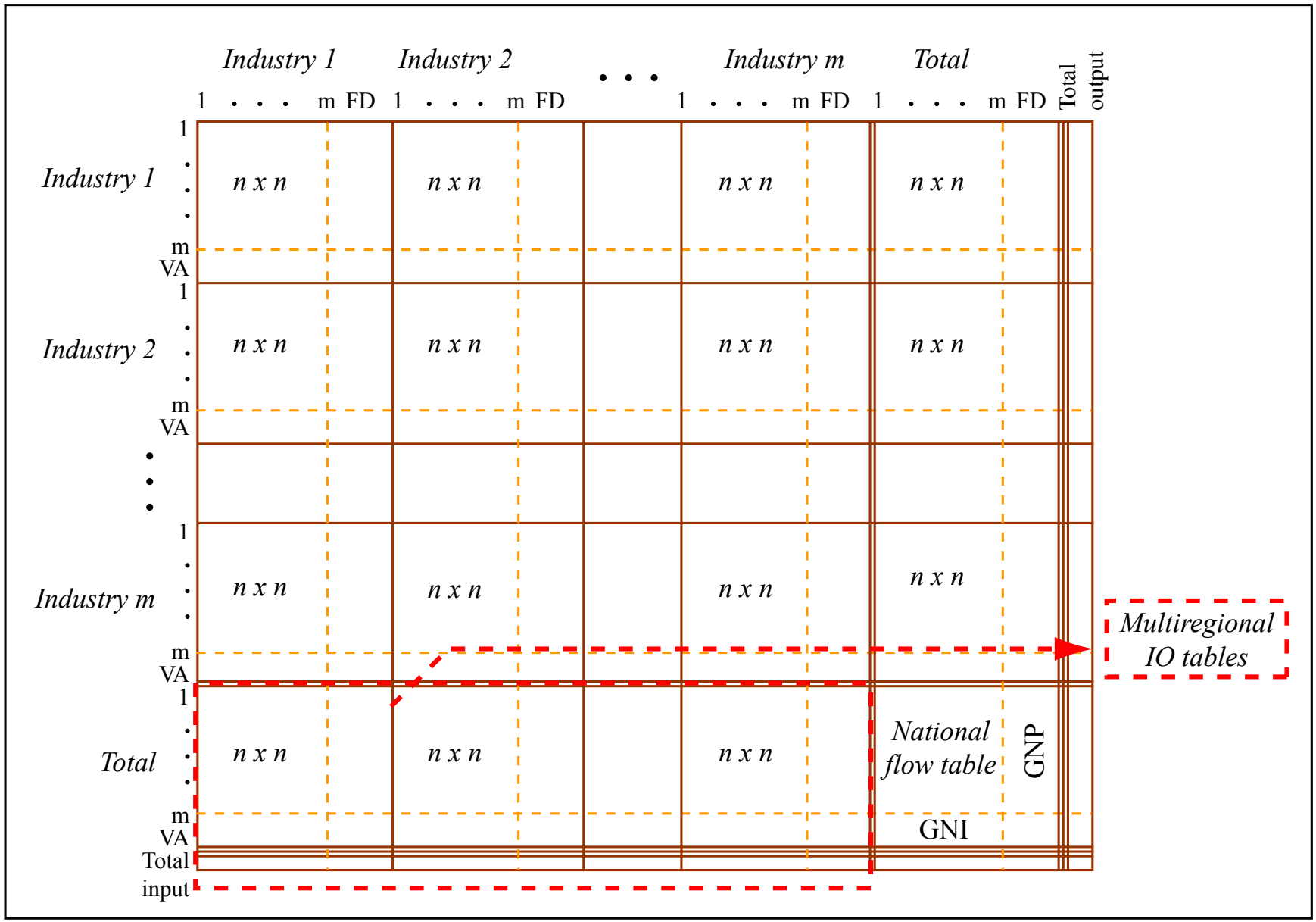


Figure by MIT OpenCourseWare, based on Polenske (1963).