Brief explanation of JIDEA Model Ver.91

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The JIDEA (Japan Interindustry Dynamic Econometric Analysis) model is a complete multi-sector model whose main blocks consist of final demand, value-added, and matrix of intermediate input coefficients. Components of final demand and value-added looked at aggregate variables are forecasted sector using industry-level data and econometric methods.

JIDEA is based on the Japanese Input-Output Table (85*85 sectors) over a 19-year horizon from 1995 to 2014. This set of I-O Table consists of the base table, the extension table (both published for the years 1995-2014 but the base year changes every 5 years), and the 2011 link table based on 2000, 2005 and 2011. A complete time series of input-output tables, including final demand and value-added components, are consistent with the 2011 link table.

One characteristic feature of JIDEA is that it can estimate the effects of international trade by using BTM, the world Bi-lateral Trade Model provided by INFORUM, University of Maryland, which integrates the export-import estimation in its national models of the INFORUM member countries. The analysis of the international trade effects is thus done jointly with INFORUM and its members.

The main components and variables determined within JIDEA are calculated as follows:

Final demands (real side) is the sum of household consumption, government expenditure, fixed capital formation of government, fixed capital formation of private sectors and export minus import. All are expressed in real term.

- The household consumption by sector is estimated by per capita disposable income and relative price of its consumer price to the total consumption price.
- Private fixed capital formation, which is converted from selling side to purchasing side by applying the capital matrix as the demand for investment goods, is estimated by the investment function by industry as purchasing investment goods. The investment function is based on lagged output, amount of capital stock, etc.
- Sectoral exports are estimated by function using the world price and foreign demand index from BTM.
- Imports are determined simultaneously with output using function of import share to domestic demand which is determined by relative price and time trend.

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Output in real term is estimated by the Gauss-Seidel method with the following equation：

$$q=A*q + f - m(q,..)$$

where

q: vector of the amount of domestic production

A: matrix of the intermediate input coefficient

f: vector of the sum of the final demand (import not included)

m(q,..): imports as a linear function of domestic demand

Output in current prices (value added side, nominal side) is the sum of intermediate costs and value-added, which consists of labor compensation, corporate profits, capital consumption allowances, and indirect taxes minus subsidies, etc.

- Total value-added is calculated by adding up the result of equation for each value added components by sector. This total value-added is then converted to unit value-added by dividing by real output in each sector, which is derived from the real side.
- Domestic production prices are estimated by the Gauss-Seidel method using intermediate input coefficients and the sum of unit value-added. Import prices are also used in the solution. Algebraically, the solution can be expressed as:

$$p=p*AD + pm*AM + v$$

where

p: vector of domestic production price

AD: domestic portion of input-output matrix (imports not included)

pm: vector of import price

AM: matrix of imports of intermediate inputs

v: vector of unit value-added

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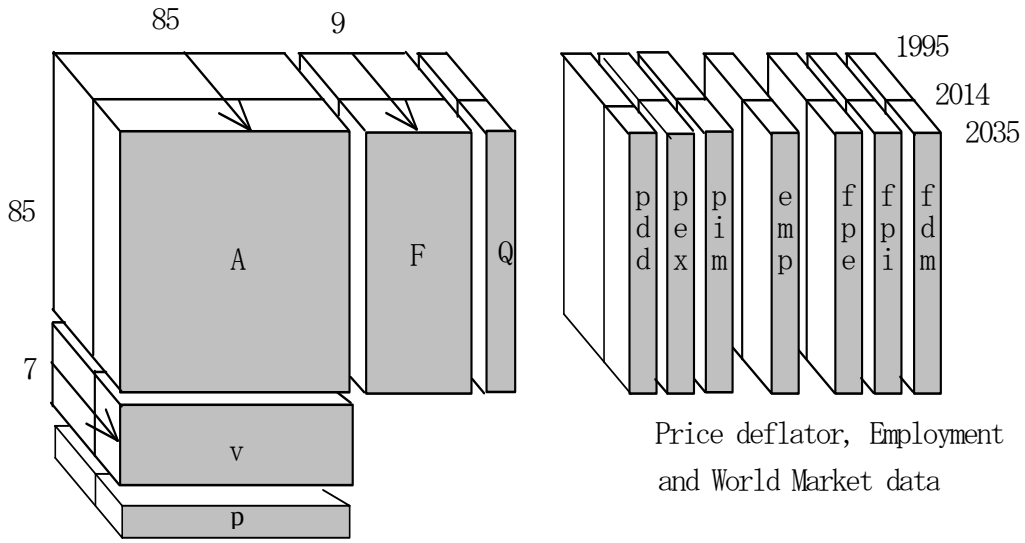
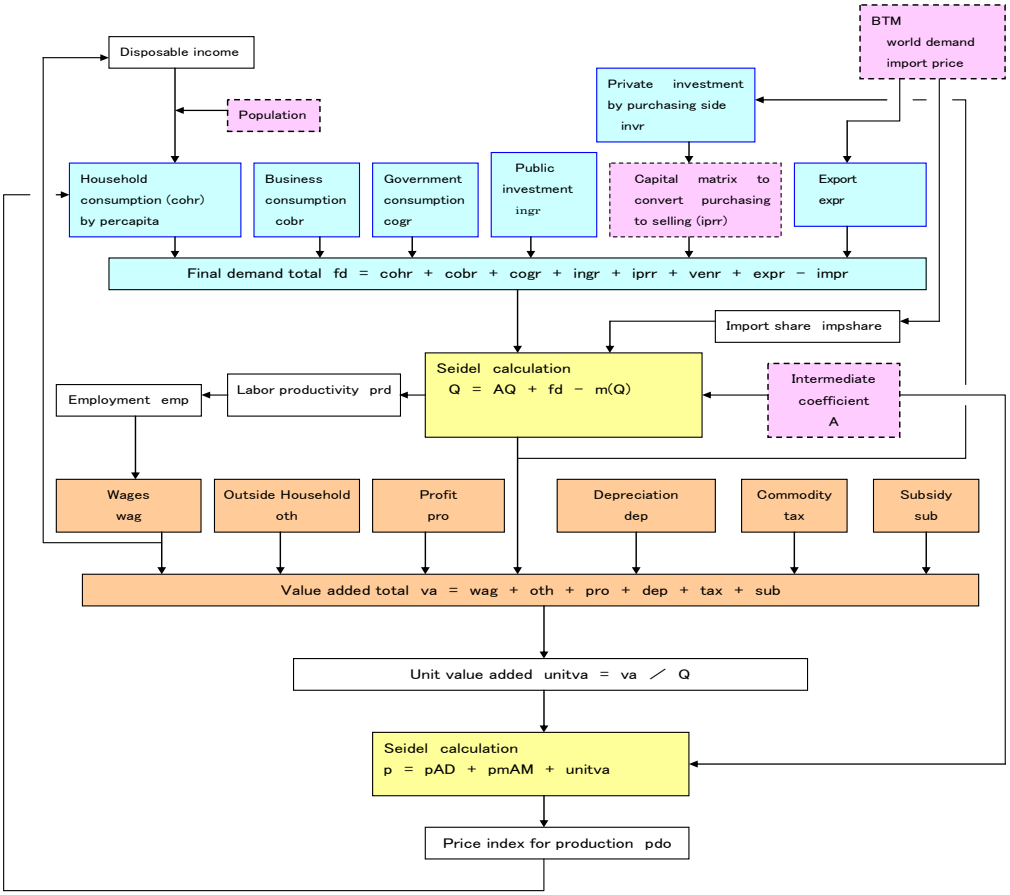
The Concept of JIDEA Model; Timeseries I-O tables extended to future



I-O table (85×85)

JIDEA Model : Concept of Data Flow



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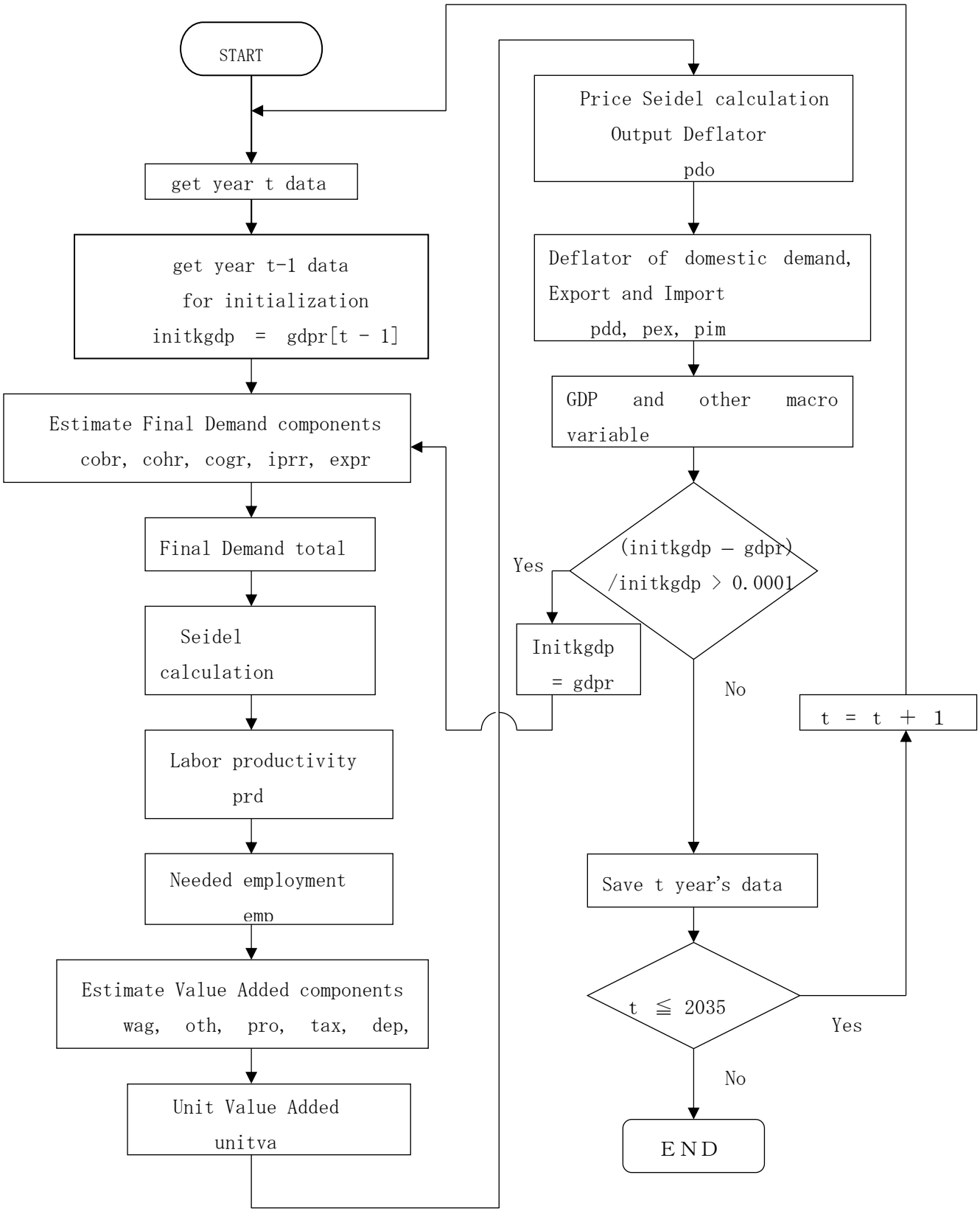
JIDEA model: Simulation flow chart



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