2. The skeleton of the Latvian multisectoral model

2.1 The Input-output table and the basic data base

The basic purpose of the model is to make long-term projections for the Latvian economy. The data used in the present version are mostly from the input-output table made available by the Latvian Statistical Office for the year 1997. Indeed, since 1997 the Statistical Office began to publish Input-output tables on annual basis; recently, the Statistical Office announced that the input-output table for the year 2000 will be produced with new criteria cancelling, at the same time, this table from the catalogue. Now, according to the last Eurostat directives, the Input-output tables of the European Union Member States will be distributed free of charge since next autumn. Of course, Latvian Input-output table will be available as any other input-output table; anyway, a direct link with the Latvian Statistical Office will make easier the collection of time series data for the implementation of the model.

At present, data on final demand and value added components are not yet available in time series with a sectoral detail similar to that of the IO table. With the available data, mostly from the IO table, a skeleton of the Latvian model has been built with a minimum of equations. The IO table distinguishes domestic and imported flows; contains 6 final demand components (personal consumption expenditure, investments, inventory changes, exports, government expenditure and collective consumption expenditure; no value added component is available at sectoral level.

Matrices and vectors supporting the Latvian model are collected in a file (a vam file described in Interdyme [3]) which constitute the basic data base. The matrices and vectors which come from the IO table and are used in the present version of the Estonian model are:

am : the input-output coefficients matrix
mm : the import shares matrix
gm : the value added shares matrix

these three matrices are described in M. Grassini (2001); then, the vectors:

out : the sectoral output vector
pceio : the private consumption expenditure vector
ccp : the private collective consumption vector
gov : the government consumption vector
pde : the investment by producers vector
ven : the inventory changes vector
ex : the exports vector
imp : the imports vector

are from the final demand sector of the IO table; indeed, the imports vector is the row sum of the import flows matrix.
Other vectors came from the value added sector of the IO table. They are:

wagev : wages
contracv : employers' actual social contribution
contrimv : employers' imputed social contribution
taxprodv : other taxes on production

[3] The following acronyms are from the configuration file of the Latvian vamfile. This file, named vamest.cfg, is reproduced in the APPENDIX 1. This file drives the construction of the vam file by using G7.

subsprodv : other subsidies on production
kconsv : fixed capital consumption
opsrplv : profits - net operating surplus
mixincv : net mixed income
vad : value added

Besides these vectors which contain the value added component flows (they end with a 'v' which stands for values), there are vectors related to the *unit of output* (the flow divided by the sectoral output in constant prices):

wage : wages
contrac : employers' actual social contribution
contrim : employers' imputed social contribution
taxprod : other taxes on production
subsprod : other subsidies on production
kcons : fixed capital consumption
opsrpl : profits - net operating surplus
mixinc : net mixed income
unitva : value added

There are other vectors

taxprodv: the net taxes on products vector
wagv : the compensation of employees vector
indtaxv : the other net taxes on production vector
rgev : the operating surplus and other income

Besides these vectors and matrices obtained directly or through very simple manipulation from the IO table, there are other vectors such as:
and others which represents exogenous (for the standing alone model) variables such as:
pim : the import prices vector
as well as vectors generated during the solution of the model:
cim : the cost of imported materials vector
pdm : the domestic prices vector
pmix : the domestic consumption prices vector (IO sectoral classification)

Bridge matrices for personal consumption and investment are not yet available. Consequently, investments by investors and personal consumption classified on the side of the consumer are not yet introduced in the Latvian vam file.

2.2 Equation formulation

The model contains only a set of import share equations.

Whatever the analytical structure of a sectoral import equation may be, total (sectoral) output appears among the explanatory variables. In fact, total real resources (imports plus output) vary to match the total (intermediate plus final) real demand. An increase (decrease) of total demand generates an increase (decrease) in total resources; then, an increase (decrease) in domestic output is expected to be associated to an increase (decrease) of imports. In other words, total demand is satisfied with domestic and foreign productions; however, the shares of these two 'resources' may vary. Imports substitution means that imports take the place of domestic production; imports elasticity (not equal to one) evokes that, as GDP increases, imports may

increase (elasticity grater than one) or decrease (elasticity less than one) its weight over domestic resources.
As for any economic variable, there may be many analytical forms suggested by the pure economic theory, by the econometric assumptions about the 'probability generating function' and by the economic wisdom. The pure economic theory, which is a synonymous of neoclassical theory, leads to analytical forms deduced through an optimization process applied to rarely observed functions (such as utility functions and production functions) but widely available from economic textbooks. The econometric assumptions may ignore the economic theory in favour of a rich and sophisticated description of the random error attached to any analytical form. For a given economic phenomenon, the economic wisdom suggests a list of determinants supported by economic theories and by the model builder's experience.
Anyhow, sectoral output is expected to be always among the explanatory variables; this implies a simultaneous solution of sectoral import and sectoral total output[4]. However, the choice of the analytical form is up to the model builder.
In the present case, sectoral import share equations have been implemented. The import share is related to the total resource (imports plus total output). The analytical form is very naive; given the sectoral import share at the base year, $impsh_0$, it varies following a trend. Then for each sector, the import share equation has the following form

$$impsh_t = impsh_0 + a * t$$

a may be positive or negative interpreting respectively the case of import penetration or domestic output expansion.

The skeleton of the Latvian model allows us to start a preliminary evaluation of the model performance.

All the final demand components are assumed exogenous; each sector of any final demand components follows the corresponding total.
In the present version of the multisectoral model, both imports and output are endogenous variables.
Since imports have processed as any other final demand component, their simulated values may now be compared with the 'past' and 'future' reconstructed values.

[4] The Interdyme code fulfils this property in the Seidel function.