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# OVERVIEW OF THE LATVIAN ECONOMY IN THE CONTEXT OF THE DEVELOPMENT OF THE MULTISECTORAL MACROECONOMIC MODEL OF LATVIA

## I. INTRODUCTION

As any other Baltic State, Latvia proclaimed the restoration of independence in 1991. Since more than 90% of the Baltic States' economy was linked to that of the Soviet Union, the freedom was accompanied by a deep structural change which brought hyper-inflation and the bankrupt of many enterprises mostly focussed on the Soviet Union's market; the consequence was a drastic collapse of production.

After the break down of the Soviet Union, Latvia like other Central and Easter European countries which decided to join the European Union, experienced a decline of its GDP up to 1995; afterwards, these countries became reliable candidates to join the European Union and began a clear economic recovery. The Latvian economic pace is still vigorous and the catching up is in progress.

This paper contains a first attempt to build a multisectoral model for Latvia. The paper is organized in two main sections. The first one describes the GDP growth and its sectoral composition; the most significant factors of the recent Latvian brilliant economic performance such as domestic demand, employment productivity, the evolution of the cost of labour are described with special attention of a peculiar factor as the perspective and the full integration of Latvia into the European Union. In the second section a very preliminary skeleton of the multisectoral model of the Latvian economy can be found. The use of elementary import shares equations gives the opportunity to stress the importance of mesoeconomic modelling approach for policy simulations.

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## II. GDP GROWTH

The Latvian economy, together with the rest of Eastern Europe, experienced a sharp and deep reduction in GDP in the early stages of transition. Between 1989 and 1995, the cumulative impact of this transition in Latvia is estimated to have halved the total amount of GDP. This implies a somewhat steeper decline than that experienced by other currently new EU member states.

This phase of collapse bottomed out in 1995 and, in 1996, the Latvian economy began to grow again (see Fig. 2.1).
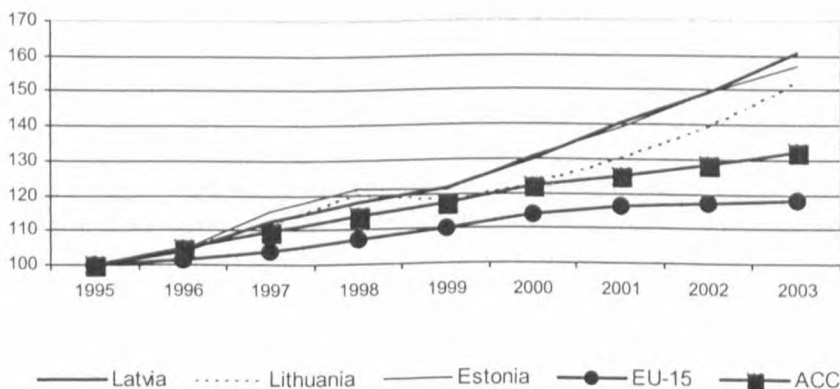


Fig. 2.1. Growth of Real GDP (1995 = 100)

S o u r c e: Central Statistical Bureau (CSB) of Latvia.

1997 marked a rapid growth, which was slightly slowed down by the impact of the Russian 1999 and 2000 crisis.

Latvia's growth over the last 8 years was the most dynamic among the new EU member states, annually on average reaching 6.1%. The growth is particularly rapid in the last 3 years – by 7.3%. At the same time, it has to be noted that the growth started from a very low level. In 2003, Latvian per capita GDP, according to PPS, accounted for 41.5% of the average EU-15 level. In 1995, it was only 29.1%. The GDP growth was ensured mostly by the growth in productivity and to a smaller extent by the increase in employment.

The Ministry of Economics has developed two medium-term development scenarios (till 2009) depending on the variations of the external demand – the slow variant of development (Variant I), with a limited possibility to increase exports, and the dynamic variant (Variant II), when growth of exports is more dynamic, which might happen in case of a more favourable external conjuncture. Table 2.1 presents the forecasts for the dynamic growth variant.

Table 2.1

GDP growth (percentage change over the previous year, average)

| | GDP | Productivity | Employment |
|---|---|---|---|
| 1996–2003 | 6,1 | 5,7 | 0,4 |
| 1996–2000 | 5,4 | 6,1 | –0,7 |
| 2001–2003 | 7,3 | 4,9 | 2,3 |
| Forecasts | | | |
| 2004 | 7,5 | 6,4 | 1,0 |
| 2005–2007 | 8,0 | 6,9 | 1,0 |

S o u r c e: 1996–2003 CSB of Latria.

It is projected that the insofar tendencies will persist also in 2004 and 2005, namely, the stable domestic demand and expansion of exports. Additional incentive for growth might be provided by the accession to the EU.

## 2.1. Sectoral composition of GDP

In order to elaborate more accurate and more substantiated national development forecasts, it is necessary to design and apply appropriate modelling instruments, especially such that would enable to more adequately forecast structural (sectoral) changes in the national economy. It is a top objective, considering the fact that over the recent 8 years the structure of the Latvian national economy has essentially changed (see Fig. 2.2 and Table 2.2).

Table 2.2

GDP growth by sectors (percentage change over the previous year, average)

| | 1996–2003 | 1996–2000 | 2001–2003 | 2004$^f$ | 2005–2007$^f$ |
|---|---|---|---|---|---|
| Primary sectors | 2.3 | 0.8 | 4.8 | 3.0 | 3.8 |
| Manufacturing | 6.6 | 5.0 | 9.4 | 10.0 | 10.5 |
| Utilities | 0.3 | –2.0 | 4.2 | 2.0 | 2.2 |
| Construction | 9.6 | 9.3 | 10.2 | 15.0 | 12.7 |
| Trade | 10.7 | 10.3 | 11.4 | 10.0 | 8.4 |
| Transport and communications | 5.8 | 4.9 | 7.3 | 9.0 | 8.7 |
| Other services | 7.7 | 8.2 | 6.8 | 6.0 | 8.6 |
| Government* | 1.8 | 1.5 | 2.3 | 2.0 | 2.7 |
| GDP | 6.1 | 5.4 | 7.4 | 7.5 | 8.0 |

$f$ – forecasts

S o u r c e: 1996–2003 CSB of Latvia.

1995                                    2003
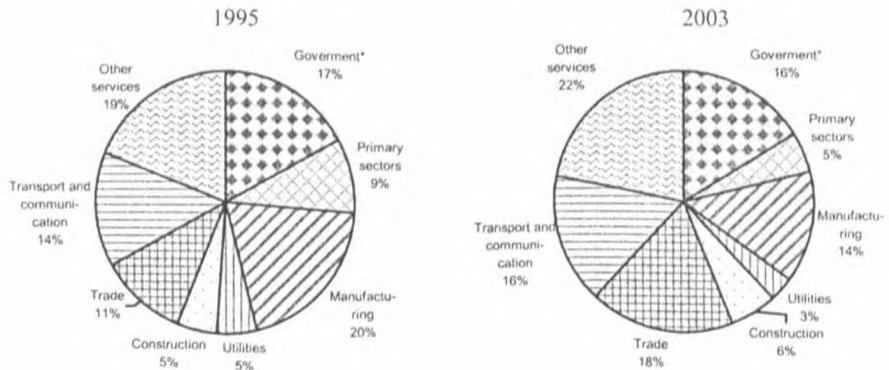


* Government sector includes public administration, health and education.

Fig. 2.2. Sectoral composition of GDP

S o u r c e: CSB of Latvia.

The share of the branches of services has essentially increased, especially that of trading services. At the same time, the share of primary industries and manufacturing industry has reduced. However, it has to be noted that over the last 3 years the share of manufacturing industry in the national economy is no longer reducing, but is even slightly increasing. The structure of the branches of the manufacturing industry has also undergone significant changes (Table 2.3).

Table 2.3

Structure of Manufacturing (value added, %)

|                                                      | 2000 | 2003 |
|------------------------------------------------------|------|------|
| Total manufacturing*                                 | 100  | 100  |
| Food industry (15, 16)                               | 27,4 | 24.9 |
| Light industry (17–19)                               | 11,4 | 9.6  |
| Wood and articles of wood (20)                       | 19,1 | 20.4 |
| Paper industry, publishing and printing (21, 22)     | 8,7  | 7.6  |
| Chemical industry (23–25)                            | 4,6  | 4.4  |
| Other non–metal mineral products (26)                | 2,9  | 2.8  |
| Metal and metal products (27, 28)                    | 9,7  | 9.7  |
| Manufacturing of machinery and equipment (29–35)     | 10,9 | 14.6 |
| Other industries (36, 37)                            | 5,4  | 6.1  |

*NACE codes are given in parentheses

S o u r c e: CSB of Latvia.

The industrial structure of Latvia is dominated by sectors using cheap labour and natural resources or sectors with a low value added. The value added created in the food industry, light industry and wood industry accounts for more than a half of the total industrial value added. The same refers to export proportions. One must note that the situation is gradually changing in the last years due to the rapid growth of some sectors in manufacturing of machinery, especially in 2003.

## 2.2. Factors of growth

The design of multisectoral model is not possible without establishment of the most relevant growth factors both in the national economy on the whole, as well as in separate its sectors, and the research of theirs impact and dynamics.

### 2.2.1. Domestic demand

The stable growth over the last years was mostly ensured by the growing domestic demand. The volume of private consumption has increased. Private consumption is favourably influenced not only by the annual increase of wages of the gainfully employed people but also by the ability of private individuals to benefit from consumption credits and loans to purchase and repair housing that are offered at affordable interest rates. Also the rate of investment is high.
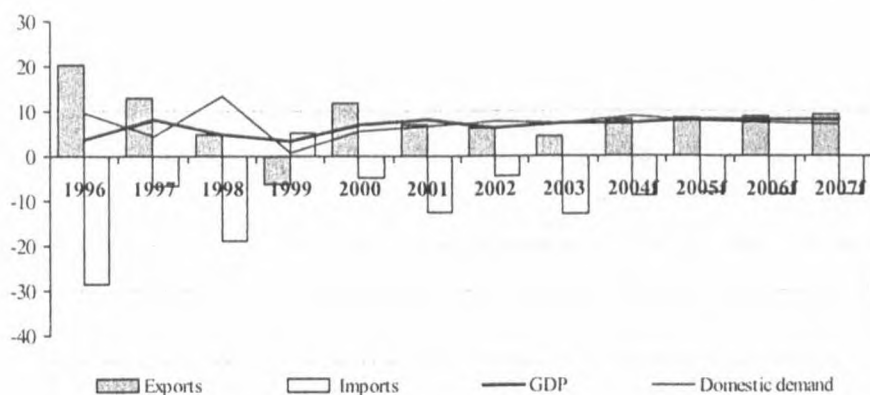


Fig. 2.3. Changes in real GDP and major expenditure items
(percentage change over the previous year)

S o u r c e: CSB of Latvia.

The increase of the domestic demand has left the most sizeable impact on the development of service sectors and, especially, on retail trade. Other sectors of services, such as commercial services and financial intermediation, have also developed quite dynamically.

At least 2/3 of the growth in the sector of transport and communications is triggered by the domestic demand, which is stable and grows faster than the external demand. This especially refers to supporting and auxiliary types of transport activity. Among these, one should mention the development of warehousing, parking services, expansion of services offered by travel firms and other services. The external demand of transit services is quite changeable. Due to the discriminatory attitude of Russia with regard to transit of oil products through the Ventspils Port, total volumes of delivered cargo in ports have declined (especially, in the second half of 2002). In 2003, the indicators improved mainly due to the increase of cargo turnover in other ports of Latvia. However the Ventspils Port is recovering, since more and more cargo is transported to the port by rail.

The significant growth of investment has a favourable impact on the development of construction. Growth rates of the latter are substantially higher than the average growth rate of the national economy.

It is forecasted that private consumption and GDP will increase at the same rate. This will be ensured by the growth of wages, which in turn will be encouraged by the annual increase of the minimum wage. The insofar-fast crediting rates may continue growing, as the volume of private credits against GDP is still very low. The growth of domestic demand directly influences the development of the services sector; its influence on the growth of industry is smaller.

## 2.2.2. Accession to the EU

The strengthening of the competitiveness of Latvia in the conditions of the EU single market, the ability to use structural funds and external conjuncture will determine the speed of growth in the period till 2007.

The accession to the EU provides new incentives linked with:

– integration into the EU single market, which will provide Latvia the opportunity to benefit from the advantages of a wide and stable market. It will raise interest of local and foreign investors in the economy of Latvia;

– growing of competition, which will have a different impact on different economic sectors. Some sectors will gain from the expansion of their markets and some sectors will lose. The pressure of the competition will become noticeably stronger in the domestic market with smaller changes in the external market. However, there is no doubt that competition will facilitate modernisation, restructuring and also specialisation, which in turn, will accelerate the change of the structure of the Latvian national economy;

–   improvement of competitiveness in relations with the third countries since Latvia will participate in international trade within the scope of the common EU foreign trade policy;

–   possibility to get access to substantial resources from the EU given to Latvia as an EU member state, which will stimulate structural adjustments upon integration into the single market allowing to intensively modernise and expand infrastructure and encourage business activity in all regions of Latvia;

–   reduction of financial risks providing access to cheaper loans for Latvian undertakings.

## 2.2.3. Employment and productivity

As already mentioned above, the total number of employed persons has slightly grown, over the period of 8 years by 3,3%. Due to the Russian crisis the number of employed reduced, but started to grow with the rapid economic growth in 2001–2003. At the same time, substantial improvement in the unemployment rate indicators is due to the reduction of the number of economically active population.
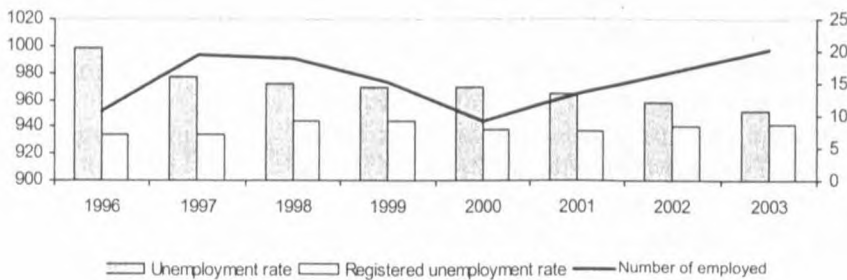


Fig. 2.4 Employment and unemployment

S o u r c e: CSB of Latvia.

The number of the registered unemployed persons is smaller than the total number of the unemployed (approximately by 20%). There are several reasons for this. Not all can get unemployment benefit since social insurance contributions have not been paid (declared); many are not interested or not able to master retraining programs, especially, in a pre-pension age; often it is quite burdensome to follow all the provisions to get the status of a registered unemployed. Besides, the status of an unemployed is not awarded to persons that are outside the labour age defined in legislation.

As already mentioned above, the main source of growth is the growth in productivity. Productivity growth has been in almost all branches of national economy, except in such a monopoly industry as utilities.

Table 2.4

Productivity (GDP per worker) growth rates (percentage change over the previous year average in the period)

| Specification | 1996–2003 | 1996–2000 | 2001–2003 |
|---|---|---|---|
| Primary sectors | 4.9 | 5.4 | 4.0 |
| Manufacturing | 8.8 | 8.2 | 9.9 |
| Utilities | -1.2 | -4.0 | 3.8 |
| Construction | 3.3 | 6.5 | -1.8 |
| Trade | 7.6 | 7.0 | 8.6 |
| Transport and communications | 3.7 | 6.8 | -1.3 |
| Other services | 4.7 | 6.0 | 2.6 |
| Government* | 2.7 | 2.2 | 3.5 |
| GDP | 5.7 | 6.1 | 4.9 |

S o u r c e: CSB of Latvia.

The productivity growth rate in the recent years is slowing down, however the indicators may not be treated unequivocally, since the number of employed taken for determining productivity does not always adequately reflect the actual situation, which is connected with the relatively high share of the shadow economy in such sectors as building construction and trading services. As every year the shadow economy in these industries is reducing, then the actual growth of productivity is higher, and, e.g., over the recent three years productivity in construction has most likely grown rather than fallen.

Despite the fact that productivity has most rapidly grown in manufacturing, its level is still lagging behind the indicators of several service sectors (Fig. 2.5).

Presently the Ministry of Economics does not elaborate productivity forecasts by sectors, we look forward to cooperation in this area.
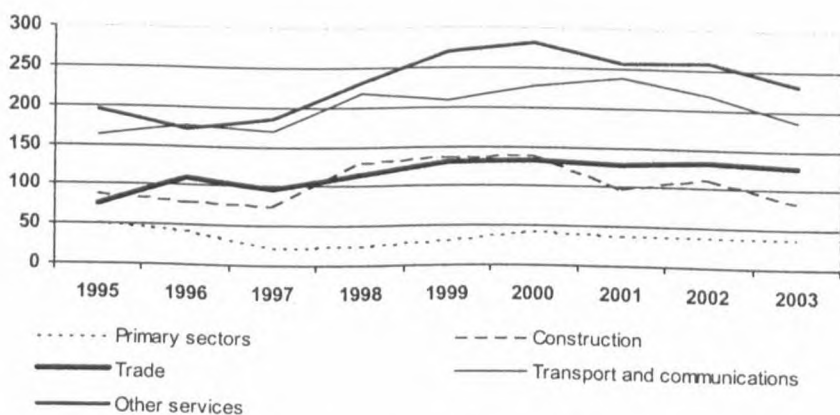


Fig. 2.5. Productivity by sectors relative to manufacturing (100)

S o u r c e: CSB of Latvia.

## 2.2.4. Wages und unit labour costs

On the whole, productivity of national economy is growing much more rapidly than labour costs, on average by 2.7 percentage points. At the same time, productivity growth in manufacturing appears more dynamic, which results in the reduction in annual unit labour costs.
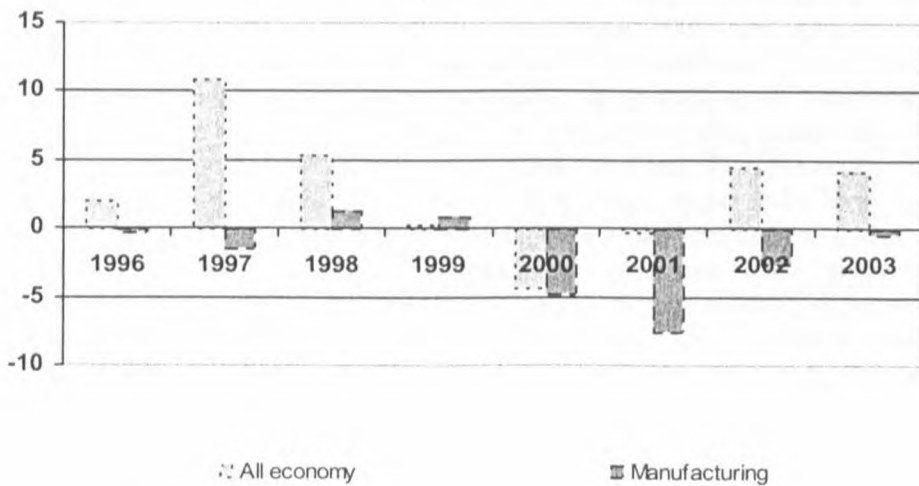


.: All economy        ▥ Manufacturing

Fig. 2.6. Unit labour costs (percentage change over the previous year)

S o u r c e: CSB of Latria.

Table 2.5

Wages and costs (percentage change over the previous year, average)

| | 1996–2003 | 1996–2000 | 2001–2003 | 2004 | 2005–2007 |
|---|---|---|---|---|---|
| All economy | | | | | |
| Wages | 8.7 | 9.2 | 7.9 | 10.0 | 7.5 |
| Productivity | 5.7 | 6.1 | 4.9 | 6.4 | 6.9 |
| Unit labour costs | 2.9 | 2.9 | 2.9 | 3.3 | 0.5 |
| Manufacturing | | | | | |
| Wages | 6.8 | 7.3 | 5.9 | – | – |
| Productivity | 8.8 | 8.2 | 9.8 | – | – |
| Unit labour costs | –1.9 | –0.8 | –3.6 | – | – |

Source: CSB of Latvia.

The trend over the recent years shows that wage increase in the future will be faster and, as a result, unit labour costs will increase.

## 2.2.5. Investments

Latvia is characterised by a relatively high share of fixed investment in utilization of GDP. It has increased from 13.8% in 1995 to 24.2% in 2003.

As there is no direct access to Latvian statistics on distribution of investments by sectors, presently, the information prepared for the analysis covers only the recent three years.

During 2001–2003, investments into the sectors of Latvian economy grew by 28.6% or on average by 8.7% annually. It should be noted that over the past three years the investment dynamics has been faster in production sectors due to the growth of general economic activities, improvement of crediting terms and investment friendly economic policy. Over the past three years investments into the production sectors went up by 37.5% (or on average by 11.2% annually), whereas investments into the service sector grew by 25.2% (on average by 7.8% annually). Over the period mentioned the fastest investment growth was recorded in primary sectors. Investment into mining industry and agriculture in 2003 doubled in comparison with 2002. Meanwhile, a decrease in investment was fixed in such sectors as education, health care, transport and communications.

Table 2.6

Investment by sectors (excluding investment in individual construction, percentage)

|  | Growth rates | | | Average in 2001–2003 | |
|---|---|---|---|---|---|
|  | 2001 | 2002 | 2003 | Growth rates | Structure |
| Primary sectors | −12.1 | 90.8 | 2.8 | 19.9 | 3.0 |
| Manufacturing | 21.8 | 15.5 | 4.0 | 13.5 | 16.2 |
| Electricity, gas and water supply | 16.8 | 4.3 | −9.0 | 3.5 | 8.1 |
| Construction | −0.9 | 10.9 | 27.0 | 11.7 | 2.9 |
| Trade | 7.4 | 4.1 | 32.8 | 14.1 | 17.6 |
| Transport and communications | 7.8 | 12.4 | −18.0 | −0.3 | 21.5 |
| Other commercial services | 20.7 | 1.2 | 13.0 | 11.3 | 17.3 |
| Public services | −6.7 | 30.1 | 15.1 | 7.6 | 13.4 |
| Total | 8.1 | 12.4 | 5.9 | 8.7 | 100.0 |

S o u r c e: CSB of Latvia.

In the years to come investment growth will also be one of the most stable items of domestic demand.

## 2.2.6. Price behaviour and inflation

Consumer price inflation in Latvia (see Figure 2.7) in the recent years was close to the level of inflation in the developed countries and among the lowest in Central and Eastern Europe.
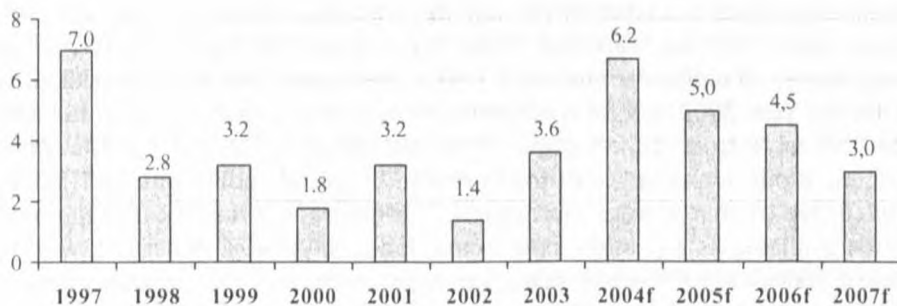


Fig. 2.7. Consumer price changes (12-month inflation, percent)

S o u r c e: 1996–2003 CSB of Latvia.

In the second half of 2003 and at the beginning of this year, the inflation rate has rocketed in Latvia. At the end of 2003, the inflation rate reached 3.6% (12–month inflation, December over December), which was the highest level in the last six years.

The rapid growth of inflation was due to the coincidence of several factors having an impact on the rise of prices:

– the rise of the euro exchange rate (especially in 2003), which made import more expensive;

– the continuously high and growing domestic demand, which, in turn, was fuelled by the rapid upsurge of wages and crediting;

– the expectations of inflation triggered by psychological reasons and speculations about the expected huge price rise when Latvia joined the EU;

– the growth of administratively regulated prices. In 2003 and at the beginning of 2004, administratively regulated prices grew more rapidly than in the preceding periods;

– the worldwide rise of fuel prices which mostly affected the increase of prices in April and May 2004.

## III. THE SKELETON OF THE LATVIAN MULTISECTORAL MODEL

### 3.1 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[1]) 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 |

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1 The following acronyms are from the configuration file of the Latvian vamfile. This file, named vamlat.cfg, is reproduced in the Appendix 1. This file drives the construction of the vam file by using G7.

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
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:
emp          : the employment vector
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.

### 3.2. 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[2]. 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

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

$$impsh_t = impsh_0 + a * t$$

where the parameter $a$ 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.

## IV. SIMULATION SCENARIOS

The scenario for the baseline is based upon historical data (1996–2003) and forecasts provided by the European Commission (2004–2007). Furthermore, an assumption about the period 2008–2010 is made to produce simulations covering the first decade of the current century.

At present, a simple system of import equations is added to the accounting identities coming from the Latvian Input-output table. Then, all the final demand and value added components are exogenously given. Their values are extended following the growth rates presented in Table 4.1. This table includes the "observed" import growth rates (years 1997–2003), and from 2004 up to 2008 those assumed by the European Commission; for the last three years, the import growth rates are assumed constant around 7,8 per cent for the second half of the first decade. From Table 4.1, we see that among the final demand components, household consumption is assumed to seriously cut down its growth rate in the last three years of the simulation horizon. This assumption will be useful to emphasize the importance of a multisectoral modelling approach.

From the input-output table accounting identities, outputs and prices are endogenous by definition for an input-output textbook Leontief model. Since the real side and the nominal side of the model are not yet integrated, only the impact of the simple sectoral import share equations on GDP is presented.

The growth rates of Table 4.1 allows us to compute the final demand vector and to apply the Leontief equation to obtain the sectoral total output vector. Consequently, the GDP is easily computed.

The introduction of simple import share equations makes imports endogenously determined. In such a case, differences between imports observed and are mirrored in the GDP only. This is shown in Table 4.2 where the comparison between the baseline scenario of Table 4.1 and the simulation results with imports

endogenously determined is shown. This table reproduces the growth rate of Table 4.1. For each item, growth rates are shown in two lines; the first line contains the values of the scenario presented in Table 4.1: the second line contains the difference from that scenario for the simulation where the imports are computed by means of the import share equations. Then, it is clear that the difference are zero for the exogenous variables; discrepancies arise for those variables endogenously determined by the model: GDP and imports.

These discrepancies come from sectoral discrepancies generated by the import share equations. For a number of sectors, Figures 4.1–4.7 show the imports generated according to the growth rates of the baseline scenario (marked as "scenario") and the imports endogenously determined (marked as "simulated"). It is possible to note that the cycle due to the Russian crisis in August 1998 is well detected for the secondary raw material (Figure 4.7) but failed in others sectors (in particular agriculture and hunting and Hotel and restaurant services, Figure 4.1 and 4.5). The sharp reduction of the growth rate in household consumption in the years 2008–2010 does not influence basic metals, forestry, logging and Secondary raw materials, while its impact is clearly shown in sectors such electrical energy, hotel and restaurants and agriculture and hunting which are related to important shares of the household's budget.

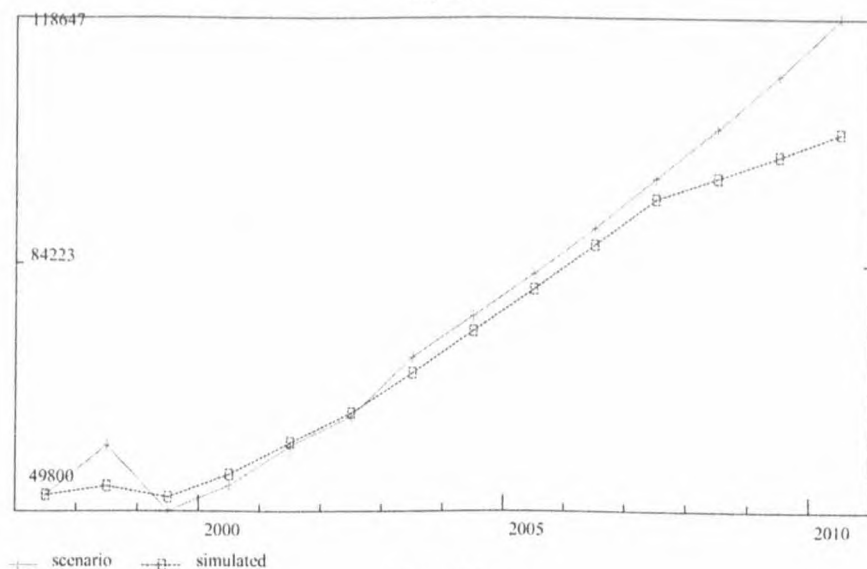## Agriculture and hunting, products and services

Imports



Figure 4.1.

S o u r c e: Own calculation.

Table 4.1

Growth rates of the baseline scenario

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008–2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Household Consumption | 7.0 | 0.6 | -1.4 | 5.1 | 8.2 | 7.1 | 8.9 | 8.4 | 7.8 | 7.5 | 7.0 | 2.1 |
| Government Expenditure | -4.0 | 16.4 | -3.2 | 2.6 | 8.4 | 4.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 3.1 |
| Collective Consumption | 0.0 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 11.7 |
| Investment | 12.2 | 51.7 | -6.7 | 12.3 | 9.9 | 3.7 | 10.6 | 11.7 | 10.6 | 10.5 | 9.1 | 6.6 |
| Exports | 8.8 | 4.5 | -13.5 | 10.9 | 6.2 | 7.5 | 6.8 | 7.8 | 8.2 | 8.1 | 8.2 | 7.8 |
| Final Demand | 9.6 | 10.5 | -6.1 | 7.9 | 8.0 | 6.3 | 7.9 | 8.1 | 7.9 | 7.8 | 7.4 | 5.2 |
| Imports | 9.5 | 13.2 | -15.4 | 7.0 | 10.5 | 7.1 | 13.0 | 8.0 | 7.7 | 7.8 | 7.7 | 7.8 |

S o u r c e: CSB of Latvia. Own calculation.

Table 4.2

First line: baseline growth rates; Second line: simulation growth rates measured as difference from the first line

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2007–2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Household Consumption | 7.0 | 0.6 | −1.4 | 5.1 | 8.2 | 7.1 | 8.9 | 8.4 | 7.8 | 7.5 | 7.0 | 2.1 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Government Expenditure | −4.0 | 16.4 | −3.2 | 2.6 | 8.4 | 4.0 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 3.1 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Collective Consumption | 0.0 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 11.7 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Investment | 12.2 | 51.7 | −6.7 | 12.3 | 9.9 | 3.7 | 10.6 | 11.7 | 10.6 | 10.5 | 9.1 | 6.6 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Exports | 8.8 | 4.5 | −13.5 | 10.9 | 6.2 | 7.5 | 6.8 | 7.8 | 8.2 | 8.1 | 8.2 | 7.8 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Final Demand | 9.6 | 10.5 | −6.1 | 7.9 | 8.0 | 6.3 | 7.9 | 8.1 | 7.9 | 7.8 | 7.4 | 5.2 |
| | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Imports | 9.5 | 13.2 | −15.4 | 7.0 | 10.5 | 7.1 | 13.0 | 8.0 | 7.7 | 7.8 | 7.7 | 7.8 |
| | 0.0 | −0.6 | 9.1 | 1.8 | −2.3 | −0.7 | −4.6 | 0.8 | 0.8 | 0.6 | 0.2 | −2.2 |
| GDP | 5.0 | 8.7 | −0.2 | 8.3 | 6.5 | 5.7 | 4.5 | 8.0 | 7.8 | 7.6 | 7.0 | 2.9 |
| | 0.0 | 0.4 | −6.5 | −1.2 | 1.3 | 0.4 | 2.8 | −0.6 | −0.6 | −0.5 | −0.2 | 1.4 |

S o u r c e: CSB of Latvia. Own calculation.

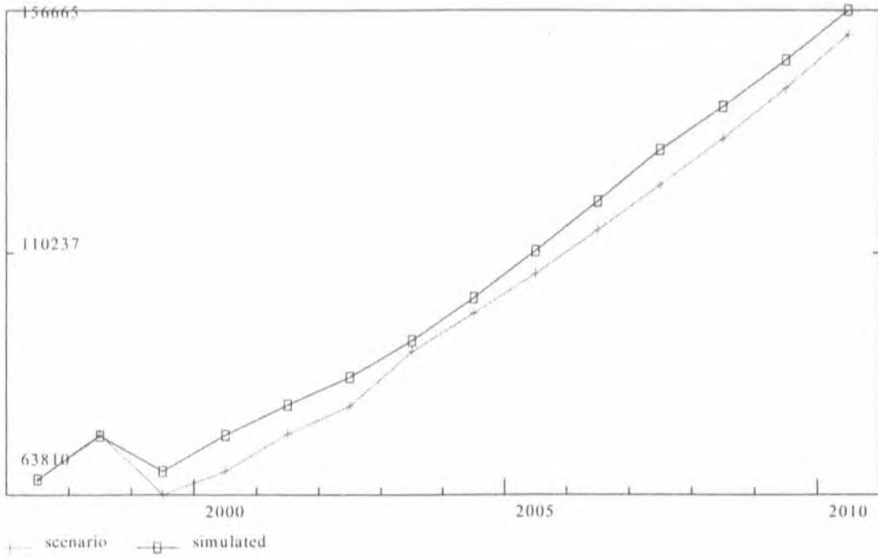## Basic metals

### Imports



Figure 4.2.

S o u r c e: Own calculation.
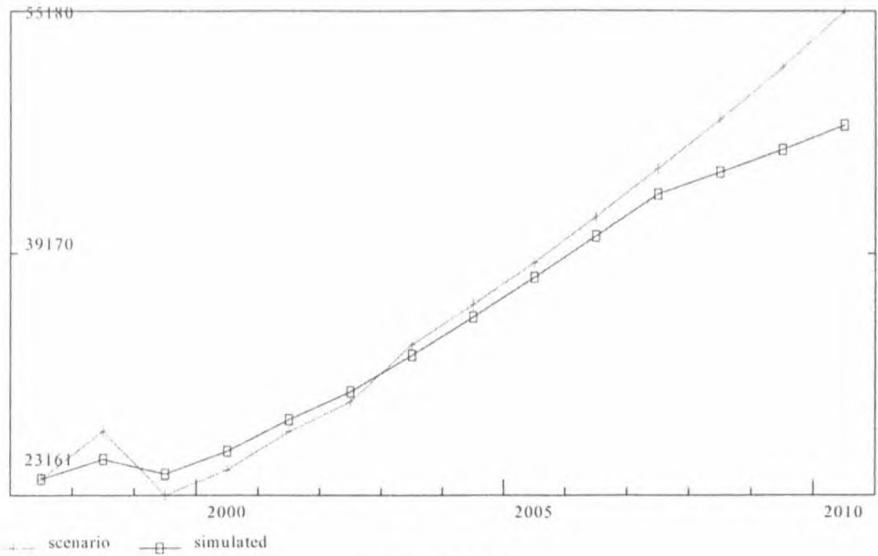
## Electrical energy, gas, steam and hot water

### Imports



Figure 4.3.

S o u r c e: Own calculation.

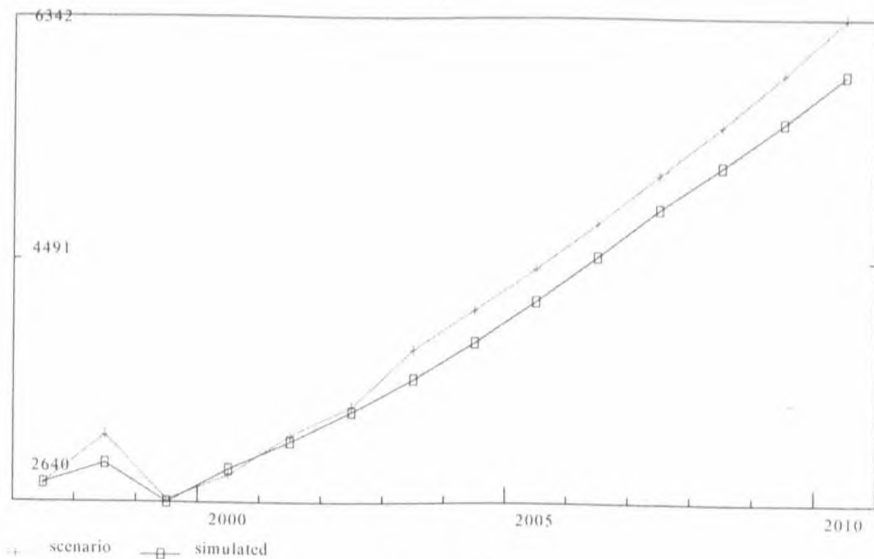## Forestry, logging; products and services

### Imports

·᛭· scenario    —□— simulated

Figure 4.4.

S o u r c e: Own calculation.

## Hotel and restaurant services

### Imports



···· scenario    —□— simulated
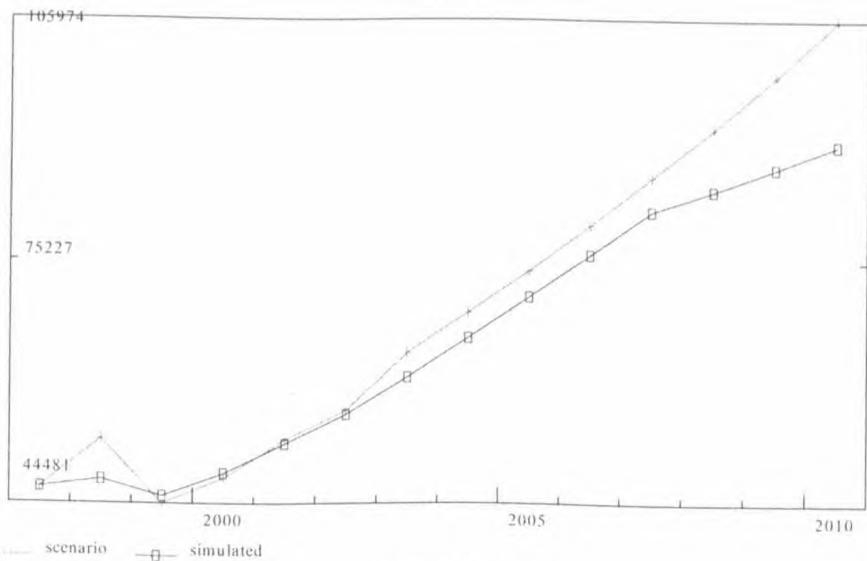
Figure 4.5.

S o u r c e: Own calculation.

# Furniture; other manufactured goods n.e.c.

Imports
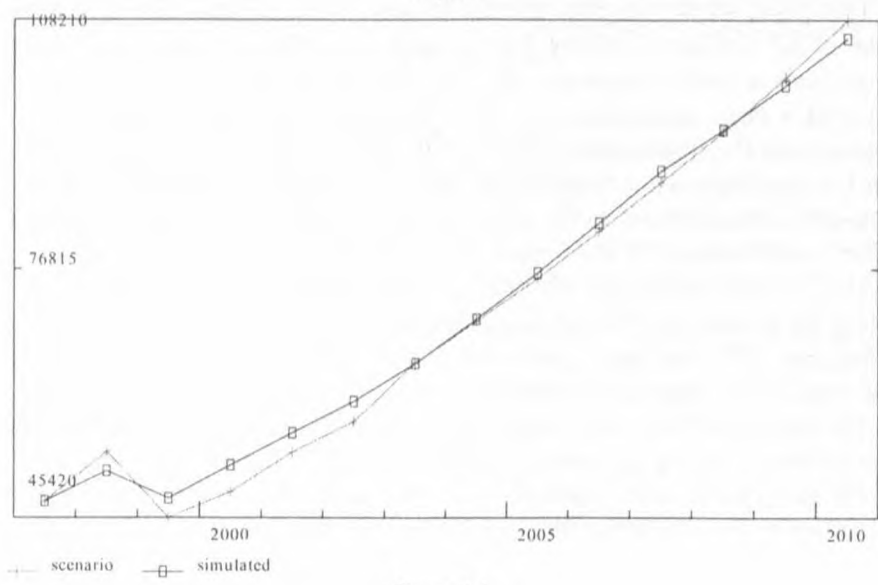
# Secondary raw materials

Imports
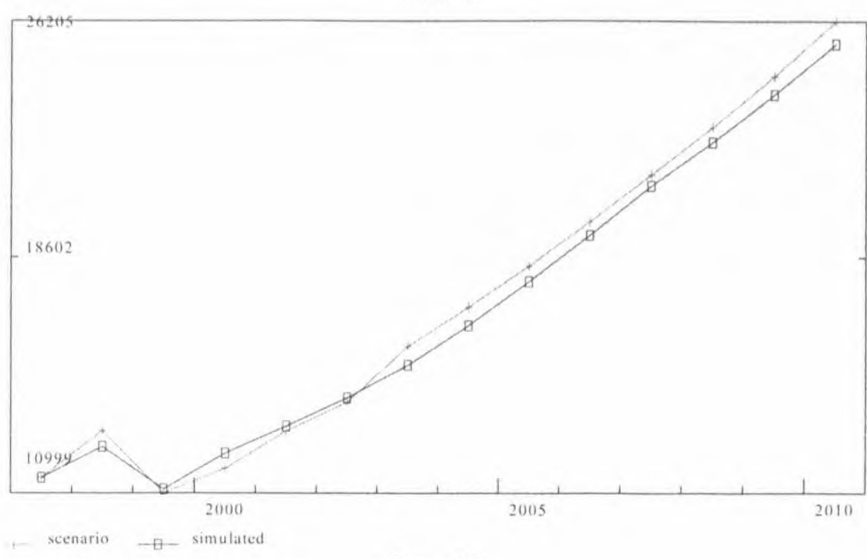
## V. CONCLUSIONS

This paper shows the first attempt to build a macroeconomic multisectoral model of the Latvian economy. Latvia, as any country which began the transition towards a market economy after the collapse of the Soviet Union, has experienced a deep economic crisis for about five years. The reshaping of the economy and the institutional reforms – quickly introduced to match the European Union obligations – began to produce positive effects around mid nineties; at present, Latvia belongs to the group of European Union Member States which perform much better than the former EU-15 countries.

The Latvian Statistical Office has already adopted the Eurostat standards including the production of input-output tables for the Latvian economy. The table of the year 1997 has been used as the starting table for the development of a macroeconomic multisectoral model.

The skeleton of the Latvian model allows us to give evidence of the importance of this modelling approach for policy simulation purposes.

The progressive enrichment of the statistics produced by the Latvian Statistical Office will surely foster the implementation of the model.

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## SPRAWOZDANIE O STANIE GOSPODARKI ŁOTWY W KONTEKŚCIE ROZWOJU WIELOSEKTOROWEGO MAKROEKONOMICZNEGO MODELU ŁOTWY

Opracowanie zawiera opis gospodarki Łotwy w momencie wejścia do Unii Europejskiej. Obejmuje on także lata poprzedzające, począwszy od połowy lat dziewięćdziesiątych. Zaprezentowano projekcje wybranych zmiennych makroekonomicznych zgodnie z programem Konwergencji dla Republiki Łotwy. Opis koncentruje się na podstawowych wskaźnikach takich jak PKB, zatrudnienie, płace, inwestycje i inflacja; w miarę dostępności danych przedstawiono te kategorie w ujęciu sektorowym, co pozwala docenić głębokość zmian strukturalnych, ciągle jeszcze trwających.

W drugiej części opracowania przedstawiono wielosektorowy model łotewskiej gospodarki. Stanowi on pierwszy krok w kierunku budowy nowoczesnego modelu input-output zgodnego z podejściem INFORUM. Szkielet konstrukcji modelu łotewskiego oparty jest na tablicy input-output opracowanej przez Łotewski Urząd Statystyczny dla 1997 r. Podręcznikowy model Leontiefa wzbogacony został o blok równań importu. Symulacja oparta na scenariuszu zgodnym z programem Konwergencji dla Republiki Łotwy daje możliwość oceny potencjału w zakresie modelowania polityki ekonomicznej tkwiącego w tym podejściu.