FACTORS AND IMPACTS IN THE INFORMATION SOCIETY
A PROSPECTIVE ANALYSIS IN THE CANDIDATE COUNTRIES

REPORT ON LATVIA

Authors:
Dr. Raita Karnite
Maris Klava
Kriss Karnitis

MARCH 2004

Technical Report EUR 21283 EN

European Commission

Joint Research Centre (DG JRC)

Institute for Prospective Technological Studies

http://www.jrc.es

Legal notice

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of the following information.

Technical Report EUR 21283 EN

Printed in Spain

Preface

The Institute for Prospective Technological Studies (IPTS) of the Directorate General Joint Research Centre of the European Commission contracted the International Centre for Economic Growth, European Centre (ICEG EC) to act as the coordinator of a consortium of 11 research institutes to carry out this project.

The main objective of the project was to provide a series of national monographs studying the development of the Information Society (IS), including both the positive and negative impacts, in each of the candidate countries. These monographs offer an assessment of the strengths and weaknesses of each country regarding the development of IS, and a view on their possible outcomes; both strongly rooted in factual quantitative data. They provide a clear, contextualised, multi-factoral and multi-causal picture of the input factors that contribute to the success or failure of IS developments, and the relevant output parameters that support mid- and long-term impacts on economic growth, employment and other relevant aspects of the future of each country. Each monograph concludes with a set of alternative scenarios for the development of IS in that country.

This report was carried out by the Institute of Economics at the Latvian Academy of Sciences, and aims to study the factors and impacts of the Information Society in Latvia. The report reflects the research results, comments and opinions of the team of authors. It does not necessarily reflect the opinion of the European Commission. It is organised around 9 themes – economy, demography, government policies, industrial development and competitiveness, relevant economic activity, IST penetration rates, institutional capacity and regulatory background, education, and culture. The section on each of these themes concludes with a specific SWOT analysis. Finally, a general diagnosis is made of Latvia's potential for IS developments, followed by a brief section on possible scenarios for the future and policy recommendations.

A Synthesis Report was also prepared by the Project Coordinator, the International Centre for Economic Growth, European Centre (ICEG EC), on the basis of all the country studies. This offers an integrated and prospective view on the future outlook for the Information Society in the Candidate Countries and can be found on the FISTE (Foresight in Information Society Technologies in Europe) website: http://fiste.jrc.es/

The contract was awarded by: Institute for Prospective Technological Studies (IPTS) of the Directorate General Joint Research Centre, European Commission
Contractor: International Centre for Economic Growth, European Centre (ICEG EC) – Coordinator of Consortium of 11 research institutes
Latvian member of the consortium: INSTITUTE OF ECONOMICS, LATVIAN ACADEMY OF SCIENCES, Akademijas laukums 1, LV-1050, Riga, Latvija; Tel: 7222830, fax 7820608, email: raimara@lza.lv
Contract name: Factors and Impacts in the Information Society: a Prospective Analysis in the Candidate Countries
Contract number: N 20089-2002-11 F1ED SEV HU

TABLE OF CONTENTS

COUNTRY PROFILE

Latvia, one of the Baltic countries, is situated in North-East Europe, on the Eastern coast of the Baltic Sea. It borders with Estonia to the North, Russia to the East, Belarus to the South-East and Lithuania to the South.

Table 1: Main data about Latvia

Area, km2	64589
of which, land	62046
inland water	2543
Extension, km, from north to south	210
from west to east	450
Length of boundary, km	1862
of which, land boundary	1368
sea border	494
Resident population, thousand persons	2319,2
of which, urban, %	67.8
rural, %	32.2
Administrative territorial division:	
cities and towns	77
counties	15
pagasts (civil parishes)	461
Population density (inhabitants per 1 km2 of area)	35.9
National currency	lats (LVL)

Source: Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, pp.7, 36, 37, Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.46, population as of 1 January 2004

Latvia belongs to the small countries of Europe. The country on the whole is determined as NUTS 2 region in the EU, and it is divided in five NUTS 3 regions (map 1).

In the past, the access to the Baltic Sea and its ice-free ports encouraged neighbours to invade these territories. That is why Latvia was first proclaimed independent as late as 18 November 1918. The first independence period was not long – just 22 year later, on 17 June 1940, the Soviet Army entered the territory of Latvia and the country lost its independence. It became a formal member of the USSR on the 5 August 1940.

Latvia was one of the most developed republics in the Soviet Union. Within the so-called production relocation schemes, Latvia and other Baltic countries were focused on knowledge intensive industries. A number of large machine building, electronic, radio engineering, pharmaceutics and chemical enterprises were located there, many of them producing for space development and military industry. Almost all of them collapsed after break of the Soviet Union that led to the total loss of former markets. Nevertheless focus on such kind of industries continues in Latvia.

Map 1. Statistical regions (NUT 3)

Industrial development both contributed to and gained from the research and development activities. Latvia advanced in science fields like physics, electronics, wood chemistry, material sciences, non-organic chemistry, microbiology, and genetics. On the other hand, research activities reduced dramatically during the transition period.

Despite being so long under Soviet regime, Latvia returned to independence. The Supreme Council of Latvia passed a Declaration of Independence on 4 May 1990, and full independence was restored on 21 August 1991, right after the political putsch in Russia.

The capital of Latvia and main city, hosting about one third of Latvia's population (739.2 thousand people[1]), is Riga. Riga was founded in 1201. Its convenient location at the crossroad of the Baltic Sea and River Daugava, good access to the eastern markets and membership in the Hanseatic Trade League promoted development of the city. The foundation of its economic prosperity was trade, but since 14th century Riga became also the most significant centre of crafts in Latvia. In 1581- 1621, when Riga was under the Polish rule, it obtained importance in trade between Eastern and Western Europe. In 1621 - 1710 Riga was under the Swedish rule and for some time the biggest city of the Swedish Kingdom. After the Nordic War the Russian Empire annexed it. In the 19th century Riga was one of the most important industrial cities in the western part of the Russian Empire. Good railway connections were established between Riga and the rest of the Empire. The Baltic Germans, who were a considerable minority in Latvia in those days, dominated the cultural, intellectual and economical life of Riga. A very prosperous period was the first independence era (1918 - 1940) of Latvia, when Riga developed to a multifunctional city with various industries, businesses, and education institutions. Riga had 185 thousand inhabitants in 1920 and 348 thousand inhabitants in 1939. The city was badly damaged in the Second World War as Latvia was occupied by the Soviet Union (1940 -1941), Germany (1941 - 1944) and once

[1] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.46, as of 1 January 2004

again by the Soviet Union (1944 -1990). Human, cultural and material losses were dramatically large under both occupation powers.[2]

In 2003, 53.3% of the total output of industry was produced in Riga and 61.4% in Riga and Riga region[3]. Riga has also become an education centre: most higher education, science and research institutions are located there; some of them have subsidiaries in other cities.

Other largest cities are Daugavpils (112.6 thousand population), Liepaja (87.0 thousand population), Jelgava (65.7 thousand population), Jurmala (55.2 thousand population), Ventspils (44.0 thousand population), Rezekne (37.8 thousand population),[4] Jekabpils (27.2 thousand population), Valmiera (27.4 thousand population), Ogre (26.2 thousand population)[5]. Daugavpils, Liepaja, Jelgava, Ventspils, Rezekne and Valmiera host a higher education institution.

Latvia is a multiethnic country, in which only 58.5% of population are Latvians. 29.0% are Russians, 3.9% - Belarussians, 2.6% Ukrainians, 2.5% Poles, 1.4% Lithuanians and 2.1% other nationalities.[6]

[2] Regions of the Baltic States, Nordregio Report 2000:2
[3] Main indicators of Latvian industry, 4(28)/2003, Central Statistical Bureau of Latvia, Riga, February 2004, p.18
[4] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.46, as on 1 January 2004
[5] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.38
[6] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.41

A. NATIONAL AND REGIONAL ECONOMY

A.1. Introduction

In beginning of nineties, Latvia survived a period of intensive decline. At comparative prices, Latvia's GDP in 1995 was at 53.2% of the 1990 level at average prices of 2000. The first positive growth indicator was registered in 1994, yet the real recovery began only in 1996. Despite remarkable fluctuations in annual figures, an average annual growth rate did not fall below 5% since 1995. The fastest annual growth of GDP - 8.6% was registered in 1997.[7]

Restructuring of economy from planned to market driven is finished in general terms. All necessary market institutions are established and legislation introduced. The whole economic system has changed dramatically.

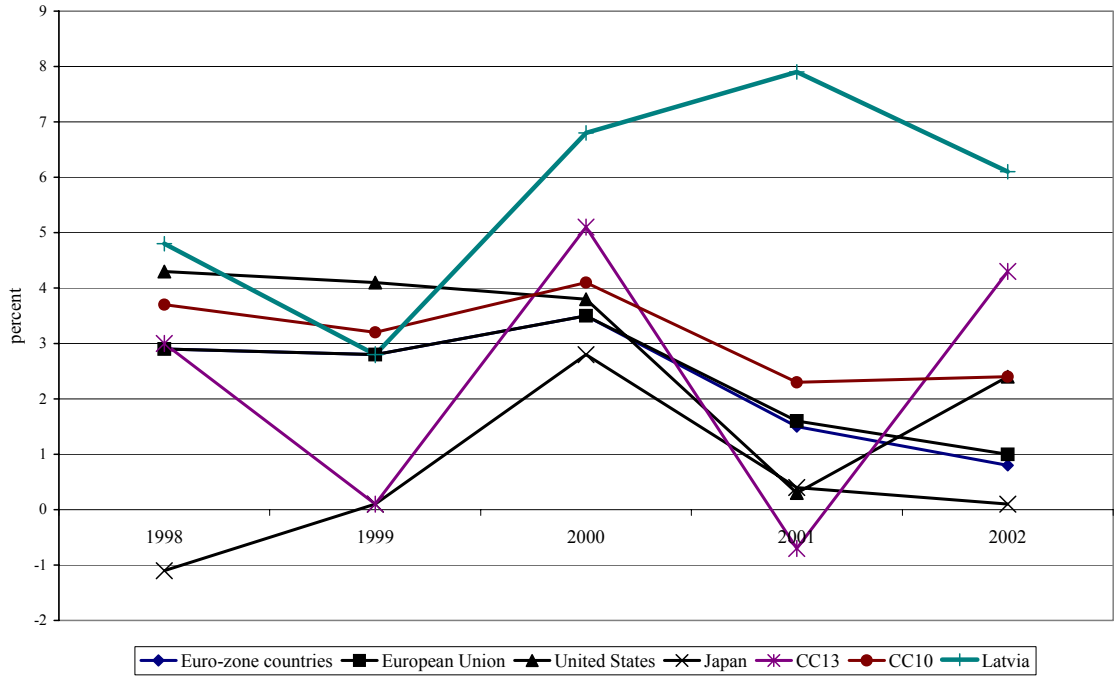
Generally the Latvian economy could be characterised as a small fast growing economy, starting from low development level, important technological gap compared with other European countries and massive institutional and structural changes. The first round of modernisation, which included change of obsolete industrial equipment, introduction of main elements of market economy (legislation, institutions) new management practices, new kinds of industry and services has been finished. The second stage, which could be characterised as "modernisation of modernised", has began.

A.2. Economic Growth

Figure 1 shows GDP growth rates in Latvia and selected countries and groups of countries. In 2003, Latvia's GDP grew by 7.5%, it was 9104.2 million EUR at current prices or 8292.9 million EUR at constant prices of 2000. [8]

[7] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga 2003, p.35
[8] Monthly Bulletin of Latvian Statistics, 2(117), Central Statistical Bureau of Latvia, Riga, March 2004, p.4

Graph A1. GDP (at constant prices) growth in selected countries and groups of countries in 1998-2002, percentage change over previous year



Source: Macroeconomics of Latvia in figures, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.100, 110

With low starting level in 1990 and the deepest economic decline among CCE countries in beginning of nineties, the level of economic development remains low in Latvia. In 2002, Latvia's GDP amounted to 8.9 billion EUR at current prices using official exchange rates or 19.8 billion of purchasing power standards.[9]

In 1998 GDP of Latvia in PPP units per capita equalled to 28% of EU average (table 2). The position of Latvia within the group of acceding countries was better, though GDP level was lower than average in CC-13 and CC-10 groups.

[9] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.113, 112

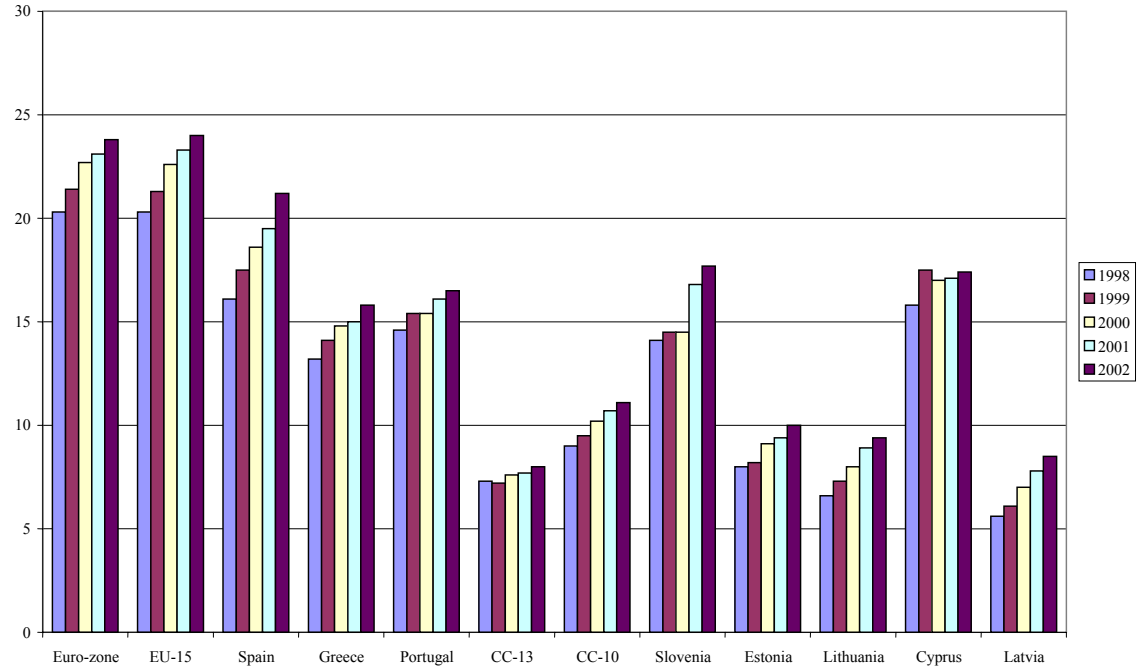
Table A1.GDP per capita in Latvia and selected countries and groups of countries

	Thousands of purchasing power standards		Latvia in percent of respective country (group of countries)		Increase in volume
	1998	**2002**	**1998**	**2002**	**2002/1998**
Latvia	**5.6**	**8.5**			**51.8**
Euro-zone countries	**20.3**	**23.8**	**27.6**	**35.7**	**17.2**
European Union	**20.3**	**24.0**	**27.6**	**35.4**	**18.2**
Luxembourg (the highest in EU)	36.5	45.4	15.3	18.7	24.4
Denmark	24.0	27.3	23.3	31.1	13.8
Ireland	21.5	29.9	26.0	28.4	39.1
Finland	20.6	24.8	27.2	34.3	20.4
Spain	16.1	20.2	34.8	42.1	25.5
Portugal	14.6	16.5	38.4	51.5	13.0
Greece (the lowest in EU)	13.2	15.8	42.4	53.8	19.7
CC13	**7.3**	**8.0**	**76.7**	**106.3**	**9.6**
CC10	**9.0**	**11.1**	**62.2**	**76.6**	**23.3**
Slovenia	14.1	17.7	39.7	48.0	25.5
Cyprus	15.8	17.4	35.4	48.9	10.1
Estonia	8.0	10.0	70.0	85.0	25.0
Lithuania	6.6	9.4	84.8	90.4	42.4
Poland	7.7	9.5	72.7	89.5	23.4
Other countries					
United States	29.8	33.0	18.8	25.8	10.7
Japan	23.6	24.4	23.7	34.8	3.4
Switzerland	25.7	28.4	21.8	29.9	10.5

Source: Macroeconomics of Latvia in figures, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.102, 118

Faster development of Latvia compared with other countries (Graph A1, Table A2) has yielded convergence by 2% of EU average per year. In 2002, Latvia's GDP per capita reached 35% of EU average, and it exceeded CC-13 average by 6%. Still with GDP per capita being only 48% of that in Slovenia and 77% of average in CC-10 group Latvia is the least developed candidate country and lags behind Estonia and Lithuania (Graph A2).

Graph A2. GDP per capita in selected countries and groups of countries in 1998-2002, in thsd PPS



Source: Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.100, 110

A.2.1. Macroeconomic stability

The major factor facilitating Latvia's development has been macroeconomic stability. In macroeconomic indicators Latvia meets almost all Maastricht criteria.

The level of **inflation** in Latvia has decreased from hyperinflation in beginning of nineties to 1.9% in 2002. Inflation increased in 2003 (to 2.9%) in result of remarkably better financing of economy in 2002 and 2003, but it remained controlled.[10] The stability of inflation rate is being ensured through strict monetary policy.

Stable national currency and low inflation stimulated fall in **interest rates**. In 1994 the average interest rates were 36.8% on long-term credits and 52.0% on short-term credits, it felt to 8.5% and 7.5% at end of 2002[11] and were even lower – 7.5% and 5.4% in 2003[12].

The tight fiscal policy, which has been realised in Latvia for all the period, kept **the state debt** low, yet it increased in 2001, 2002[13] and 2003[14]. At end of 2003 the state debt of Latvia totalled 1312.1 million EUR, compared to 817.1 million EUR at end of 1999. Central government debt equalled to 14.6 % of GDP at end of 2002.[15]

[10] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.14
[11] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.26
[12] Monthly Bulletin of Latvian Statistics 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.6
[13] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.24
[14] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.6
[15] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.24

The state financial position changed during last years. The year 1997 and 1998 finalised with a fiscal surplus (1.2% and 0.1% of GDP) and the total state debt went down, but since 1999 there was deficit in the state finance[16]. In 2002 general government fiscal balance equalled to (minus) 2.5% of GDP[17]. In 2003 the state fiscal situation slightly improved[18].

One of the main economic problems of Latvia is high **current account deficit** – 7.8% of GDP in 2002[19]. It is caused mainly by the high domestic demand, dynamic growth of investment and still insufficient export. Since the deficit of the current account is offset by FDI and long-term credits, the level of debt is not critical. Net foreign reserves of the Bank of Latvia continue growing and are able to fully cover the reserve money.

The exchange rate of the **national currency** (Lats - LVL) remained stable against the SDR currency basket (1 LVL = 0.7997 SDR units)[20]. The Bank of Latvia has decided to keep this currency peg until the accession of Latvia into the EU and joining EMU.

The current fast economic development, growing investment and developing export-oriented industry, all supported by the accession into the European Union, give reason to hope for growth in the coming years. It is anticipated that in the medium term structural reforms and investment will increase competitiveness of Latvian economy and exports will grow thus bringing down the current account deficit. It is important that investment is made in new technologies, and new export-oriented products are introduced and facilities established in industry on the basis of FDI and international cooperation. The Ministry of Economics considers that annual GDP growth in the medium term may equal to 5-7%[21].

On the basis of current development, International Agency "Standard & Poor's" has improved assessment of Latvia's credit rating in foreign currencies from "stable" to "positive". It has approved following ratings for Latvia: long-term loans in foreign currency BBB+, local currency A-, short-term loans in foreign currency A-2, local currency A-2. Future assessment for loans in local currency remains "stable". Agency "Fitch Ratings" has given BBB+ assessment for long-term loans in foreign currency, and Agency "Moody's" – A2.[22]

Analytical conclusion

Since 1996, Latvia's economy experiences growth that is ensured by macroeconomic stability, strict fiscal and monetary policy. Starting from the lowest GDP per capita level among CEE countries, Latvia has not been able to outrun other candidate countries; yet the gap between Latvia and other countries, as well as EU average gradually reduces. The largest problem of Latvia's economy is growing current account deficit that is connected with weaker performance of exports and restructuring of production and service sectors.

Like every small economy depending largely on trade, Latvia's economy is sensitive to external shocks, of which the most important are shrinking external markets and political measures against the country. However, the economy has been able to adjust to changing economic conditions so far. For instance, the impact of Russian crisis as well as cut off

[16] Monthly Bulletin of Latvian Statistics, Central Statistical Bureau of Latvia, Riga, respective years
[17] Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, December 2003, p.8
[18] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.4,5
[19] Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, December 2003, p.8
[20] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.26
[21] Economic Development of Latvia, Report of the Ministry of Economics of the Republic of Latvia, Riga, December 2003, p.9
[22] BNS, July 29 2003

Russian oil transportation through oil pipe and Latvian ports were compensated during a year. On the basis of this experience, the middle-term economic development prospective seems satisfactory, and the 5-7% growth rate – realistic.

A.2.2. Supply side of growth

We assume that the supply components of growth determinate major demand for IS.

From the supply side all sectors contributed positively in 2001 and 2002, and just one sector (electricity, gas and water supply) showed small negative impact (-0.2%) in 2000. GDP growth is mostly supported by growing of outputs in trade, commercial services and construction, and recently also in manufacturing. Contribution of different sectors to GDP growth is shown in table 3.

Table A2: Contribution to GDP growth

	1991	1995	2000	2001	2002
A: Agriculture, hunting, forestry	-0.2	0.3	0.4	0.3	0.2
B: Fishing	0.0	0.3	0.0	0.0	0.0
A+B	-0.2	0.6	0.5	0.3	0.1
C: Mining and quarrying	0.0	-0.1	0.0	0.0	0.0
D: Manufacturing	0.2	-0.1	0.9	1.3	0.9
E: Electricity, gas and water supply	-0.1	0.4	-0.2	0.2	0.2
C+D+E: Total industry	0.1	0.2	0.7	1.6	1.1
F: Construction	-6.8	-0.5	0.5	0.4	0.6
C+D+E+F: Total industry and construction	-6.7	-0.2	1.2	1.9	1.7
G..O: Services	-3.2	-1.1	4.4	5.1	3.6
D.21: Taxes on products	-0.3	-0.1	0.8	-12.3	0.0
D.31: Subsidies on products	0.0	0.0	0.0	-0.5	0.0
Taxes less subsidies	-0.3	-0.1	0.8	0.6	0.6
GDP growth	-10.4	-0.8	6.8	7.9	6.1

Source: Authors' calculation from official statistical GDP data

The current situation is a result of remarkable changes in the structure of the gross value added during the last twelve years (Table A3). The share of industry and agriculture has declined, the share of services on the contrary increased year by year.

The share of **agriculture, hunting and forestry** has declined from 21% in 1990 to 4.5% in 2002, of which the share of agriculture, hunting and related service activities constituted 2.9%, forestry – 1.6%.[23] The lowest production level compared to 1990 (46.7%, 1990=100) was fixed in 1996 and 1999[24]. In 2002 value added of agriculture, hunting and forestry reached 58.7% of the amount in 1990, but 116.7% of the amount in 1995.[25] Both sectors – agriculture and forestry grew during the last years, but the development of forestry was faster. In agriculture traditional farming prevail, but there are also examples of specific kinds of activity, like horse, sheep, goat and ostrich farms, cultivation of mushrooms, fruit-growing and biological farming.

In 2002 the share of **manufacturing** in gross value added was 2.33 times less, while the share of **electricity, gas and water supply** - 2 times more than in 1990, but remarkably less than in 1995, when it was 5.5% of gross value added.

[23] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.42
[24] All comparisons are at constant prices.
[25] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.43

Table A3: Structure of gross value added by kind of activity (at current prices, in percent)

	1990	1995	1997	2000	2002
Gross value added at basic prices	100.0	100.0	100.0	100.0	100.0
of which by kind of activity:					
Agriculture, hunting and forestry	21.1	10.4	5.6	4.5	4.5
Fishing	0.8	0.4	0.2	0.4	0.2
Mining and quarrying	0.2	0.2	0.2	0.1	0.2
Manufacturing	34.5	22.4	22.2	14.6	14.8
Electricity, gas and water supply	1.8	5.5	5.0	3.9	3.6
Construction	9.7	5.1	4.8	6.7	6.1
Services	31.9	56.0	62.0	69.8	70.6
of which:					
Wholesale and retail trade	5.5	11.3	16.0	18.0	19.9
Hotels and restaurants	1.3	1.1	1.3	1.2	1.2
Transport, storage and communication	10.9	16.0	16.8	15.4	14.5
Financial intermediation	1.7	5.6	4.8	5.4	4.6
Real estate, renting and business activities	4.4	4.3	5.1	10.4	11.1
Public administration and defence, compulsory social security	0.7	5.1	5.8	6.6	6.6
Education	2.6	5.3	4.9	5.4	5.4
Health and social work	1.8	4.0	3.4	3.1	3.0
Other community, social and personal service activities	3.0	3.3	3.9	4.3	4.3

Source: Statistical Yearbook of Latvia 2000, Central Statistical Bureau of Latvia, Riga, 2000, p.24, Statistical Yearbook of Latvia 2002, Central Statistical Bureau of Latvia, Riga, 2002, p.16, Monthly Bulletin of Latvian Statistics, 11(114), 2003, Central Statistical Bureau of Latvia, Riga, December 2003, p.31.

The reduction of the share of manufacturing was caused by remarkable decline in production in 1992 (by 48%) and 1993. The lowest value added was fixed in 1995 – 32% of the amount in 1990. Since 1995 both decline and growth have taken place, while since 2000 growth is rather fast (6-8% per year). In 2002, value added of manufacturing equalled 48.2% of the amount in 1990, but 150.5% of the amount in 1995.[26]

Volume indicators in electricity, gas and water supply sector declined sharply in 1992 – 1993, and reached the lowest level (55.6% of the amount in 1990) in 1994, and then fluctuated at 59-62% of the level of 1990. In 2002, the amount of value added in the electricity, gas and water supply was 61.8% of the relevant amount in 1990, and 101.2% of the amount in 1995[27]. Diminishing production was a result of reduction of economic activity in the beginning of nineties, and implementation of less energy intensive technologies in industrial and non-industrial sectors.

The **construction** value added has remarkably declined in comparison with 1990; still it has been growing since 1996. The lowest amount of construction value added was recorded in

[26] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.49
[27] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.53

1993 – just 12.6% of that in 1990. In 2002 the amount of construction value added increased amount in 1995 by 83.3%, yet it made up only 23.5% of the 1990 level.[28]

In the **service sector**, major contributors to GDP are trade and transport, storage and communication.

Since 1993, the share of **trade** in gross value added has grown every year – from 5.5% in 1990 to 19.9% in 2002 (14.4 percent points more). After reaching the lowest level – 54.8% of the amount of 1990, value added of trade grew, and in 2002 were 2.01 times higher than in 1990 and 2.07 times higher than in 1995.[29] The growth can be explained by fast increasing internal demand, and, in less degree, by constantly growing prices.

Development of transit business provided growth in **transport sector**, and increasing of administratively regulated prices facilitated moderate increase of value added in **communication sector**. Like all others, both sectors declined in beginning of transition. The lowest level (in 1992) was 65.1% of the amount in 1999. In 2002 value added in the sector reached 98.6% of the level of 1990, and 142.7% of the level of 1995.[30]

Financial intermediation is recorded in statistics since 1992. Sectors value added grew in the beginning of nineties, then fluctuated around the amount 280 million EUR in the period 1995-1999 (about 4% of gross value added), and then started to grow again in 2000.[31] The growth in the banking sector was stable (since 1995, after bank crisis). Total banking assets reached 8233.2 million EUR at end of November 2003, compared to 3202.1 million EUR at end of 1999 and 1133.7 million EUR at end of 1995.[32] Banks serve as infrastructure elements mainly, and despite growth in volume indicators, the share of financial intermediation in gross value added stays at 4.5-5.5%. Nowadays the main banks in Latvia belong to foreign owners.

After a long stagnation period, **security market** improved slightly in 2000. At the end of 2002 security market capitalisation was 685.7 million EUR. Total turnover in 2002 was 509.6 million EUR[33]. Security market indicators improved significantly in 2003: market capitalisation increased by 45%. Riga Stock Exchange price index RICI increased 2.33 times, Dow Jones Riga Stock Exchange index - 1.42 times.[34]

The development of the **commercial services**, as well as trade and financial intermediation is promoted by increasing income of people and enterprises, and bigger availability of lending facilities. Mentioned service sectors (trade, financial intermediation, commercial services, at some extent also transport services) are equipped with modern technologies.

Also the development of **cultural and leisure services**, as well as **education** services increased in recent years on the basis of higher incomes of population.

The Ministry of Economics reports, that at least 2/3 of growth in the sector of transport and communications triggered by the domestic demand that in recent years has gone up much faster than the external consumption. This refers to supporting of auxiliary types of transport

[28] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.55
[29] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.57
[30] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.61
[31] Macroeconomic indicators of Latvia, 2, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.31
[32] Monthly Bulletin of Latvian Statistics, Central Statistical Bureau of Latvia, Riga, respective periods
[33] Statistical Yearbook of Latvia 2003, Central statistical Bureau of Latvia, Riga, 2003, p.30
[34] Monthly Bulletin of Latvian Statistics, 1(104), 2003, Central Statistical Bureau of Latvia, Riga, March 2003, p.49, Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.45

activities, such as development of warehousing, parking services, as well as services offered by travel firms and other services.[35]

The share of **health care and social work** reached the very low level – 2.8% in 2002. In 2003, after the government decided to increase financing of health care, the share of the sector increased to 3.0% of gross value added.[36]

The very low share of health care and social work and high share of trade in gross value added is disproportion of the economic structure. Also the share of sectors producing goods is not sufficient in the Latvian economy. International comparison shows that Latvia has the lowest share of manufacturing among the EU accession countries[37], and the share of agriculture alone also is not high (2.9% in 2002 and 2.7% in 2003). On the other hand, decline of real sectors has stopped, and industry has started to grow. The share of construction is high (6.1% of gross value added in 2003), mainly because of better financing of Latvian economy on the basis of loans. Loan expansion was significant in years 2002 and 2003 – credits to domestic enterprises and private persons increased by 45% during the period December 2002 to February 2003.[38]

The share of value added in output of goods and services varies in years from 45.5% in 1996 to 42.9% (in 1998), and it was 44.2 in 2002[39]. The share of high-tech industries in total industrial output in Latvia is low – about 3-4%, the share of high-tech industries in exports from Latvia does not exceed 10%.[40] Economic activities related to production of goods and services of IT[41] in 2002 equalled to approximately 5,2% of GDP (compared with 3.23% in 1997 and 4.6% in 2001). In the sub-sector "Office equipment and computer production" the value added created in 2001 equalled to 0.1% of GDP. In the sub-sector "Computers and the related activities" the highest share (approximately 75%) belongs to software development. The added value of this sub-sector in 2002 reached approximately 0.8% of GDP (0.5% of GDP in 2001).[42]

Analytical conclusion:

Economic structure has remarkably changed. In general it corresponds to economic structure of a small modern economy, yet some disproportions exist that may impact economic development in future. We think that trade sector is oversized in GDP in connection with the dramatic shrinkage of production sectors and comparatively weaker performance of some high value added service sectors (ex. financial intermediation) and social services (health and social work). Exaggerated trade sector is characteristic for countries with large export of trade services (demand supported by tourists and visitors), but this cannot be observed in Latvia.

[35] Economic Development of Latvia; Report of the Ministry of Economy of the Republic of Latvia, Riga, December 2003 p.21

[36] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.29

[37] Statistics in Focus. Eurostat, Theme 2-17/2002

[38] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.29,41; Statistical Yearbook of Latvia, Central Statistical Bureau of Latvia 2003, Riga, 2003, p.28

[39] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p. 40

[40] Latvian Development Plan. Draft project as to 03.09.2002, p.22

[41] According to classificatory of the general economic activities (NACE), information technologies may be attributed to such sub-sectors as "Office equipment and computer production" (from the "Manufacturing" sector), "Telecommunications" (from the sector of "Transport, storage and communications") and "Computers and the related activities" (from "Operations with real estate, rent and other commercial activity"). Economic Development of Latvia; Ministry of Economics of the Republic of Latvia, Riga, December 2002, p.96, June 2003, p.104

[42] Economic Development of Latvia; Ministry of Economics of the Republic of Latvia, Riga, December 2004, p. 105,106

Trade driven economy is vulnerable to changes in purchasing power, what is provided by real sectors. Besides labour productivity in trade is not among the highest.

Under sizing of health care cause substantial social consequences. Low public funding in health care turns the sector into strongly commercial one. This impacts accessibility of health care services to majority of population in Latvia, and leads to worsening of population health and demographic situation. Under sizing of education sector is more connected with low welfare level, as the share of education service in GDP is satisfactory, but the GDP level is low.

Transformation of Latvian economy has promoted development of sectors and industries, which are based on intensive use of information, such as transportation services and communication, trade, commercial and financial services, computer industry, export oriented industries. This forms environment in which development of IS appears both necessary and possible. Approximately 51% of value added is produced in sectors that use information as a resource or are based on information systems and networks. In addition growing internal demand reflects in increasing amounts of telecommunication, financial, commercial, transport and education services, all based on use of IT and information systems.

A.2.3. Demand side of growth

We assume that demand components of growth determinate supply side of IS.

GDP by expenditure items is characterised in Table A4. Growth rates of main aggregates in GDP expenditure are provided in Graph A3.

Final consumption expenditure of households and of non-profit institutions serving households together with consumption expenditure of general government made up 82.1% of GDP in 2002. The share of consumption in GDP has declined compared with 1996, when it was 89.5%, mainly because of reducing general government consumption.[43] Volumes of private consumption go up at a steady rate. The annual increase of wages of the employed, and also by the ability of private persons to benefit from consumption credits and loans to purchase and repair housing favourably influenced private consumption. Annual growth rates of the private consumption do not exceed GDP growth rates.

The positive trend is significant increase of **gross capital formation** – from 18.3% of GDP in 1996 to 27.0% of GDP in 2001 and 26.4% of GDP in 2002[44]. The reason of the low share of investment in beginning of nineties was lack of investment resources, including FDI, and this is connected with late privatisation. Although the fast growth of investment is one of the main reasons for enlargement of the negative export-import balance, still it forms a stable base for growth.

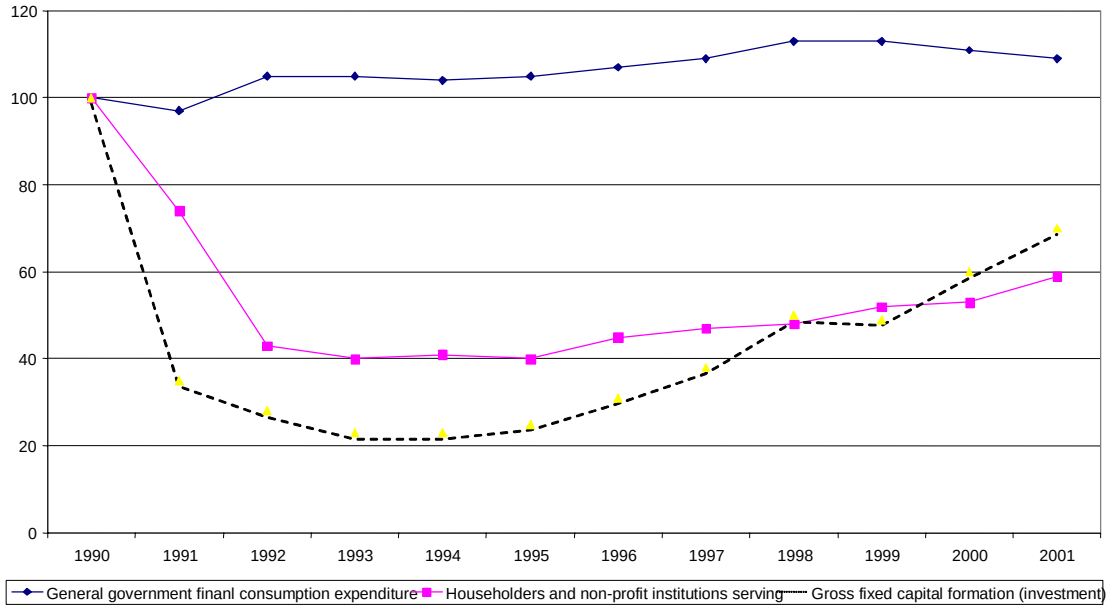
[43] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.82
[44] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.82

Table A5. GDP by expenditure items (percentage)

	2000			2002		
	Structure	Growth rates	Contribution to the growth	Structure	Growth rates	Contribution to the growth
GDP	100	6.8	6.8	100	6.1	6.1
Private consumption	62.0	7.4	4.5	62.7	6.9	4.3
Government consumption	19.7	-1.9	-0.4	19.4	1.5	0.3
Gross fixed capital formation	26.5	20.0	4.7	26.4	10.4	3.0
Changes in inventories	0.5	-	-4.5	2.1	-	-1.9
Exports	45.6	12.0	5.2	45.5	6.3	2.8
Imports	-54.3	4.9	-2.7	-56.1	4.5	-2.5

Source: Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, December 2002, p.19 (2000), December 2003, p.20 (2002)

Graph A3. Growth rates of main aggregates in GDP expenditure (at constant prices, 1990=100)



Source: Macroeconomics of Latvia in figures, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.85

Exports of goods and services increase year by year, yet in the long-term period **imports** increase faster. Since 1994, when Latvian foreign trade balance turned to negative, positive impact on the GDP growth of net export-import was fixed just in 1995, 1997, 1999, and negative contribution of export-import activities to GDP remarkably exceeded positive.[45]

[45] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.83

Analytical conclusion:

From the demand side development of Latvian economy is favourable for IS building. Population and business income grow and this improves financing of IT use. As mentioned in the previous chapter, the consumption of telecommunication services and information based services increases. This means that population and business use some part of resources for implementation of IT and in this way contributes to development of IS.

A.3. Labour market, labour productivity

A.3.1. Changes in employment

We assume that all aspects, concerning employment, unemployment and labour supply determinate a human factor, that impact development of IS from the demand side. Higher share of employed in information intensive sectors increases demand for IS both at business and private use. Evidence suggests that persons who use IT at work are more motivated to apply IT also in their private life (eBanking, shopping, communication via E-mail instead of phone and mail).

Brief characteristic of employment situation in 2002 (latest available analytical data) is provided in Table A5[46].

A comparatively low average employment rate – 54.4%, is connected with low employment in early age groups (15 – 25 years old), what is a result of high share of students in the total number of population in these groups. As table 6 shows, the share of economically active people in this group is low. Lower employment in elder age groups (55-69 years old) appears because employers give preference to younger employees that have better skills in modern technologies. The situation may be explained from another side – among economically inactive population, 29% are pupils and students, and 44.7% are pensioners.[47] In addition, table 6 gives rate of employed to the total population in the respective age group.

In international comparison, employment rate in age brackets 15-64 years old is 58.9% in Latvia – it is about average among Central and Eastern European countries[48]. Employment figures are even better when compared to working age population (which is lower than in the mentioned international comparison) – 68.9%, or economically active population[49] – 88.1%.[50]

[46] Methodological footnote: From 1996 to 2001 employed persons are all working persons aged 15 years and over, in 2002 employed persons are all working persons aged 15-74 years. For detailed evaluation of the labour market, the Central Statistical Bureau of Latvia conducts regular labour force surveys twice a year since November 1995 (in May and November). In this chapter all data for the period until 2001 are taken from: Social trends in Latvia, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.40 – 51, and Statistical Yearbook of Latvia, 2003, Central Statistical Bureau of Latvia, Riga, 2003.. Data for 2003 are taken also from Monthly Bulletin of Latvian Statistics, 11(114), 2003, Central Statistical Bureau of Latvia, Riga, December 2003. Unfortunately, there is methodological change in employment statistics that makes employment data not comparable in the long run. Beginning in 2002, the unemployment rate is recalculated using data from the Labour Force Survey on the economically active population aged from 15 years to the retirement age. Previously the number of economically active population aged 15 years and over was used. This change makes unemployment rate higher.

[47] Labour force surveys: Main indicators (in the III quarter of 2003), Central Statistical Bureau of Latvia, Riga, December 2003, p.58

[48] Employment and labour market in Central European countries 1/2003, EUROSTAT, p.58

[49] Methodological footnote: Economically active population refers to persons of both sexes who in reference period offered their work for the production of goods and services. Economically active population consists of employed persons and non-working persons actively seeking a job (both those who are registered with the State Employment service and those who are not).

[50] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.22

Latvian society is ageing, and this causes high dependency rates and the funding of the costs thereof. However, the apparently low employment is not threatening, since people find jobs after graduating from universities. As Table A5 shows, in the age groups 25 – 44 years old (after university graduation age) the share of employed persons exceeds 75% of the total population in the respective age group. It must be added that employment situation has improved in 2003, compared with 2002, when employment rate was 49.2%, while employment in age group 15-19 years old has worsened.

Table A5: Rates of economic activity, employment and jobseekers (annual average) in 2002 (%)*

	Rate of economically active population to the total population			Rate of employed population to the total population			Rate of jobseekers to the economically active population		
	Total	**Males**	**Females**	**Total**	**Males**	**Females**	**Total**	**Males**	**Females**
Total	61.8	68.4	56.0	54.4	59.6	49.9	12.0	12.9	11.0
15-19	15.2	18.8	11.5	10.1	13.6	6.5	33.7	27.8	43.6
20-24	66.2	73.2	58.8	54.6	61.8	47.2	17.4	15.6	19.8
25-29	82.2	91.9	72.2	72.4	79.6	64.9	12.0	13.4	10.1
30-34	87.1	92.3	82.1	78.4	83.6	73.2	10.1	9.4	10.8
35-39	86.2	89.7	82.9	76.7	79.0	74.5	11.0	11.9	10.2
40-44	87.8	88.4	87.2	76.2	74.3	77.9	13.2	15.9	10.7
45-49	86.5	87.3	85.9	79.3	79.5	79.2	8.3	9.0	7.8
50-54	83.8	85.1	82.8	74.2	72.5	75.6	11.5	14,8	8.7
55-59	64.9	75.1	56.9	58.1	65.9	52.1	10.4	12.3	8.5
60-64	31.1	41.3	23.8	28.6	37.5	22.2	8.0	9.2	6.6
65-74	12.7	18.2	9.4	11.7	16.7	9.4	7.7	8.0	7.4

* According to Labour Force Survey data.
Source: Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p. 59

The number of employed persons reduced significantly in the beginning of nineties, then stopped and further varied between 940 – 993 thousand people.

In 2003, the number of employed persons increased; employment rate comprised 56.5% of population aged 15-74 (65.1% and 52.2% for males and females respectively). The number of employed persons reached 989 thousand persons in 2002 and 1003 thousand persons at end of 2003.[51] Increase in number of employed persons is caused by larger demand of the growing economy.

In 2003, the absolute majority of employed persons were employed in the services sector (60% of total employed), while manufacturing and construction accounted for 27.9% and agriculture, hunting, forestry and fishery – 12.3%.[52] It is expected that employment in agriculture and fishery will further decline. Compared with other Central European countries, in Latvia less share of employees are employed in industry, but more in agriculture.[53]

In 2002, compared with 1996, the average annual number of employed has decreased in manufacturing (by 27 thousand persons), and agriculture (by 19.4%), and increased in wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods (by 26.5%), construction (by 17.6%), real estate, renting and business activities (by

[51] Labour force surveys: Main indicators (in the III quarter of 2003), Central Statistical Bureau of Latvia, Riga, December 2003, p.12; Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.49

[52] Statistical Yearbook of Latvia, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.58

[53] Employment and labour market in Central European countries 1/2003, EUROSTAT, p.58; Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvian, Riga, March 2004, p.49

29.5%), hotels and restaurants (by 50%). Compared with 2001, in 2002 remarkably more people were employed in forestry, fishing, industry, transport and health care and social care, less in construction, trade, real estate, renting and business activities.[54] Some of these sectors show fast growth trends. It may be admitted that since industry has started to grow in recent years, it faces lack of qualified specialists.

61.5% of total are employed in private sector. The highest shares of public sector (62.2% and 58.6%) are in the less developed territories – Ludzas and Balvu districts.[55]

An increase in the proportion of females in the labour market is observed in Latvia.

The highest level of economic activity both for males and females is in the 30 - 54 age group. At earliest age groups employment is less due to military service and studies, and bringing up children until they reach 3 years of age.

Table A6: Employed population aged 15-74 years by occupation in the main job and sex

	1996 XI			2003, III quarter		
	Total	**Males**	**Females**	**Total**	**Males**	**Females**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Legislators, managers and senior officials	9.9	10.0	6.4	8.9	10.5	7.3
Professionals	11.4	6.4	16.8	10.8	7.6	14.0
Technicians and associate professionals	13.2	8.8	18.0	12.3	8.5	16.2
Clerks	4.7	1.6	8.1	5.2	2.2	8.2
Service workers and shop and market sales workers	10.0	4.8	15.8	14.0	6.0	22.3
Skilled agriculture and fishery workers	10.7	11.8	9.5	8.4	8.5	8.3
Craft and related trade workers	15.0	23.0	6.1	15.2	23.8	6.4
Plant and machine operators and assemblers	12.6	19.2	5.3	11.2	18.2	3.9
Elementary occupation	14.0	14.2	13.8	13.9	14.4	13.4
Armed forces	0.02	0.03	0.0	(0.1)	(0.1)	…
Of total employed	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
employees	84.8	82.9	86.9	86.7	84.7	88.7
employers	2.9	3.9	1.7	3.7	4.9	2.5
self employed	7.9	9.0	6.6	5.9	6.7	5.1
unpaid family workers/relatives	4.3	3.8	4.9	3.7	3.7	3.8

Source: Labour force surveys: Main indicators (November 2000), Central Statistical Bureau of Latvia, Riga, March 2001, p.42, 44, Labour force surveys: Main indicators (in the III quarter of 2003), Central Statistical Bureau of Latvia, Riga, December 2003, p.17,21

The breakdown of employment by occupation (table 7) shows that craft and related trades workers, service workers and shops and market sales workers, as well as elementary occupations have the highest share. The breakdown of occupations by sex shows essential differences. Females are mainly service workers, as well as technicians and associate professionals and professionals. Males are more employed as craft and related trades workers, plant and machine operators and assemblers, elementary occupations, as legislators, senior officials and managers.

[54] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.58
[55] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.59

Characteristic of employed persons by education qualification is given in Table A7.
In connection with development of ICT, new forms of employment are used. Having high infrastructure costs employers support work at home. In most cases this mode of employment is based on use of IT, or is organised as telework.

Unemployment in Latvia is characterised as structural unemployment due to essential restructuring of the national economy, leading to liquidation of a large number of enterprises and decline in the demand for labour force. Officially unemployment was first recorded in Latvia in 1992. Reported unemployment rate reflects only the number of persons registered with the Latvian State Employment Board.

The highest peak was recorded in 1999 – 9.7%, and it was 8.9% at end of 2002.[56] Despite fast growing economy and declining number of population, unemployment increases – it was 9% in February 2004.[57] Several contradicting processes influence employment and statistical employment indicators. Employment reduces due to technology-based gains in labour productivity and expiration of special employment requirements in privatisation contracts. On the other hand, employment increases due to expansion of economy. In addition, larger number of population in working age (that is connected with favourable demographic situation in end of nineties) forms higher frame of reference for derived statistical employment and unemployment indicators.

At end of February 2004, the absolute number of unemployed increased, long-term unemployed constituted 26% of the total number of unemployed persons, 58% of unemployed were women, 0.2% - juveniles under 18.[58]

The number of job-less persons searching for work and ready to start it, but not registered as unemployed persons is larger than officially registered unemployment. This measurement can be recorded only during the labour force survey. The share of jobseekers in the number of economically active population exceeded the registered unemployment rate 2.9 times in 1996, but 1.4 times in 2002 – the difference declined.[59]

The share of male jobseekers is slightly higher than that of females. The highest rate of jobseekers to the economically active people is in the age brackets 15-19, but the rate of economically active people is low (table 6) in this age group.

In regional aspect unemployment rates vary from 4.7% (Riga city) to 13.2% (Liepaja city) in cities and from 5.7% (Riga district) to 29% (Rezekne district) in rural districts (including towns).[60] The highest unemployment maintains in less developed territories in East Latvia (20-29% in February 2004).[61]

Analytical conclusion:

The reserve of unemployed persons is not large in average estimation, and it is insignificant in economically developed territories – where information intensive industries are located (Riga,

[56] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.23
[57] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.49
[58] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.49
[59] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.57,61
[60] Methodological note: division "cities and rural districts" corresponds to administrative-territorial division of Latvia – administratively Latvia is divided in seven cities (Riga, Liepaja, Daugavpils, Rezekne, Jelgava, Jurmala, Ventspils) and 26 districts. Districts include rural local administrative units – small towns and rural units (*pagasts* and *novads*), and all together are accepted as rural territories.
[61] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central; Statistical Bureau of Latvia, Riga, March 2004, p.50

Ventspils cities). In economically backward territories unemployment is high, more long-term, and may be characterised as structural unemployment. Regarding IS it means that human factor is weaker in backward territories (about 1/4 of entire territory) and outside seven large cities, and there are limited labour reserves in developed territories.

Employment rates are lower in younger and elder age groups – first because high share of population in these age groups are in education, and second because employers prefer to hire younger employees.

In future unemployment situation might improve in rural areas in result of two processes – migration to large cities where employment situation is better and higher economic development in rural areas in result of better financing (including application of EU structural funds for rural development). The potential sectors that might improve rural development are tourism and supplementary economic activities (trade, hotels and restaurants, culture) and manufacturing on the basis of agriculture row materials, as well as activities connected with maintenance of large infrastructure objects (roads, railways etc). In large cities, lack of labour force may appear.

A.3.2. Changes in labour supply

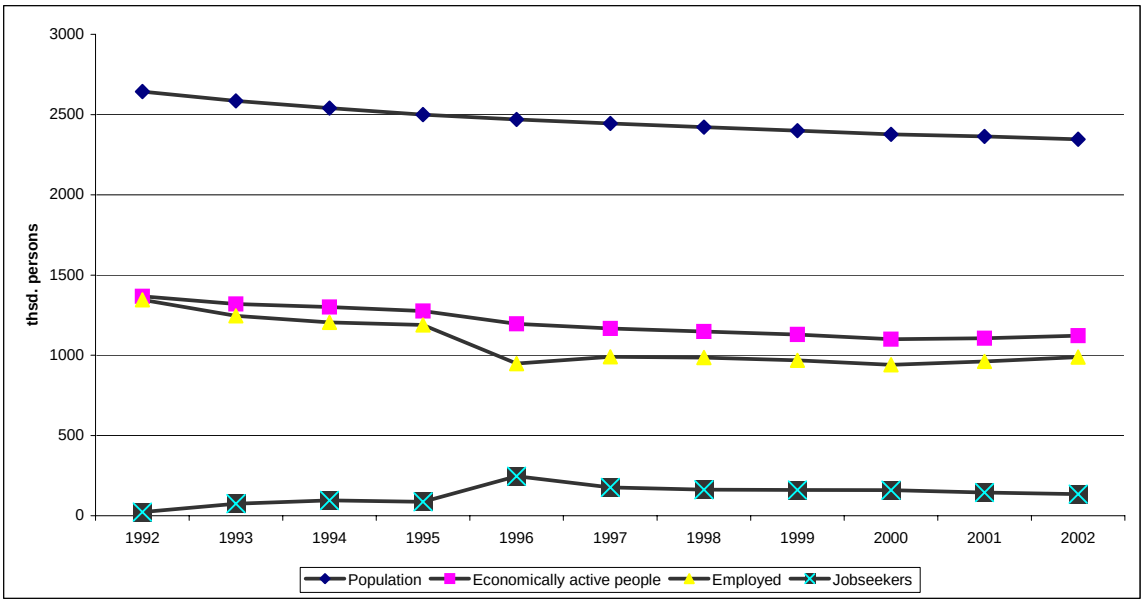
Several trends impact labour supply. Since 1990 number of resident population, as well as number of **economically active population** constantly decreases. In 2002 number of economically active population increased. Participation ratio, calculated as share of economically active population to total number of resident population has declined from 53.1% in 1990 to 46.5% in 2001, but increased to 47.9% in 2002. [62]

On the other hand, number of **employed** persons increases, and the share of population in working age has changed from 56.5% of total population in 1990 to 60.8% at beginning of 2002 as a result of favourable demographic trends in middle and late eighties. Number of population in working age increases slightly since 2001, but it is by 81.8 thousand people (5.5%) less than in 1990.

Figure 4 characterises changes in labour supply since 1992. It shows the contradicting situation when number of population declines while number of economically active people as well as number of employed increases since 2000-2001. It is possible that there will be some more years with growing number of population in working age. Sharp changes in employment figures in 1996 are due to methodological changes.

[62] In this chapter all data for the period until 2001 are taken from: Social trends in Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.40 – 51, and Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003. Data for 2002 are taken also from Monthly Bulletin of Latvian Statistics, 11(114), 2003, Central Statistical Bureau of Latvia, Riga, December 2003.

Graph A4. Changes in labour supply since 1992



Source: Statistical Yearbook of Latvia, Central Statistical Bureau of Latvia, relevant years

In the long run, labour supply deteriorates in Latvia. The number of population in working age in general decreases; the possibilities for their reproduction fall as decrease rates of population under working age – who shall substitute the employed persons in future - are considerably sharper then in other age groups.

The share of employers in the total number of employed persons has increased (Table A7), as well as the total number of employers. The proportion of employers and employees in Latvia is 1 to 17.1 for males and 1 to 36.1 for females. In total 38.2 thousand persons were reported as employers, against 889.9 thousand persons being employees (proportion 1 to 23.3). The number of enterprises per 100 persons in Latvia also is much lower than in EU countries: about 1.8 in Latvia against about 5 in EU countries[63].

We examine the **unemployment** structure as a potential labour force reserve. In compliance with the household survey results, the lack of working experience required nowadays by employers is one of the major unemployment reasons. Jobseekers without experience and young people who have finished an educational establishment (more often general education or special technical education) or dropped out and are searching for job form the largest share of jobseekers.

From the other source 77% of jobseekers aged 15 – 74 years were with working experience, and just 23% without working experience. Of all jobseekers, 30.8% of males and 33.4% of females leaved last job because were dismissed from job or lost job as a result of redundancies.[64]

Table A7 characterises labour force from the point of view of education qualification.

[63] Labour force surveys: Main indicators (in the III quarter of 2003), Central Statistical Bureau of Latvia, Riga, December 2003, p.17

[64] Labour force surveys: Main indicators (in the III quarter of 2003), Central Statistical Bureau of Latvia, Riga, December 2003, p.30,31

Table A7. Population by education qualification in 2001 and 2002

	All population aged 15 and over	Employed population (annual average)*		Unemployed population (at end of year)*	
	2000*	2001	2002	2001	2002
Total	100	100	100	100	100
Higher education	12.5	21.4	21.8	7.1	7.3
Secondary education	46.2	61.6	63.5	69.6	68.3
secondary general	28.0	22.8	24.1	27.8	28.3
secondary vocational	18.2	38.7	39.4	41.8	40.0
Basic	39.2	15.6	13.6	21.3	22.5
basic (7-9 year)	29.2	12.2	11.9	20.3	20.0
vocational basic	10.0	3.4	1.7	1.0	2.5
Incomplete basic and no formal education	2.1	1.5		2.0	1.9

*Results of the 2000 population and housing census in Latvia, Central Statistical Bureau of Latvia, Riga, 2002, p.188

**According to Labour Force Survey data

Source: Statistical Yearbook of Latvia 2002, Central Statistical Bureau of Latvia, Riga, 2002, p.60, 62, Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2002, p.58, 61

Analytical conclusion:

In absolute figures, employment situation deteriorates in middle- and long-term period because of unfavourable demographic situation, and number of population in working age decreases. In terms of quality, the situation is not that clear. Majority of both the employed and the unemployed have secondary education. The share of persons with higher education is rather high in the total number of employed population, and the share of such persons is low in the total number of unemployed population (see Table A7). The current structure suggests that unemployed persons cannot provide labour resources for growing high-tech industries without special training and substantial changes in education. Still further analysis show that there are positive trends that might improve situation in future. First, even now almost 6.5 thousand persons having higher education (2.7% of total population with higher education) are not employed. Second, the enrolment in upper education levels increases. Third, the adult education is popular in Latvia.

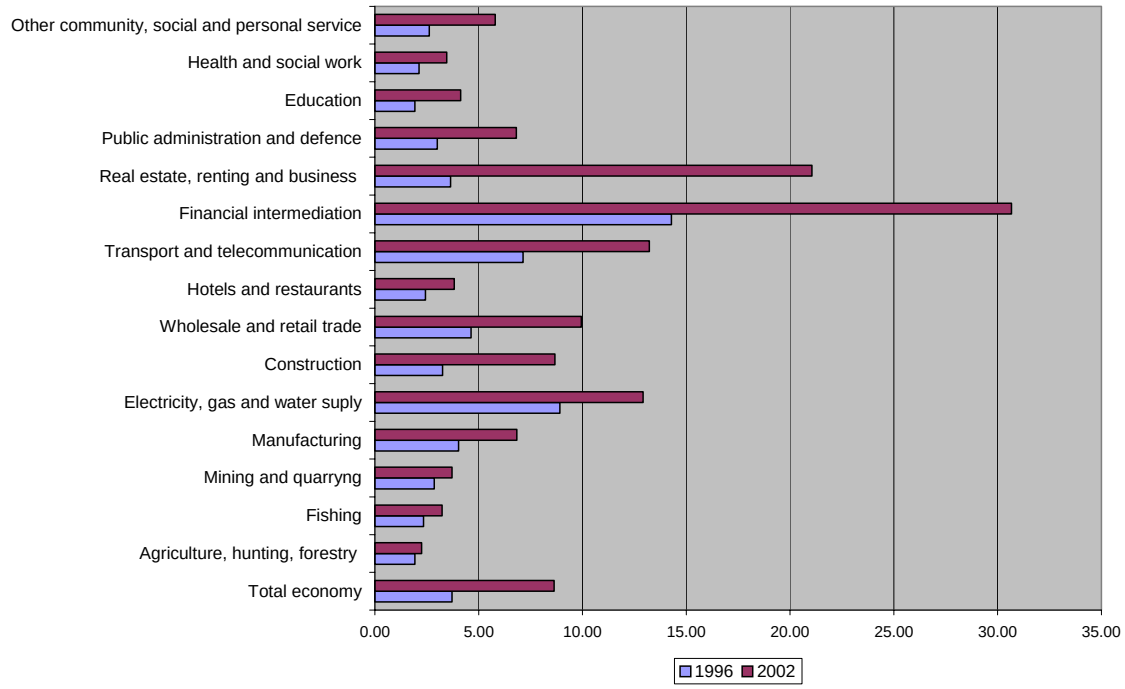
A.3.3. Changes in labour productivity[65]

Labour productivity measured as GDP per employer has increased in all sectors, and remarkably increased in many sectors (Graph A5).

[65] Methodological footnote: In this paper labour productivity is understood as output or value added per employee.

Graph A5. GDP per employee in sectors of Latvia's economy

Source: Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p. 14,58

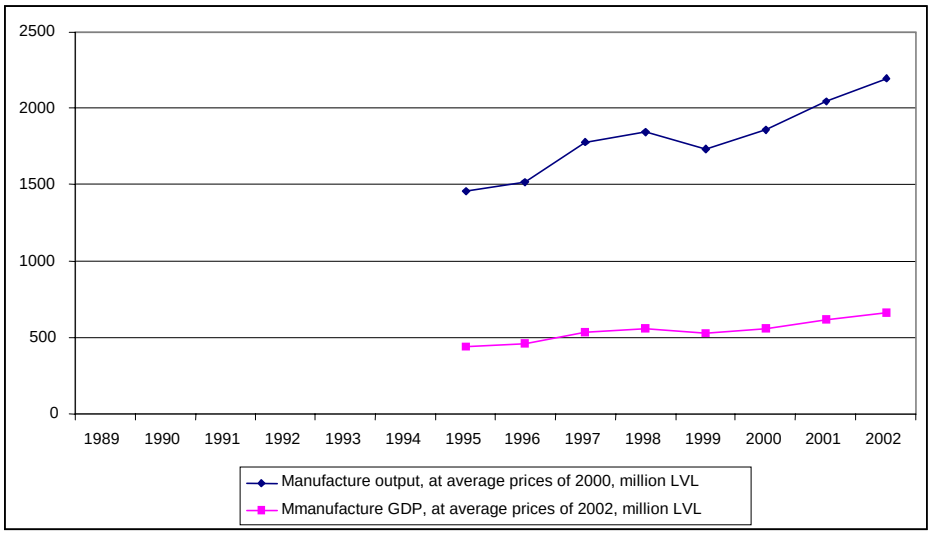


Restructuring of industry entailed dramatic decline in the number of employed in manufacture – from 373 thousand persons in 1990 to 156 thousand persons in 2001.[66] Since decline in manufacture production in long run was slower, labour productivity figures, calculated as production per employee, increased.

In 1995 – 2001 also growth in manufacture (by 5.7% in average per year) has provided increase in labour productivity. On the other hand, relative prices of manufacture decline, or, in other words, increase of manufacture prices is lower than increase of production costs. This entails decline of value added in manufacture and inappropriate share of manufacture in GDP.[67] Since 1997 output of manufacture increased by 23% while value added – by 8%, that evidence faster growth of low value added sectors of industry.[68]

[66] Statistical Yearbook of Latvia, relevant years.
[67] Latvian Development plan, Draft project as to 03.09.2002, p.19
[68] Possible scenarios of development of Latvia's economy with entering or no-entering European Union. "Konsorts" research paper, Riga, 2003, p.19

Graph A6. Dynamics of manufacture output and manufacture GDP in Latvia



In 2002 number of employed in manufacture increased by 7%, while manufacture output increased by 7.2% and labour productivity in both assessments: output per employee and GDP per employee improved.

Analytical conclusion:

Labour productivity increases in all sectors, but it remains very low in manufacture. In 2002, value added per employee in manufacturing was 6.7 thousand EUR. It has grown from 3.7 thousand EUR in 1995, but was less than 10 thousand EUR in 2001. According to EUROSTAT estimations, labour productivity in Latvian was as high as 12 thousand PPS (purchasing parity standards). It is the lowest one among other EU accession countries – lower than all countries but Rumania, and just slightly higher than in Rumania (9 thousand PPS).[69] The fact that the average labour productivity and labour productivity in manufacture in Latvia is the lowest one among CCs may be explained by high share of low value added industries and remarkably slower restructuring of industry. This in turn might be explained by slow and unsuccessful privatisation (intentional or coincidental attenuation of enterprises before privatisation), lack of clear industrial development policy.

A.4. FDI inflows

We assume that capital flows (including FDI) impact development of IS both from demand side (increasing transactions) and from supply side (financing).

In Latvia, current account balance[70] is negative since 1994 due to constantly growing imbalance in goods transactions. In 2003 value of imports was 1.88 times more than exports

[69] Latvian Development Plan, p.19

[70] As a part of the balance of payments, financial account is compiled following the guidelines of the IMF Balance of Payments Manual, 5th edition. The balance of payments has two parts: the current account and the capital and financial account. The capital and financial account shows capital transfers received and changes in investment (direct, portfolio and other investment) and reserve assets. Accordingly financial account is recorded in the balance of payments in the following items: direct investment, portfolio investment, financial derivatives, other investment, and reserve assets. Reserve assets (monetary gold, Special Drawing Rights, other foreign assets) are foreign assets that are controlled by monetary authorities and may be used at any moment for the adjustment of payment imbalances.

(1.75 times more in 2001).[71] Positive net in "service", "income" and "current transfers" items of current account balance covers negative net in "goods" item by about a half. Current account constituted minus 9.6% of GDP in 2001 and minus 7.6 of GDP in 2002.

Respective volume of capital and finance account is divided as follows: capital account constitutes less than 5% and financial account - more than 95%.[72] Since 1994 financial account is positive. Of all items, direct investment has largest positive value since 1994, when FDI inflow increased after adoption of legislation that provided its legal background.

In 2002, incoming and outgoing financial flows were bigger than one year ago. Non-resident deposits in Latvian banks have gone up and assets of Latvian banks in foreign countries also have increased. Latvia has become a capital attracting country. The attracted capital at the end of 2002 equalled to 103% of GDP and the debt of Latvia to the rest of the world was 79.7% of GDP, including the government debt – 8.4%. The amount owed to Latvia by the rest of the world equalled to 56.9% of GDP.[73]

At end of 1992, total amount of FDI was just 28.2 million EUR. At end of 2002, total amount of FDI stock was 2679.0 million EUR. In 2001, FDI stock per capita was 3432.9 EUR, up from 608 EUR in 1995. In 2003, FDI flows per month varied from 11.3 to 38.8 million EUR.[74]

At end of 2003, main investing countries were Sweden, Germany, Denmark, Finland, USA, Norway, Estonia, contributing nearly 70% of the total FDI stock. First three of them have invested more than 160 million EUR.[75]

It is known that FDI has been done in ICT related industries, still precise figures are not available due to several reasons:

- if number of companies is small, investment data is considered as commercial secret and not available,
- ICT sector is not identified as independent NACE classification group.

The largest ICT related foreign investment was made in telecommunication sector in 1995 – the state telecommunication company Lattelekom. From 1995 to 2000, transport, storage and communication kept the largest amount of FDI. Since 2001, the largest amount of FDI is located in industry. FDI is also made in mobile telecommunication companies (Latvijas Mobilais Telefons and Tele-2) and equipment suppliers – most of them are subsidiaries of foreign multinational companies (MNCs).

If all transactions are properly accounted and recorded, the current account and the capital and financial accounts should be mutually balanced. Inasmuch as data are collected from various sources and expert assessments are often used, it is not possible to reach this equilibrium, and the balance of payments has a special item "net errors and omissions". It varies from 1.6% of GDP in 1998 to (minus) 0,5% in 2002.

[71] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.21-22

[72] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.42

[73] Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, December 2003, p.32

[74] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2003, p.18,19

[75] Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, December 2003, p.49; Monthly Bulletin of Statistics, 9(112), 2003, Central Statistical Bureau of Latvia, Riga, October 2003, p.99

FDI supply patterns differ:

- in Lattelekom FDI was made in frameworks of enterprise restructuring plan,
- in other telecommunication service enterprises FDI was made at the stage of establishing of company,
- telecommunications equipment supplier companies were (1) established as foreign owned enterprises, (2) obtained via privatisation (former state owned enterprises) or (3) overtaken by foreign owner after,
- in computer industry FDI appeared later – by joining enterprises or establishing foreign owned enterprises.

It is difficult to forecast further development of FDI in ICT industry. It is known that Norwegian call centre and telecommunication market research company *Runway International Communications* currently operating in Estonia plans to concentrate its activity in Riga. It expects to employ about 500 people having good knowledge in English, Scandinavian languages and German in international call centres that are based on communication in Scandinavian languages. It is estimated that about 6000 people in Latvia are skilled in Scandinavian languages. In Estonia the company operates *Runway International*, where main investors are British consultancy company Gcom (call centres) and Norwegian Internet finance service consolidation portal E-best (banking service, trade with real estate). The company delivers passive (call answers) and active (research) services. Currently there are three active call centre companies – Lattelekom call centre (national coverage), Transcom, serving Tele2 clients, and clients service centre of Latvijas Mobilais Telefons. The attempt to establish international call centre (British Latvian Contact Centre (LCC) on the basis of English language) was not successful, presumably due to high international telecommunication tariffs.

Analytical conclusion

Necessity to improve imbalance in goods transactions press even more to ensure development of production of goods and services in higher value added sectors as well as to intensify export. If this strategy is chosen, the demand for IS would increase. Increasing financial flows reflect growing interest in doing business in Latvia, and improve financing of economy.

FDI grow in Latvia, and it is located also in prospective sectors, including ICT. FDI contributes to development of IS from demand side (by facilitating information intensive industries and international communication) and supply side (development of telecommunication infrastructure, ICT industry).

Still the Ministry of Economics of the Republic of Latvia emphasises that there are very few "greenfield" projects implemented in Latvia, where foreign investors bring in new and modern technologies. Even in sectors that have the highest potential to implement such projects, the part, which requires use of relatively cheaper workforce, is as a rule implemented in Latvia. To ensure long-term sustainable development of the state the government should continue to develop infrastructure targeted at attraction of foreign investors, invest into education and create other preconditions to orient foreign investors to invest in knowledge intensive and high technology sectors."[76]

[76] Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, December 2004, p.49

A.5. Trade flows

Trade flows in the sectors of information; communication and technology follow general trends in foreign trade, namely:

- trade direction changed from mainly to East to mainly to West,
- the share of EU countries remarkably increased (50 – 60% of total foreign trade turnover in entire economy),
- in the latest years – inter-Baltic trade increase.

In Latvia foreign trade is measured according to HS code, therefore **exports and imports** in the sectors of information, communication and technology **according to NACE is not available.**

From special research it is only known that the share of high-tech industries constitute about 10% of the total amount of export from Latvia. From other sources 16% of exported goods and services might be attributed to production of high technologies, producing higher value added.[77]

Table A8: Structure of export by groups of commodities (FOB prices) in 2002

	Mln EUR	Structure, %	Increase 2002 / 2001, current prices, %
Total	**2416.5**	**100.0**	**12.1**
Including:			
Wood and wood products, paper and paperboard	**811.0**	33.6	10.7
Transport vehicles, products of metal industry and engineering	**519.7**	21.5	14.7
Light industry products	**329.0**	13.6	1.2
Agricultural and food products	**247.0**	10.2	29.7
Products of chemical industry and allied industries, plastics	**177.7**	7.4	7.7
Other commodities	**332.1**	13.7	15.2

Source: Economic Development of Latvia, Ministry of Economics, June 2003, p.35

Latvia is a very open economy – total foreign trade turnover constitutes 102% of GDP[78]. Exports and imports increase year by year. Export of Latvian commodities in 2002 exceeded the level of the preceding year (in current prices) by 12.1 % (Table A8). In 2003, exports of commodities grew by 17.2%, import by 20%, thus the negative trade balance became even worse.[79]

Export in 2002 increased in all groups of commodities. The fastest growth was observed in the manufacture of wood and wood products (nearly 1/3 of export increase) and manufacture

[77] Commission of the Cabinet of Ministers has approved project of the National Innovation Program of Latvia. Interview with the leader of the last working group Janis Stabulnieks. Zinatnes Vestnesis, 5(255), 10 March 2003, p.1

[78] Foreign trade data are compiled on the basis of information taken from customs declarations and statistical surveys. According to the conceptions and recommendations of International Merchandise Trade Statistics prepared by the United Nation in 1998, data on a country's foreign trade may be compiled either according to the general trade system or special trade system. Statistics on foreign trade compiled according to the general system also includes commodity flows to or from customs warehouses and free economic zones. The special trade system does not cover these commodity flows.

[79] Monthly Bulletin of Latvian Statistics, 2(117), 2004, Central Statistical Bureau of Latvia, Riga, March 2004, p.20,22

of basic metals and manufacture of machinery sectors. Significant increase was in light manufacturing export (1/5 of all export increase). Therefore the structure of export of Latvian commodities has changed – the share of light industry increased but the share of agricultural and food products decreased[80]. Export of Latvian commodities to the EU countries slightly decreased at the beginning of 2002, but at the second half of the year it overtook the level of preceding year by 21 %. Export to Russia and other CIS countries in 2002 continued to grow.

Table A9: Structure of import by groups of commodities (CIF prices) in 2002

	Mln EUR	Structure, %	Increase 2002 / 2001, current prices, %
Total	**4283.7**	**100**	**13.4**
Of which:			
Products of metal industry and engineering	**1272.0**	29.7	14.6
Products of chemical industry and allied industries, plastics	**660.5**	15.4	15.1
Agricultural and food products	**574.4**	13.4	18.4
Transport vehicles	**419.4**	9.8	18.3
Mineral products	**417.2**	9.7	-0.8
Light industry products	**342.7**	8.0	5.9
Wood and wood products	**71.7**	1.7	42.6
Other commodities	**525.8**	12.3	14.7

Source: Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003, p.36

Import of Latvian commodities in 2002 grew up by 13.4 %. Import structure is shown in Table A9.

The biggest trading partners of Latvia in 2002 were Germany, Lithuania, Estonia, Sweden, Russia and United Kingdom (Table A10).

Table A10: The biggest trading partners of Latvia in 2002, mln. EUR

	Exports (FOB prices)	Imports (CIF prices)
EU	**1459.5**	**2268.3**
CIS	**241.2**	**561.7**
Germany	374.4	736.7
Great Britain	352.3	99.3
Sweden	254.9	273.6
Lithuania	201.9	421.6
Estonia	144.9	264.0
Russia	141.5	375.3
Finland	56.3	343.4
Other countries	890.2	1769.8

Source: Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003, p.37

The clearly negative foreign trade balance of Latvian commodities is partly offset by the positive balance of services. The balance of payments shows that in 2002 export of services had increase by 3.6 % in comparison with 2001, while imports - by 0.1 %.

[80] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003, p.33

Table A11: Export and import of services in 2002

	Million EUR			Structure, %		Increase 2002/ 2001, %	
	exports	imports	saldo	exports	imports	exports	Imports
Total services	**1326.2**	**747.7**	**578.6**	**100**	**100**	**3.6**	**0.1**
Of which							
Transport services	**818.7**	**245.8**	**572.9**	61.7	32.9	-1.2	9.8
– sea transport	**436.7**	**80.6**	**356.1**	32.9	10.8	-7.7	19.8
– air transport	**62.4**	**66.4**	**-3.9**	4.7	8.9	6.3	0
– other	**319.7**	**99.0**	**220.8**	24.1	13.2	7.6	9.5
Travel	**169.5**	**242.5**	**-73.1**	12.8	32.4	31.4	0.4
Commercial services	**318.7**	**244.1**	**74.6**	24	32.7	5.2	-8.2
Other services	**19.4**	**15.1**	**4.3**	1.5	2	-4.6	-1.2

Source: Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003, p.38

Analytical conclusions

At the current stage of economic development import exceeds export, and current account is negative. According to authorised assessments and available statistics low value added products are dominant in exports, and investment goods – in imports. It is expected that further restructuring of industry will facilitate increase in exports and thus improve current account balance. Also export structure of service may be improved (knowledge based services, tourism). The export capacity of high tech industries is high – the share of high-tech industries in total output is 3-4%, while in exports – 10% or even 16%.

Trade structure corresponds to FDI structure. The biggest trading partners of Latvia in 2002 were Germany, Lithuania, Estonia, Sweden, Russia and United Kingdom. Inter-Baltic trade increases.

A.6. Regional developments

Regional differences are important in Latvia and the gap between less developed and better developed regions increases (Table A12).

Table A12: GDP per capita in regions

	Year	Per cent of national average	Percent of maximum value in the country*	Percent of minimum value in the country**	Contribution to total GDP, %
Total	1996	100	26	260	100
	2000	100	33	415	100
Riga region	1996	131	34	341	53.6
	2000	153	51	636	62.2
Vidzeme region	1996	67	17	175	10.0
	2000	56	19	232	8.5
Kurzeme region	1996	113	29	292	15.3
	2000	100	33	414	13.5
Zemgale region	1996	71	18	183	10.2
	2000	56	19	234	8.3
Latgale region	1996	67	17	174	10.9
	2000	46	15	191	7.5

* From 1996 to 2000 the Ventspils city (Kurzeme district) had the highest GDP value in the country.
** In 1996 the lowest GDP value in the country was in the Kraslava district (Latgale), in 2002 – in the Rezekne district (Latgale region)
Source: Macroeconomics of Latvia in figures, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p. 38

The best-developed regions are Riga region (including capital city) and Kurzemes region (including Ventspils and Liepaja cities). The share of Riga region in the total GDP increases, while the share of other territories decline. Deeper analysis show, that main growth engines are large cities, especially port cities (Riga, Ventspils, Liepaja).

The synthetic characteristic of regional potential is given in Table A13.

Table A13: Main economic indicators by regions

	Non-financial investments mln EUR		Increase of NFI %	Thsd. EUR per capita	Number of enterprises (NoE)		Increase of NoE %	Enterprises per 1000 population	Unemploy-ment, %	
	2000	2002		2002	2000	2002		2002	2000	2002
Total	**1959.8**	**2272.6**	**16.0**	**968.7**	**41992**	**42549**	**1.33**	**18.72**	**7.8**	**8.5**
Cities										
Riga	1057.0	1121.3	6.1	1501.0	22837	23379	2.37	20.85	3.7	4.6
Daugavpils	44.8	60.4	34.7	534.3	1568	1551	-1.08	25.69	10.4	11.1
Jelgava	21.6	31.4	45.3	475.6	921	961	4.34	30.62	7.9	8.6
Jurmala	31.8	32.2	1.5	586.3	894	887	-0.78	27.51	8.2	8.9
Liepaja	55.2	84.4	52.9	959.0	1437	1458	1.46	17.28	11.4	13.5
Rezekne	12.0	17.3	44.8	455.9	595	600	0.84	34.63	11.4	12.9
Ventspils	166.3	93.5	-43.8	2124.6	857	787	-8.17	8.42	6.5	7.9
Districts										
Aizkraukles	31.8	42.5	33.8	1037.5	450	434	-3.56	10.20	9.1	9.8
Aluksnes	6.6	8.6	29.8	329.9	272	262	-3.68	30.55	9	8.7
Balvu	6.8	8.6	26.4	285.9	250	224	-10.40	26.12	21.8	24.7
Bauskas	13.8	36.0	162.0	692.7	492	467	-5.08	12.96	8.9	9.4
Cesu	30.5	45.3	48.3	754.7	892	842	-5.61	18.59	6.8	7.6
Daugavpils	29.1	36.2	24.3	861.7	172	164	-4.65	4.53	17.1	20.5
Dobeles	12.9	45.6	254.9	1140.7	322	312	-3.11	6.84	10.6	11.1
Gulbenes	13.0	13.4	2.6	477.8	323	299	-7.43	22.35	8.9	8.6
Jelgavas	7.5	18.4	144.7	496.0	266	276	3.76	15.04	11.3	9
Jēkabpils	18.0	28.5	57.9	517.7	639	619	-3.13	21.74	12.6	11.2
Krāslavas	9.1	11.7	28.1	324.0	235	226	-3.83	19.38	21.8	18.5
Kuldīgas	14.5	24.2	67.2	636.5	421	396	-5.94	16.37	8.4	9.2
Liepājas	11.8	17.0	44.1	369.2	393	361	-8.14	21.26	11.6	11.3
Limbažu	17.0	22.5	32.5	561.7	437	432	-1.14	19.23	6.9	7.6
Ludzas	7.5	12.2	62.4	358.2	270	238	-11.85	19.54	19.3	23.8
Madonas	12.9	21.3	65.4	462.4	472	507	7.42	23.84	11.4	12.9
Ogres	34.6	44.1	27.2	699.7	709	782	10.30	17.74	5.3	5.8
Preiļu	10.5	13.9	31.9	338.9	392	367	-6.38	26.41	20.1	20.3
Rēzeknes	9.6	12.5	29.9	291.2	217	229	5.53	18.29	25.6	26.2
Rīgas	165.7	188.0	13.4	1296.5	2173	2402	10.54	12.78	6.6	5.6
Saldus	15.9	23.5	47.9	618.4	500	490	-2.00	20.85	6.5	5.4
Talsu	20.7	33.8	63.1	689.6	631	637	0.95	18.85	7.3	6.9
Tukuma	29.3	35.7	21.8	648.7	645	672	4.19	18.84	6.8	6
Valkas	12.0	33.1	176.7	1003.2	350	324	-7.43	9.79	7	8.7
Valmieras	24.8	36.2	45.8	613.4	854	845	-1.05	23.35	7.5	7.8
Ventspils	5.4	19.6	265.0	1396.7	106	119	12.26	6.09	8.9	6.4

Source: Statistical Yearbook of Latvia, relevant years

Regional disparities correlate with dispersion of SME across the country. The average SME number per 1000 population in Latvia is 18.1, but it varies significantly among regions.
It is extremely difficult to forecast future development in regional aspect. It is hoped that implementation of SME development strategy as well as increasing activity in other programs and application of EU funds will improve regional development.

A.7. SWOT analysis

Strengths	**Weaknesses**
Restructuring of economy from planned to market driven is finished in general terms Fast economic development Strong and stable macroeconomic framework In general favourable structure of national economy with emerging high share of information intensive sectors High share of investment in GDP expenditures Growing export Improving access to financial sources Intensive inflow of FDI Open economy, intensive foreign trade Some sectors are equipped with modern technologies Capital attracting country Strong trade links with Baltic Republics Low dependence on CIS markets	Low starting level, low GDP per capita Slightly disproportional structure of national economy Dependence on external demand Dependence on external financing of economy Slow modernisation of industry Competitiveness of main export goods is provided by low labour costs Growing imports for consumption needs Growing current account deficit Low labour productivity Deterioration of employment Insufficient qualification of reserve of labour force
Opportunities	**Threats**
Integration into EU Development of export oriented industry Faster modernisation of economy Better financing of social sphere Better professional education improves qualification of labour force Expanding of external markets	Diminishing market capacity due to economic decline in main economic partners Diminishing FDI Increase in labour costs Social tension Insufficient innovation capacity Supply of labour force does not meet needs of economic growth Overheating of economy

B. NATIONAL AND REGIONAL INFORMATION SOCIETY POLICIES

B.1. Institutional settings

The main elements in the current state management system are State President, *Saeima* and Cabinet of Ministers.

Legislation body (parliament) – Latvian *Saeima* consists of 100 deputies, elected by Latvian citizens for four years in general, equal and proportional elections. *Saeima* is ruled by the *Saeima* Speaker. Four parliamentary elections have taken place since regaining independence. *Saeima* elects President of the Republic of Latvia for a period of four years, for no more than two terms. State President in Latvia has mainly representative functions and rights to act in critical situations, but also exclusive duty to nominate the candidate for the position of Prime Minister.

Executive body – the government is formed by a majority coalition in the parliament. It is the most dynamic structure of the state management system. Every election brings changes in the list of higher positions and ministries. State institutions may operate in several forms – ministries, state ministries, state agencies or special institutions (State Audit Office, Public Utilities Commission, Tripartite Council). Commissions, committees and working groups, normally with representatives of non-governmental institutions treat specific problems. Currently the government is ruled by the Prime Minister, the Associate to Prime Minister and the Cabinet of Ministers, consisting of 16 members, of which 14 are ministers equipped with appropriate ministries and 2 are state ministers equipped with secretariats.

Local government system consists of 33 regional local governments of which 7 cities administrations fulfil functions of regional and local governments, 26 are regional local governments, and more than 540 are lower level local governments. Reforms in local government system are not finished – it is planned to consolidate local governments so that their number remarkably reduces. Five models are proposed for discussion in which the number of local governments varies from 33 (current regional level) to 102. It is not yet clear what will be at the regional level – local government, or the state administrative structure, 5 regions (present EUROSTAT regions) or more, or, perhaps, none. However it is clear, that the local government reform will bring in a lot of changes in the state administrative structures concerning their regional institutions.

Analytical conclusions.

The institutional setting has been neutral to the development of IS in Latvia so far. Until 2001, a special governmental institution responsible for implementation of IS was not established. However, ICT development issues (separate or in connection with the innovation policy) were on agenda at the state level since middle nineties. The government established several working groups to tackle mentioned problems. Since ICT ranged among the growing sectors, the business and the government found common language and some progress was achieved in the field of special legislation and conditions for entrepreneurship in ICT sector (special tax regime) (see details in Chapter B2, B3).

No doubt EU integration has influenced the development of the issue at the institutional level. Requirement to elaborate local economic development policies and harmonise them with the EU practice, as well as regular assessment and proposals regarding consistency and reasonability of such policies, has promoted co-ordination of ministries' work and more comprehensive treatment of aspects of a "new economy" (including IS) in local policies.

There were attempts to raise the issue of IS in late nineties. At that time representatives of ICT business initiated first ideas about e-systems (eCommerce, e-management). The government responded with elaborating of rather comprehensive legal basis, providing functioning of IS (see chapter B2). In 2002 the government established National Council of Information Society with wide rights and responsibility. However the Council never started to work. Other special institution - the Office of Information Society was established in the end of May 2002.

Local governments' ability to deal with IS implementation problems is limited due to low financial capacity. Yet there are some developments in richer local governments (Riga, Ventspils), and on the basis of Public Investment Program (computerisation of schools, implementation of unified local government information system, unified library information system) that are described further.

B.2. Chronological description of national and regional IS policies

Specific national and regional IS policies in Latvia did not exist so far.

IS was considered as a natural side effect of socio-economic development that arises from wider use of computers and IT in business and private life, special training in education system and self-education. Consequently, the problem of IS was permanently tackled in strategic documents, but in the context of economic development, and the government policy was focused mainly on implementation of IT. Co-ordinated IT policy in Latvia started from mid 1996 with the establishment of the Department of Informatics at the Ministry of Transport.

From this point of departure, national and regional IS policies should be analysed from two aspects: implementation of IS and economic development that makes IS feasible.

Economic development policies are identified in many documents:

- Long-term Economic Development Strategy of Latvia (adopted by Cabinet of Ministers on July 17, 2001),
- Industrial Development Guidelines of Latvia (adopted by Cabinet of Ministers on March 20, 2001),
- National Innovation Concept (adopted by Cabinet of Ministers on February 27, 2001),
- Development Plan (developed in 2002),
- National Innovation Programme (adopted by Cabinet of Ministers (Regulation Nr.203) on 8 April 2003), and corresponding Action Plan,
- Several documents identifying regional and rural development and development of agriculture,
- Sector development strategies.

The characteristic feature of strategic planning in Latvia is a system of National Programs. National programs are elaborated with the aim to facilitate development of more significant sectors or to solve serious social or economic problems. Up to now eleven National programs are forwarded for implementation. These are:

- National Program of Quality Assurance;
- National Program of the Development of Energy Sector;
- National Program for the Development of Small and Medium Sized Enterprises;
- National Program on Foreign Trade;

- National Program on Biological Diversity;
- National Program on Development of Tourism;
- National Program of Transport Development;
- National Program "Informatics";
- National Program on Road Traffic Safety;
- National Program on Culture;
- National Program: Population of Latvia.

IS is mentioned in all main strategic documents listed above. These documents envisage transformation and substantial modernisation of the Latvian economic and social systems, and implementation of ICT is seen as the first step in this direction. In the majority of strategic documents IS appears as a result, but not as a target that must be achieved, and consequently these documents (except National Development Plan) do not elaborate special action plans for creation of IS.

The basic strategic document in Latvia is the Long-term Economic Development Strategy, elaborated by the Ministry of Economy. In order to systemise all strategic planning and to avoid overlapping and contradictions, the Cabinet of Ministers has determined that in future all kinds of strategic development documents, including national the Development Plan, national programs, sector strategies and programs in the process of development should be co-ordinated with the goals and priorities set in the Long-term Economic Development Strategy.

Long-term Economic Development Strategy of Latvia focuses on transformation from current economy model characterised by the use of cheap labour and the available natural resources and production with low value added to the model based on intensive use of knowledge and high technologies. The Strategy identifies its goal, to create favourable conditions for functioning of the "new economy", which is understood as economy, based on information and knowledge as the main asset of the enterprise.[81] It is mentioned that development of new post-industrial sectors and promotion of creation of the IS is also vitally important.

The key priorities in the state economic policy are:

- Creation of favourable condition for functioning of economy,
- Promotion of efficient and competitive structure of sectors,
- Lessening of socio-economic disproportion and risks.

The Strategy specifies that the creation of an effective sector structure require large long-term contributions into human capital, increase of productive capacity and radical changes in the current practice and support of research as well as introduction of new technologies that cannot relay only on market mechanisms. For the above purposes state support and participation is needed.

National Development Plan develops policy statements of strategy in the light of use of EU funds. Several important measures are focused specifically on creation of IS: to promote the implementation of IT and access of SMEs to IT, to support all kinds of innovation activities, to promote development of telecommunication and IS that includes several tasks – to create an environment that enables the operation of eCommerce and eManagement, to provide co-ordination of mobile connections for emergency services, to develop a National information

[81] Long Term Economic Development Strategy of Latvia, Ministry of Economics, 2001.

system and eServices at the local market, to provide quality and speed of information flows and accessibility to everybody, among other tasks.

Measures under the priority "Development of human resources and employment" provide implementation of IS both from the demand and the supply side: measures concerning education and development of skills in use of IT and information, as well as development of eEducation regionally and at different levels of education and at a wide network of consulting institutions.

IS issue is also tackled in the **National Innovation Concept.** Two working groups were established in 1998 and 1999 with the aim of elaborating the National Innovation Concept. Their work has ended without any significant results. A third working group was established in 2000 (order of President of Ministers of 13 July 2000, Nr. 268). This group elaborated the National Innovation Concept that was adopted in the Cabinet of Ministers on 27 February 2001. According to the following order of President of Ministers on 2, July 2001, Nr. 240, a fourth working group was established with the aim of elaborating the National Innovation Program. The Program was adopted by the Cabinet of Ministers in April 2003. In May 2003 an institution responsible for the implementation of the National Innovation Program – the Coordination Council – was established.

The **National Innovation Program** is expected to facilitate the development of knowledge intensive innovative economy. Four main principles of the program are: creation of business environment that is favourable to innovative business, implementation of favourable legislation, standing of the joint principles of EU policies in the science and innovation activities, creation of innovation culture. The Program does not include special measures or subprograms for creation of IS or facilitating of its formation. IS is defined as a "vision of desirable development of society – a movement towards creation of high educated, knowledgeable and skilled, open-to-improvements society; in narrow understanding it may be considered as a notion that reflects in a formal way the increasing need to formalize knowledge in the form of codes (also characters) (codification), to register, systematise it and to disseminate in society". IST are defined as "distinguished implementation of innovative technical, technological and management sciences in all sectors of professional activities, as well as for effective management of organisations and resources". IT is a method, skills and systems of registration, systematisation and dissemination of knowledge and skills. Nothing more is said about IS in the National Innovation Program, however from the context follows that the implementation of the Program will facilitate the development towards IS.

IS related education development issues are tackled in the **National Program for Development of Education.** It envisages a significantly increasing number of graduates in IT specialities – up to 2500 persons per year. Unfortunately, the Cabinet of Ministers did not adopt the Program and therefore it does not have legal consequences.

Current governmental IT activities are based on the **national program "Informatics"** approved by the Cabinet of Ministers on 30 March 1999. The program is a complex target program for the time period 1999-2005, consisting of 13 subprograms that include more than 120 projects. The goal set out in the program is to integrate Latvia into the global development process and to form preconditions for IS.[82]

There are some other economic policy measures that are not related directly to the IS yet promote its development. The Long-term Development Strategy, as well as Industrial Development Guidelines of Latvia established that an important task of industrial policy in

[82] Virtmanis A. Information prepared for e-business forum, 2001

Latvia is to support the development of **industrial clusters**. Up to now Forest Cluster, Information Systems Cluster, Scientific Research and High Technologies Cluster, Engineering Cluster is officially shared out.

Of all mentioned, Information Systems Cluster (ISC) is institutionalised to the best advantage. It comprises 17 Latvian software development and communication services companies and data centres, a testing company, universities, a vocational training centre and web-design, marketing and PR companies. The goal of the ISC is to reach the international growth and competitiveness of the sector and to increase exports, to re-enforce co-operation between IT companies and the related institutions. In 2003, in the framework of the international exhibition and forum *Baltic IT&T*, an international seminar was held in Latvia in order to discuss opportunities of closer partnership between the Baltic States. It was decided to increase co-ordinated activities in several fields concerning common export policy (marketing, exhibitions). There are plans to expand IT cluster to the Baltic scale.[83]

In general, the success in development of industrial clusters depends on the activity of the involved industries. In sectors, where industries are active (ICT, forest) some success is achieved, in others not. Also, clusters having been quite recently established, it is still too early to assess their efficiency.

In 1999, a **special tax regime** was introduced for knowledge intensive industries. The target of this measure is all knowledge intensive industries, but in practice it concerns mainly IS supporting industries – hardware and software. The special tax regime includes several specifications:

- Value added tax is not applied to research works that are financed from financial sources of public funds, state and local government budgets and international institutions (law "On value added tax"),
- Business income tax is not applied to companies that correspond to ISO 9000 standard and in production of which more than 75% correspond to the class of high-tech products, set by the Regulations of the Cabinet of Ministers, Nr. 218 (law "On business income tax", article 18, item1),
- Law "On business income tax" sets tax reduction by 20% for SMEs,
- The same law envisages that companies have the right to write-off in current year R&D expenditures that are related to their main activity,
- Several specific norms are provided regarding to the customs tax.

Practical implementation of IS will be facilitated by the adoption of the system of laws determining operation of large information and IT based systems (see next chapter):

- Socio-economic system eLatvia,
- eCommerce, eGovernment, eProcurement,
- Legislation on use of electronic documents and electronic signature and others.

Regarding data protection in such systems, the State Data Inspectorate, established under the law on Personal data Protection of March 2000, started operating in January 2001. The 1981 Council of Europe Convention on the Protection of Individuals with regard to the Automatic Processing of Personal Data was ratified in April 2001.[84]

[83] Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, June 2003, p.125

[84] Regular Report on Latvia's progress Towards Accession, 2001, Commission of the European Communities, Brussels, 13.11.2001, SEC(2001) 1749, p.92

Analytical conclusions.

There were no special national and regional IS policies in Latvia so far. Yet IS was considered as an important development factor and therefore it is mentioned in all existing strategic documents. Special National Program "Information" is envisaged for development of the state information services. Implementation of IS is based on the package of legislative acts (concepts, relevant laws and instructions), that enables implementation of IS constituents: socio-economic system eLatvia, eGovernment, eCommerce, eProcurement and legislation on the use of electronic documents and electronic signature and others. Formally, supporting systems (education) are included.

A statement that these documents correspond to any commitment, establishment of decision-making authority, increasing implementation capacity, dedicating budget and human resources would be too ambitious. They include provisional division of responsibilities and financing calculations. No doubt they form a framework for future actions, while implementation depends on the available financial resources and political will.

B.3. Implementation and assessment of IS policies

Since the implementation of IS was considered as a side effect, and specific IS policy was not elaborated, objectives of IS policies were not formulated. It follows from the context, that creation of IS is a measure for improvement of business environment and quality of human capital. If IS policy does not exist, also policy-results cannot be found. In general, implementation of economic development policies have contributed to the development of IS, as higher welfare level improve access to ICT.

Regarding special policy measures (direct or indirect) major achievements can be found at the central government level. Several measures are focused directly on the implementation of IT. The most important element of the national program "Informatics" is a mega-system – a logical unity of the important national information systems, such as: Population Register, Enterprise Register, Tax Payers Register, Cadastral Register, information system of the Road Traffic Safety Directorate. Information about other information systems developed in Latvia and data objects stored in these systems is aggregated in the Register Registry.

For implementation of the National Program "Information", Ministry of Economics has developed a socio-economic program eLatvia that is aimed at the creation of the national information infrastructure. The Cabinet of Ministers approved the basic guidelines of the program on 12 December 2000. The plans of this program correspond to the Nordic eDimension Action Plan approved by the meeting of the IT ministers of the Baltic Sea countries in Riga, September 26-28, 2001. The Action Plan of the program eLatvia is generally in line with the eEurope+ Action Plan[85].

The Action Plan was discussed (but not adopted) in the Cabinet of Ministers on 18 December 2001. This medium term-document includes 5 groups of activities:

- Infrastructure development - basic telecommunication services, services of banking and electronic finance, standards,
- Setting the legislation – consumer rights protection, taxes, protection of intellectual property, implementation of EU directive 2000/31/EC on electronic commerce,

[85] Regular Report on Latvia's progress Towards Accession, 2001, Commission of the European Communities, Brussels, 13.11.2001, SEC(2001) 1749, p.82

- Creation of confidence: protection of personal data, electronic signatures, combating cyber crime,
- Maximisation of gains: education, support to SMEs,
- Other activities: statistics, telework.

The Ministry of Economics annually has to submit a report to the government about implementation of the Action Plan. Up to now several institutions are responsible for the implementation of the plan, and the Ministry of Economics has proposed to set up a special task force to deal with this task.

The fulfilment of the National program "Informatics" and connected eLatvia was delayed for several reasons – unclear and unrealistic commitments, lack of money, corrections in some goals concerning technical progress (for instance, total digitalisation of telecommunication network that had to be finished in 2002 was not done). Nevertheless it proceeds, and the most successful directions are:

- Elaboration of legislation acts forming framework for wide implementation of electronic communication,
- Implementation of the Integral State Information System (megasystem) and its components,
- Increasing offer of telecommunication services, improving quality,
- Education and training in ICT,
- Harmonisation of Latvian and international information systems.[86]

On 13 June 2000 the Cabinet of Ministers approved a concept on legal status of electronic documents. On 7 May 2002 it approved a concept on eGovernment in Latvia that has to be implemented within the program eLatvia. On 13 March 2001 the Cabinet of Ministers approved "Concept on eCommerce" (developed by the Ministry of Economics) and a long-term action plan for "timely and adequate solution of problems related to eCommerce, using all instruments at a disposal of the state".

On 20 June 2002 Saeima adopted the law "On declaration of the place of residence" aimed to ensure that every person might be reached if required to settle legal relations with the state or local government (in effect since 1 July 2003).

On 31 October 2002 the Saeima passed the law "Law on electronic documents", that provides legal framework for electronic interactions "business to business", "business to government" and others. According to the law, pilot project for implementation of the law will be carried out for registration of commercial pledge in Company Register. The law will be valid in general order from 1 January 2004.

The government also promotes development of information and e-based systems at its institutions, using Public Investment Program (PIP) resources, EU aid and pre-accession funds as well as other financing. The biggest of them are the "Information system of the state revenue and customs policy implementation", "Creation of the technical security, control and information system at the border", "Creation of the information system of education in Latvia" and "Computerised Register of Real Estate", United Library Information System.
In 2003 several conceptual and legislative documents were approved:

- The Cabinet of Ministers has approved "Concept about registration of Internet providers and creation of the state supervision system in Internet provision" (23 October, 2001),

[86] Conceptual background of the Socio-economic program e-Latvia, p.2

which defines the state policy in Internet use and measures for promotion of Internet use, establishment of fair competition in Internet provision and the state supervision system,

- The Saeima has adopted a law "Law on the state information systems" (22 May 2003) that envisages to provide accessibility and good quality of information services delivered by the government and local governments,
- The cabinet of Ministers approved eGovernment concept (7 May 2003) that appoints Ministry of Communication responsible for implementation of the Concept,
- The Saeima passed the Law on Implementation of the National Library Project, stipulating completion of the project by November 18, 2008.

In connection with the implementation of the Long-term Strategy of Economic Development in Latvia, the Cabinet of Ministers has passed series of political documents: Industrial Development Guidelines, the national Innovation Concept, development Guidelines for Higher Education, Science and Technologies for 2002 – 2010, all contributing to development of IS.

IT legislation is aligned with the demands of the EU, WTO and other international organisations.

Before the accession to the EU Latvia has to establish the Integrated Administration and Control System (IACS), which is an aggregate of equipment, procedures and staff functioning to ensure administering and control of direct payments to agriculture. IACS is being established on the basis of the following registers: Herd and Animal Register (holder: JSC State Pedigree Information Processing Centre"), Rural Register (holder: Rural Support Centre), Support Applications Administering System (holder: Rural Support Centre), Payment and Reporting System (holder: Rural Support Centre). It is planned to link IACS to the State Treasury Information System, State Real Estate Cadastre, Computerised State Land Book and other systems and registers. A lot of work has to be done in 2003, as currently only each tenth of the potential direct payment beneficiaries are included in the system. It is also necessary to designate blocks of all agricultural land of Latvia[87].

The Development Plan that identifies direct measures towards IS is not yet valid.

Activities were increased towards the implementation of National Innovation program. On 18 December 2003 the Ministry of Economics revised the National Innovation Program 2003-2006. Besides traditional measures characteristic for such kind of documents, the program pretends to solve difficult financing problem of innovation process. Two measures are interesting there: to increase contribution of business so that financing of R&D reaches 1.5% of GDP of which 0.9% is business contribution, and to establish a Development Bank – a main institution dealing with financing of the National Innovation program[88]. In January 2004, the Ministry of Economics specified its plans in Action Plan 2004 for the implementation of the National Innovation Program. 33 activities will be undertaken in order to achieve three goals: creating harmonised, coordinated and innovation supporting business environment, creating a basis for establishment and growth of innovative enterprises, establishing of a unique and competitive structure of national economy in Latvia. For these purposes the Ministry of Economics has reserved approximately 200 thousand EUR from its budget, in addition approximately 16 million EUR (of which approximately 4 million EUR from the state budget) will be reserved within the state support programs. In 2004 the main

[87] Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia. Riga, December 2002, p.99

[88] Benfelde S. Innovations: research, concepts and real life. "Nedela", 13.01.2004

tasks are: to create, to facilitate implementation of innovative solutions and to promote international co-operation of business and scientific community.[89]

Progress in regional aspect up to now is achieved insofar private mobile telecommunication operators expend their networks and Public Investment Program deals with implementation of local government information system, library information system and school computerisation program in rural areas. However, in conditions of economy regime and change in priorities in public spending, investment resources for these purposes decrease. In 2003 and 2004, the government put social issues (pensions, financing of health care, assistance to families with children) as priority for public spending.

Best regions and cities implement local information systems. The ongoing projects are: eVentspils, eRiga, Baltic Cybercity, eSaldus district, local government information systems in Liepaja, Cesis, Bauska, Kuldiga. Local government united information system centre in Ogres region. Baltic Cybercity project aims at establisment of ICT cluster in Vidzeme, one of NUTS regions in Latvia, on the basis of Valmiera higher education institution and local and foreign owned ICT businesses. Generally speaking local government projects include establishment of the Internet access point, where population can make business communication, payments to service providers and the government institutions (taxes, fees) in electronic mode, as well as training facilities for population.[90] In many cases these information systems are implemented in close cooperation (sometimes even on the basis of incentive) of ICT enterprises.

Analytical conclusion:

Since 1999 a lot of work has been done at the governmental level in elaboration of legislative background for development of IS. Approved and adopted documents generally enable functioning of IS from the legislative point of view. Practical implementation of the state level information systems is ongoing, yet it is a gradual process that depends on availability of financial resources. The main activities are at the government institutions, in frameworks of mega-system "Integral state information system" (according to National program "Information"). Regional information systems are less developed, however some regional components of the state information systems have been created: computerisation of schools, unified local government information systems, united network of state public libraries.

There is a clear contradiction between the rather wide application of ICT and the poor economic condition in the country. To explain this, some conditions must be taken into account.

First, Latvia inherited from the Soviet Union a developed telecommunication network (physical), a theoretical research system and practical skills in computer use (Latvia was advanced in USSR in computer systems for planning, statistical recording and registration needs). Latvia was one of first Soviet Republics, which implemented registration system in the Ministry of Internal Affairs, as well as comprehensive computer management systems (on the basis of soviet produced computers BESM, MINSK, and ES) in Gosplan and ministries. **Second,** after 1990, new businesses have appeared. These businesses implemented the newest technologies, including information systems. **Third,** new technologies are implemented in connection with FDI. **Fourth,** in Latvia higher education is a standard of normal status in society. Educated people are more open to innovations in business and at home. **And fifth,** implementation results differ: legislation is a part of government functions and in this

[89] BNS, 21 January 2004, http://www.em.gov.lv
[90] all information from http://eparvalde.delfi.lv

meaning less expensive and therefore develops better, while practical implementation and regional development that requires financial contribution moves slower.

B.4. Driving motivation of IS policies

Analytical conclusion:

The driving motivation of political decisions promoting development of IS is the understanding of that IS (more often ICT) is necessary for economic development, modernisation and restructuring of economy from low value added production to a more effective one, based on knowledge intensive industries. In the open economy where information and effective communication is decisive, competition without effective information service is impossible.

The government had to react to the business' claim for an effective information infrastructure, as well as for information services that respond to ICT at their disposal. The latter one is very important, as to be able to communicate with foreign partners, Latvian enterprises have to adjust to the world's technical level of communication means. Consequently, if ICT at business disposal provides faster communication, the business strives to improve and also fastens local communication, what includes implementing of new communication technologies and information systems at state institutions.

To answer business' claim, the government prepares a plan for improvement of the business environment every year, which is based on proposals elaborated by the responsible ministries in cooperation with the social partners, of which the Council of Foreign Investors is the most influential. For instance, the plan for 2002 included a claim to introduce an eProcurement project in government policies and to develop it in practice-– to use Internet based technologies when the government purchases tenders. The eProcurement concept currently is on discussion in the government.

Wide representation of IS related measures in the National Development plan is promoted by the necessity to respect EU policies, as National Development plan frames use of EU funds.

No doubt, implementation of IS policies fall into business interests of ICT producers and service providers, as it increases demand for ICT industries. This explains the fact that representatives of large ICT companies are main drivers of the policy making process in IS issues – and they really benefit from the active ICT and IS policy. Strong ICT business lobby has often promoted changes in the governmental information systems. Also involvement in promoting of education has strong material background – growing industry needs for specialists.

B.5. The institutional setting behind the IS policies

The responsible governmental institutions for development of IS are the Ministry of Communication, Ministry of Education and Science and Ministry of Economy and Ministry of Welfare (labour quality), but in fact all ministries take care about implementation of ICT in their structures.

The Ministry of Communication is responsible for the development of telecommunications and post, and until end of 2003 also for development of IT sector. The Ministry sets regulatory frameworks, issues licences and technical provisions, controls operation of subordinated areas, and elaborates development documents for these sectors. At the end of 2003 the information department was closed and its responsibility was forwarded to the Bureau of Information Society, founded in May 2003.

The Bureau of Information Society will be the main executive and co-ordinating body. The Bureau is authorised to co-ordinate IT projects at the state level. The chief of the Bureau is subordinated directly to Prime minister of the Republic of Latvia, and institutionally – to the State Chancellery. Therefore the chief of the Bureau is to be hired and laid off by Director of the State Chancellery after reconciliation with Prime Minister. The last fact is rather important in aspect of authority of the Bureau.

The Bureau is established, it has office and address, but only one person in its staff – the director. Nevertheless the work in preparation of IS legislation continues in cooperation with specialists who were involved in tackling of the problem before reorganisation.

According to the government functions, the Ministry of Economics has to co-ordinate economic development policies and their implementation. Therefore the Ministry deals with the IS problems in a more general way – in aspects of economic development, industrial development and business environment.

The Ministry of Education is responsible for specific education issues.

From the state agencies, the Latvian Development Agency is involved in creation of IS. The main financial institution at the governmental level is Public Investment Program (PIP). The Ministry of Economics is responsible for management of PIP.

The Public Utility Commission is the main relevant regulatory institution at the national level. The Commission was established in 2001, following the concept of a single public service regulatory body. It operates on the basis of the law "On public utilities regulators" (adopted on 19 October 2000). According to the law, "regulators" are the state or local government institutions. The law envisages that the state regulates public utilities in four sectors – energy production (except heat production when it is not connected with production of electricity), telecommunication, post services and railway, including passenger transportation by rail. Local governments regulate public utilities in waste disposal (except recycling of waste), water supply and sewerage, heating, if it is not connected with production of electricity. The division of particular services from these sectors into "regulated" and "free" is rather complicated. The Cabinet of Ministers adopts the list of regulated services at the state level, and local governments decide at the local level.

The Public Utility Commission is really independent. The staff of the Commission is approved by the Saeima for 5 years, and the decisions of the Commission are indisputable for any state of private institution except the court. The Commission is financed from the state fee that is set at the 0.2% level from the net turnover of delivered public services.

Also several public organisations are involved in the state management process in capacity of social partners, such as trade unions, Tripartite Council, Employers' Association, Local Government Association and some others. National Economic Council with the Ministry of Economics, the Foreign Investors' Council, and sector associations represent the business society. Other institutions, such as Chamber of Commerce and Industry, Association of SMEs and others are less important.

Analytical conclusion:

Institutional setting behind IS policy up to now prescribed divided responsibility. Specialists consider that it is one of the factors hampering fast implementation of ICT/IS policies and constituents. It is expected that the establishment of the Bureau of Information Society will improve the situation, however some specialists consider, that the problem must be institutionalised at the level of a single ministry – existing or the new one.

B.6. The commitment of private and public actors, main actors and their tasks

The division of responsibilities in creation of IS is not firmly institutionalised in Latvia. Some perception about eventual commitment may be found in the concept of eLatvia.[91]

The entire actions in eLatvia framework are divided into three functional groups:

- Wide access to Internet, which envisages fulfilment of several tasks that could be divided between public and private actors:

  1) Private: full digitalisation of telecommunication networks, higher Internet service providers responsibility for data security, data protection.

  2) The government: liberalisation of telecommunication networks, opening of the market of leased lines, regulation of Internet segmentation and service, installment of Internet service terminals in each library, school, local government (together with local governments), providing of data protection,

- Total information skills (ability to use information) and access to information:

  1) Private: implementation of teleservices,

  2) National, local governments: informatisation of all education institutions in Latvia, elaboration of relevant methodological materials, teachers' training, installation of technologies, Internet connections in schools; implementation of relevant education programs in higher education institutions, total training in information skills; implementation of tele-education and teleservices; training and obtaining capacity of computer skills according to European licence, implementation of library network,

- Information services and application:

  1) Private: application of electronic documents, openness to the government's offers to use electronic mode of communication,

  2) The government: implementation of ID cards serving as a universal access mean to the information services (not implemented), creation of legislative framework for and application of electronic documents, creating of environment in which eCommerce is possible, implementation of eGovernment, development of transactions government-enterprises, government-population, implementation of the state sector information portal.

As mentioned before the implementation of eGovernment concept is delayed. Nevertheless it proceeds according to the goals and principles that were set in the conceptual documents.

Analytical conclusion:

Private sector finances the inter-business and private information systems and IT infrastructure. Since education capacity is not sufficient, private sector finances education for employees. Some services sectors (financial intermediation, commercial services) implement e-systems in the course of modernisation of their business. As it was mentioned before, private sector participate in policy-making and policy implementation in general and in particular issues. For instance, industry representatives initiated co-operation with high education institutes in setting education standards, they organize training for computer sciences students and telecommunication specialists at business enterprises (e.g. Lattelekom

[91] Conceptual background of socio-economic program e-Latvia. http://eparvalde.delfi.lv

Training Centre), facilitate computer training in basic education. Business representatives are lecturers in computer related subjects in high schools and universities.

The government is responsible for general economic development, education, basic infrastructure, regulatory framework, licensing and quality control, elaborating of strategies and policies and creation and maintenance of its own information systems.

The government co-operates with business. For instance, eBanking gained popularity rather fast partly because the state institutions implemented debit-cards for salaries.

The role of the government in implementation of IS cannot be over-estimated, however at the time being the offer of private sector (eBanking, eShops, information systems etc.) is larger. Creation and maintenance of governmental information systems, as well as adoption of relevant legislation will be decisive in development of IS. These steps will allow business for even wider implementation of e-systems in financial intermediation, transportation and post services, commercial and legal services and trade. Latvian population is co-operative to e-systems and readily participate in such systems. From interviews with business representatives follows that ICT specialists and Internet providers observe close relation between welfare growth and Internet use. They expect increasing activity of their business in the nearest future[92]. Also statistical data show, that during the last two-three years economic growth correlates with increasing ICT penetration and Internet use (see Chapter A.2.1. and E.2.1.).

The idea of IS is strongly supported by the Latvian Development Agency – the state institution responsible for promoting FDI in Latvia, and the Council of Foreign Investors**.** Both organisations have similar motivation for involvement - the foreign owned businesses are located in export oriented sectors and therefore have clear benefit from the development of IS infrastructure.

IS as a problem has active support of lobbying institutions – IT enterprises and research centres. Telecommunication enterprises are considered too commercial, earning high profits and normally disassociate from the open lobbying process. At the time being discussion focuses on improvement of education related to IT sector. The lobbying institutes claim to raise study programs that are free of charge and are focused on revitalisation of professors' quality and age for IT related sciences in universities.

[92] Baltic News Service, December 21

B.7. SWOT analysis

Strengths	Weaknesses
The government supports IS creation Single responsible institution is established IS is included (directly or indirectly) in strategic goals Several important strategic development documents are elaborated and passed for implementation Precise measures facilitating creation of IS (from supply and from demand side) are envisaged in national Development Plan. Institutional basis is partly created Private sector supports and finances creation of IS Private sector provides e-services Public-private cooperation in education and implementation of e-systems FDI stimulate implementation of IS Some regional and local systems implemented	Until now – lack of single responsible institution Difficult coordination of involved parties Emphasis on IT provision, less attention to IT use Gap between legislation and practical implementation Difficult to apply adopted policies because of financial reasons Gradual and partial implementation of information systems makes them inconsistent Lack of regional IS policies Development plan is not valid Supporting systems (education, library system) less developed and treated as second round task
Opportunities	**Threats**
Development of IS in the world Implementation of EU strategies with regard to IS Increasing financing of the process by private sector Improvement of infrastructure (telecommunications) in less developed regions Better and more systemic financing of the process (EU funds) Pressure from social partners and business Business supports programs (SME, export facilitating etc.) Foreign investors - active supporters	Fragmenting of IS related policies, inadequate comprehensiveness Limited support from the government due to economic difficulties Latvian government does not recognise needs of IS Weak co-operation of involved parties Insufficient financing in result of economic slow down

C. INDUSTRIAL DEVELOPMENT AND COMPETITIVENESS

C.1. Structural changes

C.1.1. General situation

Industrial production embraces mining and quarrying (about 1% of total industrial production and 1.4% of total number of employed persons in industrial production in year 2002), manufacturing (respectively 85% and 89.1%) and electricity, gas and water supply (14% and 9.5%). The highest gross industrial output per employee in industry was observed in manufacture of pulp, paper and paper products (40,3 thousand EUR), the lowest (7.03 thousand EUR) – in leather industry. Both sectors are small. In 2002, gross total industrial output of manufacture production was EUR 29.3 thousand per employee, output of electricity, gas and water supply sector was EUR 36.3 thousand per employee. .[93]

As mentioned in chapter A.2.2, in 2002, the value added in manufacturing equalled 48.2% of the amount in 1990. Slow restructuring and still insufficient competitiveness were the main reasons of decline in manufacturing. Still structural changes have happened. Instead of the former state owned industry, now 99% of value added in manufacturing is provided by private sector.[94] Share of value added in output is not high – only 30.6%.[95] About 46% of industrial production is exported, of which 55.7% are exported to EU countries[96].

Table C1: Key indicators of manufacturing by sectors in 2002

	Value added*		Share of exports sales in realisation	Fixed investment structure	Foreign direct investment	
	structure	growth			structure	change
Total manufacturing	100	7.2	51.9	100	100	100
Food industry (15,16)	28.3	5.8	21.8	29.4	27.5	-20.3
Light industry (17-19)	10.5	-1.2	84.1	6.2	12.4	-5.1
Wood and articles of wood (20)	17.0	5.8	69.5	33.0	20.4	45.2
Paper industry, publishing and printing (21, 22)	7.5	-3.1	24.9	6.3	3.9	11.2
Chemical industry (23-25)	5.1	15.4	63.0	4.5	11.6	10.4
Other non-metal mineral products (26)	3.5	15.3	26.6	2.6	6.8	26.7
Metal and metal products (27-28)	10.7	2.0	78.8	7.5	9.5	35.7
Manufacturing of machinery and equipment (29-35)	12.0	10.0	68.9	6.7	7.6	13.3
Other industries (36,37)	5.4	6.0	69.5	3.7	2.3	17.2

*Estimation of the Ministry of Economics ** NACE codes in parentheses
Source: Economic Development of Latvia. Report of the Ministry of Economics of Republic of Latvia, Riga, June 2003, p.76

The food industry, wood processing, metal processing and machinery, electronic and electro-technical industry and light industry (textiles) dominate in industry. Food industry provides

[93] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.153-155
[94] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.49
[95] Macroeconomics of Latvia in figures 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.48
[96] Main indicators of industry in Latvia, 2(26) 2003, Central Statistical Bureau of Latvia, Riga, August 2003, p.18

about 1/3 of value added in industry, but only 21% of its output is exported, mainly in Russia, Lithuania and Estonia. Wood processing industry provides 1/5 of industrial output, more than 70% is exported, mainly to Western Europe. Metal industry and machine building gives 1/5 of industrial output, 75-80% of production is exported. Just 16% of light industry output is consumed in Latvia, 78% of its production is exported to EU countries.[97]

5567 economically active enterprises operated in industry at the beginning of December 2003, of which 5244 in manufacturing.[98] 35% of enterprises with number of employed more than 250 are manufacturing enterprises, and majority of them are former state enterprises.

At the time being privatised former state enterprises provided the largest share of industrial production. Some of them are still under ownership of national capital (examples: "Latvijas Finieris" – wood processing, Rigas kugu buvetava – ship building, "Jauda" – electro-technical equipment, Rigas Piena kombinats, Rigas Piensaimnieks – milk processing, Lode – building materials and many others). These enterprises improve competitiveness by innovating in products, technologies and management. Foreign owners have overtaken some, for instance Liepajas Metalurgs – steel industry, Valmieras glass fibre factory, Olaine chemical factory, Laima and Staburadze – confection producers, Daugavpils chemical fibre factory, Sauriesu bulding material enterprise (currently Knauff). Some enterprises ensure competitiveness on the basis of low labour costs (Bolderaja Ship repairing factory, Ogre textiles factory). Contribution of new-established private industrial enterprises is less important in amounts, but based on modern technologies and deep integration with market partners, what provides them with high development potential.

In some enterprises information transaction is a part of technological process (for instance, composition of chemical materials is calculated in laboratories abroad).

Competitiveness of Latvian industry is provided by low production costs and sufficient quality. Access to foreign markets for national enterprises is more difficult for different reasons (lack of national trade marks, small supply, and similar), and foreign owned enterprises or enterprises with foreign capital show better performance in this respect.

Recently the government has increased efforts in facilitating high-tech industries. On 12 January 2004 the Committee of the Cabinet of Ministers approved a draft project on the development policy of Latvian industry. The whole document is focused on the development of knowledge-based industry. First time since beginning of transition, the document not only sets vision, but also envisages real actions aimed at creation of basis for development of such kind of industry – education, R&D and co-operation between R&D and industry. The planned results are: annual growth of industry 7-10%, productivity growth to 40% of average EU15 until 2010, increasing share of high-tech industry in exports, and annual 10% increase in number of enterprises that have established quality management systems and good production practices [99]

The government also increased the list of innovative products that are eligible to reduced company income tax as stipulated by Regulations of the Cabinet of Ministers Nr.218 "On list of high-tech products and software products". In 2003, 63 enterprises in Latvia produced

[97] Latvian Development plan, draft as on 03.09.2002, p.22, Economic Development of Latvia, Report of the Ministry of Economy of the Republic of Latvia, Riga, June 2003, p.78.79, Main indicators of industry in Latvia, 2(26), Central Statistical Bureau of Latvia, Riga, 2003, p.15

[98] Monthly Bulletin of Latvian Statistics, 11(114) 2003, Central Statistical Bureau of Latvia, Riga, December 2003, p.74

[99] http://www.em.gov.lv

high-tech products, and about 30% of them were certified according to ISO9001, 14001 or GMP.[100]

Analytical conclusion:

At the time being, major part of industrial output comes from low value added sectors, but restructuring of industry is not finished yet. Regarding IS, it is important that new enterprises appear in information intensive sectors, these enterprises are based on FDI or international co-operation and produce for export. In addition, as the Latvian Development Agency study shows, foreign owned companies perform better at exports, and their share increases.[101]

C.1.2. Main regions of industrial production

Main industrial regions in Latvia are large cities: Riga, Liepaja, Daugavpils, Rezekne and Valmiera. Regional dispersion of manufacturing is given in Table C2.

Table C2: Gross industrial output, % of total

	1997	1998	1999	2000	2001
Total	100.0	100.0	100.0	100.0	100.0
Riga region	60.7	61.3	61.8	61.7	62.5
Vidzeme region	9.6	9.2	10.2	10.8	10.3
Kurzeme region	12.2	12.8	12.5	12.2	12.0
Zemgale region	8.1	8.4	9.2	9.4	9.1
Latgale region	9.4	8.3	6.4	6.0	6.1

Source: Regional statistics

About a half of industrial enterprises are located in Riga.[102] Riga has multisectoral industrial structure, industry forms 47.6% of Riga's GDP (current prices). Riga and Riga region provides 62% of the total industrial output[103].

Liepaja (Kurzeme region) is famous with the largest in Baltic States metallurgy enterprise Liepajas Metalurgs. The enterprise produces about 600 thousand tons of steel and steel products, of which more than 95% is produced for export. Liepajas Metalurgs was established in 1882, and was improved significantly during the Soviet period. Nowadays the enterprise has started intensive modernisation to meet requirements to environment protection and to increase efficiency of production. The enterprise has important competitive advantage - low labour costs and location near the seaport.

Daugavpils is an example of difficult transformation of industry. Unable to exist without investment, many former large state enterprises were subjected to FDI that led in some cases to substantial restructuring of existing producing units (ineffective as they were) up to operation of enterprise in regime of workshop or subsidiary. Despite the fact that Daugavpils hosts higher education institution, and there are subsidiaries of the Riga Technical University, the city's industrial development is not fully recovered.

Before 1990 several very large industrial enterprises were located in Rezekne, the city was an important transport cross point. Nowadays large enterprises have reduced production or have closed thus causing massive unemployment. Several small enterprises have appeared.

[100] http://www.em.gov.lv
[101] Foreign Direct Investment and the Latvian Economy. Draft report of the Latvian Development Agency. Riga, December 1999.
[102] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.215
[103] Latvia's regions in figures, 2002. data collection. Central Statistical Bureau of Latvia, Riga, 2003, pp.563, 88

Majority of them produce export commodities and are equipped with modern machinery. Yet former industrial capacity of city is not achieved, and the level of unemployment is still high.

One of former large state enterprises in Valmiera – Valmiera glass fibre factory, on the contrary, has provided significant achievements in modernisation of its production on the basis of FDI. The enterprise contributes to welfare of population and local government in Valmiera that allows supporting community activities in fields related to the creation of IS (secondary school and professional education).

In rural areas industrial activities are weak, mainly food production and wood processing enterprises exist. The process of concentration has started in these industries that will hamper small enterprises and aggravate rural economics even more.

Analytical conclusion:

Industrial production is allocated unevenly across the territory. Major part of industrial enterprises exists in Riga and the Riga region. Across the country, almost all large enterprises are former soviet state enterprises that were successfully restructured. Some of former enterprises are closed, but as a rule, on the basis of such enterprises new production units appear. There are some cases of comparatively large grass-root investment in industry (for example Kellog's, Stora Enso, Bralis (brewery), however in most cases new production units (mostly SMEs) occupy buildings of closed enterprises. With respect to IS it is important that (1) access to ICT infrastructure counts in allocation of enterprises – it follows scattering of communication networks, and (2) eventual places of new investment in industry are former large enterprises. It is worth to remind that such enterprises were originally allocated across country with purpose to encourage regional development.

C.1.3. Declining and rising sectors of industry and services

The economic system of Latvia is very new, not yet formed. In addition, Latvian statistics describe industry and services sector extremely niggardly. Because of this it is not easy to identify declining and rising sectors precisely.

The fastest growth has been achieved in trade. The trade sector transforms from dominance of small trade enterprises and large wholesale establishments serving shops and population, to supermarkets and large shops, FDI based trade chains. In service sector also the share of commercial services grow.

In industry, wood industry is still growing, however the growth becomes slower. The industry gradually implements production with higher value added. Intensive inflow of FDI has turned wood industry into a completely foreign-based industry. In other "old" sectors - food industry, textile, metal production, machine building, former state enterprises accumulate investment resources and prepare for restructuring. In some sectors, restructuring is finished and enterprises demonstrate stable performance (polygraph, food industry, pharmacy etc), still their future development is questionable, depending on their strategy. FDI interest in such enterprises is evident.

Fast growth was recorded in electronics and electro-technical industry. In this sector small newly established enterprises show the fastest growth. Majority of electro technical enterprises operate in co-operation chains and produce for export. Also ICT is a successful sector, but it is based strongly on the local demand, great part of which is government procurement. ICT sector provide modern services and technologies. Still the potential of industry seems not fully employed, especially concerning software production. Glass fibre industry and building material production has been able to modernise enterprises. In both

industries foreign owned enterprises dominate. Some new industries accumulate in power, namely, audiovisual industry (cinema, TV).

Sectors providing public services (electricity, gas and water supply) develop on the basis of local demand in concert with overall economic development – with good profits and slowly increasing outputs.

Examples of declining sectors are all metal and energy intensive industries, like railway car industry, agriculture equipment industry, and others.

Analytical conclusion:

The fastest growing sector is trade. Industrial structure is diversified. SMEs, which in many cases are restructured or modernised former state enterprises, represent different industries. Assessing from the foreign trade aspect raising industries are these who are strong in exports, namely, metal industry, textiles and food production. Recent estimation show, that development of these industries decline. All these industries are sensitive in many aspects: influenced by growing labour costs, market regulations and low competitiveness due to small scale etc. Generally industrial structure is diversified and industrial potential increases in high technology sector.

Regarding IS it is important that information intensive industries grow. The share of truly knowledge intensive industries in Latvia is very small (5-6%) still the sector seems to be the most prospective one.

C.1.4. Changes in the structure of services

Structural changes in services are characterised by GDP figures (at average prices) (Table C3).

Table C3: Structure of gross value added in service by kind of activity (in %)

	1990	1995	1997	2000	2002
Gross value added at basic prices	100.0	100.0	100.0	100.0	100.0
of which by kind of activity:					
Electricity, gas and water supply	1.8	5.5	5.0	3.9	3.6
Services	31.9	56.0	62.0	69.8	70.6
of which:					
Wholesale and retail trade	12.9*	20.2	26.0	25.7	27.9
Hotels and restaurants	3.8*	1.9	2.0	1.8	1.7
Transport, storage and communication	30.4*	28.5	27.1	22.1	21.6
Financial intermediation	9.5*	10.1	7.7	7.7	7.6
Real estate, renting and business activities	11.0*	7.7	8.2	14.9	15.6
Public administration and defence, compulsory social security	8.0*	9.1	9.4	9.5	8.8
Education	10.6*	9.4	7.9	7.7	6.9
Health and social work	7.3*	7.1	5.5	4.5	3.9
Other community, social and personal service activities	6.6*	6.0	6.2	6.2	5.8

* - in 1992

Source: Statistical Yearbook of Latvia 2000, Central Statistical Bureau of Latvia, Riga, 2000, p.24, Statistical Yearbook of Latvia, 2002, Central Statistical Bureau of Latvia, Riga, 2002, p.16,

Since 1992, the share of wholesale and retail trade has doubled in services GDP. It is the largest service sector and the fastest growing sector of Latvian economy. The share of transport, storage and communication has declined – from 30.4% in 1992 to 21.6% in 2002. The decline might be attributed to the fact that transport, storage and communication were active sectors in beginning of nineties, when loss of former markets paralysed activity in many other sectors. The amount of GDP produced by the sector has increased. Fast development was achieved in real estate, renting and business activities sector, which includes also computer related activities – from 11% in GDP produced by service sector in 1992 to 15.6% in 2001.

The share of public administration and defence, compulsory social security has also grown, mainly due to increase of wages in this sector. The share of education declined critically in the end of nineties. The share of other community, social and personal service activities declined in the nineties, and this reflected in less consumption of culture and leisure services. The decline of the share of health and social work, on the contrary, is not stopped.

Expectations concerning hotels and restaurants sector and financial intermediation were not fulfilled – the share of both sectors decline. In 2002, 2003, the activity of financial intermediation remarkably increased on the basis of loan expansion. It is too early to say that financial intermediation has become an independent export oriented sector (besides serving as an infrastructure for local needs).

Analytic conclusions

Regarding IS it is important to see that even in the services sector the share of information intensive services grow. In addition, services (except for ports) are allocated geographically more evenly then industry. Nevertheless, from further analysis we see that there are great challenges in the computerisation of service sectors that have to be faced.

C.1.5. Changes in investment

In this chapter "investment" must be understood as a gross fixed capital formation. Proportional distribution of fixed investment and FDI in industry is given in Table C4 and C5.

Table C4: Investment by sectors

	Structure		Real growth (average per year)			Real growth in 2002 against 2001
	1996	2002	1996-1998	1998-2000	2000-2002	
Total	100.0	100.0	32.6	8.6	10.2	12.4
Agriculture and fishing	1.9	3.2	41.7	12.8	28.7	87.4
Manufacturing and mining and quarrying	16.4	16.7	29.9	3.7	18.9	16.0
Electricity, gas and water supply	5.1	8.3	68.4	8.8	10.4	4.4
Construction	1.9	2.7	52.1	21.6	4.8	10.9
Trade	11.2	14.3	50.4	8.2	9.9	11.8
Transport and communication	37.7	23.3	12.8	0.5	10.1	12.4
Other services	25.8	31.5	42.2	16.7	5.6	8.7

* Excluding investment in individual construction

Source: Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, June 2003, p.46

In the first years of economic transformation, as in other transition economies of Eastern Europe as well, investment declined at a faster pace than outputs. With the stabilization of economy and improvement of business environment investment started to go up. Between 1996 and 2002 Latvia had the highest growth rate of investment among EU accession countries. Rapid growth of overall investment was mainly ensured by investments in the private sector.[104]

Investment located mainly in labour intensive and low technology industries. Lately investment growth was also observed in sectors of high technologies, such as production of electronic and optical devices (by 22%), and transport vehicles (by 24%). Investment in high technology sectors in 2002 equalled just to 10% of total investment in manufacturing.[105], but FDI per employee is higher in high-tech industries (Table C5).

Annual growth rate of investment in the period between 1996 and 2002 reached 17.9% exceeding GDP growth rates more than three times. The share of investment in GDP went up from 18.3% in 1996 till 26.4% in 2002.[106] The dynamics of investment in Latvia greatly depend on the general economic condition in the state as well as conjuncture fluctuations, which was demonstrated by the decline of investment by 4% in 1999 under the impact of Russian crisis. In 2000 and 2001 investment went up in the average by 18.5% per year mostly because of stability of macroeconomic and financial environment, positive evaluation of investment environment in Latvia given by the international organisations and investment friendly government policy.

Table C5: Investment in industry by technological classification in 2001

	High-tech	Middle-tech	Low-tech	Manufacturing, total
Structure of FDI in basic capital (%)	22	18	60	100
FDI per employee (thsd. EUR)	3.2	2.1	2.1	2.3
Non-financial investment per employee (thsd. EUR) in 1998-2001	5.0	6.9	8.5	7.6

Source: Progress report on implementation of the Long term economic development strategy of Latvia. Ministry of Economics of the Republic of Latvia, Riga, September 2002, p.17

Public investments in Latvia amount to 4% of GDP[107]. The priorities of the public investment program are transport, environment protection and internal affairs, nevertheless some part of public money is spend for creation of information systems.

Foreign investors show interest in the development of the sector "Office equipment and computer production" in Latvia, the majority of investment is made by USA and Estonian businesses. The total investment made by the end of 2002 in this sector equalled to 1432 thousand EUR. In the sub sector "Computers and related activities" the accumulated foreign direct investments amounted to 21.3 million EUR at end of 2003 [108].

Analytical conclusion:

Rapid growth of investment and investment structure is favourable for development. Of total non-financial investment, 85% is capital investment. 50.9% of investment is purchase of equipment, tools and inventory. 65.7% of total investment is invested in private sector. FDI

[104] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003. p.44
[105] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003. p.45
[106] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003. p.44
[107] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003. p.46
[108] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, June 2003, p.104

constitute 10.3% of total investment[109]. The total investment sum presumably does not cover all modernisation needs, but it is harmonised with market capacity, which at the time being is major problem of industrial development. The same regards lending availability for industry.

C.2. The role of ICT industry

C.2.1. Specific sectors' market size and value

Table C6 demonstrates the number of enterprises, turnover and revenue of the ICT sector in Latvia. The information is taken from the Enterprise Register and is official.

The whole sector has grown remarkably since 1996, and in particular in 2001 and 2002. The **fastest growth** in all aspects is fixed in manufacture of office machinery and computers, wholesale of office machinery and equipment, telecommunication services and computers and related services. The largest sector in terms of **number of enterprises** is computers and related activities, manufacture of office machinery and computers and telecommunications. In the last one, the fast growth in number of enterprises in 2001 and 2002 may be explained by liberalisation of the telecommunication market. The largest **turnover** was fixed in service sectors: computers and related activities and telecommunication services. In telecommunications three main operators provide the largest share.

Table C6: Number, turnover and revenue of ITC enterprises by NACE, EUR

	1996			2000			2002		
	No: *	T/mln **	R/th ***	No: *	T/mln **	R/th ***	No: *	T/mln **	R/th ***
NACE 22.33	1	0.23	4.39	8	6.01	-1895.41	61	344.13	6628.94
Manufacture of office machinery and computers (NACE 30)	4	0.35	-5.84	27	15.55	-219.6	201	696.32	13077.49
Manufacture of television, radio and communi-cation aparatus (NACE 32)	7	2.98	39.91	10	50.61	-597.86	79	263.47	4239.38
NACE 33.20	0	0	0	3	0.02	-11.2	40	94.32	4169.93
NACE 33.30	0	0	0	2	0.22	-6.61	36	64.19	-25630.8
Wholesale of office machinery and equipment	5	0.86	2.01	20	26.18	-884.86	163	520.26	6827.23
Telecommuni-cations	4	2.23	92.32	13	4.57	-149.05	118	1032.49	214808.68
Renting of office machinery and equipment, including computers	0	0	0	9	4.8	-101.64	69	183.7	16476.02
Computers and related activities (NACE 72)	37	17	317.53	148	58.79	633.88	1344	2771.06	29180.49

Source: Latvian Enterprise register data bases, www.lusoft.lv
*: No: Number of enterprises
**:T/mln: Turnover – million
*** R/th: Revenue – thousand

According to another source, namely, "Indicators for the Information Society in the Baltic Region", ICT sector turnover amounts to approximately 9% of the total turnover of the private sector. ICT manufacturing amounts to 1% of total manufacturing, ICT services about 12% of total services. 90% of turnover provide ICT wholesale and telecommunications, 1% is

[109] Statistical Yearbook of Latvia 2003,Central Statistical Bureau of Latvia, Riga, 2003, p.162

on part of ICT manufacturing and 9% is ICT consultancy. Regarding employment, ICT sector employment compared to employment in the private sector is approximately 5%, ICT manufacturing is 1.5% of total manufacturing and ICT services represent approximately 5.5% in total services in 2001. The employment structure differs from the turnover structure – the share of employed exceeds the share of turnover for ICT manufacturing and IT consultancy. The largest share of employment in ICT manufacturing is provided by enterprises with 100 and more employees. In ICT services the employment distribution is more even.[110].

It must be admitted that information in both sources differ significantly.

Analytical conclusion:

There is not sufficient information about development of ICT industries in terms of market size and value. By all means, the share of the sector is not large, but it may be estimated as remarkable in diversified economic structure.

C.2.2. International co-operation and competition

The ICT sector offers a wide range of opportunities to the foreign IT investors, particularly in:

- software development outsourcing and system integration;
- application hosting and related services;
- independent testing, adaptation and localization services;
- information systems auditing;
- call centres and telemarketing.

Software development firms choosing to locate in Latvia can take advantage of:

- developed educational system;
- skilled and cost-effective personnel;
- Western business culture;
- strong government support;
- modern communications and logistics infrastructures;
- strategic geographic location.

A number of Latvian IT companies (including DATI, Exigen, IBM-Latvia, Data Pro, BTG, Vide Infra Grupa) have experience in providing software development services mainly to large international clients. Tieto Konts and Tilde are export market oriented and focus on product development and product localization services. Several local companies: such as IT Alise, Fortech, Elva, and Verdi are currently working in the Baltic markets and are exploring new market opportunities.

Latvia's estimated current packaged software sales volume is EUR 28 million (a growth of 150% a year) and this business involves around 500 specialists. According to Datamonitor[111], Latvia's software potential can be expected to triple before 2004. The companies DEAC and Verdi offer customized ASP services. IBM Latvia also offers some limited data centre services, but network-related services are provided by Telia Latvia.

[110] Indicators of the Information Society in the Baltic Region. Action Line 6. Northen eDimension Action Plan, Statistics Denmark, July 2003, p.29-37

[111] Datamonitor, 2001

Table C7: Examples of international co-operation

Company name	Number of employees	Major products and services	Markets served
DATI	515	Large scale software projects, design and development. New systems development, re-engineering, software testing, CASE tools.	Telecommunications, finance and banking, transportation, public sector
Exigen (former SWH-Technology)	270	Medium and large scale IT projects, and implementation, consulting and training. Core competencies include Java, Lotus Notes, SAP, B2B, internet technologies, software re-engineering, Interfacing R/3 with legacy systems and ABAP/4 programming.	Large international corporate customers (e.g. IBM), public sector
Fortech	240	IT system integration, business applications and software development.	Large corporate customers, public sector
Verdi	240	IT strategies and consulting, software and Web solutions development, system integration, networking solutions, PC workstation and data center services.	Corporate customers, public sector, telecommunications, other system integrators and partners.
Tieto-Konts	128	Credit/debit card processing systems. The systems developed by Tieto Konts are used in Russia, the Ukraine, Lithuania, Georgia, and Poland.	Banking and finance
IT Alise	100	Large-scale software project design and development. Client/server and Internet/Intranet software (SW) development using Oracle and IBM technologies, office solutions based on Lotus/Domino, IT consulting and management.	Telecommunications, utilities, banking and finance, public sector
Data Pro	90	A leading developer and provider of data base and data warehouse applications. Development of financial and office applications, business intelligence solutions	Banking and finance, distribution and sales, public sector.
BTG	80	Financial applications on a Unisys platform.	Banking and finance.
Tilde	75	Localisation of software, multilingual solutions, Internet solutions, development and marketing of software applications	Software developers (e.g. Microsoft, IBM, Adobe, Corel, Bitstream), SW end-user market
IT	30	Business Intelligence solutions (CRM, decision support systems and data warehousing), Internet technologies (integration of Internet functions in existing applications, application integration), and management consulting	Banking and finance, health care, manufacturing &distribution, public sector.

Source: Latvian development agency, IT report 2002

International and domestic competitiveness of Latvian ICT sector can be characterised by several comparisons.

Table C8 presents local ranking of IT companies according to TOP 500 (by turnover). This ranking is based on voluntary participation and therefore cannot be accepted as ideally representative.

Table C8: Largest IT companies in Latvia

	Position in the sector in 2002	Position in the sector in 2002	Turnover in 2002, mln. EUR	2002 in percent to 2001	Position in TOP 500 in 2002
Trade					
GNT Latvia	1	1	50.6	50.6	43
Elko Latvia	2	3	18.9	51.9	146
Tech Data Latvia	3	2	17.7	14,3	160
TVG*	4	-	7.7	124.9	412
Software production					
Microlink**	1	1	14.1	27.5	-
Exigen Latvia	2	3	9.5	11.4	327
Dati	3	2	9.3	8.4	330
IT Alise	4	5	7.2	45.8	448
Tilde	5	6	1.8	n.a.	-
TietoEnator	n.a	4	n.a.	n.a.	-
Hardware and service					
Commercial centre Dati Group	1	1	8.5	2.3	368
Capital	2	2	6.9	-11.1	465
BIT	3	-	5.8	139	-
EET-Riga	4	3	4.4	-7.6	-
Elva-1	5	4	3.2	-7.5	-
Microlink DATORI	6	n.a.	3.0	-13.3	-

* Software wholesale

** Turnover in software production

Source: TOP 500. Largest enterprises in Latvia. Dienas Bizness in cooperation with Lursoft, 2003, p.70

Latvia's position is rather high in international comparison also. According to the research of International Trade centre, competitiveness of Latvian ICT industry is assessed with high mark – 8 points out of 10 possible (EU – 8, Poland – 6, Russia – 5, USA – 10), while unused export potential is assessed with 6.7 points out of 10 possible (EU – 9, Poland – 6, Russia – 8, USA – 10).

"The Global Information Technology Report. Towards an Equitable Information Society", produced by the World Economic Forum, the World Bank and INSEAD (France), gives ranking of countries on data from International Telecommunication Union as in 2000-2003. According to these estimations, Latvia's Environment component index ranks 38 among 102 countries, Readiness component index – 36, and Usage component index – 41[112].

[112] The Global Information Technology Report. Towards an Equitable Information Society. Editors Soumitra Dutta, Bruno Lanvin, Fiona Paua, World Economic Forum, New York, Oxford University Press, 2004, p.162

Analytical conclusion:

The competitiveness of Latvia's ICT is sufficient in software sector and systems development. Some companies provide services mainly for foreign clients. Some of them are subject to FDI, but FDI is less important in software industry. Competitiveness of software business in Latvia is provided by skilled and cost effective personal.

The professional indicators in software sector are high. According to the survey (1997) 82% of employed at software enterprises in Latvia has university education and 6% of them have scientific degree. 70% of them are computer scientist by education, 6% mathematicians, 16% other scientists. Almost all employees speak at least two foreign languages. [113]

C.2.3. Major sectors of innovation activity

There is not much precise information about innovation activity in Latvia. In 2002 the Central Statistical Bureau conducted the first official innovation survey[114]. Results were published in Statistical Bulletin "Innovation Survey Results"[115].

According to the survey, in the period between 1999 and 2001, 19% of Latvia's enterprises introduced new or significantly improved products (goods or services) to the market or introduced new, significantly improved technological processes. Large enterprises with 250 and more employees were the most active in introducing technological innovations, 58.1% of all respondents were innovative. Among small enterprises with 10-19 employees only 12.7% were innovative. In the manufacturing sector 23% of enterprises were innovative, but in the service sector innovations were introduced in 15.4% of enterprises. It is common trend in the EU that innovations in the manufacturing sector are developed more frequently than in the services sector. The share of innovative enterprises in Latvia is considerably lower than the EU average and lower than in Estonia and Lithuania.

Product innovations were introduced in 13.8% of enterprises and process innovations in 14% of enterprises. The majority of innovative enterprises had introduced both product and service innovation, however 5% of enterprises were only product innovators but 5% were service innovators.

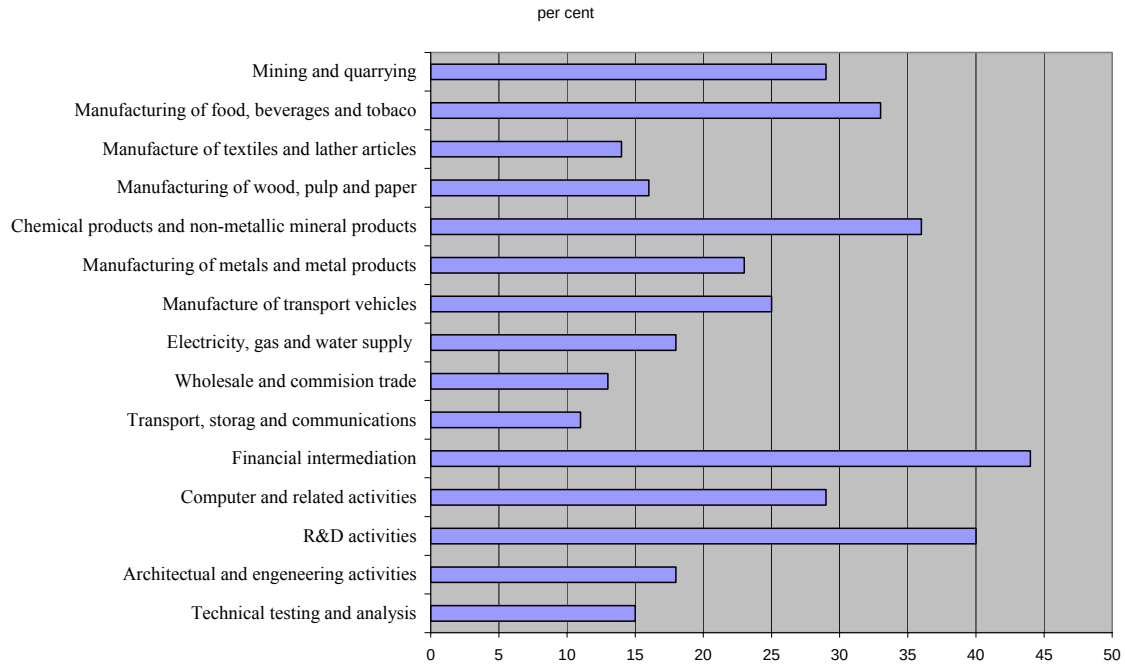
Share of innovative enterprises by various industry groups is shown in Graph C1.

[113] Karnite R. Software industry in Latvia. Final report for EC Phare ACE DIFEBALT research project "Infrastructure policies for sustained growth in the Baltic countries, Riga, April 1997

[114] The questionnaire and the organisational methodology for the third Community Innovation Survey – CIS 3 were used in this survey. The Innovation Survey covered 2491 (enterprises (55% in the manufacturing sector and 44% in the services sector) from NACE sections that were mentioned in the methodological instructions prepared by Eurostat experts and which employed more than 10 persons (total number of such enterprises was 4398). Of the sampled enterprises, more than 60% were small enterprises with less than 50 employees, large enterprises were only 6.3%.
Questions asking to describe innovations introduced into the enterprise were taken out due to negative experience accumulated in Latvia in the compilation of detailed information. The following **definitions of innovations** were used in the survey. An innovation has taken place if a new or significantly improved product (good or service) has been introduced into the market or if a new of significantly improved process has been introduced in the enterprise. The innovation can be new to the specified enterprise but it needs not necessarily be new to the market. Changes of solely aesthetic nature and selling of innovations wholly produced and developed by other enterprises are not considered as innovation.

[115] Innovation Survey results, 2003. Central Statistical Bureau of Latvia, Riga, 2003

Graph C1: Share of innovative enterprises by various industry groups 1999-2001



Source: Innovation Survey results 2003. Central Statistical Bureau of Latvia, Riga, 2003, p.22

Table C9 shows that the largest density of innovative enterprises is observed in large high-tech enterprises' group, the smallest – in small low-tech enterprises' group. In all groups of enterprises, the innovativeness increases with increasing quality of technologies.

Table C9: Innovative enterprises in the manufacturing sector by kind of technology sector and number of employees (in per cent of total in the group)

	Number of employees			
	Total	10-49	50-249	more than 250
Total	**23**	**17**	**35**	**61**
High-tech enterprises	43	38	67	100
Medium high-tech enterprises	40	29	29	78
Medium low-tech enterprises	26	21	37	62
Low-tech enterprises	20	15	32	57

Source: Innovation Survey results 2003. Central Statistical Bureau of Latvia, Riga, 2003, p.37

Further data on of innovation activities is described in chapters B2 (Policies) and D2 (Institutions and spending, R&D activity).

Analytical conclusion:

Institutional basis for innovation is created, but it is rather general. Policies in this field are not properly supported by real actions. Innovations mean implementation "new to existing". The share of innovative enterprises in Latvia is considerably lower than the EU average and lower than in Estonia and Lithuania. Large enterprises are the most active in introducing technological innovations. Innovations in the manufacturing sector are developed more frequently than in the services sector. Major sectors of innovation are financial intermediation, R&D activities, production of chemical products and non-metallic mineral

products, manufacturing of food, beverages and tobacco. More than a half of innovative enterprises are located in Riga.

C.2.4. Trade balance of ICT industry

Latvian enterprises do not produce any hardware parts for ICT, the sector deals only with assembling systems from imported parts. From this point of view Latvia is a strong importer. As mentioned before, in the sub-sector "Office equipment and computer production" the value added created in 2002 equalled to 0.1% of GDP. Computers for domestic use are mainly imported. In 2002 imports of these products by 8.4% exceeded the level of the first half of the preceding year. Export of office equipment produced in Latvia is ten times smaller than import. However it has been rising, and in 2002 export was by 5.8% bigger than in 2001. Indicators of 2002 show a slight decline in comparison with 2001.

In sub-sector "Computers and related activities" the highest share belongs to software development – approximately 75%. Lately, the output of this sector is rapidly growing, and in 2002 was 2.5 times bigger than in 1998. Export of software also increases. In 2002 it went up by 9.6% (current prices) compared with 2001. Growth of the imports during the same period was slower – only 4.4 %.[116]

According to another source, export of telecommunication equipment represents approximately 25% of export if ICT goods, consumer electronics represents approximately 5%, share of computers is approximately 23%, share of electronic components is approximately 20% and instruments for measuring represents 23%. The share of ICT export to total export is approximately 1%. The import structure is as follows: telecommunication equipment – 32%, consumer electronics – 18%, computers – 30%, electronic components – 12%, office machinery – 1%, and instruments for measuring – 7%. The share of ICT import in the total import is approximately 8%. Export/import ratio of ICT goods is increasing negative[117].

Analytical conclusion:

Foreign trade balance in ICT is negative. Statistics on foreign trade relations is not reliable. In additions, once the sector is not large, indicators vary significantly in result of case-to-case actions.

However the slow export capacity of local IT enterprises does not threaten the implementation of IS in Latvia. These are not mandatory local IT enterprises that should provide computerisation and implementation of ICT (in a sense that they produce all necessary equipment and IT sector is highly developed). Basically it is enough if local enterprises have the capacity to be intermediates in supplying ICT to the economy and provide instalment (localised software and system works).

[116] Economic Development report, June 2003, Ministry of Economics of the Republic of Latvia, p.104-105 .
[117] Indicators for the Information Society in the Baltic Region. Action line 6. Northern eDimension Action Plan, Statistics Denmark, p.54-57

C.3. SWOT analysis

Strengths	**Weaknesses**
Industrial decline is stopped Share of high-tech industries increase Foreign companies' show high capacity for export FDI driven innovation in technological process High professional quality of employed in IT sector Low labour costs in ICT (especially software) industry Investors interest in ICT sector Presence of leading foreign ICT companies Ability to compete in global markets with ICT product quality ICT sector is driven by the private sector and new established companies ICT sector provide modern services and technologies	Slow modernisation of industry Declining comparable prices, declining income in industry Dominance of low value added production in entire economy Labour and capital intensive industries produce 80% of output Uncompensated negative trade balance of ICT Export capacity is hampered by small size of industrial enterprises Ex-innovations dominate Low inclination to innovation Low recognition of Latvia as an ICT producer Slow regional development in IST Lack of qualified specialists in high-tech and ICT sectors for further development
Opportunities	**Threats**
Modernisation of industry continues Role of FDI in innovation/modernisation of the economic activities "Latvian" ICT software develops as high VA sector Increasing internal and external demand Better market and FDI access after EU accession Structural changes in ICT industry Co-operation and concentration – increasing competitiveness Access to wider innovation sources (EU research area)	Increasing competition Labour costs will rise Declining competitiveness of ICT industries Ownership of ICT companies is mainly foreign Latvian enterprises are last point of the branch for investors – limited further development Enable to explore wider innovation sources

D. PRESENCE OF MOST RELEVANT ECONOMIC ACTIVITIES FOR IST APPLICATIONS

D.1. The most relevant potential spill-over effects of IST

Analytical conclusion:

It is likely that magnitude of spill-over effects depend on the level at which IS is developed. In Latvia the process is at the beginning, at the stage of technical preparation (implementation of ICT and information and communication infrastructure). It characterises as highly uneven. Up to now there is no evidence of "too much" ICT in enterprises. As statistics shows, the general level of computerisation is rather low in Latvia. On the other hand it is known from experience that successful enterprises have good IT provision. It is likely that the spill-over effects of IST (at the current stage – implementation of ICT) cannot be measured in general terms. Once the implementation level is different, the effect of IST has to be measured first in particular units – preferably by a special survey, and a generalisation made on the basis of these measurements. In addition, it is impossible to estimate economic impact of IST related activities if these are tailored in a complex of measures that have been implemented simultaneously.

Yet there are some spill-over effects at this early stage of implementation of ICT. Computerisation of enterprises and state institutions was the first step in the modernisation of the Latvian economy. It is worth mentioning that in the beginning of the nineties enterprises, as well as majority of state and local government institutions did not use computers in management process. Computers were present only at certain research institutions and one institution of state management – Gosplan, and they were applied in some industrial processes (for instance, Siemens technological mangement system in milk processing enterprise Rigas Piena kombinats).

Generally observed spill-over effects in enterprises are: new technologies in management, work organisation and marketing, new customers relations and even new business models. IT applications fasten management operations and interactions, improve access to information necessary for production and process management.

In this respect we conclude that regarding business, the marginal return from rise of the level of IS implementation was positive so far. Unfortunately, it is not possible to prove this by statistics, because statistical reporting of innovation and IS issues is still imperfect in Latvia. Investment in ICT is not reported by statistics; therefore it is impossible to compare input-output relation with regard to investment. Lack of relevant statistics was also mentioned in other studies devoted to R&D and innovation issues[118]. Regarding state institutions the conclusion is not as clear (discussed further).

Also some negative spill over effect is possible. Implementation of IST facilitates reducing of number of management personal in enterprises (less people are needed for technical management operations, for instance in bookkeeping). On the other hand, implementation of IS encourages emerging of new businesses – consultancy, education, and other services (discussed further).

Strong circular influence of IST exist - development of IST promote sectors that are more or less constituents of IS: telecommunications, IT industries, education and, at some extent, also science. At the time being, all enterprises and majority of households have telephone access.

[118] Kristapsons J., Martinson H., Dagyte I. Baltic R&D systems in transition. Experiences and future prospectsRiga, 2003, p.69,70

In Latvia the penetration rates of ICT are at average or lower than average. Even if we assume that equipment will be purchased abroad, installation of computer systems and computer services will belong to local companies. In this respect, development of IS may promote maintenance of competitive size of local ICT enterprises developing for the domestic market as seen in Section C.

We think that spill-over effect of IST will be felt in the entire economy. Implementation of information mega-systems at the state institutions will not only promote but also require access of enterprises to information networks. Easy communication and accessible information networks promote development of businesses in general. It is favourable for businesses where information transactions are within technological process.

D.2. Level of IT investment

Latvian statistics does not gather data about IT investment neither in total nor in division by sectors. In this chapter we provide data from the innovation survey[119], but this data concerns total investment and as it was given by the enterprises. Innovation expenditure includes intramural R&D, extramural R&D, machinery and equipment acquisition, industrial design. All data regards to 2001.

Innovation expenditure in **industry** equalled to 1,2 million EUR in mining and quarrying (11% of sector's GDP in 2001) and 123.2 million EUR in manufacturing (10.9% of sector's GDP in 2001).

Innovation expenditure in **services** equalled to 127.1 million EUR (2.4% of sectors GDP in 2001). Biggest amount was invested in land transport and transport via pipelines sector (29.7% of total in services), supporting and auxiliary transport activities (21.6%), financial intermediation (17.5%).

Slightly more information is available concerning IT investment in public administration.

There are several sources for financing of ICT investment in public administration (local and international), and clear total sum is not available. It is known from the Report of the Ministry of Economics,[120] that investment in the sector of information and communications made up more than ¼ of total public investment program (PIP) in 2001 and 30% of total PIP in 2002 (51.2 million EUR and 57.5 million EUR respectively)[121]. 28 projects were implemented in 2001 of which 24 were continued in 2002, and 3 new projects were started. These projects received financing from the central government budget in the amount of about 100 million EUR by 2002. PIP financing for these purposes was 31.7 million EUR in 2002, and 26.9 million EUR in 2003.

Two-thirds of financing in 2003 is earmarked for the continuation of the 3 biggest projects that are linked with preparing the border and improvement of tax administration. These are: "Creation of the technical security, control and information system at the border", "Development of NAF communication system" and "Information system of the state revenue and customs policy implementation". As Ministry of Economics puts it: "Smaller financing than necessary is allocated to continuation of projects on "Creation of the information system of education in Latvia" and "United Information System of Local Governments"". The

[119] Innovation survey results. Statistical Bulletin, Riga, 2003, Central statistical bureau of Latvia, Riga, 2003, p.33
[120] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, Riga, December 2002, p.97
[121] Investment in Latvia, Central Statistical Bureau of Latvia, #2(30)/2003, p.46

amount of PIP investment in ICT total itself is not big - just about 1% of total non-financial investment.

Unfortunately there is no way to assess possible investment in IT in the whole economy. The total amount of non-financial investment in Latvia is growing, and it was 2214 million EUR in 2002. If we assume that the whole economy uses investment for ICT acquisition in the same proportion as PIP (30%), than the sum is about 664 million EUR. On the other hand this seems highly unrealistic compared to the innovation expenditure for acquisition of machinery and equipment - 153 million EUR in 2001. However this figure also says little, as only innovative enterprises (selected sectors) are taken into account, while ICT are used in all enterprises.

Analytical conclusion:

Since investment levels are not known, and special investigation on this topic was not done in the frameworks of this project, it is not possible to assess the expected effect of investment on business organisation, production value, productivity, and trade.

D.3. Trends in innovation and R&D

In order to assess trends in innovation we put together results of two innovation surveys – pilot project (1999) and first official innovation survey[122]. Unfortunately, due to methodological differences only part of results can be compared. Comparisons are presented in Tables D1 – D2 – D3.

Table D1: Firms that have implemented technological product and/or process innovation (% of total number of enterprises observed in industry)

	1996-1998	1999-2001
Total	**30.8**	**19.3**
Extractive industry and opencast pit management	36.4	29.4
Manufacturing industry	37.4	23.0
Electricity, gas and water supply	14.3	15.2
Construction	16.3	n.a.
Services total	n.a.	15.4

Source: Latvian Statistics

The density of innovative enterprises declines in all sectors but electricity, gas and water supply. It is difficult to assess the reason – it may be because of a methodological problem, or different understanding of what is innovation in the first and in the second period. As survey organisers mention, the main task for them was to explain the essence of the definition of technological innovation, which was particularly difficult in the services sector. In both periods manufacturing was more innovative than other sectors.

Most of enterprises develop their innovations alone without collaboration with other partners, 76% of product innovation and 61% of process innovation is made in-house. According to the results of the survey, Latvian innovative enterprises mentioned most often the suppliers of equipment, materials or software as their cooperation partners for development of innovations.

[122] Pilot survey results, Central Statistical bureau of Latvia, 1999, and Innovation survey results. Statistical Bulletin. Central Statistical Bureau of Latvia, Riga, 2003.

During the pilot survey, major part of enterprises almost in all sectors have implemented technological product and process innovation. On the contrary, in electricity, gas and water supply sector more firms were engaged only in technological process innovation. The same situation repeats in 1999-2001.

In both surveys large enterprises (250 and more employees) are more innovative than small and medium size (Table D2).

Table D2: Firms that have implemented technological product and/or process innovation by size class (% of total number of enterprises in observed size class)

Size class by number of employees	1999-2001	1996-1998	Of which (1996-1998) innovation		
			in technological products and process	only in technological products	only in technological process
Total	**19.3**	**30.8**	**21.5**	**5.1**	**4.2**
0 – 49	14.4	17.0	11.0	3.8	2.2
Of which:					
20 – 49	17.3	21.7	15.1	4.7	1.9
50 – 249	32.5	34.0	23.8	5.7	4.5
250+	58.1	66.7	50.0	6.3	10.4

Total expenditure for innovation activities of observed enterprises in Latvia in 1998 was 84.4 million EUR, in 2001 – 251.5 million EUR. Table D3 illustrates main expenditure items as reported in the pilot project.

Table D3: Money spent on innovation activities in 1998 and 2001

	Number of enterprises	Expenses (mln EUR)	Expenses as % of total
Total		**84.4**	**100**
Development of technologically new products and process	81	9.9	12
Adaptation of purchased technology	39	1.8	2
Purchase of equipment related with innovation	204	47.4	56
Preparing and implementation of industrial project	41	21.0	25
Training related with innovation	86	0.8	1
Introduction of innovation in market	41	3.5	4

Survey in 2002 uses different classification of expenditures for innovation. According to this classification, 7.4% of money is used for intramural research and experimental development, 11.1% for acquisition of R&D from other enterprises/organisations (extramural R&D), 61% for acquisition of machinery and equipment, 6.8% for acquisition of other external knowledge and 13.7% (more than before) for training, introduction of innovation in market and other preparations for production. Enterprises with 250 and more employees spent 52% of the total expenditures for innovation. By sectors, the highest expenditures were made in the

manufacture of food products and beverages, transport enterprises and in the manufacture of wood and products of wood.

In 2001, the indicator of innovation expenditure intensity[123] in Latvian enterprises was 2.3% (3.6% in the manufacturing sector and 1.6% in the services sector), and this is lower than the average in the EU countries but only slightly differs from the closest neighbouring countries.

Despite critically low funding, the R&D sector provides ideas and technical solutions, but they are rarely applied in local industry. Experts consider, that interrelation between the R&D sector and business is not satisfactory, and this hampers commercialisation of research findings and development of local innovation drivers. 74% of respondents of pilot innovation survey answered that they do not use universities as a source of information for innovation, and 81% answered that they do not use research institutes. The most popular answer to this question for years remains "within the enterprise" and "clients or customers". On the other hand, up to now the economy did not demand local innovative ideas.

The main effects of innovation activities meant by respondents is improved quality of goods and services, increased range of goods and services and what is important, the ability to meet regulations and standards and increased market or market share. The main factor hampering innovation activities is the lack of funding, or economic factors.

The brightest evidence of innovation driving activity (cooperation of R&D sector and business) is participation of EU 5th Framework program. In the period 1999-2002, 592 projects from Latvia were submitted to this program, of which 174 were approved. In the subprogram "Innovation and SMEs" 78 projects were submitted from Latvia, of which 31 was approved for financing. Latvian SME and innovation support organisation have received approximately 2.5 million EUR, and total amount of received support from the EU 5th Framework program has exceeded 13 million EUR – twice as much as the participation fee.

Up to now there is no one single organisation directly responsible for the facilitation and implementation of innovation in Latvia. The situation is clearly in conflict with the official vision of Latvian economy, based on knowledge intensive sectors and producing product with high value added. The Ministry of Education and Science of the Republic of Latvia is the main management organisation in the field. The Ministry is responsible for strategic and methodological issues concerning all levels of education, academic and applied research. The Ministry also is responsible for drafting and implementation of laws and funding of education and research. Other ministries are not deeply involved in innovation process and usually do not have special departments, except for the Ministry of Agriculture (department) and Ministry of Culture (a special institution outside the Ministry responsible for education in the culture sector). Some ministries are responsible for subordinated higher education institutions.

Analytical conclusion:

The results of surveys and assessment of innovation environment in Latvia leads to the conclusion that at present there is no innovation-friendly regulatory legislative environment and that at present the innovation process develops fragmentarily and sporadically. We agree with the conclusion of the innovation survey that in order to improve the existing situation, the government of Latvia and other interested parties should immediately start the implementation of its National Innovation Programme and while pursuing the policy of innovation the government must at the same time become its investor, catalyst and coordinator.

[123] Calculated by dividing the total innovation expenditure by enterprise net turnover in all enterprises.

D.4 R&D investment levels

D.4.1. Expenditure on R&D

Gross domestic expenditure in R&D (GERD) was 37.5 million EUR in 2000, 37.48 million EUR in 2001 and 41.3 million EUR in 2002 (Table D4). Of this 41% in 2002, 37% in 2001 were spent in the business enterprise sector, 18.6% in 2002 and 21% in 2001 in government sector and 40.2% in 2002 and 42% in 2001 in higher education sector. The total funding of research from the GDP (GERD as % of GDP) in Latvia is only 0.46% in 2002, 0.44% in 2001. [124]

Precise data of amounts spend on R&D by regions is not available. Taking into account that main research institutions and business enterprises are located in Riga, it is likely that the major part of R&D funding is allocated in Riga as well.

The number of R&D personnel per 1000 population is low – just 1.47 persons in Latvia[125]. Number of R&D personnel decreases year by year.

The Latvian Council of Science (LCS) is the main organization responsible for policy and financing of R&D and science. It was founded in accordance with the decision of the Council of Ministers, Republic of Latvia, in July 1990 as a collegiate institution of the scientists with the rights of a legal entity. The above Law on scientific activities determines the competence, obligations, membership and rights of the LCS. LCS is a semi-governmental body that embraces 140 scientists elected by academic staff in the way of secret ballot for a three-year period. The Council itself consists of 20 members with representatives from: the Ministry of Education and Science, the Latvian Academy of Sciences, the Board of Rectors of the higher education institutions, the Latvian Academy of Agricultural and Forestry Sciences, the Latvian Association of Scientists, and Expert Commissions (currently 14, elected from 14 research disciplines). Members of Expert Commissions are chosen by scientists who are actively involved in the respective field. The LCS experts, in turn, select the members of the LCS itself. They select a chairperson, deputy chairperson, and other LCS officers.

LCS tasks include advancement, evaluation, financing, and co-ordination of research in Latvia. The Council jointly with the Ministry of Education and Science prepares the draft of the Republic's science budget for the current year and elaborates projects for decisions and laws aimed at development and organisation of science in Latvia. The Latvian Council of Science gives the rights of promotions to higher education institutions and State research centres, which form the Promotion boards.

The LCS does not finance institutions, but specific projects.

The structure of expenditure on R&D in 2000 -2002 is given in Table D5.

Total public funding of R&D activities was 17.7 million EUR in 2002 (0.18% of GDP). In 2001, the state financing made up 18.7 million EUR or 0.22% of GDP.

[124] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p. 97
[125] Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p. 36,96

Table D5: Expenditure on research and development by sector, million. EUR

	2000	2001	2002
Business enterprise sector	15.2	13.7	17.0
Business enterprise funds	5.7	5.0	6.0
Government funds	0.9	0.7	3.4
Foreign funds	8.6	8.0	7.5
Government sector	8.4	8.0	7.7
Business enterprise funds	1.6	0.4	1.2
Government funds	5.0	5.5	4.6
Foreign funds	1.8	2.1	1.9
Higher education sector	13.9	15.8	16.6
Business enterprise funds	3.8	1.6	1.7
Government funds	9.6	12.4	9.6
Foreign funds	0.5	1.8	5.3
Private non-profit sector	0.0	0.0	0.0
Government funds	0.0	0.0	0.0
Gross Domestic Expenditure on R&D (GERD)	37.5	37.5	41.3
Business enterprise funds	11.1	6.9	8.9
Government funds	15.5	18.7	17.7
Foreign funds	10.9	11.9	14.8
R&D expenditures as percentage of GDP	**0.48**	**0.44**	**0.46**

Source: Statistical Yearbook of Latvia 2003. Central Statistical Bureau of Latvia, Riga, 2003, p.97

Analytical conclusion:

R&D spending is low in Latvia. The proportion between government and business spending for R&D is opposite compared to developed countries – in Latvia the government spends more than business.
The governmental policy in R&D spending is not clear, and there is evident contradiction between the government economic policy and R&D spending. The amount of government funds for R&D remained almost unchanged (at the level of about 15 million EUR) up to 2000. Increase in government spending in 2001 is connected with allocation of additional funds for participation in the 5th Framework program.
There is discussion about priority sectors in R&D, yet in given conditions promoting of priorities would cause closing of many other science disciplines.

D.4.2. Investment levels in the ICT sector

Data about total investment in the ICT sector is not available.

Innovation expenditures in ICT industries (NACE codes 31, 32, 33, 64, 72) are given in Table D6.

Table D6: Amount spend on R&D in ICT sector, million EUR

NACE	Intramural R&D	Extramural R&D	Total
Manufacturing, total	**0.64**	**1.72**	**2.36**
Manufacture of electrical machinery and apparatus	0.47	1.72	2.19
Manufacture of radio, television and communication equipment and apparatus	0.07		0.07
Manufacture of medical precision and optical instruments, watches and clocks	0.10		0.10
Services, total			**5.16**
Trade (total trade, including ICT)	0.14	0.07	0.21
Post and telecommunications	0.17	0.29	0.47
Computer and related activities	3.64	0.84	4.48

Source: Innovation survey results. Statistical Bulletin, Riga, 2003, p.33

FDI in ICT industries is given in Table D7.

Table D7: FDI in ICT sector, million EUR

NACE	1997	2000	2001
Manufacturing, total			
Manufacture of electrical machinery and apparatus	4.3	5.5	5.5
Manufacture of radio, television and communication equipment and apparatus	0.6	0.1	0.1
Manufacture of medical precision and optical instruments, watches and clocks	0.6	0.9	1.4
Services, total	0.0	0.0	0.0
Post and telecommunications	152.5	185.9	188.5
Computer and related activities	0.1	1.8	6.2

Analytical conclusion:

The amount of innovation expenditures in ICT sector is not big. For instance, level of innovation expenditures in post and telecommunication sector seems very low. To some extent, FDI may also be considered as investment in innovation, yet FDI also is not very high, except in the telecommunications sector. The larger FDI in the telecommunication sector is connected with privatisation. The low level of innovation in computer industry could be explained by the fact that industry per se is new, profitable and innovative by nature (software production), and at the time being does not need serious investment in innovation.

D.4.3. Technological innovations in different sectors

Analytical conclusion:

In conditions of intensive modernisation, the amount of technological innovations – if it is understood as "new to existing" – is large and it is practically impossible to systemize and

describe it without deeper research. Therefore we provide here only examples from our experience from case studies in enterprises.

Technological innovations are usual phenomenon in telecommunications, where enterprises are large, and in the newly established electronic and electro-technical industry, where enterprises are mainly small. These enterprises normally operate in chain with larger foreign enterprises as subcontractors, and usually the partner determinates direction of innovation. In some cases the partner even supplies the equipment to the Latvian enterprise so that it responds to the technical and technological requirements of the main enterprise. This phenomenon can also be found in production of building materials.

In technological innovation larger enterprises are more independent, for instance in wood processing, printing and publishing, or enterprises that do not have a firm partner (audiovisual industry, ICT). The typical kind of innovation is laser technologies where they may be applied (machine building, furniture industry, polygraph industry).

There are some examples where information is a part of technology. These technologies are not attributes of IS, yet development of IS enables the application of such technologies. In glass fibre industry a computer-based system with main office in the mother enterprise regulates the production process at the stage of preparation of raw materials. In milk processing enterprises the whole production process (from door to door) is managed by computer based management system. The *Siemens* system was implemented at the end of eighties, and it is upgraded time to time in co-operation with the company producing it. In building material industry new computer-based technologies are implemented for management of technological processes.

At the current stage implementation of new technologies is essential for enterprises, and a great part of GDP growth in industry has been achieved on the basis of implementation of better technologies. The general judgement of this conclusion is the close correlation between investment structure and GDP growth figures.

Unfortunately, financial information on particular enterprises that could give clear impression about real contribution of new technologies is not available without a special survey and enterprises' admission. From previous experience we know that especially foreign owned enterprises are not open to such kind of investigations.

D.4.4. Effect of massive investment in IST

Analytical conclusion:

The previous analysis does not prove massive investment in IST, as well as does not reject the existence of quite large recourses spent on purchases of IST. The term – massive investment is not appropriate even for the government spending.

Effectiveness of the existing government computer based registration, control and other systems is not very high. It is likely that the main reason of low effectiveness of governmental systems is gradual or even partial implementation. For instance, customs service information system was implemented gradually, and the therefore it was never effective. The other reason of low effect is the difference in technical provision of government and users. In other words, technical compatibility is crucial for effective operation of e-based systems. The third reason is content quality.

Although even with lower effectiveness, the state information systems are beneficial. For instance, former home page of the Ministry of Welfare provided perfect information and

means for self-education (tests, formulas' explanations and case resolutions) in social issues that were used by business and population.

In business, exaggerated investment in IST is not common. Hard economic conditions of the most part of business enterprises keep business reserved to any additional spending. But, on the other hand, the need to communicate with the world requires regular updating of existing ICT that causes regular investment.

D.5. Major players of the ICT sector

D.5.1. Present and future development of ICT sector

Major actors of ICT industry in Latvia are fixed and mobile telecommunication operators. Latvijas Mobilais Telefons, first and by that moment largest mobile operator (by number of clients, by size of infrastructure and by financial indicators) is also the Top 1 enterprise in Latvia[126]. Lattelekom, fixed telecommunications operator is a market leader, as the monopoly on fixed telecommunications was closed only by May 2003.

The second largest group of major actors of ICT industry are ICT whole-sellers – GNT Latvia, ELKO Riga and others (see also Table C8).

Software producers also play a serious role in ICT industry. DATI grupa, Tilde, DataPro, Tieto Enator and Exigen Group should be mentioned in this chapter.

Fast growing and taking more and more market shares are Internet Service Providers – Delfi, Apollo (part of the Lattelekom) and Latnet.

Regarding to the hardware industry Microlink group is one of the most important players. [127]

D.5.2. Role and presence of multinationals and/or foreign companies

Main international companies that are present in Latvia:

- Alcatel (France)

Headquarters are located in Riga. The company provides sales, installation and maintenance services.

- Cisco (USA)

Developed marketing and sales network in Latvia.

- Ericcson (Sweden)

Serves the Latvian telecom market, providing sales, installation and maintenance operations for all types of equipment, including sophisticated telecom solutions.

- IBM (USA)

Along with hardware and software sales and related services, IBM has introduced IT outsourcing and ASP services to the Latvian market.

- Marconi (U.K.)

Marconi's Baltic headquarters are located in Riga, providing sales, consultancy and maintenance services in the field of telecommunication equipment.

- Microlink (Estonia)

[126] Top 500 enterprises, Lursoft

[127] Turnover and other financial data about exact enterprises is paid service in Latvia.

Microlink has established 2 out of 5 Microlink Competence Centers in Latvia, specializing in system integration and retail and service. Microlink Competence Centers serve Baltic countries and Russia.

- Microsoft (USA)

Microsoft's headquarters for the Baltic countries are located in Latvia. The company offers sales, services, support, and training.

- Motorola (USA)

Distribution and customer care services of cellular phones in the local market.

- Netcom (UK)

An operator in the Latvian wireless telecommunications market.

- Nomad Software (UK)

Headquarters are located in Latvia, serving the Central and Eastern European market. The company provides maintenance services, customized IT solutions and consultancy services in the field of electronic payment systems.

- Oracle (USA)

Oracle offers technical assistance and consultancy services, and has established an engineer training center in Latvia.

- Siemens (Germany)

Siemens has established a Competence Center in Latvia for Microwave Data Transmissions serving the Baltic countries and Finland.

- Sonera (Finland)

Sonera operates as the major operator in Latvia's fixed and wireless telecommunications market. New services (IT outsourcing, ASP) are being explored.

- Sybase (USA)

Sybase has outsourced various Latvian software companies in the area of Financial Applications Development.

- Telia (Sweden)

Telia's subsidiary in Latvia provides Internet and data transmission services, with access to Telia's international carrier network center. Telia has introduced alternative microwave relay networks in the cities of Riga and Stockholm.

- TietoEnator (Finland/Sweden)

TietoEnator specializes in payment card systems, and has set up headquarters in Riga serving the CEEC, Baltic and CIS markets.[128]

The companies mentioned above are not the only ones, but the most important examples in this chapter.

Analytical conclusion:

Interest of FDI and foreign MNC in Latvian ICT sector is evident. The sector is practically overtaken by FDI. We assess that the development of the sector is strongly determined by behaviour of foreign partners.

[128] Latvian Development agency, IT report, 2002.

D.5.3. Contribution of multinationals and/or foreign companies to IST related developments

Contribution of foreign companies to IST related developments differ in the telecommunications and the computer sector. FDI was decisive in the period of restructuring of telecommunication services – restructuring of state owned public network operator Lattelekom and establishment of mobile telecommunication services. The main contribution of multinationals and foreign companies to development of telecommunications by all means was investment and ICT infrastructure development. Not so important, but still remarkable are the different training and professional skills improvement programs done by foreign and multinational companies.

In the computer sector FDI plays a similar role as in other sectors. It facilitates access to markets, knowledge, R&D. This is one of the reasons why Latvian computer companies are involved in cooperation with foreign enterprises up to amalgamation of enterprises. It must be admitted that in most cases Latvian advanced specialists in IT established national ICT enterprises as new enterprises. Their shape and management before the overtaking was not bad, and the main reason for overtaking from the side of Latvian enterprises was rather to improve market access and to enlarge in order to be competitive than to improve business skills.

No doubt, foreign companies were first able to implement ICT at their enterprises, thus contributing to the modernisation process and showing good example for local companies.

On the other hand, foreign and multinational companies operate correspondingly to their strategic plans. In addition, enterprises in Latvia are just subsidiaries for multinational companies. This imposes some consequences: Latvian economic policy must respond to interests of foreigners, and there are fewer possibilities to implement national policy in development of ICT sector.

Analytical conclusion:

Latvia has a strong tradition in the branch of electronics and electromechanical production. That should be taken in account when speaking about the ICT branch. The ICT branch came into existence in the end of eighties. In the beginning of nineties ICT branch in Latvia and all over the world experienced fast development. Fast growing and stable market of ICT – promoted governmental and enterprise needs for new and adequate technologies – provided high profits and thus attracted entrepreneurs. The development of the ICT branch was supported by the fact, that this branch was new, and there were no special needs for previous experience to be successful in it. ICT enterprises operated mainly in whole- and retail trade. In this period the very first Internet connections appeared in Latvia.

Later on fast development of the branch can be observed all over the world as well as in Latvia. Clients in Latvia were more and more interested in complete solutions, not in single units of ICT, small local area networks with Internet connection as well as large and intelligent systems for full enterprise management. The structure of the branch changed – services took a more important part than products. Software branch was getting stronger as well.

At the time being the situation in general is similar. Services (including Internet and telecommunications) have the largest share in the branch. Strong software producers are observable in the branch, mainly working for international markets. Strong convergence is present in the branch: more and more classical businesses merge with ICT.

We believe that this situation will expand in a similar way in the nearest future. The possible movements are further concentration (amalgamation of enterprises), increasing Baltic cooperation and expansion towards external markets with software and System design products.

D.6. SWOT Analysis

Strengths	**Weakness**
Strong spill-over effect of implementation up to now Investment in ICT in public and private sector Institutional basis of innovation is created Innovation process develops in large enterprises Technological innovation evenly spread in sectors ICT industry is FDI driven sector Strong tradition in electronics and electro technical sectors.	Poor monitoring of the IST creation process (especially in regional aspect) Emerging negative manifestations of IT use (SPAM, virus damages etc.) Poor statistics on ICT investment IS related investments are uneven Impossible to implement policy recommendation on innovation Poor monitoring of the innovation process Ex innovation dominate R&D policy is not clear Financing of R&D sector is poor (local R&D is neutral to innovation process) Declining number of researchers
Opportunities	**Threats**
Implementation of Lisbon strategy will increase R&D financing Better statistical recording Development of local innovation sources Effects of FDI Effects of FP6 Pressure towards global competitiveness	Lack ICT investment in case of economic decline Low effectiveness of ICT investment Inconsistency of the whole system Regional discrepancies remain General IS problems increase (piracy, information damage etc.)

E. INFORMATION SOCIETY TECHNOLOGIES (IST) PENETRATION RATES

E.1. General trends

General trends facilitating improving penetration of IST in Latvia are:

- price optimisation via liberalisation of telecommunication market (chapter E.2.1.),
- improving information infrastructure (telecommunication services, Internet access),
- implementation of state information systems, implementation of ICT based systems in government – local government, government/local government – business, government/local government – population communication,
- implementation of ICT based systems in business – business and business-client relations (banks, commercial and legal services, transport),
- improving access to information and ICT for population (local government information points, library information system),
- education, improving skills in use of IST and information as such.

E.2. Penetration and diffusion of information society technologies

E.2.1. IST in enterprises

Provision with computers and Internet is characterised in Tables E1-E5.

Table E1. Computerised enterprises
(at the end of the year, percent of the total number of enterprises within the corresponding group)

	Total		Of which			
			with number of employees >10		with number of employees <10	
	2000	2002	2000	2002	2000	2002
Total	38	49.5	72.7	81.1	26.8	39.4
Manufacturing, trade, transport and business service enterprises	37.2	48.5	73.6	81.5	26.7	39.1
Manufacturing	45.2	56.8	68.3	80.4	26	38.0
Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods	31.6	41.3	77.5	79.8	22.3	33.4
Hotels and restaurants	24.3	32.4	60.5	76.8	15.6	17.7
Transport, storage and communication	40.1	57.2	64.8	82.2	31.9	48.0
Financial intermediation	59.8	68.0	94.7	92.5	48.3	60.2
Real estate, renting and business activities	51	62.1	82	89.1	43.4	56.8
Other	42.3	54.0	70.2	80.1	27.6	41.0

Source: Latvian statistical yearbooks, 2002, 2003, Central Statistical Bureau of Latvia, Riga

Table E2: Enterprises with access to the Internet
(at the end of the year, percent of the total number of enterprises within the corresponding group)

	Total		Of which			
			with number of employees >10		with number of employees <10	
	2000	2002	2000	2002	2000	2002
Total	19.6	32.0	43.6	59.0	11.8	23.4
Manufacturing, trade, transport and business service enterprises	19.6	31.7	45.6	60.0	12.1	23.6
Manufacturing	23.7	38.0	40.8	59.1	9.4	21.0
Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods	16.6	25.2	48	58.4	10.3	18.4
Hotels and restaurants	6.2	13.8	23.6	44.9	2	3.5
Transport, storage and communication	22.4	38.2	42.2	63.1	15.8	29.1
Financial intermediation	44.4	55.0	87.7	86.7	30.1	44.8
Real estate, renting and business activities	28.1	46.0	56	69.3	21.3	41.4
Other	19.6	33.7	37.2	55.6	10.3	22.7

Source: Latvian statistical yearbooks, 2002, 2003, Central Statistical Bureau of Latvia, Riga

Table E3: Enterprises with a home page on the Internet
(at the end of the year, percent of the total number of enterprises within the corresponding group)

	Total		Of which			
			with number of employees >10		with number of employees <10	
	2000	2002	2000	2002	2000	2002
Total	4.6	10.5	12.7	24.2	2	6.2
Manufacturing, trade, transport and business service enterprises	4.6	10.4	13.6	25.7	2	6.0
Manufacturing	6.1	13.7	11.1	22.9	1.9	6.3
Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods	2.7	7.9	10.1	23.3	1.3	4.7
Hotels and restaurants	1.5	5.4	6.4	19.7	0.3	0.6
Transport, storage and communication	5.1	13.3	17.5	29.2	1	7.4
Financial intermediation	17.8	28.8	64.3	64.9	2.5	17.3
Real estate, renting and business activities	9.6	14.1	25.6	35.0	5.7	9.9
Other	4.9	11.1	9.7	19.6	2.4	6.8

Source: Latvian statistical yearbooks, 2002, 2003, Central Statistical Bureau of Latvia, Riga

At July 2003, the number of Internet users has reached 450 thousand people (38% of economically active population)[129]. This is remarkably more (by 45%) than at the end of 2002 (310 thousand). According to the Association of Internet Users explanation, the number of Internet users has increased due to positive effect of liberalization of telecommunication market in Latvia that promotes increase and differentiation of supply of Internet services. The Association emphases that the state support and investment is minimal, and the biggest role business enterprises have. There is also a multiplicative effect - about two persons using a computer with Internet access at business enterprises, and up to four persons at households. The Association plans that the number of Internet users will be about 530 thousand at the end of 2003.

Table E4: Number of computers used by enterprises
(at the end of the year, thousands)

	Number of computers		Internet access	
	2000	**2002**	**2000**	**2002**
Total	92.1	118.2	48.1	79.2
Manufacturing, trade, transport and business service enterprises	73.5	93.2	39.4	61.7
Manufacturing	13.2	17.6	6	10.7
Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods	21.9	28.1	9	17.2
Hotels and restaurants	1	1.4	0.4	0.7
Transport, storage and communication	12.7	15.9	8.2	9.5
Financial intermediation	11	11.3	7.7	9.4
Real estate, renting and business activities	13.7	18.9	8.1	14.2
Other	18.6	25.0	8.7	17.5

Source: Latvian statistical yearbooks, 2002, 2003, Central Statistical Bureau of Latvia, Riga

[129] BNS, July 30, 2003

Table E5: Number of computers used by enterprises
(at the end of the year, thousands)

	Number of employees that at their work place regularly use:			
	2001		2002	
	Computer	Internet access	Computer	Internet access
Total	19.2	11.5	20.3	13.4
Manufacturing, trade, transport and business service enterprises	20.5	12.2	21.6	14.2
Manufacturing	11.5	6.3	12.5	7.5
Wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods	20.6	10.6	22.3	13.6
Hotels and restaurants	9.5	3.7	9.3	4.5
Transport, storage and communication	21.7	12.6	22.8	13.9
Financial intermediation	63.8	49.2	59.8	50.5
Real estate, renting and business activities	33.4	23.2	53.5	26.8
Other	15.5	9.4	16.5	11.0

Source: Latvian statistical yearbooks, 2002, 2003, Central Statistical Bureau of Latvia, Riga

E.2.2. IST in financial services

Latvian banks are very active in implementing of new technologies in banking services both at national and at local level.

At national level banks are interlinked in the Interbank Payment Network. It includes all commercial banks, the Bank of Latvia and the State Treasury. Several other systems operate on the basis of this network: Electronic Clearing System (EKS) for banks since 1998, Clients Payment Proceeding System for the State Treasury (KMAS) – since 1999, Real Time Settlement System (RTGS). The infrastructure of the Interbank Payment Network is also used for other purposes – for instance, information gathering for calculation of Latvian payments balance.

At the bank level, all main banks have Internet bank, giving clients the possibility to make money transactions, define payments and operate with securities. This is in most cases free of charge, and banks try to attract clients providing higher quality of Internet banking.

Approximately 50% of Internet users use eBanking, it is the most popular e-product after news services.

The security market is fully based on IT use. According to the law of the Republic of Latvia "On security markets" all public securities must be dematerialised, and therefore accounting and saving of securities at Central Depository of Latvia is in the form of electronic records. Also trade in the Riga Stock Exchange is functioning in electronic way – brokers exploit a special computer system. Settlements for security deals are carried out in the form of clearing in virtual security accounts.

E.2.3. IST in major services sector

E.2.3.1. Telecommunication

The Latvian law "On telecommunications" (adopted in 1993) granted a monopoly in the provision of basic telecommunication services for 20 years (until 2013) for company Lattelekom (51% of capital parts belong to Latvian state, 49% - Sonera). The goal of this action was to ensure investments that enable to replace the technologically backward and technically worn out telecommunications network inherited from the USSR. This decision facilitated the establishment of a new infrastructure in Riga and several other cities, without encouraging increase of prices. The way in which telecommunications were modernised (digitalisation) did not correspond to the agreed plans. Lower quality analogue communications remained intact in most districts with a lower population density and lower concentration of businesses, thus hampering the development of such territories even more.

The digitalisation fastened after 2000. At the end of 2002, 496 thousands telephone subscriber's lines (83.2% of total, compared to 68.7% of total in 2001) were switched on to the digital network and 118 thousand telephone subscriber's lines (16.8% of total, compared to 31.3% of total in 2001) were switched on to the analogue network[130].

In 2002, amendments to the law "On telecommunication" prescribed liquidation of monopoly rights and introduction of free market in the telecommunication sector, and since May 2003, telecommunication market in Latvia is formally fully liberal. Still Lattelekom may maintain its network closed to alternative operators until 2007, according to license. This condition eliminates operation of other operators, as they should lease network facilities from Lattelekom.

In 2003, the Ministry of Communication elaborated "Basic principles of electronic communication sector 2003 – 2007". According to these principles, a new electronic communication law should be elaborated. The document was not supported. Specialists consider that at the current stage the document does not provide clear vision of the future market of electronic communication and telecommunications and other important aspects.

Besides Lattelekom, two mobile operators provide mobile connection. One of them "Latvijas Mobilais Telefons" is partly owned by Lattelekom. Other – "Tele2" is an independent foreign-owned company. Plans about a third mobile operator were not fulfilled.

[130] Statistical Yearbook of Latvia 2003. Central statistical Bureau; p.178

Characteristics of telecommunication are given in Table E6 - E7.

Table E6: Means of communication (at the end of the year)

	1997	2000	2001	2002
Total number of telephone subscriber's lines in the public telecommunication network (equivalent basic lines):	740	735	722	701
per 100 inhabitants	31	31	31	30
urban localities	36	37	37	36
rural localities	19	18	18	17
Of the total number of telephone subscriber's lines – private telephone subscriber's lines:	608	600	588	569
per 100 inhabitants	25	25	25	24
urban localities	29	30	29	29
rural localities	17	16	16	15
Applications for telephone installation, thsd	-	45	46	45
Mobile phone subscribers, thsd	76.2	401.3	625.2	1000.0.
TV stations	38	36	37	41
TV transmitters	66	64	69	79
Average per 100 households (household budget survey data); annual average:				
TV sets	102	103	110	111
video recorders	16	24	29	32
computers	1	5	10	13

Source: Statistical Yearbook of Latvia 2002, Central Statistical Bureau of Latvia, Riga, 2002, p.176, Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.178

Table E7: Communication services

	1990	1995	2000	2001	2002
Outgoing long-distance calls in the public telecommunication network, million	48.5	47.7	76.6	79.3	80.1
Domestic	-	37.0	58.9	62.1	64.2
International	-	10.7	17.7	17.2	15.9

Source: Statistical Yearbook of Latvia 2002, Central Statistical Bureau of Latvia, Riga, 2002, p.176, Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.178.

Besides the three large service providers, a lot of small companies offer different telecommunication services. Unfortunately their operation is not reported by statistics. According to other sources it is known that the Public Utility Commission has awarded more than 160 individual licences that allow delivering of telecommunication services[131]. These companies operate on the basis of interconnection contracts with main network owners – Lattelekom, Latvijas Mobilais Telefons and Tele2.

The first impact of market liberalisation was the decline in prices and rapidly increasing competition. Other structures (Latvenergo, Latvijas Dzelzceļš, Latvijas Pasts) had wide telecommunication networks that were immediately offered for use.

Overall the telecommunication market is very dynamic after the liberalisation. Further development is connected with increasing competition both for existing and emerging

[131] Forecast bankruptcy of small telecommunication companies. BNS, 23 September 2003

companies. Free market has also sharpened some institutional problems: distribution of electromagnetic frequencies (including institutional setting of this process), distribution of number range (paid service or free of charge), and establishment of reasonable interconnection prices.

The telecommunication market expands (the number of subscribers increases) and intensifies (the amount of service increases). Economic growth has facilitated development of telecommunication sector, and two main mobile telecommunication enterprises (Latvijas Mobilais Telefons and Tele2) report the highest profits in 2003.[132]

Despite the fact that Lattelekom faces increasing market pressure and its main market – voice service has narrowed (switched to mobile service), it is an important player of the telecommunication market. Besides voice services it is one of largest provider of Internet service. Lattelekom Internet provider "Apollo" covers all territory. Since the market of voice services decline (number of subscribers in mobile network is larger and grows faster compared to the number of Lattelekom subscribers, Table E1.) the company focuses on providing of data transmission services and infrastructure.

There are about 40 Internet service providers in Latvia, among them the larger ones are "Apollo", "Latnet", "Baltkom TV", "Telia Multicom". In 2003, the number of Internet users has increased. It is expected that in 2004 the number of Internet users could double[133].

To increase the number of subscribers, Internet providers expand their activities outside the capital city. For instance, "Telia Multicom" has established service in Rezekne. This will improve access to information networks in regions.

Companies understand that IS development is important since it creates demand for their services. They have started activities aimed at increasing involvement of population into information transactions by using electronic means. For instance, the telecommunication operator Lattelekom has installed public wireless Internet access points in the International Airport Riga. Up to now Lattelekom has installed more than 20 public wireless Internet access points in Riga and Ventspils, and the capacity of such points will be expanded. The company offers wireless Internet access Wireless Internet space (BIT) using "Wireless LAN" technologies and "WiFi" standard. All access points are joined in unified BIT network.

In January 2004 the Public Utilities Commission published results of the first year of liberalisation.[134] In the first half of 2003, new operators (other than the three largest) have acquired 4% of the total market in fixed voice services and 25% in leased lines market. During the first half of 2003, 12 new operators appeared. Some of them had their own networks. New operators acquired 10% of geographical numeration. International telecommunication prices have declined, and access to Internet improved during the period (wider networks, better technological solutions, lower prices).

Tariffs remain the most discussed issue in the telecommunication sector. In January 2003, the Public Utility Commission elaborated a methodology of tariff calculation, and companies had a one-year preparation period to meet the requirements of new system. The precise calculations of costs help to set economically reasonable tariffs. The other discussed issue is interconnection conditions – companies claim Lattelekom in using discriminatory interconnection tariffs. The Public Utility Commission is eligible intermediate in negotiations on interconnection conditions, yet prices remain in network owners' competence. In 2003, 17 new interconnection contracts appeared.

[132] TOP 500. Larger enterprises in Latvia, Dienas Bizness, Lursoft, 2003.
[133] Internet providers forecast increase in number of internet users. BNS, 21 December 2003.
[134] Diena, 9 January 2004, p.2

E.2.3.2. Other service sectors

Development of banking services is an important prerequisite for implementation of e-services in **trade**. The idea of eCommerce in Latvia was institutionalised in document called "Concept of eCommerce" in 2000-2001, but without further activities. The implementation of eCommerce program was delayed due to two reasons:

- Legislation on electronic communication and personal data protection must be fully implemented before operation of eCommerce,
- A critical mass of users must be ensured to make eCommerce effective and this depends on the welfare of population.

Right now there are more than 40 local Internet shops (eShops) with business to consumer (B2C) business model in Latvia. Turnover of these eShops according to the Latvian Internet Users Association data is growing from 158 thousands EUR in 2000 to 622 thousands EUR in 2002. In B2B (business to business) segment mainly those enterprises operate that have good knowledge of ICT or which ones' main business is in ICT. These enterprises can estimate better the usability of e-wholesale. Enterprises of other branches (manufacturing, agriculture etc.) are very slow in adopting these new possibilities. Still turnover in B2B eCommerce is growing – from 9.5 million EUR in 2000 to 24 million EUR in 2002.

An active zone for ICT development is **information services**. Main indicators of TV and radio broadcasting companies are given in Table E8.

Table E8: TV and radio broadcasting companies in 2001

	Year	Total number	Total length of programmes (thousand hours)			
			Total	Latvian	Russian	Other languages
TV broadcasting companies	2001	27	45.7	38.0	7.6	0.07
	2002	26	60.3	49.7	10.6	0.01
Radio broadcasting companies	2001	28	267.0	230.1	27.8	9.1
	2001	30	295.8	249.8	34.9	11.1

Source: Statistical Yearbook 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.179

The number of broadcasting companies is large both in radio and TV broadcasting. The companies are state financed or private. Competition in the sector is high. Some TV programs are translated simultaneously in packages in Internet. At the time being the implementation of digital TV is discussed.

There are also some examples of implementation of large information systems in mass media. Latvian main radio broadcasting company Latvijas Radio continues its project on digitalisation of sound-recording library. It is not clear if the library will be accessible for the population. At the time being the sound-records funds include more than 100 thousand units.

In media information services sector three large actors operate: Eniro Latvia Ltd., Latvijas Tālrunis Ltd. (ZL Hotline) and Interinfo Latvia Ltd. Companies' specialists say: saturation of printed media information resources market is high in Latvia and companies try to expand e-media markets.

Table E9: Main indicators of media information services

	Turnover in 2002, million EUR	Profit in 2002, thousand EUR	Market share, %
Latvijas Talrunis	2.03	55.4	38
Interinfo Latvia	1.9	n.a.	35
Eniro Latvia	1.45	n.a.	27

Source: Newspaper *Dienas Business*, 1.08.2003

On the governmental level (PIP, EU funds), the main emphasis **in transport** is put on the implementation of security systems (rail transport, sea transport, air transport), as well as providing better services.

On the business level, up-to-date ticket booking systems are available in travel offices and official offices in transport stations. Automatic ticket booking and reservation systems operate in air and railway transport. Generally, ICT use in transport is more connected with technological and management processes. Customer oriented systems are less important.

Quantitative characteristics of **postal services** are given in Table E10.

Table E10: Postal services in Latvia

	Total		Domestic		Dispatched abroad		Received from abroad	
	1992	2002	1992	2002	1992	2002	1992	2002
Number of post offices	1055	965						
Number of postmen	3193	2794						
Pieces of mail handled								
letters, post cards, mln			19.4	50.0	15.1	3.6	15.6	4.4
Parcels, thsd			112	101	46	53	124	913
money remittances, thsd			615	297	157	53	184	19
Newspapers and periodicals delivered, mln	112.8	54.9						
Of which foreign, mln	0.23	0.06						

Source: Statistical Yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.179

The dynamics show that number of letters, post cards and money remittances dispatched abroad and received from abroad has decreased, what might be result of expanding internet communication.

Information about ICT components in postal service is not published. ICT in postal service are mainly for internal use. Supplementary to its main business, Latvijas Pasts has established IT service centre "Latvijas Pasts Service Network", but this institution provides IT services and not postal services.

We did not find large comprehensive information systems in **other service sector**. Use of ICT in service sectors' enterprises is demonstrated in Tables E3-E7.

E.2.4. IST in public services

E.2.4.1. IST in health services

Latvian health care system is divided into three levels: primary health care is based on family doctors institution and primary services, secondary health care system includes ordinary ambulatories, hospitals and diagnostics, medical treatment and rehabilitation services, tertiary health care system is formed of specialised hospitals and medical centres and highly specialized services.

Health care services institutions are state or local government owned or private. The financing of health care system is organised through sickness funds. Health care budget includes a part of personal income tax and subsidies from the state budget. Total financing of the health care system is very low. The State Mandatory Health Care Insurance Agency is responsible for administration of the health care budget. The health care system has its own ministry that was established in end of 2002.

Development of IST differs in the three levels. The best conditions are at the highest level of the health care management system - the State Mandatory Health Care Insurance Agency and sickness funds' level. According to expert information, sickness funds are included into an information network, but not the hospitals and neither the family doctors. The Agency receives the information that is necessary for the organisation of financial flows and medical statistics from hospitals or family doctors via the Internet or on diskettes. The information is to be prepared according to a unified form and electronically.

The World Bank credit line contributed to the computerisation of health care management systems quite significantly. In frameworks of the health care reform project, supported by the World Bank, a unified health care information system will be offered to clients in 2004. The system includes the Register of health care institutions and doctors (analytical and statistics system), the Register of sickness funds clients, service management system (to eliminate waiting lines), and the payment system for hospitals' services. The project was implemented by companies Fortech and SEMA Group.

Hospitals use their own computer systems for economic analysis and bookkeeping, and registration of patients. Depending on the economic situation of hospitals, computer systems are more or less complicated. Family doctors are less provided with computers, especially in rural areas. Main hospitals (tertiary level) are equipped with modern health care technologies, also presenting some kind of IT. E-based service systems (registration for visit to doctor) do not exist in health care.

There are plans to implement e-medical treatment technologies in main clinics in Latvia in the framework of an eventual co-operation project. Implemented technologies will enable direct consultation with outstanding specialists abroad during medical treatment or indirect participation at surgical treatment in Latvian hospitals. Information systems will provide specialists abroad with all the information about the current situation during the operation necessary for making decisions and giving advises about the proceeding of the operation.

Latvian government participates in eHealth financing in frameworks of health care financing and PIP, but these resources are limited. Health care financing from government funds is very low in Latvia – 3.5% of GDP and 9.1% of the consolidated budget.[135]. Health care institutions use revenues for modernisation from paid services.

E.2.4.2. IST in educational services

Computerization of Latvian schools started just a couple of years ago. The existing situation is reported in Table E11. 92% of secondary schools have at least one computer class and 65% of secondary schools have Internet access. Some schools have better equipment in result of co-operation or pilot projects. In general, provision of ICT in schools (including professional capacity of teachers) is uneven. The situation is going to improve (even in the current situation when economy of public finances is set as a priority) as the government has allocated some money for computerisation of basic education institutions. The law on

[135] Yearbook of health care statistics in Latvia, 2001, Ministry of Welfare of the Republic of Latvia, Health statistics department, Riga, 2002.

education envisages that computer science is compulsory subject in all Latvian schools beginning with the school year 2003/2004.

State universities and higher schools are better equipped, yet they suffer from lack of updated equipment. IST provision in high schools supported by private and local government is remarkably better. Establishment of a unified academic network is not finished. Structure of the Academic network of Latvia is provided in Graph E1. State universities and research institutions have access to University based network LANET and use Internet free of charge for research purposes.

Table E11: The Use of Computers in Comprehensive Schools*

(at the beginning of academic year 2001/2002)

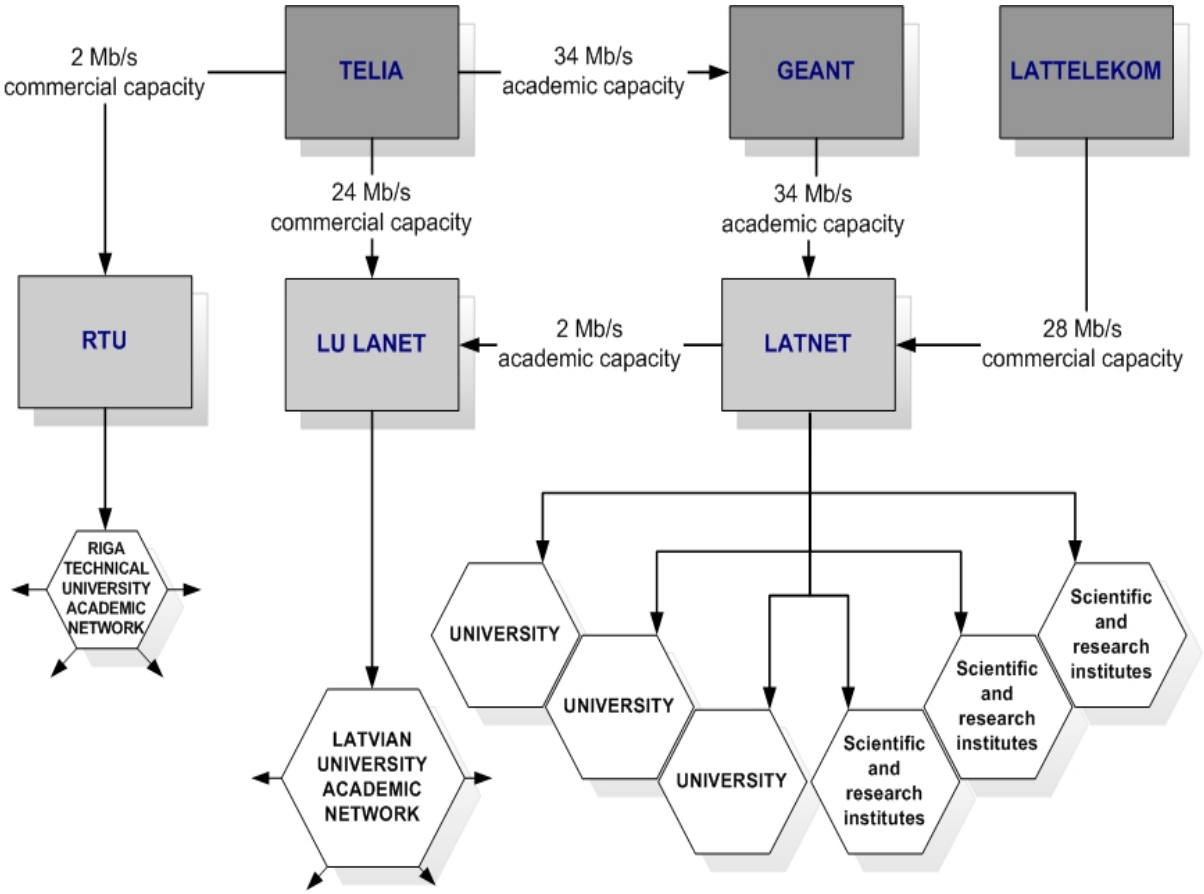
	Number of schools	Number of computers for study purpose	Schools with computers, % of total amount	Computers accessed to the internet for study purpose	Schools with internet access, % of total amount	Computers accessed to the internet, % of all computers
Latvia	**1066**	**13426**	**94.8**	**5549**	**73.0**	**41.3**
Riga region	243	4645	87.2	1544	81.9	33.2
Vidzeme region	237	2491	96.6	1153	76.8	46.3
Kurzeme region	167	1888	95.8	1004	76.0	53.2
Zemgale region	199	2308	99.0	1026	75.4	44.5
Latgale region	220	2094	96.8	822	54.5	39.3

* Data of the Ministry of Education and Science

Source: Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, Riga, June 2003, p105

With respect to IS needs education institutions are not sufficiently equipped with computers and Internet access.

Graph E1: Academic network



Source: Ministry of Transport and Communications of the Republic of Latvia, Department of informatics

The idea to introduce eEducation technologies in one of private high schools is under consideration in one of the largest computer enterprises. Envisaged technologies will enable students to listen in interactive regime lecturers from other countries directly from their universities. This project might expand access to teaching capacities (knowledge, teaching technologies) of foreign high schools without leaving Latvia. Success of the project will depend on the ability of the high school to finance this project.

E.2.5. IST in public administration

Analytical conclusion:

Several large information systems are at the stage of implementation as indicated in the previous chapters. The whole implementation of IST in public administration is co-ordinated with socio-economic concept "eLatvia".

Central institutions of public administration are better equipped with ICT. Since 1990, several programs have been implemented for the creation of information systems and these are renovated time-to-time (ex. Ministry of Finance, Ministry of Welfare, Ministry of Communication, Ministry of Culture, and others, the State Revenue Service, the State Land Service, Company Register, Customs Service and others). These are financed from the state budget investment resources appointed to maintenance of ministries, or within the State

Public Investment Program, from international funds, Phare resources and aid resources assigned for this purpose from some of EU countries (Denmark for instance has contributed in the beginning of the nineties to the system of local governments).

The development of IST in public services is promoted by implementation of eLatvia and eGovernment concepts. eGovernment is understood as delivery of public services via Internet. The state institutions have already started the implementation of eGovernment - before the relevant legislation is adopted. All ministries and state institutions have home pages. Ministries try to organise and operate their home pages according to international principles and at the same time to respect eventual local eManagement principles. In frameworks of implementation of eGovernment, the Department of Citizenship and Immigration explores unified visa information system. This includes information about all issued visas as well as a database on invitations (since February 2003). The database is available for consular and diplomatic services abroad. The Department also offers direct e-access to Population Register to local governments. Since July 2002, the Department operates a modern passport registration database that is tied to the Population Register thus providing cross-checking and correction of population data.

From the wide spectrum of cultural services, libraries are the ones that need computer systems the most. At the moment only a part of local libraries have access to Internet, hardly every library is equipped with at least one computer. Therefore a library information network just conditionally exists; libraries would like but are not able to serve as the main information centres in their locations. The system is not frozen, and the idea of Unified library system in Latvia is being developed since the early nineties, when building of the National Library was first proposed. This project envisages creation of the library network on the basis of the main library, the Latvian National Library that has to be built in Riga.

Large local governments are better equipped with computers and all of them have access to Internet. Among local governments, the most advanced are financially well-of administrations – Riga, Ventspils. The most popular means are phone service, stationary service points and Internet home pages in interactive regime. Yet also small town Cesis has implemented phone based information service in co-operation with Lattelekom. This service supplements existing information means: Internet home page and stationary service centre in the building of local government. Similar service will be implemented also in Liepaja.

E.2.6. IST in households

Main data about IST in households is given in Table E12.

Table E12: Information technology and telecommunication indicators (at end of year)

	2000	2001	2002
Number of computers (thsd)	173.6	247.2	292.5
in households	37.7	86.7	115.0
in enterprises, organisation	135.9	160.5	177.5
Number of computers per 100 persons	7.3	10.5	12.5
Households, having computer (percent)	4.7	9.4	12.7
Households with access to the internet (percent)	0.8	2.3	3.3

Source: On Information society in Latvia, 2004. Central Statistical Bureau of Latvia. Collection of statistical data, Riga, 2004, p.9

According to the ranking by the indicator "Households online (as % of households with computers), 2002" given in "The Global Information technology Report - Towards an Equitable Information Society", Latvia ranks 90 (out of 102 countries).

Analytical conclusion:

IST in households is very limited – just 8-9% of households have computer. In practice use of IST for personal needs is much wider as employed persons use business computers for personal needs. Also the actual number of computers at home may be larger as companies (banks) and state institutions use to give computers to employees when updating equipment. The most popular services in households are: news services (portals Delfi, TvNet, Apollo) and eBanking.

This may be explained by several factors[136]:

- Telecommunication network is satisfactory for Internet access in different modes, yet telecommunication tariffs and Internet tariffs are high compared to the welfare level, and also compared to tariffs in other Baltic states and EU countries,
- Language – Internet content is mainly in English, and therefore is not available for the ordinary public,
- Content problem – information that is available for general public does not attract its interest (according to estimations of Internet Association),
- Developing context – it is important to observe the segmentation of population – children, pensioners, specialists, students, users of public services etc..

On the other hand, the number of people working at home increases. This includes installation of business computers at home. Private access to information increases with the development of public access Internet service points (in libraries, computer classes in schools, Internet cafes). ICT companies introduce several preferential modes for purchase and use of computers – leasing, preferential Internet prices etc. Also in result of market liberalisation Internet service prices go down.

The Association estimates that at present about 65% of population cannot use Internet because of age, lack of skills, lack of computer and communication technologies. 34% of population are potential users, but they lack skills and access to technologies. Many people (half of respondents of the Associations' survey) adjudge lack of information about preferences and potentialities of Internet use in everyday life and also in business.

[136] Information from Latvian Internet Association, Informatics department of the Ministry of Communication of the Republic of Latvia (30.07.2003)

E.3. SWOT analysis

Strengths	**Weaknesses**
Comparatively high penetration rates in business sector Liberalised and dynamic telecommunication market Some government information systems are available to customers Developed information services in banking eShops working Computerisation of schools Plans to develop innovative e-systems in education and health care	Incompatibility of government systems (unable to establish mega-system e-Latvia) Low coverage of households High prices Content problems Language problems Financial problems in implementation of all systems
Opportunities	**Threats**
Financial provision improves with development of economy Education improves Prices decline Third telecommunication operator increases competition EU programs in education	Education does not improve Welfare level remains low

F. INSTITUTIONAL CAPACITIES AND REGULATORY BACKGROUND

General information[137]

In line with the provisions of the law "On Telecommunications" the market of fixed voice telephony services, leased line services and payphone services is opened for competition from January 1, 2003. In 2002 the Public Utilities Commission prepared and approved a Telecommunications service cost calculation and allocation methodology that foresees separation of accounting for different fields of operation of a company as well as the procedure of cost calculation for voice telephony, leased line, interconnection and special access services. Methodology of activities is used for cost allocation – each cost of a company is allocated to a specific service on the basis of direct or indirect causality.

The Commission – adhering to principles of transparency and non-discrimination – developed a procedure to single out the companies using the market power to influence significantly the development of competition and to restrict consumer choice.

Companies with significant market power are endowed with several commitments and obligations to ensure non-discrimination of other market undertakings and consumers. The Commission has listed three companies – Lattelekom in the market of voice telephony and leased lines and Latvijas Mobilais Telefons and Tele2 in the market of interconnection services.

Special requirements are formulated in the Commission's "Regulations on special conditions for telecommunications undertakings designated as having significant market power" and contain a number of provisions, of which the most important are:

- To ensure the connection of its public telecommunication network with other public telecommunication networks,
- To ensure access to other providers of commutation services that are connected to the specific telecommunications network and are publicly available and within the terms set by the Commission to satisfy requests of providers of telecommunications services with regard to special access,
- To develop and publish proposals of commercial negotiations with operators of other public telecommunications networks,
- To ensure that interconnection or special access tariffs are non-discriminatory in all interconnection or special access agreements.

In 2002 the Commission adopted several decisions to ensure availability of telecommunications services of certain quality and volume without relation to the geographic location of the customer and at a reasonable price, because the incumbent after market liberalization may refuse the service to specific customer groups or geographical territories due to economic reasons. The main demand-side benefits are as follows:

- Tariffs of voice telephony and leased lines are approximated with costs;
- Universally available basic array of telecommunication services at affordable prices;
- The possibility to choose the service of fixed voice telephony based on the operator's choice and preliminary selection, leased line service, provider of telecommunications services of electronic messaging and Internet access.

[137] Based on the relevant chapter of "Economic Development of Latvia. Report of the Ministry of Economics of the Republic of Latvia, Riga, June 2003, p.140, 141"

Demand side activities and participation in the process of liberalisation will promote supply side competition. Promotion of competition on the demand side will on the whole ensure positive effect with regard to possibility to choose and receive a service that matches the price.

F.1. Regulation of the major markets affecting IST industries

Markets of ICT manufacturing industry[138] are not regulated in Latvia. Producers should observe technical requirements that are relevant to their product. Markets of ICT services are partly regulated.

Wholesale of electrical household appliances and radio and television goods, office machinery and equipment, other machinery for use in industry, trade and navigation are not regulated.

Since May 2003, after liquidation of the monopoly status of public telecommunication operator Lattelekom, telecommunication service markets in Latvia are fully liberalised. The law "On telecommunication" regulates telecommunication services.

Tariffs applied in public telecommunication services are regulated by the Public Utilities Commission (the Commission has special telecommunication department).

Consultancy services [139]are not specifically regulated.

Software producers and other producers should observe legislation related to intellectual property protection. Enterprises dealing with the state orders should observe law "On state and local government procurement".

Regulation of prices and quality at ICT markets (where appropriate) is the responsibility of the Public Utility Commission – an institution with high capacity.

Property Rights Protection Agency regulates protection of property rights and controls observation of the law "On Property Rights", relevant legislation acts and financial payments to authors. The tasks are just partly fulfilled and there are complains about violation of property rights.

Fighting against software pirates is the responsibility of local office of Business Software Alliance. This institution has just started its operation.

Personal data protection is the responsibility of the State Data Protection Inspectorate.

The State Electro-communication Inspection, affiliated with the Ministry of Communication is responsible for use of frequencies in Latvia.

It must be admitted that privatisation is almost over in Latvia. Specific features of privatisation in Latvia are:

- in beginning – responsibility of ministries,
- since 1994 - single responsible institution – Latvian Privatisation Agency

[138] Includes by NACE: manufacture of office machinery; of computers and other information processing equipment; insulated wire and cable; electronic valves and tubes and other electronic components; television and radio transmitters and apparatus for line telephony and line telegraphy; television and radio receivers, sound and video recording or reproducing apparatus and associated goods; instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment; industrial process control equipment

[139] Include renting of office machinery and equipment, including computers, hardware consultancy, software consultancy and supply, data processing, database activities, maintenance and repair of office, accounting and computing machinery, other computer related activities

- use of privatisation certificates (vouchers),
- slow speed, many unclear cases, high corruption,
- small number of successful performance cases after the privatisation.

Regarding IST constituents, only one enterprise – public telecommunication operator Lattelekom is questionable with respect to privatisation. The state owns 51% of property shares in this enterprise. Privatisation of Lattelekom has been often discussed. The latest decisions prescribe privatisation for money instead of using privatisation certificates (vouchers). Privatisation of the state post company Latvijas Pasts is not discussed. Latvijas Pasts is a single provider of public mail services. Former state owned ICT enterprises VEF, Alfa, Komutators, Rigas Popova Radio Rupnica are privatised. The development of enterprises after privatisation was not successful due to different reasons: break of former markets (in many cases – military industry) and inability to find other markets, slow restructuring, exaggerated belief to competitiveness of their product and success at CIS markets, inappropriate management after privatisation, unsuccessful privatisation model.

Majority of ICT enterprises were established anew, on the private basis and were not subjected to privatisation at all. In large, openness to foreign investment during the privatisation helped a lot in implementation of ICT in business sector enterprises.

Privatisation policy, as it was designed and implemented in Latvia, allowed damage of Latvian industry. Yet privatisation was a necessary prerequisite in transformation from the state to private ownership, and this task was fulfilled. Applied privatisation policies do not impact development of enterprises in future.

Inappropriate capacity of regulation institutions in this group lead to loses of income for producers of IST – producers of software, audiovisual information, and contents for networks. The level of software piracy is very high – 58% according to the latest survey of Business Software Alliance. Losses caused by piracy of computer software in 2001 equalled to 5.8 million EUR. The decrease of the rate of computer piracy by 23 percentage points during the year is attributed to the fact that new computers are purchased with licensed software installed, and companies do not want to deal with BSA Latvian Committee.

F.2. Regulation in the main services and infrastructure sectors

In 1995, Telecommunication Tariff Council was established in Latvia to observe and manage telecommunication tariffs and service quality.

In 1999, the concept of unified Public Utilities Regulatory Commission was introduced and TTC was closed. The Public Utilities Regulation Commission is authorised to regulate price and quality issues for all services that may be qualified as public – water and gas supply, electricity, transport, and also telecommunications. The system of regulatory institutions also includes independent regulatory bodies in local governments that are dealing with public services provided by local governments. There is not direct subordination between the two levels, still methodological unification of approaches exists.

The Regulator carries out the following functions:

- sets the tariff calculation methodology,
- approves tariffs for utilities,
- issues licences and supervises implementation of the set conditions,
- supervises compliance of utilities with requirements for quality and environmental protection, technical regulations, standards,
- performs dispute out-of-court settlement etc.

All mentioned functions are applied in the telecommunication sector, mainly to the enterprise that is considered having monopoly – Lattelekom. This enterprise was granted natural monopoly status by the Latvian telecommunication law up to 2013. Following the current tendencies and requirements to special support to enterprises in connection with Latvia's accession to EU, the Law on telecommunications was amended in the way that Lattelekom has lost its monopoly rights since 1 January 2003.

The enterprise remains responsible for public telecommunication network, and leases lines to other operators – these services form the basis for regulation. However, more and more new networks are opened in Latvia, thus creating real competition in telecommunication sector.

Tariffs of mobile operators are not subject for regulation.

There are only some large service providers that are up to now not fully privatised, Lattelekom being one of them.

F.3. Regulation of the IST based public information and services sector

The entire legislation that regulates the operation and the rights of the mass media institutions is based on norms prescribed by the Latvian Constitution: it is the fundamental right of Latvia's population to obtain and to exchange information freely.

Activities of the mass media are regulated by "The Law of Press" and "The Law of information publicity". There are no state or nongovernmental organization that regulates the operations of mass media. It is only the Ministry of Culture that has a Department of Copyrights and related rights. There is an article in the "Criminal law" about trespassing reputation and dignity. In the criminal procedure there is a discussion about the publicity of judicial proceedings and the protection of under age persons.

Regulation of IST-based public information and services is based on the system of concepts and laws regulating the operation of television, radio, mass media and Internet. The system includes the law "On Radio and Television" and other laws.

Internet services and public information services are regulated by a system of laws described in chapter B2.

The agency of Copyrights Protection is also responsible for the protection of intellectual property in the mass media. As mentioned before, the capacity of the Agency is not satisfactory.

Radio and Television Council decides on development of relevant organisation, its financing and content. In addition, program and studious councils are responsible for provided product.

F.4. SWOT analysis

Strengths	**Weaknesses**
Liberal market Private sector dominate ICT market Good institutional capacity of main market and service regulation Unified Public Utilities regulator Market role high Competition environment satisfactory Asymmetric regulation in telecommunication Economic principle in tariff policy – price corresponds to costs Implementation of eProcurement is ongoing	Difficulties connected with implementation of new systems (lack of effective methodologies for tariff calculation, lack of behaviour history for improving policies etc) Weaker institutional capacity of regulators at the local governments Low capacity of property rights regulation institutions Comparable high software piracy
Opportunities	**Threats**
Third operator Impact of EU accession on regulated sectors eProcurement system eliminates unfair competition in ICT market	Copyright issues Unexpected effects of the privatisation of the operator (changing strategies, tariffs, etc.) Impact of EU accession on regulated sectors

G. EDUCATIONAL SECTOR

G.1. Main characteristics of educational system

G.1.1. Achievements in secondary and tertiary education

The educational level of the population is high – 139 people in every 1000 have had higher education.[140]

Remarkable reforms have been done in the education in the nineties. According to the reform context, national education should be of a quality that would create the conditions for the development of a well-educated society and would open prospects for the population to compete in the labour market in Latvia and outside it. Co-ordination of the Latvian educational system with the educational systems of the EU member states is taken as a priority, and diplomas of some Latvian universities are recognised in other European states. The training process has changed at all education forms and levels. In basic and general secondary education, more attention is paid to the studies of foreign languages, computerisation of schools has been started and bilingual training has been introduced in minority schools. Still the technical/financial provision of education is not satisfactory.

By 1998, in basic and general secondary education the number of schools, students and teaching staff increased in Latvia, compared to 1990, but the low fertility rates caused a decrease of these indicators since 1998. In some rural regions number of born children even does not allow to complete a class. For this reason, and also according to the optimisation of the network of general educational establishments, many small rural schools were closed in mid-1990s. In the 2002/2003 school year 1017 general full time schools operated in Latvia, of which 384 were secondary schools (1^{st}-12^{th} grades)[141].

224.5 thousand persons attended general full time secondary schools in the school year 2002/2003, of which 80.9 thousand (36%) attended school in Riga. Of all students in general full time schools (325.5 thousand persons), 144 thousand persons learn one foreign language, 137.7 persons learn two foreign languages and 8.7 thousand persons learn three and more foreign languages.[142]

124 vocational (professional) schools with total enrolment of 46.5 persons operated in the school year 2002/2003.[143] Since 1990, the number of students in vocational educational establishments has decreased by about 1/3, because of problems related to the insufficient quality of vocational education. Pursuant to labour force survey data, only 30% of the total number of school leavers of vocational educational establishments of 1990 – 2000 worked in their professional field[144].

Number of higher education institutions has increased from 10 in 1990 to 36 in 2002[145]. In higher education, on the contrary, numbers of students increase year by year. It has increased 2.8 times compared with 1993. In the academic year 2001/2002 it totalled 110.5 thousand persons, and was 118.9 (increase by 7.6%) in 2002/2003. 50.7 people per 1000 of the Latvian

[140] Results of the 2000 population and housing census in Latvia. Collection of statistical data. Central Statistical Bureau of Latvia, Riga, 2002, p.187
[141] Statistical Yearbook of Latvia 2003. Central statistical Bureau of Latvia, Riga, 2003, p. 89
[142] Education institutions in Latvia at the beginning of the school year 2002/2003. Central Statistical Bureau of Latvia, Riga, 2003
[143] Education institutions in Latvia at the beginning of the school year 2002/2003. Central Statistical Bureau of Latvia, Riga, 2003, p.63
[144] Social Trends in Latvia, 2003. Analytical report. Central Statistical Bureau of Latvia, Riga, 2003, p.30
[145] Education institutions in Latvia at the beginning of the school year 2002/2003. Central Statistical Bureau of Latvia, Riga, 2003, p.83

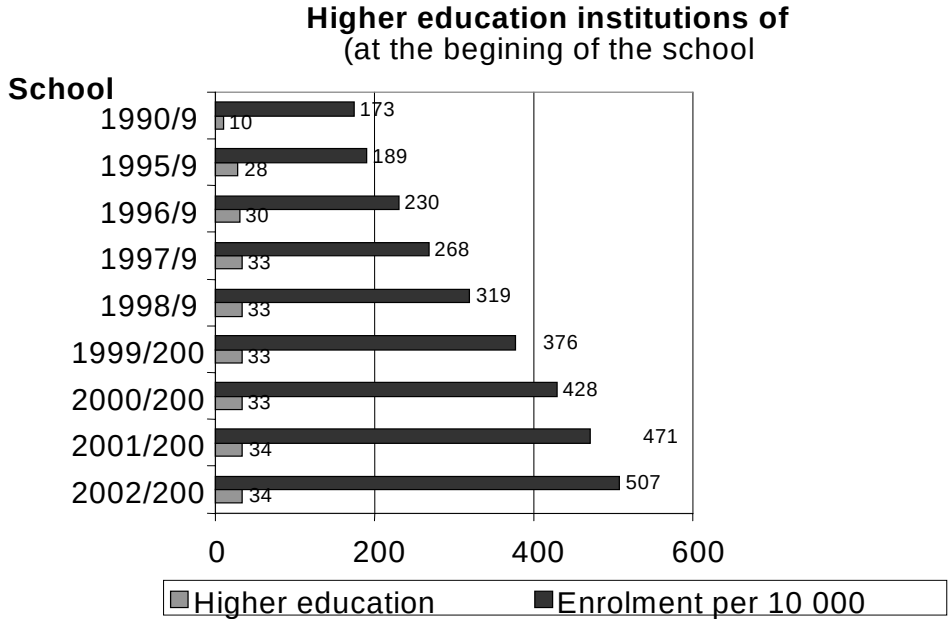
population are students – one of the highest rates in Europe.[146]. High enrolment contradicts to economic conditions of education – stipends are insignificant in Latvia, while tuition fees are high. Also state high education institutions are allowed to provide paid education.

Average stipend in state financed education is 13.7 EUR per month (164 EUR per year) for students with study score in main subjects above 7 points (from 10) and 17.2 EUR for excellent students (score above 8). Students with study score in main subjects less than 7 points are not eligible for stipends. Tuition fees in state universities vary from about 823 EUR per year to 1200 EUR per year, depending on study direction. They are higher in private institutions.

Of total enrolment, 2% (2.4 thousand persons) are foreign students. 45% of them come from Israel for studies in University of Latvia, 15% come from Lithuania for studies in the Baltic Russian Institute.

Main characteristics of higher education in Latvia is given in Graphs G1-G4.[147]

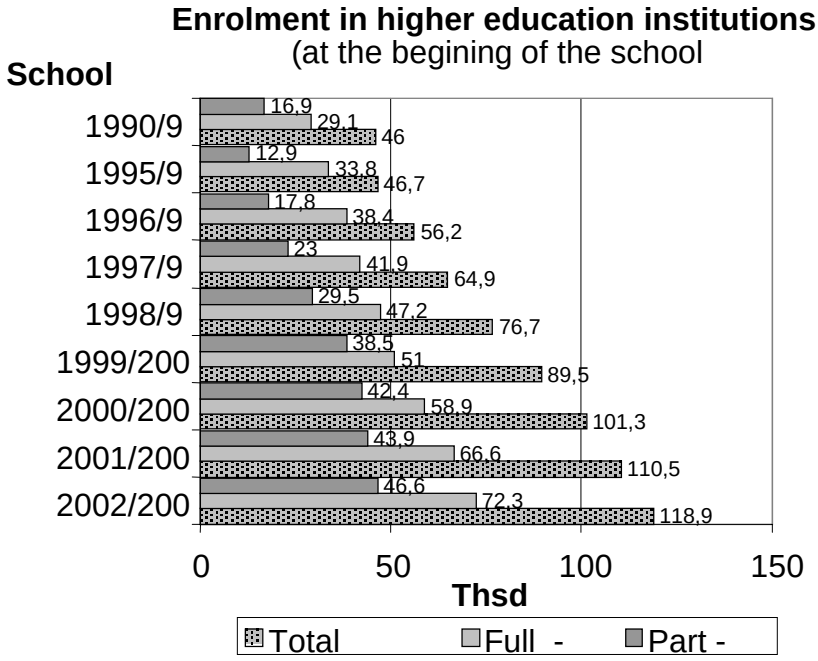
Graph G1.



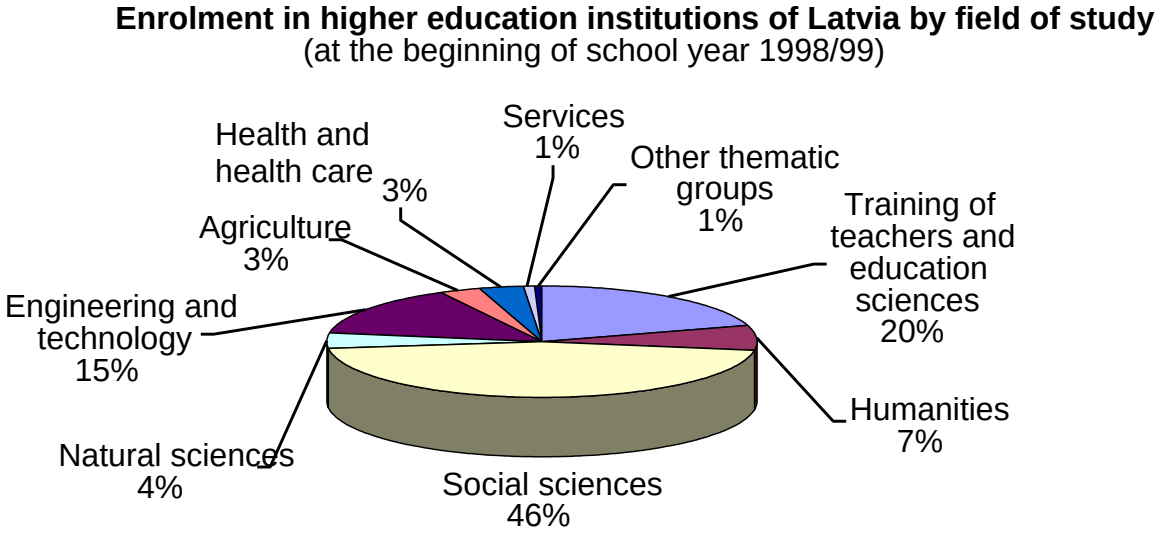
[146] Social Trends in Latvia, 2003. Analytical report. Central Statistical Bureau of Latvia, Riga, 2003, p.30

[147] All data in tables is taken from: Educational institutions in Latvia at the beginning of school year (relevant years). Central Statistical Bureau of Latvia, Riga

Graph G2.

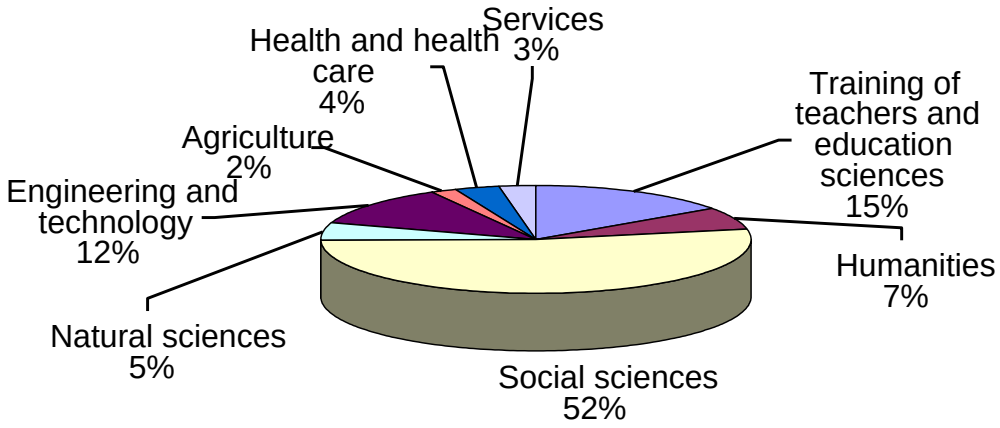


Graph G3.



Graph G4.

Enrolment in higher education institutions of Latvia by field of study
(at the beginning of school year 2002/2003)



The three largest higher educational institutions in Latvia are University of Latvia, Riga Technical University (located in Riga) and Latvia University of Agriculture (located in Jelgava, outside Riga).

Higher education is only partly free of charge in Latvia. Just 27% of students attend studies that are financed from the state budget (down from 36.4% in 1999/2000), others pay for studies even at the state universities. For instance, 78.7% of studies in the University of Latvia are studying for a fee (up from 76.7% in 1999/2000). Higher education institutions set the fees for themselves. Fees differ from one school to another and from one study program to another depending on several preconditions (education policy of the school, financial conditions, price of program), or are constant for all studies at the particular school. There is great number of higher schools, usually established by legal entities that provide studies only for charge. These schools are specialized in social sciences, including economics. Having good traditions and image in educational work these schools take an important position in development of higher education as a business.

Studies in social sciences are the most popular study directions in Latvia. Importance of social sciences increases. An important study direction is teacher training and educational sciences, but its importance is being declining. The share of engineering and technology is still quite low, what can be explained by the poor condition of Latvian industry. Of engineering and technology sciences more popular are computer related sciences and IT, as well as specialities from the scope of construction industry (architectures, computer design, construction engineering etc.). The quality of studies in engineering sciences is better, but still could be improved.

Several reasons have caused the reduction of engineering and technology studies. These study directions were popular before 1990. In the beginning of the transition, many foreign experts assessed this sector as too large. This assessment helped governments to motivate reducing financing for engineering and technical studies. In addition a sharp decline of industry in beginning of the nineties led to poor employment opportunities for engineers, and engineering sciences became a prospectless study direction. Besides, in general education many

previously compulsory subjects that are necessary for engineering sciences were turned into free choice subjects.

33.6% of new enrolees come from Riga, 50.5% come from the seven largest cities and the other 49.5% come from other territories, of which 6.7 percent points of students arrive from the Riga region[148].

Only selected institutions (12) offer doctoral degrees. These are the universities with long traditions. Other institutions go only as far as the master's level (19) or bachelor's level. A part of higher education institutions does not have affiliated research institutions, but even these institutions carry out individual research projects.

In adult education the most popular fields are economic education, languages, health care and social work, driver's courses, teacher training and only then comes computer sciences (Table G1). Computer training occupied 8% of programs and 6,2% of enrolees what hampered knowledge in these subjects in 2002. The number of enrolees remains within 12-15 thousand persons per year in computer training and around 10 thousand persons in English.

Table G1: Adult education in 2001*

	No. of Programmes,		Enrolees, Thousand.	
	2001	2002	2001	2002
Total	5101	5062	204.8	210.7
Teacher training	641	698	18.2	23.8
Humanities and art	658	589	27.8	27.7
Of which languages	480	473	24.4	24.4
English	299	256	10.5	9.1
Latvian	81	119	12.1	13.8
German	58	48	1.1	0.8
Spanish	4	8	0.2	0.2
French	12	18	0.2	0.2
Social sciences, business and law	1516	1654	49.9	60.8
Of which: social and behavioural sciences	213	218	6.7	9.7
Library and information science, archiving	71	34	2.3	1.2
Economic education	1067	1030	34.4	38.5
Law (changes in legislation, etc)	118	273	5.1	10.1
Natural sciences and mathematics		424		13.5
Computer training	462	411	14.8	13.2
Engineering science and technologies	192	224	7.7	8.7
Agriculture	451	297	12.6	13.8
Health care and social work	364	315	29.3	31.0
Services	370	390	24.7	24.1
Of which: catering services (hotels, restaurants)	44	44	0.7	0.9
Driver's courses	186	192	20.7	19.5
Regional development and environment	38	40	0.9	0.9
Security services (security, police, home guard etc.)	25	33	0.4	0.7
Safety and protection at work	114	136	7.7	10.3
Other program groups	270	262	16.6	9.0

* In 2001, 367 institutions provided education for adults. Source: Statistical Yearbook of Latvia 2002. Central Statistical Bureau of Latvia, Riga 2002, p.97, Statistical Yearbook of Latvia 2003. Central Statistical Bureau of Latvia, Riga 2003, p.96

[148] Educational institutions in Latvia at the beginning of school year 2002/2003. Central Statistical Bureau of Latvia, Riga 2003, p.100

4027 enterprises and business companies provided continuing vocational training (CVT) in 1999[149], and 48.6 thousand persons participated in these courses. Not surprising, the largest number of such enterprises fall in group with 10-49 employees, while the largest number of participants – in groups 50-249 and 1000 and more.

G.1.2. Reforms in secondary and tertiary education

Education and science system was substantially reformed in early nineties, and reforms continue.

In 1990-1994 the education system was revised and transformed in order to adjust it to the conditions of independent state. The legal background of reforms in education, the law "On education" was adopted on 10 June 1991. Main activities included: de-politisation of the content of education, provision of free choice in education, diversification of education options, decentralisation of management of education. Private education institutions appeared for the first time.

In 1995 – 2001 the most attention was paid to the perfection of education system and its legislative background. Education Concept in Latvia was elaborated and approved by the Cabinet of Ministers on 4 July 1995. In 1998 the Cabinet of Ministers approved "Strategic program for development of education for 1998 – 2003". "Amendments to the Education Law" that were adopted by Latvian Saeima prescribes that the government is responsible for the state policy and strategy in education, and that the government must submit to Saeima an education development conception for the next four years. In 1992, the Ministry of Education, Culture and Science prepared the concept for the development of technological centres in Latvia and the first two centres were established.

On 2 November 1998 Saeima adopted a law "On higher education", on 29 October 1998 it improved the law "On education" and on 10 June 1999 a law "On general education" and a law "On professional education". Adoption of "Education Law" in 1998 earmarked the beginning of even more fundamental reforms in higher education. The law prescribed the integration of higher education and S&R&D institutions. Consequently almost all science institutions have integrated into universities and high schools, and many new research institutions were established in universities.

Recent strategic plans in development of education are set in the National Concept of Education for 2002-2005 that was elaborated and discussed in the Cabinet of Ministers in 2002. The concept is based on guidelines set by other strategic documents such as the National Development Plan, the National Employment Plan, the Life-long Learning Memorandum of the EU, the UNESCO program "Education for all" and other policy documents in education elaborated up to 2002.

Up to now primary and secondary education was available in Latvian and other languages, while tertiary only in Latvian and English (the latter one only in foreign based high schools). The law envisages that beginning with 1 September 2004 secondary education in non-Latvian schools must be 60% in Latvian and 40% in minorities' language.

Analytical conclusion:

The education system is still under reforms. Improvements are necessary in financing of education, as well as in its content. For instance, free choice in selection of subjects in general education have squeezed out more difficult natural science subjects, and this eliminates

[149] The latest available data from the sample survey of enterprises and business companies, published in Statistical Yearbook of Latvia, 2002.Central statistical Bureau of Latvia, Riga, 2002, p.97

possibilities to study engineering sciences at higher education level. On the other side, the demand for engineers increases in industry.

G.2. Key educational trends

Reform of the educational system in its initial phase before 1994 resulted in the democratisation of education; people were provided gradually the opportunity to acquire an education according to the interests and abilities of the society and the individual.

Between 1995 and 2001 the government focussed mostly on streamlining the system of education, essentially supplementing the regulatory base. The Law on Higher Education Establishments, the new Law on Education, Law on General Education, Law on Vocational Education, etc. were passed.

The objectives of the third phase of development of the education system are identified in the Concept of the Development of Education for 2002-2005 adopted in Saeima on October 17, 2002. The goal of the concept is to transform the educational system of Latvia into the system promoting formation of knowledge-based integrated society and increase of competitiveness of people and the economy of Latvia. The concept foresees the improvement of the quality of education matching the needs of economy, to ensure access to lifelong learning to all residents and also to raise cost efficiency of education.

Data of Population Census 2000 show that compared to 1989 the share of persons with higher education (aged 15 and older) has gone up till 13.9% or by 2.4 percentage points compared to 1989, the share of persons with secondary education grew up to 51.2% (by 2.3 percentage points). The number of people with elementary education and lower has dropped from 16.2% till 8.4%.

The number of students in educational establishments since 1993/1994 was gradually going up until the year 2001, yet starting with 2002 began to decline because of the demographic crisis. Now it equals to 506 thousand (511 thousand in 2001). The biggest decline of the number of pupils (9%) is observed in the elementary (1-4) grades of the general full-time education schools. The number of students in higher educational establishments continues to grow. At the beginning of the academic year 2002/2003 the number of students in higher educational establishments of Latvia continued going up and reached 119 thousand – by 2.6 times exceeding the respective figure of 1990/1991. The number of university students in Latvia is among the highest between the EU accession countries.

Educational system (because of insufficient financing) still does not provide teaching staff with adequate remuneration, which hampers the attraction of well-educated teachers to schools (and especially to rural schools), introduction of new programs, subjects and methods of teaching. There is a shortage of resources for maintenance of educational infrastructure. Creation of the general information system of education in Latvia proceeds at a rather slow pace. It is necessary to use the existing financial resources more efficiently.

Main achievements, as it is concluded in the National Concept of Education for 2002-2005, are:

- The education system is organised according to the education program principle, implementation of the official standards in education, thus facilitating that the content of education programs responds to the needs of society and labour market.
- The education quality monitoring system provides international recognition of diplomas issued in Latvia.

- Financing according to expenditure normative that provides differentiation of funding regarding different education spheres and programs has been started.
- Systematic investment in education infrastructure and optimisation of the network of educational institutions provides at least some economy in spending.
- Wage reform in education has been started with the purpose to increase wages in education.
- Implementation of minorities' education programs has been started, that simultaneously provides the observation of minorities interests, social integration and also the improvement of official (Latvian) language skills.
- Normative for professional education in arts, culture and sports have been produced.
- Regional levelling of funding for "interests education" (special training outside official training in fields of interests, like technical, art, music, dance classes etc.) that eliminates differences in accessibility of such education.
- Creation of study credit system, that improves the accessibility of high education for economically less provided people and increase students' interest in the quality of education.
- Participation of international comparative research in education provides a better insight into local problems and solutions, as well as helps to learn trends, quality requirements and problems in education at the world scale.
- A unified system of reporting of credit-points in academic study programs is implemented, which is necessary for international recognition of Latvia's higher education study programs.
- Accreditation of high schools and study programs in high schools that corresponds to the international criteria is implemented.
- The state requirements (study standards) in academic education and high professional education are adopted and consequently unified requirements to study programs in all high schools are implemented,
- A system of academic and professional degrees that is comparable with the European education space is established, that facilitates mobility of Latvian students in European context and foreigners' studies in Latvia.

In accordance with the Education Development Concept, within the next four years the government plans to achieve three goals:
- to improve quality of education at all levels and forms of education,
- to improve accessibility of education,
- to increase effectiveness of education costs at all levels and forms of education.

In the general education the main problems are:
- theoretical knowledge prevail, graduates fail to apply knowledge in practice,
- education does not provide skills in independent and creative thinking, decision-making,
- professional training of teachers is not satisfactory, teachers are not able to provide advanced knowledge,
- there are methodical problems in teaching: application of specific methods, such as games is not sufficiently professional and therefore does not provide expected result,
- the interrelation between science, education and economy is weak, employers do not participate at early stage of education,
- professional orientation in general education is not sufficient,

- free choice of subjects in early age or in beginning of secondary stage of education leads to the situation that graduates are not prepared to study exact sciences.

Analytical conclusion

The main problem in academic and professional education is that the number of graduates is important, but specialists are not flexible at the labour market, and their profession and/or skills are not corresponding to the demand of the economy. Business, on the contrary, reports lack of skilled specialists, and growing lack of engineers and other technical specialists. There are attempts to improve inter-relation among education, R&D and business by creating innovation institutions.

G.3. Domestic and international mobility of scientific personnel

Information in this chapter is borrowed from a research "Baltic R&D systems in transition" (Dagyte, Kristapsons, Martinson, 2000).[150]

As it is concluded in the mentioned research, "a considerable part of researchers in the Baltic States changed their field of activities or emigrated at the beginning of nineties". The process is characterised in Table G2.

Table G2: Migration direction of research personnel leaving during 1989 – 1994 (thsd persons)

Country	Left the country	Another research institution in the home country	NGO	Private inst. in home country	Public admin. and service	Unemployed	Other	Unknown
Estonia	14.5	18.9	12.9	27.0	19.6	0.9	6.0	21.1
Latvia	2.1	8.4	0.6	0.7	25.5	5.3	57.4	22.4
Lithuania	13.4	16.3	2.7	3.9	16.3	3.3	22.9	21.1

Source: Kristapsons J., Martinson H., Dagyte I. Baltic R&D systems in transition. Experiences and future prospects. Riga, 2002, p.86

Researchers note that little information is available through aggregate statistics on the external and internal brain drain. In 1996, researchers of the Institute of Economics, Latvian Academy of Sciences (Parsla Eglite, Inna Zarina) carried out a survey on the brain drain. The president of Latvian Academy of Sciences, Janis Stradins has said in his papers, that in 1992, about 500-700 post doctoral scholars went abroad, but "if we include in those who left for Russia and Israel, then total number exceeds 3000-5000" (Stradins, 1999).

In Latvia the internal brain drain (to commercial and governmental structures) has dominated over the external brain drain (Eglite, 1996). Emigration was mostly to countries of the Commonwealth of Independent States (CIS). The number of long-term business visits in Western countries grew significantly in the beginning of 1990's. The dominating destinations for Latvian researchers were U.S.A. (29%), Sweden (20%), and Germany (19%).

[150] Kristapsons J., Martinson H., Dagyte I. Baltic R&D systems in transition. Expperiences and future prospects. Riga, 2002, p.85-86

Unfortunately, more information is not available, migration of the research personal and technical personal after these investigations (period after 1996) has not been observed. It is known from discussions at the Academy of Science, that many of emigrants that left country in the beginning of nineties would like to return, but financial conditions of Latvian science do not allow them to continue their work at home. Even more, many of graduates cannot find appropriate scientific occupation in Latvia after postgraduate studies abroad and so they rather stay abroad.

G.4. Tertiary sector and research performance in IST related subjects

IST related subjects are treated specially in one research institution – Institute of Electronics and Computer Technique of the Latvian Academy of Sciences. The institute has achieved some results in information proceeding.

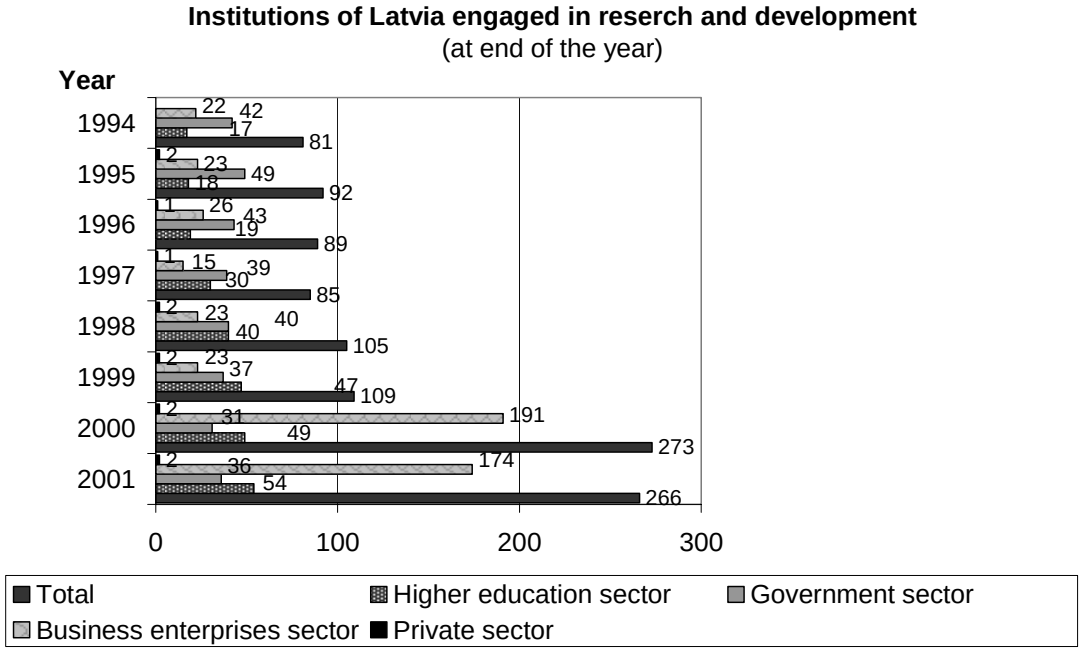
Other research institutes participate in the development of IS in an indirect way – by providing R&D basis. All institutes explore the same conditions; no preferences are given to any particular institute. The basic legislation includes the law "On Scientific Activities" and several Regulations of the Cabinet of Ministers: On state ordered research projects, Statutes of State Commission of scientific qualification, On state research programmes, On the arrangements and criteria for awarding of scientific degrees, On the Latvian Council of Science, On state scientists emeritus.

The Saeima adopted the law "On Scientific Activity" on 10 November 1992, it was amended in 1996 and 1998. The law changed status of research institutes from units subordinated to the Academy of Science to independent research units. Latvian Saeima adopted the "National Concept of Higher Education and Research Development" in spring 1998. This was a summary of strategic statements based on the forecast of national development and financial estimates with a view to ensure up to 2010 a constantly growing role of research in the society and national economy (National Concept). The Concept recommended increasing funding of research from the state budget to at least 0.8% of the GDP by 2001, but this was not implemented. The Concept also sets the priorities of research development. These are information technology, material sciences, forestry and timber technology, organic synthesis, biotechnology, biomedicine and pharmacy, and Lettonics (national humanities sciences). The Ministry of Education and Science has also identified the priority research directions in co-operation with the European Commission: information technology and telematics, life sciences and biotechnology (biomedicine, drug design and biotechnology), new materials and technologies, ecology and environment protection.

The Concept envisaged the development of state research centres in perspective research areas that may be established on the basis of current research institutes (single or by merging several institutes). The maintenance of infrastructure in such centers had to be insured by the state. With this perspective 11 academic institutes founded the first state research center – the Center of Material Science. Expected financial system however was never implemented, as the state was neither able nor willing to provide for stable financing of research infrastructure units.

In order to improve the quality of higher education a new position – namely a State professor – was introduced for educational staff, and criteria were developed for election for this position. The "Scientist's Code of Ethics" was adopted by the LAS Senate on November 4, 1997 and by LCS on November 11, 1997.

Graph G5:



Several other conceptual documents were discussed, but not adopted. In the meantime situation in science deteriorates very fast. Total number of research units in Latvia increases. 43% of the total number are academic research units, 33% are established within business sector. In 2003, the number of institutions engaged in research and development increased to 315, of which 53 were in higher education sector, 34 in government sector, 225 (by 51 more) in business enterprise sector and 3 private. Total number of R&D personal (full-time equivalent employment) was 3451 persons (less than in 2001), of which 2226 (less than in 2001) were in higher education sector, 549 (less than in 2001) – in government sector, 675 (less than in 2001) in business enterprise sector and 1 in private sector. This is official statistics, but figures seem unrealistic.

At the same time, number of researchers declines year by year (Table G3).

Table G3: Number of R&D personnel*

	1990	1993	2000	2001	2002
Total	18970	3999	3814	3497	3451
higher education sector	1528	994	2156	2242	2226
government sector			662	571	549
business enterprise sector			995	683	675
private non-profit sector			1	1	1
self-dependent R&D institutions	9649	2451			
design institutions	3898	225			

Estimation based on full-time–equivalent employment
Source: Statistical Yearbook of Latvia 2003. central Statistical Bureau of Latvia, Riga, 2003, p.96

Of 44 research institutes in Latvia, 9 are established by the state or are private. 8 institutes are research institutes of the University of Latvia (LU), 1 belongs to Latvian Agriculture University (LAU) and 26 to Riga Technical University (RTU).

Characteristic feature of Latvian science is the co-existence of basic and applied research in the research institutes. This phenomenon is pre-determinate due to financial conditions – applied research has consumer financing while basic research does not have. Research institutes try to attract applied research and to share financing with the basic research (on behalf of researchers salaries), and also they try to develop services for charge (testing and control laboratories) to get money for academic research.

The knowledge transfer from the research institutes to enterprises is very limited. The process is not organised and facilitating structures do not exist. Still several models can be identified, how enterprises and institutes find each other:

1) on the basis of former contacts and information about specialisation and product of research institutes,
2) on the basis of former own experience or information about other's experience,
3) from information in general mass media,
4) with help of phone book and seeking for contacts on the basis of name and eventual specialisation of institutes or enterprises.

Participation in the teaching process is also used for introduction and dissemination of research results and creation of innovative education. On the other hand, institutes provide enterprises with control and certification facilities. Institutes operating in exact sciences are more active in these fields. For instance, the Institute of Wood Chemicals hosts a group of professors – specialists in innovation and marketing, provides lecturers for Universities, hosts laboratory that provides certification and quality control of exported timber, provides study practice for university students.

Regional innovation structures do not exist in Latvia, as there is no operating innovation system at the national level. The first attempt to establish a regional innovation system was in seaport Ventspils, where local authority tried to create innovation promotion system consisting of innovation fund, high school with research units, industrial park and innovative business entities. The attempt was not successful.

Relationships between Latvia and trans-national and EU are formed in several ways:

- through international co-operation in research programs – Latvia participates in EU 5th and 6th Framework Programme and some other research programs,
- through international co-operation at the level of higher education,
- through the market.

The first two knowledge distributing organisations – Riga Technological Centre and Salaspils Technological Park were founded in 1992, on the basis of the concept for the development of technological centres in Latvia. The first technological park, established in Salaspils (academic town in 23 km distance from Riga) on the basis of academic institutes was not a successful story (mainly because of poor management). An example of successful development is Latvian Technological Center (LTC) in Riga. Founders of the LTC are Municipality of Riga, Latvian Academy of Sciences, Institute of Physical Energetics, Association of Latvian Scientific and Technical Societies. LTC operates according to the principles of business incubators, and at present it supports more than 30 tenant firms or new small enterprises. The main fields of their activities are: electrical engineering and telecommunications, biotechnology, equipment for medicine and biology, remedies for

veterinary etc., multimedia systems, computer networks, software, environmental protection, technology for industrial waste utilisation, new material technology, laser technology etc. LTC manages 2000 square meter business space and provide for appropriate infrastructure.

From April 1995 the Bureau for Information and Consulting (BIC) provide services on business planning, marketing, international co-operation, quality assurance, regional market research etc. On the basis of LTC another innovation institution - FEMIRC-Latvia was established with financial support of the EC DG XIII (INCO-COPERNICUS program). FEMIRC-Latvia was the centre for European integration of research, technologies and development. The mission of the Centre was to promote economic development in Latvia by integration EU and Latvia's research and industrial potential. The Centre worked in close co-operation with the Latvian government. In 2000, FEMIRC project was closed, but on its basis a new project – IRC LATVIJA began. IRC LATVIA is an innovation-facilitating centre.

Since 1 August 1999 Latvia is a full right member of the EU 5th (now 6th) Framework Program, and a special contact office carries out management of this program in Latvia.

LTP - Latvian Technological Park was established with incentive of Riga Technical University. Business innovation centre (BIC) is a structural unit of LTP. BIC delivers consulting and information services to business and scientists from universities.

The role of the academia in development of ICT and innovation is rather important. Latvian Academy of Sciences still is the main co-ordinator of science activities in Latvia. Together with the Science Council (what is about the same as it consists of academicians) it is also a main initiator and lobbying institution for innovation and science related activities, including creation of IS.

Academia, as well as Universities take an active part in dissemination of innovation ideas via:

- cooperation with the Ministry of Education and Science (expertises, advisory),
- co-operation with universities and high schools,
- co-operation with business enterprises (awards for outstanding researchers initiated by Academia and financed by business enterprises),
- Academic meetings in business enterprises and local governments.

It is questionable if the existence of universities or other type of higher education and research organisations attract foreign companies to establish their centres around them. We did not find such examples, however the attempt to improve academic environment is there. Academia, as well as national universities and high schools are not subjects for FDI, but there are some high schools that are established or supported by foreign governments – Stockholm School of Economics and the School of Law (Sweden), Business College (Canada), and 2-3 more. Foreign governments or institutions establish education institutions and support their operation for some years, and after that forward them under the responsibility of Latvian education system.

G.5. ICT-related education

Two study directions may be considered as ICT related – computer science with 5.56 thousand students, of which 2125 are in groups financed from the state budget, and electronic commerce – 295 students, all in paid education groups. These specialities occupy 4.9% of total number of students. In addition, 366 students study mathematics, of which 277 in groups financed from the state budget (all data for the 2002/2003 school year).

Adult education embraces 411 courses in 2001 in computer training (8% of total number of courses) with 14.8 thousand enrolees (6,2% of total number of enrolees). The amount of adult

training in courses in computer training remains stable, however it is less in 2002 than in 2001.

Total number of graduates from ICT related education is 1099, of which 53 in mathematics, 542 in computer sciences, 504 in electrical engineering. 34 students have started studies in study direction "information systems". [151]

Total number of scientists with a doctoral degree at end of 2002 was 5612 persons. Number of citizens with research degree in mathematics was 129 at end of 2002 (2.3% of total), in computer sciences 109 (1.9% of total).

Analytical conclusion:

Computer skills training is included in almost every study program in economics and business administration, therefore the number of persons having computer literacy is larger than the number of graduates in computer related specialities. The share of ICT related enrolment exceeds the share of employment in the ICT sector in total employment, which is quite natural, as ICT specialists are employed in every sector of the economy. This explains claim from the ICT industry about increased need of specialists – both directly for the industry and for customer organisations.

There are no special ICT related education institutions in Latvia. It is impossible to assess the budget of high schools and institutions that could be attributed to training in ICT. According to ICT specialists, the main problem in ICT related education is the quality of teaching staff (both in age and qualification aspects) and technical provision (students are trained on the basis of old technologies). Naturally, graduates have to proceed re-training in order to be competent in new technologies. The same apply to research basis in high schools.

Data about employment by recently trained is not available. The demand for ICT specialists in industry and entire economy is high.

Majority of recently trained in ICT related education institutions find job in Riga in state institutions, enterprises, as well as in computer firms. Computer companies report lack of qualified specialists as one of the most significant barriers to development, and therefore they offer compatible wages thus attracting young employees.

International mobility of these graduates is potentially high, but practically not significant. Despite tempting offers from many European countries, outflow of ICT specialists is not large. In telecommunication experts mention higher mobility, particularly among researchers, in order to get access to new technologies.

[151] Education institutions in Latvia at the beginning of the school year 2001/2002. Central Statistical Bureau of Latvia, Riga, 2002, p. 87-89

G.6. SWOT analysis

Strengths	**Weaknesses**
Education system is modernised 92% of students learn foreign languages Developed adult education Regional higher education schools Improving ICT education Technological transfer institutions are established ICT specialists find job in Latvia Mobility of recently trained is low	Low and declining funding of R&D Aging researchers and university staff Development of technological transfer institutions is not satisfactory Lack of ICT specialists Weak quality of ICT Education Claimed ICT Skill shortage Scarce international connections
Opportunities	**Threats**
Implementation of Lisbon strategy in Latvia Activation of implementation of innovation policy Implementation of measures envisaged in Development plan	Aging of researchers and university staff continues Emigration of R&D specialists if R&D financing remain low Decline of research staff continues ICT skills shortage becomes a real issue

H. NATIONAL AND REGIONAL DEMOGRAPHY AND PROSPECTIVE

H.1. General characteristics and trends

H.1.1. Age distribution

Since 1995 the number of children and adolescents (0-14 years old) has decreased by 144 thousand, and their share in the total number of population decreased from 20.9% at the beginning of 1995 to 16.6% at beginning of 2002 and 16.0% at beginning of 2003. The number of population aged 60 years and over increased by 36 thousand and their share increased from 19.0% to 21.9% and 22,1% over the same period of time.

The level of demographic burden (population under and over working age per 1,000 population of working age) is high – 646 persons in 2002 and 603 in 2003. It declines in comparison with 1991, when it was 772 persons, mainly due to the increase of retirement age for male and female. The level of demographic burden in 2003 was formed from: 256 persons under working age (404 in 1991), and 347 persons over working age (368 in 1991)[152].

In the eighties the proportion of children and adolescents was higher in the demographic burden than the proportion of pension-age population. Their number decreased since 1993 when fertility rates declined and mortality and migration of working-age population increased. At the beginning of 2002 the number of children and adolescents per 1,000 working age population was almost 1.4 times less than the number of pension age population.[153]

H.1.2. Population dynamics

Since 1990 number of population in Latvia fast has declined – it reduces by about 1 thousand people per month. At the beginning of 2003, the estimated population was 2.331 thousand. At the beginning of the nineties the main reason for population decline was migration, while since approximately 1995 – intensive negative natural growth. The natural increase of population started to fall in the sixties – from 7 persons on average per 1000 population to 1 person at the end of seventies. In the eighties, a slight rise in the natural increase of population was observed as a result of the increase of fertility, caused by some effective state measures (larger family benefits, longer paid stay with child after birth, etc.). In 1991 it was negative, which it is still now. In 2001 the number of deaths exceeded the number of births by 13.3 thousand, and the natural increase per 1,000 of population was minus 5.7 persons.[154] In 2002, natural increase was minus 12.4 thousand; net long-term migration was minus 1.8 thousand.[155]

Due to the above-mentioned reasons, the demographic situation in Latvia is evaluated as adverse.

The fall in the number of urban population was sharper compared with rural population (by 14% and 8%). This is explained by emigration from Latvia (including army troops), which mainly concerned urban areas and first of all – Riga and other cities.

The proportion of urban and rural population has not essentially changed in the country in total. 68% of population live in urban areas, 32% - in rural areas. The proportion of males and

[152] Statistical Yearbook of Latvia 2002. Central Statistical Bureau of Latvia, 2002, p. 42; Statistical Yearbook of Latvia 2003. Central Statistical Bureau of Latvia, 2003, p. 39,41
[153] Social trends in Latvia, Central Statistical Bureau of Latvia, Riga, 2003, p.11
[154] Social trends in Latvia, Central Statistical Bureau of Latvia, Riga, 2003, p.9
[155] Monthly Bulletin of Latvian Statistics, 2003, 3(106), central statistical Bureau of Latvia, Riga, 2003, p.51

females has also not changed over since 1990 – 46% are males and 54% females. 32% of population live in the capital of Latvia – Riga. The proportion of Riga in total population decreases – from about 35% in early nineties to 33% in 1995 and 32% in 2003.

In the latest years the negative balance of long-term foreign migration of residents has speedily decreased. In 2002 it was almost five times less than in 1996 (10081 persons in 1996, 5159 – in 2001, 1834 – in 2002). At the same time the negative natural growth of population has decreased only from -5.9 till -5.3 per 1000 residents.

The number of newly born children in 2002 was only slightly above 20 thousand, exceeding the number of the preceding year by nearly 400 children. Birth rate per 1000 residents during this period went up from 8.3 till 8.6 newly born.

There is an on-going trend of reduction of the average size of a family mainly due to the dramatic decrease of the number of children. Almost half – 47.9% of all families are families with one child, 36.1% – families with two children. The number of incomplete (one-parent) families consisting of a mother or a father with children is rather high – 32.5%.

To reach positive changes in demographic processes the Ministry of Welfare developed the action program for improvement of the demographic situation. The strategic directions of the implementation of the program are: strengthening of families and promotion of birth rate, raising educational and cultural levels. Feasibility of the objectives is linked with economic growth of the country, increase of employment, perfection and further growth of the system of science and education.

On June 4 2002 the Cabinet of Ministers adopted the Public Program for Improvement of the Status of Children. The program foresees activities to provide daily assistance to a child, help in crisis situations and with social integration.

In December 2002 the Cabinet of Ministers reviewed the decision of the previous government on the increase of a benefit for the first child in the family. The amendment foresees that starting with January 2003 the benefit is going to be raised till 6 LVL regardless of the year of birth of a child. The benefit paid for the second child is 1.2 times bigger, for the third – 1.6 times and for the further ones – 1.8 times bigger than the benefit for the first child in the family.

Public health plays an important role in demographic processes. Average life expectancy in 2001 was 71 years (65 years for men and 77 years for women), which is considerably less than in the EU member states. In the group of the EU accession countries this indicator (for men) is slightly lower in Estonia (64.7 years) and for women – in Bulgaria, Hungary and Estonia. Still, this indicator is higher than that of 1990 and has considerably risen also since 1994 when it equalled to only 66 years (men – 61 years, women – 73 years). Shorter life expectancy of men is mainly explained by the higher death rate in younger and middle age groups due to accidents, intoxication, traumas, and other external causes.

Diseases of the vascular system and tumours were among the most frequent reasons of death, the same as injuries and intoxication and other external causes. Infant mortality has gone down from 15.9 cases of death per 1000 born alive in 1996 till 9.8 cases per 1000 born alive in 2002. To improve the situation in this area the Ministry of Welfare developed and the Cabinet of Ministers in February 2001 adopted “The Strategy of Health Care of Mother and Child in Latvia”.

In the Declaration of the Intended Activities of the Cabinet of Ministers of November 5, 2002 the government emphasises that one of the future priorities is to establish a uniform, qualitative and available to all residents of Latvia health care regardless of social status, age

and place of residence. For this purpose it is planned to develop and introduce the compulsory free of charge state insurance system, increase of health care budget till 7% of GDP (3.3% in 2001), etc. To perfect the system of health care the Ministry of Health Care was established at the beginning of 2003.

H.1.3. Main economic and social effects of population dynamics

Up to now declining population dynamics contribute to better economic indicators; namely, it contributes slightly to the increase of GDP per capita and low unemployment figures.

In future aspect, declining population growth will increase the rate of population aging even more, as well as cause even higher demographic burden and other socio-economic consequences.

In 2000, due to emigration the number of core ethnicity – ethnic Latvians, decreased by 390 persons, the respective number being (minus) 294 persons in 2001 contrary to 1995 when an increase of 340 persons was observed. Male and female percentage in departures and arrivals differ. 44.9%of immigrants and 45.2% of emigrants were males, the respective figures in international migration were 55.0% and 49.1%. Therefore more young females depart from Latvia to settle down in other countries and more males arrive in Latvia. Over the year 2001, migration resulted in a decrease of population with higher education by 739 persons, while population with secondary special education decreased by 1258 persons, with secondary education – by 1523 persons, with basic school and lower level of education – by 1639 persons. All latest groups form largest shares among unemployed.[156]

H.1.4. Ethnic composition and minorities

Ethnic composition of the population is given in tables 45-48.[157] As table shows, just 58% of population are Latvians. The share of Latvians has increased after intensive migration of Russians and other Russian speaking population to republics of the former USSR.

Table H1: Resident population by ethnicity, per cent distribution

	Population in 2003, thsd	Structure, per cent distribution			Natural increase	
		1935	1989	2003	1995	2002
Population-total	2331.5	100	100	100	-17336	-12454
Latvians	1362.7	77.0	52.0	58.5	-7730	-5105
Russians	677.0	8.8	34.0	29.0	-6441	-4695
Belarussians	91.8	1.4	4.5	3.9	-1191	-1033
Ukrainians	60.6	0.1	3.5	2.6	-299	-378
Poles	57.9	2.5	2.3	2.5	-820	-566
Lithuanians	32.3	1.2	1.3	1.4	-256	-257
Jews	10.1	4.9	0.9	0.4	-26-	-130
Roma	8.3	0.2	0.3	0.4	77	106
Germans	3.6	3.3	0.1	0.2	-11	-10
Estonians	2.6	0.4	0.1	0.1	-44	-26
Other ethnicities	24.6	0.2	1.0	1.0	-361	-360

Source: Statistical Yearbook of Latvia, 2003, Central Statistical Bureau of Latvia, Riga 2003, p.41, 45

[156] Social trends in Latvia, Central Statistical Bureau of Latvia, Riga, 2003, p.19

[157] The estimate of the ethnic composition of the population is based on the 2000 Population Census and information obtained from the Population Register.

Regional distribution by ethnicity is given in Table H2.

Table H2: Resident population by ethnicity and by city and district at the beginning of 2003 (percent distribution)

	Latvians	Russians	Belarussians	Ukrainians	Poles	Lithuanians	Other
Latvia	**58.5**	**29.0**	**3.9**	**2.6**	**2.5**	**1.4**	**2.1**
Cities							
Riga	41.7	43.3	4.6	4.1	2.1	0.9	3.3
Daugavpils	16.7	54.7	8.6	2.3	15.0	1.0	1.7
Jelgava	53.8	30.7	5.9	3.1	2.0	1.5	3.0
Jurmala	49.7	36.7	4.3	2.9	1.7	1.0	3.7
Liepaja	50.7	34.0	3.8	5.5	1.2	3.0	1.8
Rezekne	43.3	49.9	1.7	1.3	2.7	0.2	0.9
Ventspils	52.8	31.1	4.9	5.1	1.2	0.8	4.1
Districts							
Aizkraukles	76.5	14.3	2.6	1.4	1.4	3.0	0.8
Aluksnes	82.2	13.7	0.5	1.2	0.3	0.2	1.9
Balvu	77.2	18.9	0.7	0.8	0.3	0.1	2.0
Bauskas	73.4	11.3	3.8	2.3	1.5	6.6	1.1
Cesu	85.5	9.4	1.6	0.9	1.0	0.5	1.1
Daugavpils	39.6	38.1	6.4	1.4	11.9	1.5	1.1
Dobeles	73.4	12.0	4.5	1.9	1.6	5.3	1.3
Gulbenes	84.9	11.3	1.1	0.9	0.8	0.3	0.7
Jelgavas	65.8	18.7	7.0	1.9	2.3	3.2	1.1
Jekabpils	67.4	22.7	2.9	1.5	2.4	1.7	1.4
Kraslavas	48.7	24.7	17.3	1.1	6.6	0.4	1.2
Kuldigas	91.4	3.2	0.7	1.0	0.5	2.0	1.2
Liepajas	87.6	3.4	0.8	1.2	0.4	6.0	0.6
Limbazu	88.6	6.1	1.2	1.3	0.8	0.6	1.4
Ludzas	56.8	35.7	4.0	1.3	1.1	0.3	0.8
Madonas	87.4	8.8	1.2	0.7	0.8	0.4	0.7
Ogres	76.5	15.6	2.9	1.4	1.4	0.8	1.4
Preilu	67.4	27.1	1.6	0.9	1.8	0.2	1.0
Rezeknes	56.8	39.1	1.2	0.8	1.2	0.2	0.7
Rigas	64.5	24.5	4.1	2.6	1.8	1.0	1.5
Saldus	83.6	5.3	1.5	1.2	0.6	7.1	0.7
Talsu	92.1	3.5	0.8	0.7	0.6	0.5	1.8
Tukuma	84.7	8.2	2.3	1.2	1.0	1.1	1.5
Valkas	80.9	12.6	2.2	1.3	0.8	0.5	1.7
Valmieras	83.0	10.9	2.1	1.1	0.9	0.5	1.5
Ventspils	89.9	5.0	0.9	1.6	0.5	1.0	1.1

Source: Statistical Yearbook of Latvia, 2003, Central Statistical Bureau of Latvia, Riga 2003, p.42

Table H3: Population of Latvia by citizenship (per cent distribution)

	1996	2000	2003
Total	**100**	**100**	**100**
Citizens of Latvia	72.33	74.46	77.07
Non-citizens of Latvia	-	21.20	21.64
Citizens of Russian Federation	0.33	0.81	0.93
Citizens of Lithuania	0.06	0.06	0.08
Citizens of Ukraine	0.02	0.06	0.08
Citizens of Belarus	0.02	0.03	0.05
Citizens of Estonia	0.01	0.02	0.02
Citizens of Poland	0.01	0.01	0.01
Citizens of United States	0.01	0.01	0.01
Citizens of Germany	0.00	0.01	0.01
Citizens of former USSR with no other granted	27.15	3.18	0.00
Citizens of other countries	0.04	0.09	0.10
Not stated	0.02	0.06	0.00

Source: Statistical Yearbook of Latvia, 2003, Central Statistical Bureau of Latvia, Riga 2003, p.43

Table H4: Mixed marriages (as per cent of the total number of spouses of the corresponding ethnicity)

	Males with spouse of different ethnicity		Females with spouse of different ethnicity	
	1995	2002	1995	2002
Latvian	18.4	19.0	17.7	18.6
Russian	38.2	40.4	40.5	45.1
Belarussian	91.6	89.6	91.8	88.3
Ukrainian	90.4	88.5	90.4	90.3
Polish	87.6	91.1	89.3	91.6
Lithuanian	94.7	96.4	95.3	95.9
Jewish	83.3	84.7	70.0	72.5

Source: Statistical Yearbook of Latvia, 2003, Central Statistical Bureau of Latvia, Riga 2003, p.43

H.1.5. Migration

In the early nineties the direction of migration processes changed, emigration increased rather sharply, its size exceeded the inflow several times.

Nowadays migration is not an important problem in Latvia. In 2002, 32.8 thousand persons immigrated, of which 95.7% was internal (domestic) migration, and only 1.4 thousand persons arrived in Latvia for permanent stay. 34.6 thousand persons emigrated, of which 3.3

thousand persons (less than 6.6 thousand in 2001, 7.1 thousand in 2000 and over 16 thousand in 1995) emigrated from Latvia to settle permanently in other countries.[158]

Internal migration has changed direction. At the beginning of the nineties the direction from cities to rural areas was supported by two processes: former owners returned to regained land estates from cities, economic difficulties and unemployment in cities encouraged people to move to the countryside to get subsistence from agriculture farms. Nowadays people more often move to economically active territories.

Also international migration changes pattern – from dominant migration to CIS countries at the beginning of the nineties to dominant migration to other countries, among them European countries. The amounts of emigration have dramatically decreased compared with the beginning of the nineties, but has increased since 2000.

Total number of immigrants decreases, but there are differences in country aspect. Immigration increases in so called "other countries"[159]. 330 people arrived from this group of countries and stayed in Latvia in 2003, compared to 233 in 2000 and 153 in 1995. Less than at the beginning and middle nineties Latvians return back to their motherland.

Migration balance is negative – more people leave the country than arrive, but with a declining volume. The magnitude of migration depends on economic conditions in Latvia. There are fears that immigration may increase after Latvia joins the EU. Due to lack of specialists it may happen that with the increase of FDI, which is expected after joining the EU, immigration may increase. The statement that after joining the EU migration to European countries may increase is not justified. There are no conditions unless economic difficulties that prevent emigration up to now, still it is not significant.

Analytical conclusion:

Population mobility has never been high in Latvia. Like everywhere, it is directed towards economically developed territories (Riga, Ventspils).

Several factors hamper mobility: just several economically attractive places due to sharp regional disparities, lack of incentives to move (special measure to attract economically active people to backward territories), people are not ready to changes even if given conditions are not satisfactory.

[158] Social trends in Latvia, Central Statistical Bureau of Latvia, Riga, 2003, p.18

[159] Other countries are all immigrant home countries except NVS, Germany, Israel, USA. Information from Statistical yearbook of Latvia 2003, Central Statistical Bureau of Latvia, Riga, 2003, p.50

H.2. SWOT analysis

Strengths	**Weaknesses**
Insignificant migration Internal migration dominates	Population aging Number of population declines Unfavourable age distribution Extremely unfavourable age distribution in economically active territories Depopulation of rural areas
Opportunities	**Threats**
Better social policies Active government policy towards families with children Economic development improve welfare	Immigration Depopulation of countryside continues Social and financial impacts of ageing

I. CULTURAL AND SOCIOLOGICAL ASPECTS

I.1. Income distribution[160]

According to the Human Development Index (HDI) of the United Nations Development Program (UNDP), Latvia in 2002 is placed in the 53rd position in the world according to the standard of living (92nd in 1997, 63rd in 2000).

According to Eurostat data, in 2002 per capita GDP estimated in purchasing parity units equalled to 35% of the average in the EU (25% in 1995). Wages of people employed in the national economy and the disposable income of households have continued going up for several years. However, growth of income of people is very uneven, polarisation of material well-being of people is increasing (see Section 3.7.2). Gini index161 has gone up from 0.30 in 1996 till 0.34 in 2002.

Income of people, both nominal and real, is going up in parallel with the general economic growth (table 49).

Household consumption expenditure per one household member in 2002 equalled in the average to 91.37 LVL162 (including the consumption of self-made products in kind), of which in urban households – 101.51 LVL and rural – 69.97 LVL. In the 20% of the poorest households of the first quintile163 the consumption expenditure was only 47.72 LVL per one household member, using in the average 46% for food and 12% for housing of their total consumption expenditure. Household consumption expenditure of the first quintile equalled to only 52% of the average level of household consumption expenditure in Latvia. In turn 20% of the richest households (fifth quintile) consumed 183.55 LVL per one household member, which is 2 times more than average indicator and 3.8 times higher than consumption expenditure of households of the lowest quintile.

The net wage earned by people employed in the national economy in 2002 was almost 1.6 times higher (by 58%) than in 1996. It went up by 8% in comparison with the preceding year.

Wage continues growing also in 2003. In the first quarter of 2003 net wage was by 9.7% higher than in the first quarter of the preceding year. Real income of people employed, adjusted for inflation, in recent years has gone up by 4% per annum. Wages of people employed in the public sector went up faster than in the private sector.

Labour surveys of the fourth quarter of 2002 testify that almost one fifth (19.1%) of employees received net wage till 60 LVL at their basic workplace, 60.01-100.00 LVL was earned by 29.5%, 100.01-150.00 LVL – by 24.1% and 23.9% of salaried employees received wage which was higher than 150 LVL. However the wage earned at the basic workplace is not always enough to support one's living. Therefore people look for additional work. The results of the survey demonstrate that in the fourth quarter of 2002, 63 thousand people were doing additional work (6.3% of the total number of employed). Besides, we should also take into consideration the fact that not all the respondents were willing to share their information about their additional income.

[160] Copied from the Economic Development of Latvia. Ministry of Economics of the Republic of Latvia, Riga, June 2003

[161] Gini index varies from 0 to 1. It equals to 0 on condition that there is absolute income distribution equality and 1 – in the opposite case.

[162] Because of the change in methodology these results may not be directly compared to results of previous surveys.

[163] Quintile – one fifth of the number of surveyed households grouped in a growing order according to the size of disposable income per one member of a household per month.

Starting with January 1, 2003 the minimum wage approved in the country was raised from 60 LVL to 70 LVL. Previously such increase was approved on July 1, 2001. In May 2003 the government approved the concept on the minimum wage envisaging in the course of the next seven years to raise the minimum wage till 50% of the average monthly gross wage of the employed in the previous year. At the moment it equals to almost 35% of the average gross wage of the employed.

Average wages in Latvia are slightly lower than in Estonia and Lithuania. Average monthly gross wage in euros in the 1st quarter of 2003 in Latvia was 279 EUR, in Lithuania – 326 EUR and in Estonia – 405 EUR (less sickness allowances).

The highest wage in the 1st quarter of 2003 was paid in the sector of air transport (530 LVL), financial mediation (459 LVL), water transport (345 LVL), post and communications (331 LVL). Growth rates of wages in some sectors were very high. In the 1st quarter of 2003 compared to the 1st quarter of 2002 the average remuneration for work substantially increased in post and communications companies (by 21.8%), railway transport (by 28.9%), health and social care (by 16.5%), educational institutions (by 13.6%). Low average gross monthly wage is still typical for workers of construction (by 20% lower than average level of remuneration in the state), agriculture (by 19% lower), road transport (by 22%), fishing (by 41%) and service sectors.

There are substantial differences between public and private sector. In the 1st quarter of 2003 the average gross monthly wage of people employed in the public sector was 201 LVL (162 LVL in the private sector or by 24% more). This is mainly attributed to inadequate wage records in accounting documents of private enterprises.

Table I1: Wages and Other Revenues (average per month, LVL)

	1996	1997	1998	1999	2000	2001	2002
Average monthly wage of employees:							
– in LVL gross	99	120	133	141	150	159	173
– in LVL net	79	88	97	103	109	115	124
– in USD gross	179	207	226	241	247	253	280
– in USD net	143	152	165	176	179	183	201
Average old age pensions of non-working pensioners under social welfare system	37.82	42.24	51.26	58.18	57.79	58.16	62.14
Value of goods and services basket of complete subsistence minimum, per capita	73.78	78.78	82.15	83.18	84.47	86.93	88.76
Real wage index of people employed (percentage against the respective period of the preceding year)	91.2	103.6	105.3	102.9	103.0	103.5	106.0

In 2002 the size of old-age pensions paid to pensioners under the social welfare system went up by 6.8%, compared to the preceding year. This is mostly explained by the fact that starting with the end of March 2002 working pensioners are eligible for full pensions. In March 2002 the Constitutional Court decided that norms restricting the size of pension were contradictory to the state Constitution and therefore invalid.

Moreover, from October 1, 2002 pensions below 90 LVL are adjusted (indexed) for changes in the current consumer price index and 25% of insurance contribution's real wage increase interest or in the average by 1.3 LVL. Pensions between 90 LVL and 150 LVL were adjusted only for consumer price index (average 1 LVL).

Pensions in Latvia are slightly higher than in Lithuania. In the 1st quarter of 2003 average old age pension in Latvia was 101 EUR (63.54 LVL), in Lithuania – 97 EUR. In Estonia average old age pension was higher and equalled to 117 EUR.

One of the factors having a negative impact on the size of pensions is the high share of very low, recently awarded pensions. This may be explained by the pre-pension age retirement caused by the increase of the retirement age. For some pensions this is explained by a lowly remunerated work, especially in rural areas. Also private sector enterprises often hide real income of their workers and do not pay social contribution payments in full amount. Still, it must be noted that the average size of newly awarded pensions in 2002 has gone up from 49.4 LVL till 59.9 LVL.

I.2. Consumption patterns

Analytical conclusion:

In consumption a very modest model dominates with high share of goods of prime necessity (food, public services). For instance, at the beginning of the nineties, attendance of theatres, music halls, cinemas, museums, as well as purchases of books sharply declined. People with average financial conditions could not afford more than what is necessary to survive. On the other hand, even in these days, a lot of luxury cars belonged to the Latvian population. Nowadays more emphasis is put on culture, recreation, other consumption matters, as well as durable articles (cars, household items, computers), health and education.

In 2002, access to credit resources increased and caused remarkable increase in the purchase of real estate – land and housing, as well as other consumption focused on the improvement of living conditions – for instance, repairs of apartments. This in turn caused increase in economic activity in sectors like retail trade, construction, commercial and real estate services, and culture and education services.

It has to be mentioned that Latvian society is open to IS. The high ability to use ICT is based on high computer literacy among younger people. It is estimated that more than 90% of people aged between 15 and 30 are computer literate. It means that in every family there is at least one member who is able to use the computer as means of communication. In addition, only the number of computers in households cannot measure access to infrastructure. It is true that also business computers and public access computers are used for personal communication, and this pattern remarkably improves access to infrastructure.

I.3. SWOT analysis

Strengths	**Weaknesses**
Latvian cultural patterns support IST Attractiveness of Western lifestyle Multiethnic society High computer literacy rate – more than 90% of people aged between 15 and 30 are computer literate Several projects to open distance work opportunities for disabled persons (Soros Foundation Latvia, 5th FP)	Low income level Depression in some part of society Inability to use IST in some regions
Opportunities	**Threats**
Economic development improves Incomes improve	Economic stagnation No collective support for IS in civil society No major IST-based trend in employment patterns

DIAGNOSIS OF FACTORS AND IMPACTS IN THE INFORMATION SOCIETY IN LATVIA

The diagnosis for Latvia is built on conceptual considerations concerning the mission and feasibility of IS.

A simplest definition of IS is that "IS is a society where information and ICT are used:
- as a resource,
- as means for education and self-education, development of skills,
- as means of communication."

In general, IS is important because:
- information has become an important resource,
- skills and technical means are needed to ensure use of information,
- IT and precise information make communication and transactions faster,
- use of information and ICT increase efficiency of any activity.

The main actors and interrelations of the IS are:
- the state – world
- within the state: the government – population, the government – business, business – population, business – business, population – business, population – population.

Implementation of IS is expensive and economic impact (or return) must be always assessed. Like transport and telecommunications, information and information networks belong to infrastructure elements that business and population use for business and private needs. Economic impact depends on the proportional distribution between business and private use of information and information networks. Wider use of information for business needs gives higher economic impact, however, economic impact also exists if information is used only for private needs.

In the last case IS contributes to human development, but this is rather a side effect than the direct mission of IS. The general mission of every action having economic impact is welfare building and this also regards to IS. If higher welfare is ensured by higher efficiency of information use, and this is return, IS may be analysed from the demand and supply sides.

From the demand side IS pays off, if there are fields with high level of information intensity, in which efficient use of information raises efficiency. From this point of view economic development and structure are analysed in the Diagnosis.

From the supply side, two items are important – information as such (content), and technical provision enabling use of information. From the technical point of view, IS is feasible and effective only if:
- all or majority of actors are able to use information and ICT - in this aspect qualification of labour force, education and human component (demographic situation, cultural habits) are analysed,
- all or majority of actors have access to infrastructure – in this aspect development of infrastructure elements and conditions of their use is analysed.
- From the supply side, the roles and status of actors differ.

The world provides information (content) and sets certain technical requirements.

The government sets framework for development of IS by its special IS policy, regulating measures (price regulation), education, R&D policy and other policies, as well as for

economic development that provides financing of IS. Within IS the government is an important element of the internal information network, as it provides information and communication traffic for IS.

Business and population organise and finance large part of IS infrastructure, create customer-oriented information systems, operate and finance these systems.

Thus the feasibility of IS depends on the ability of business and population, as well as on the government to maintain and finance proper (adjusted to the world) infrastructure, information systems, networks and skills.

An important conceptual conclusion is that IS is neither a local problem nor a local organisation. It is a part of a world-wide system, and national policies concerning the content, technical and technological shape and implementation order of IS are national only in one point – to join IS or not. In general, there are only two options with regard to IS – it exists or not, and a coincidence of national policies with external challenges is decisive.

I. Demand side

There are two consumers for IS – business and population. Both consumers are important in aspects of consumption needs (amount, structure) and financing, and certainly there is synergy between them.

Business demand depends on economic structure, size and income (mean for financing of the demand). Population demand also depends on population ability to utilise information and ICT, as well as income (ability to buy services). Both depend on economic development.

I.1 Economic development and structure

We analyse economic development in order to assess need and feasibility of IS (demand side of IS)**.** IS is feasible if there is need for information as a resource or a need for communication, and if economic development provides its financing. Information is more needed in high-tech and information intensive industries, and more intensive communication is needed if FDI and foreign trade are at a high level.

I.1.1. Macroeconomic framework

Economic development in Latvia is fast (growth by 5% in average since 1997), and even faster growth (by 6-8%) is expected in the coming years. Growing domestic demand and increasing exports ensure economic growth. Despite fast growth, mainly because of a very low starting point at the beginning of the transition period in 1990-1993, the GDP per capita in PPP units is the lowest among the candidate countries and makes just 35% of the EU average. Thereby economic background in Latvia is less favourable for IS than in EU countries and other CC, but the gap is reducing.

The majority of high internal risks that could reverse economic development are eliminated. Implementation of market economy has become an irreversible process. Privatisation is almost finished; main legislation of market economy is prepared and is being implemented. Necessary market institutions are established, yet some of them (security markets) are not very strong. Macroeconomic situation is stable, with a stable currency and a financial structure. Latvia meets almost all Maastricht criteria.

Thereby macroeconomic framework in large is prepared for functioning of the economy in a normal regime in compliance with market rules, existing conditions and legislation. The

probability of internal shocks is low and there are not any evident obstacles for progressing economic development.

I.1.2. Economic structure

Emerging economic structure requires information as a resource

Economic structure has remarkably changed compared with early nineties. Service sector dominates. In the service sector the main services are trade and transport services. Knowledge intensive services (finances, commercial services, business consultation services) develop on the basis of FDI. The share of industry and agriculture has remarkably reduced. Construction develops on a stable demand basis.

Since 2000, all sectors give positive contribution to the GDP growth. Fast growing sectors are trade, construction and commercial services. Declining trends have stopped in real sectors – industry and agriculture. Modernisation of manufacturing continues and manufacturing output has started rapid growth (7-8% per year).

From the foreign trade aspect rising industries are those which are strong in exports: metal industry, textiles and food production. All these industries are sensitive in many aspects: growing labour costs, market regulations, low competitiveness due to small scale and other. Besides, these industries belong to low value added sectors.

New industries, such as machine building, pharmaceutical industry, polygraph industry, audiovisual industry and others gain in power. Growth was recorded in electronics and electro-technical industry. In these sectors small newly established enterprises show the fastest growth. Majority of these enterprises operate in co-operation chains with international partner and produce for export.

Yet, the fastest growth has been achieved in trade. In service sector commercial services also grow. Sectors providing public services (electricity, gas and water supply, telecommunications) develop on the basis of local demand. Transport services are also important for development. Development of cultural and leisure services, as well as education services increases on the basis of higher income of the population.

Some service sectors (financial intermediation, commercial services) are generally equipped with modern technologies. Several service industries use e-based business technologies (eBanks, information systems etc).

Thereby all sectors grow, but the main contributors to the total economic growth are traditional industrial sectors and trade, both characterised by low value added. The share of value added in output of goods and services was 44.3 in 2002.[164] The development of high-tech industries and services shows growing trends. FDI contributes to the development of such industries.

Labour productivity differs in sectors, but it remains very low in manufacture. The low labour productivity could be explained by the dominance of low value added sectors in Latvian industry.

The "quality" of economic structure is reflected in particular in macroeconomic fields. The most serious problem of the Latvian economy is growing current account deficit. Exports of goods and services increase year by year, yet in the long-term period imports increase faster. The share of industries producing higher value added is still low (the estimated share of high-tech industries in value added is 3-4%). The share of high-tech products in exports also is not

[164] Macroeconomics of Latvia in figures, 2003, Central Statistical Bureau of Latvia, Riga, 2003, p. 40

high – according to different estimations it is about 6-10%. Also in services the low value added sectors dominate. On the other hand economy needs equipment for modernisation and consumption goods, and this increases imports. These are main the reasons for negative trade balance and consequently growing current account deficit.

Therefore strengthening of the industries and services producing higher value added is seen essential for economic development of Latvia. Production of higher value added is necessary also if there is purpose to speed up welfare growth and convergence with the EU countries. It has to be mentioned that the declared strategic goal of Latvia is to increase welfare on the basis of economic growth that has to be achieved in result of the development of industries and services producing high value added. Sooner or later these plans must be realised.

Taking into account that high-tech industries and services are based on information, we conclude that the need for information as a resource may only increase.

I.1.3. Impact of emerging economic structure

Communication increases and expands territorially

Emerging economic structure mark out increasing need for communication. Trade, transport services, tourism, international business and other services, as well as export-oriented industry are connected with high intensity of international communication. In brief, expansion of communication is connected with emerging higher share of information intensive sectors in economic structure, as well as with the expansion of trade and FDI.

FDI and foreign trade increase the demand for IS. The first chain-react of FDI and foreign trade is larger information flows and increasing amount of transactions, characterised as "the state – world". International transactions require that IS infrastructure in Latvia is to be comparable and complementing at the world level. Second, FDI and foreign trade are important sources for financing of IS: FDI provides investment resources and foreign increases business income through expanding market capacity. Third, FDI and especially foreign trade help to maintain local ICT industry at a compatible scale. It is important as some capacity of ICT business is needed in order to maintain and develop IS networks and to adjust national systems to the world level.

The FDI and foreign trade activity in Latvia is important in relation to the entire economy. In 2003 the main investing countries were Sweden, Germany, Denmark, and the USA.

Latvia is a very open economy – total foreign trade turnover constitutes 102% of GDP. Exports and imports increase year by year. The total trade balance of Latvia is negative.

The emerging composition of the Latvian economy shows that the importance of sectors using information as a resource or IT as a part of applied technologies increases, as well as ICT industries. The development of high-tech industries, of which majority are information-based industries, is set as long-term goal of development of Latvia's economy. This proves the demand for the development of IS in Latvia. In addition, Latvia is a very open economy. Development of FDI and high intensity of foreign trade that is connected with intensive information flows and use of information for business needs increase the demand for development of IS and facilitates its implementation. In order to provide easy communication, ICT must be adjusted to technologies used in the main economic partners, which are European advanced economies and the USA.

I.2. Conditions providing development of information-based and high-tech industries

Henceforth we analyse conditions providing development of information-based and high-tech industries. These are financing of the economy, labour supply, education, innovation and R&D development.

I.2.1. Financing of the economy

Financing of the economy has remarkably improved. Between 1996 and 2001 Latvia had the highest growth rate of investment among all the EU accession countries.[165] Since 2001, financing of economy has improved even more on the basis of FDI and better accessibility of loans. It has provided better financing of the industry. Having undersized industry (just 15% in GDP) it is likely that more investment is needed in order to continue modernisation and speed up development. Yet current financing is balanced with market opportunities. Better financing and investment encouraged even faster development of trade, commercial services and construction, but also increased threats of overheating of Latvian economy. The stability is ensured by the structure of loans (long-term loans dominate), growth in industry and construction, and deep integration of the Latvian economy in EU economic system (larger Latvian banks are owned by foreign investors, Western industry re-locates to low wage zone, more than 60% of trade are directed to EU countries etc).

Private consumption is going up at a steady rate. Private consumption is favoured by the annual increase of wages of the employed and also by the ability of private persons to benefit from consumption credits and loans to purchase and repair housing. Annual growth rates of private consumption do not exceed GDP growth rates.

Thereby better financing of the economy has improved incomes in business and population sectors and this facilitates economic development and consequently, if information intensive sectors progress, they increase demand for IS and improve its financing.

I.2.2. Labour supply

Different situation appears regarding labour supply. We analysed labour supply from two angles: first – the current employment structure, and second, the reserves of labour supply. Doing this we followed two purposes: first we tried to understand the role of employment in economic development and in creating demand for IS.

Participation ratio and employment structure is comparable to that of Western economies in active working age groups. Number of employed persons increases in result of larger demand of the growing economy. In 2002, the absolute majority of employed persons were employed in the services sector.

Since industry has started to grow in recent years, it faces lack of qualified specialists. It was mentioned in the previous text that the growing industry is a high-tech and information intensive industry. This means that industrial specialists will need and must have IS skills.

An increase in the proportion of females in the labour market is observed in Latvia. The highest level of economic activity both for males and females is in the 35 - 44 age group. In the younger age groups employment is less due to military service and studies, and bringing up children.

The breakdown of employment by occupation shows that craft and related trades workers, services workers and shops and market sales workers, as well as elementary occupations have the highest share in the total number of employed. The breakdown of occupations by sex

[165] Economic Development of Latvia, Ministry of Economics, Latvia, June 2003, p.42

shows essential differences. Females are mainly clerks, service workers, as well as professionals, technicians and associate professionals. Males are more employed as plant and machine operators and assemblers, craft and related trades workers, in armed forces, as legislators, senior officials and managers. We did not observe and did not find justification that computer skills or attitude to use of e-systems differ between females and males.

In the long run, the situation in employment deteriorates in Latvia. Demographic situation in Latvia is not favourable. The number of children and adolescents (0-14 years old) and their share in the total number of population constantly decreases. The number of population aged 60 years and over increased over the same period of time. The level of demographic burden (population under and over working age per 1,000 population of working age) is high – 646 persons in 2002[166]. At the beginning of 2002 the number of children and adolescents per 1,000 working age population was almost 1.4 times less than the number of pension age population.[167]

Since 1990, the number of population in Latvia has been declining fast – it reduces by about 1 thousand people per month. At the beginning of 2002, the estimated population was 2346 thousand. In 2002, natural increase was minus 12.4 thousand; net long-term migration was insignificant.[168]

The demographic situation in Latvia is evaluated as adverse. In economic terms it means less labour supply and higher social expenditures, which together summarises in higher taxes or low social benefits.

Other demographic indicators are not so important from the employment aspect. The proportion of urban and rural dwellers as well as the proportion of males and females also has not changed over since 1990. 32% of population live in the capital of Latvia – Riga. The proportion of Riga in total population decreases – from about 35% in early nineties to 33% in 1995 and 32% in 2003.

Population situation is not favourable for fast development.

For the time being international migration of population is not large. More young females leave Latvia to settle down in other countries and more males arrive in Latvia.[169] Internal migration has changed direction. At the beginning of the nineties the direction from cities to rural areas was supported by two processes: former owners returned to regained land estates from cities, economic difficulties and unemployment in cities encouraged people to move to the countryside to get subsistence from natural agriculture farms. Nowadays people more often move to economically active territories.

Also international migration changes pattern – from dominant migration to CIS countries in the beginning of the nineties to dominant migration to other countries, among them European countries. The amounts of emigration have dramatically decreased if compared with the beginning of the nineties, but it is slightly increasing now.

The opinion that after joining the EU migration to European countries may increase is not justified. There are no conditions that prevent emigration, still migration is not important.

Population mobility has never been high in Latvia. Like everywhere, it is directed towards economically developed territories (Riga, Ventspils).

[166] Statistical Yearbook of Latvia, 2001, Central Statistical Bureau of Latvia, 2002, p. 42
[167] Social trends in Latvia, Central Statistical Bureau of Latvia, Riga, 2003, p.11
[168] Monthly Bulletin of Latvian Statistics, 2003, 3(106), central statistical Bureau of Latvia, Riga, 2003, p.51
[169] Social trends in Latvia, Central Statistical Bureau of Latvia, Riga, 2003, p.19

Several factors hamper mobility: few economically attractive places due to sharp regional disparities, lack of incentives to move (special measures to attract economically active people to backward territories), people are not ready to changes even if given conditions are not satisfactory.

Under the conditions described, the number of population in working age in general decreases; the possibilities for their reproduction fall as decrease rates of population under working age – who shall substitute the employed persons in the future - are considerably sharper. This means that availability of workforce may eliminate economic development in the future in general and eventually may hamper also the development of high-tech industries (depending on quality of future labour force).

Looking from the other side, also job creation reserves are not exhausted. The share of employers in the total number of employed is rather low. The number of enterprises per 100 persons in Latvia is low: about 1.8 in Latvia compared to 5.0 in EU countries. Consequently, there are reserves and much effort must be devoted to develop entrepreneurship and management skills.

It is worth to examine unemployment structure as a potential labour force reserve. Average unemployment rate is not very high (7-8% of economically active people), but it varies in regions – from 4.2% in Riga to 26.6% in Rezekne (East Latvia). The unemployment situation copies regional disparities in economic development.

In compliance with the household survey results, the lack of working experience required nowadays by employers is one of the major unemployment reasons. Jobseekers without experience and young people who have graduated from educational establishment (more often general education or general professional education) or dropped out and are searching for job form the largest share of jobseekers. At the same time this is the most prospective reserve to increase labour supply.

Educational level per 1000 population is rather high – 139 persons with higher education.[170] At the same time, the majority of employed as well as unemployed have secondary education. The share of employed persons with higher education is rather high. Still almost 6.5 thousand persons having higher education are not employed. Industries report lack of engineers.

It may be concluded, that qualification of employed people is not quite satisfactory for the development of high-tech industries and IS with regard to formal indicators of education and skills, but, at the current stage, provides operation of information intensive sectors and use of information technologies. Reserves of labour force for expansion of economic activities in knowledge intensive sectors are limited.

From the IS point of view, the population aging may slow down adoption of ICT. In addition, the share of newly educated people may decline, and this may hamper development of information intensive industries, that form demand for IS. It is difficult to forecast population structure and behaviour in the future.

A lot of problems in employment and job creation are caused by shortcomings in the Latvian education system and stemming from the government policy towards creation of economic environment that is favourable for building a modern economy, including innovation policy and development of SMEs.

[170] Results of the 2000 population and housing census in Latvia. Collection of statistical data. Central Statistical Bureau of Latvia, Riga, 2002, p.187

I.2.3.Education

We analysed education from two angles – first, how it corresponds to human development and to economic development, and how it contributes to IS building.

Since 1990, education system has been constantly reformed at all levels and forms and formally is prepared to current requirements. Main achievements, as it is concluded in the National Concept of Education for 2002-2005, are reduced to the organisation of education system, optimisation of the network of educational institutions), the education quality, financing, accessibility, internationalisation, participation in international comparative research in education that provides better insight in local problems and solutions, as well as helps to learn trends, quality requirements and problems in education at the world scale.

In school year 2002/2003, 224.5 thousand persons attended general secondary schools of which 36% in Riga.[171] Good language skills are typical for Latvia's population. At the same time, Internet specialists mention insufficient language skills as one of the reasons of low Internet use.

The quality of vocational training is not satisfactory. Only 30% of the total number of school leavers of vocational educational establishments of 1990 – 2000 worked in their professional field[172].

There is large demand for high education, and correspondingly the number of higher education institutions increase. The number of students has increased 2.8 times compared with 1993. For every 1,000 people in Latvia, 50.7 are students (one of the highest rates in Europe).[173].

In higher education, studies in social sciences are the most popular study direction. Importance of social sciences increases. The share of engineering and technology is still quite low, which can be explained by the poor condition in Latvian industry and low flexibility of education system to labour market demand. Among engineering and technology sciences the most popular are computer related sciences and IT, as well as specialities from the scope of construction industry (architectures, computer design, construction engineering etc.). Technical provision of education institutions is rather poor. More attention is paid to teachers' and lecturers' salaries, renovation of school buildings etc. These measures are urgent, as many schools are in critical technical condition.

Largely because of incentive from the industry representatives, much attention is paid to improve teaching in IT related sciences. It is important to note that improvements in education are the result of lobbying from industries (metal industry, chemical industry), and this does not happen where industries are not active.

It may be concluded that massive reforms have been made in education, and for the time being it is harmonised with the international practice from the institutional point of view. In the future more attention must be paid to content and skills development and development of education as a united system (consisting of all levels and forms of education). With respect to IS, education system provides basic skills for use of ICT, but is not sufficient for supplementing of labour force that is necessary for development of "new economy" (forming demand side of IS).

[171] Education institutions in Latvia at the beginning of the school year 2002/2003. Central Statistical Bureau of Latvia, Riga, 2003

[172] Social Trends in Latvia, 2003. Analytical report. Central Statistical Bureau of Latvia, Riga, 2003, p.30

[173] Social Trends in Latvia, 2003. Analytical report. Central Statistical Bureau of Latvia, Riga, 2003, p.30

I.2.4. Innovation

Innovation in the meaning "new to existing" or "new to economy and local market" (modernisation) is a main measure taken by enterprises in the period of transformation. All kinds of innovation are represented in the Latvian industry and services. Regarding particular sectors the most innovative are financial intermediation, R&D activities, and production of chemical products and non-metallic mineral products. In the former state enterprises innovation is performed as modernisation of old technologies fully or partially. Up to now innovation has been carried out on the basis of imported technologies. Local research achievements are rarely used. It is likely that the real need to innovate (in the meaning "new to market") is just approaching.

Recent innovation survey shows that the share of innovative enterprises decline, and it is low in the group of small enterprises. This may be caused by the differences in statistical reporting or the differing perception of what innovation is, but also by the fact, that enterprises are satisfied with new technologies obtained in the first round of innovation (many of them were established not so long ago). We cannot exclude that the reason of low innovation performance is the weakness of national R&D system.

At the government level, the process is strengthened by the Innovation Concept, National Innovation Program and the relevant Action Plan, and establishing of innovation institutions. The Concept envisages the development of R&D and education institutions, as well as improving interconnection of business and science and development of innovation dissemination and diffusion institutions. Several such institutions are established in Latvia, but their effectiveness is low. Also improvement of R&D is not achieved.

We believe that activation of the innovation process is decisive for development of high-tech industries and enterprises, not only in industry but also in services. The first step in this direction is strengthening of national R&D system to ensure true innovativeness (new to market) at least in some sectors.

I.2.5. R&D

Funding of R&D activities in Latvia is as low as 24.7 million EUR in 2002 – just 0.45% of GDP. In Latvia the government spend more for R&D than business. Precise data of amounts spent on R&D by regions is not available. Taking into account that main research institutions and business enterprises are located in Riga, it is likely that also the major part of R&D funding is allocated in Riga. The number of R&D personnel per 1000 population is low – just 1.52 persons in Latvia. In addition, the number of R&D personnel is decreasing year by year.

The conclusion is that R&D is not sufficient for science-driven economy.

I.2.6. Population income

Population demand for IS depends on income level and consumption patterns of population.

During last years (1996-2000) the disposable income of the population increased in Latvia, but it is still very low. The increase is not homogeneous, and it has mainly increased in urban areas. The gap between urban and rural population and the differentiation among regions, particularly between Riga region and others, has increased. In rural areas income has increased insignificantly not surpassing the pace of consumption price increase. The purchasing power of rural population has decreased.

In 2000 the disposable income of Riga region was 20% higher than on average in the country. In other regions household income was lower than the average income in the country, but in

Eastern parts of Latvia - Latgale region they were the lowest – about 75 EUR per one household member monthly.

In consumption a modest model dominates with high share of goods of prime necessity (food, public services). At the beginning of the nineties, attendance of theatres, music halls, cinemas, museums, as well as purchases of books sharply declined. People living with average financial circumstances could not afford more than what is necessary to survive. On the other hand, even in these days, a lot of luxury cars belonged to Latvian population. Nowadays spending on culture, recreation, other consumption matters, as well as durable articles (cars, household items, computers), health and education increases.

In 2002, access to credit resources increased and caused remarkable increase in the purchase of real estate – land and housing, as well as other consumption focused on improvement of living conditions – for instance, repairs of apartments.

I.3. Conclusion: demand side of IS

From the **demand side** current and forthcoming processes in Latvian economy show favourable trends regarding development and financing of IS. Emerging economic structure, based on increasing share of high-tech industries and services, growing exports and imports and FDI, is connected with increasing use of information and intensive communication. The placidity in implementation of the envisaged economic structure is caused by inadequate processes in education, innovation and, to some extent, local R&D. Innovation activity is low, partly because of the weak national R&D system, and this may hamper competitiveness. On the other hand in an open economy FDI and foreign trade to some extend compensates for the weakness of local R&D system, while the effective national education system remains important.

In the long run, adverse demographic trends will cause economic development problems.

Population and business income and investment grow. Large portion of income and investment resources is used for purchase of IT and thus favour the development of ICT industries. Yet the available financing is comparatively low as the welfare level in Latvia is still low, as well.

II. Supply side

From the supply side we analyse national and regional policies and legislation, institutional setting and regulatory framework, driving motivation and main actors, access to infrastructure, provision with information systems.

II.1. National and regional IS policies and legislation

- National and regional IS policies and legislation are analysed with respect to the consideration that the government plays an important role in creation of IS:
- It must be a mover of the process, since IS is beneficial for society,
- With this purpose it has to develop IS from the supply side – by creating nutshells of widely used information networks (communication G-W, G-B, B-G, G-P, P-G),
- It contributes from the supply side also by providing functioning of general infrastructure (telecommunications),
- It elaborates and implements policies.

We analysed government policies from two aspects: how they facilitate economic development and what support is provided by these policies to thecreation of IS.

Up to 2002, there was no special IS policy in Latvia, but IS and development of ICT was mentioned in all active strategic documents. The government policy was focused more on implementation of IT. Coordinated IT policy in Latvia started from mid 1996 with establishment of the Department of Informatics at the Ministry of Transport.

The system of strategic documents in Latvia is based on the Long-term economic development strategy of Latvia, and it includes sector development strategies and National programs. Special measures for achieving IS were not identified in these documents, but IS was understood as a side effect, or as a factor promoting economic development.

More precisely, the IS problem is tackled in the Development Plan. The Plan includes special measures and presumable financing for expanding use of information both from the demand side (improvement of skills) and the supply side (improvement of infrastructure, creation of e-based governmental, education, consultancy etc. systems). The Development Plan is envisaged for the future and its feasibility depends on the availability of EU funds.

The National Innovation Program is focused on facilitating of innovation activities. The National Innovation Program, its action plan and conceptual documents in education envisage increasing number of students in IT sciences, in order to improve the quality and characteristics of the teaching group and training in this sector.

The Long-term Development Strategy, as well as the Industrial Development Guidelines of Latvia established that an important task of industrial policy in Latvia is to support the development of industrial clusters. Up to now Forest Cluster, Information Systems Cluster, Scientific Research and High Technologies Cluster, Engineering Cluster is officially shared out of the entire economy. Of all mentioned, Information Systems Cluster (ISC) is institutionalised to the best advantage.

The state support includes special tax regime for knowledge intensive industries since 1999. The target of this measure is all knowledge intensive industries, but in practice it tackled mainly IS supporting industries. In 2004 the government included several other industries outputs in the list of high-tech products subject to the special tax regime.

Several measures are focused directly on implementation of information technologies. These are the National Program on Information, the Socio-economic program eLatvia, the Action Plan for this program, a set of documents that allow and promote use of electronic documents: Concept on legal status of electronic documents and the law “Law on electronic documents”, Concept on eGovernment Latvia that has to be implemented within the program e-Latvia, Concept on eCommerce, the law “On declaration of the place of residence”.

In 2003 several conceptual and legislative documents were approved: Concept about registration of Internet providers and creation of the state supervision system in Internet provision, the law “Law on the state information systems”, eGovernment concept that appoints Ministry of Communication responsible for implementation of the Conception.

At the end of 2003 – beginning of 2004, the Ministry of Economics elaborated the Action plan for implementation of Innovation Program and the Industrial Development Guidelines.

IT legislation is aligned with the demands of the EU, WTO and other international organisations. Before accession to the EU Latvia has to establish the Integrated Administration and Control System (IACS), which is the aggregate of equipment, procedures and staff functioning to ensure administering and control of direct payments to agriculture.

The government promotes the development of information and e-based systems at its institutions, using Public Investment Program (PIP) resources, EU aid and pre-accession

funds and other financing. Investments in the sector of information and communications made up more than ¼ of total PIP.[174]

It may be concluded that the government makes efforts to create institutional and legislative background for the development of knowledge intensive type of economy, and contributes to development of IS with implementing of information systems at its institutions. Much attention is paid to implementation of ICT, less to other aspects of IS, such as ability to use information and IT.

II.2. Institutional setting

Up to 2003, several state and public institutions were involved in the implementation of IS. Since 2003, the Office of Information Society (established in end of May, 2003) has been the main executive and co-ordinating body. The Office is authorised to co-ordinate IT projects at the state level (former responsibility of Ministry of Communication). The chief of the Office is subordinated directly to the Prime Minister of the Republic of Latvia, and institutionally to the State Chancellery. The chief of the Office is to be hired (and dismissed) by Director of the State Chancellery after reconciliation with Prime Minister. The last fact is important in aspect of authority of the Office.

II.3. Regulatory framework

The Public Utility Commission regulates services that are considered as public and issues licenses. The Commission was established in 2001, following the concept of a single public service regulatory body. The Commission is really independent. The staff of the Commission is approved by Saeima for 5 years, and the decisions of the Commission are incontrovertible for any state of a private institution except the court. The Commission is financed from the state fee that is set at the 2% level from the net turnover of delivered public services.

As regards data protection in information systems, the State Data Inspectorate, established under the law on Personal data Protection of March 2000, started operating in January 2001. The 1981 Council of Europe Convention on the Protection of Individuals with regard to the Automatic Processing of Personal Data was ratified in April 2001.[175] Relevant institutions are responsible for the protection of intellectual property rights and fighting against software piracy.

The capacity of managing and regulating institutions is satisfactory; some problems exist with the protection of intellectual property and software piracy. Regulatory framework is very liberal, only affects the most essential regulations (intellectual property rights, distribution of frequencies, telecommunication process).

There are voices that telecommunication market is not actually liberal, as the Public Utility Commission does not regulate interconnection tariffs, which are high. There are also other problems in the telecommunication sector, caused by lack of updated sector strategy. The government plans to issue a new Communication law that would replace the current Telecommunication law.

[174] Economic Development of Latvia, Ministry of Economics of the Republic of Latvia, Riga, December 2002, p.97

[175] Regular Report on Latvia's progress Towards Accession, 2001, Commission of the European Communities, Brussels, 13.11.2001, SEC(2001) 1749, p.92

II.4. Driving motivation and actors

The driving motivation of political decisions promoting development of IS is the understanding that IS (more often ICT) is necessary for economic development, modernisation and restructuring of economy from low value added production to more effective, based on knowledge intensive industries. Indeed, functioning of the open economy where information and effective communication is a decisive competitiveness factor without effective information service is impossible.

The government has to react to the requirements of business for effective information infrastructure, as well as information services that respond to ICT at their disposal. The last is very important, as to ensure communication with foreign partners, Latvian enterprises have to adjust to the world technical level of communication means. On the other side, if available ICT provides faster communication, business strives to implement new communication technologies within the country, which also includes functioning of the state information systems.

To answer business request, the government prepares a plan for improvement of the business environment every year, which is based on proposals elaborated by the responsible ministries in co-operation with the social partners, of which the Council of Foreign Investors is the most influential. This plan also includes measures aimed at the improvement of the business – government communication (for instance, computerisation and Internetisation of the state procurement system).

Wide representation of IS related measures in the National Development plan is promoted by the necessity to respect EU policies, as National Development plan frames use of EU funds.

Implementation of IS policies fall into interests of every business, and especially ICT producers and service providers are interested in fast development of IS. This explains the fact that representatives of large ICT companies are main drivers of the policy making process in IS issues – and they really benefit from the active ICT and IS policy. Strong ICT business lobby has often promoted changes in the governmental information systems.

IS has active support from lobbying institutions – IT enterprises and research centres, public organisations and state institutions that are responsible for economic development (Latvian Development Agency, the Council of Foreign Investors).

No doubt that EU integration has influenced the development problems concerning IS at the institutional level. Requirements to elaborate local economic development policies and harmonise them with the EU practice, as well as regular assessment and proposals regarding consistency and reasonability of such policies, have promoted co-ordination of ministries' work and more comprehensive treatment of aspects of a "new economy" (including IS) in local policies.

It may be concluded that despite the lack of special IS policy, legal background of IS is being created. State institutions implement information systems and eGovernment components. EU integration, business interests and necessity to provide open economy with the relevant infrastructure promote the process. In general, main emphasis is put on the development of IT and IT related education. Less attention is given to improvement of IT use, including training and access (for instance, in rural areas, where access to IT and Internet is limited, and schools are not properly equipped with IT for training needs). The process has started, but without common and comprehensive policy it appears fragmented and therefore the potential efficiency has not been achieved. Main actions are at the government institutions, while actions aimed at improvement of education, regional developments, development of SMS, are less applied.

II.5. Access to infrastructure

The provision with the physical infrastructure (networks) is at a rather high level, even too high compared with the level of economic development. It is partly because of heritage from the former USSR, when the density of telecommunication systems, especially in rural locations was very high, and partly because of rapid development of new ICT providers. It is expected that liberalisation of telecommunication market will facilitate expansion and modernisation of physical infrastructure even more and appearing of alternative public networks. On the other hand, having only low income, potential customers are not able to obtain necessary attributes (computers) and pay for services that enable access to infrastructure. Regional differences are important.

Three operators – Lattelekom, Latvijas Mobilais Telefons and Tele2, provide telecommunication services. Mobile telephone network covers the majority of the territory of Latvia. Penetration rates of telecommunication services are satisfactory, but prices are high. With increasing competition in telecommunication sector, prices go down. It is expected that new undertakings might enter the market – the auction of the new standard UMTS mobile telecommunication licences was held in 2002.

Computer penetration and the number of Internet users is rather poor. Application of ICT in industry is a necessary pre-requisite of competitiveness. In 2001just 47% of companies in Latvia use computers. Just 36% of small enterprises (with number of employers less than 10) may afford computer. The less equipped with computers are enterprises in the hotel and restaurant sector (28.2% of enterprises within the corresponding group in average, 20.1% in group of small enterprises). The best equipped are financial institutions – 71.3% in average and 61.9% in the group of small enterprises.

Just 26.4% of enterprises have access to the Internet, but the share of such enterprises grows. Even faster growth of Internet users is fixed in the group of small enterprises. Again, the lowest provision is in hotel and restaurant sector, the highest – in financial intermediation. The most popular is Dial-up access – 51.2%. Just 7.4% of enterprises have home page on the Internet.

On the other hand, a lot of investment is done in order to improve IT provision in state institutions by using Public Investment program, international funds, international aid and others. Public administration and defence institutions are best equipped with computers – the level of computerisation there reaches 93%, followed by educational establishments – 75%.

It may be concluded that ICT penetration rates are high in comparison with the economic situation but moderate with regard to provision of effective communication and management. The major obstacle of wider computerisation is lack of finances. The provision improves rapidly, but correlating with the economic development.

II.6. Information systems and networks

Provision with information systems and networks available for public are rather rich. Several (but not all) of mentioned state systems are available for public access in the state institutions. Each ministry and state institution has Internet home page, some of them are built in interactive regime. State supported and private TV provides reproduction of their programs on the Internet and on-line viewing. Customer related system operates in the Road Traffic Safety Directorate and also in some local governments.

In the private sector e-technologies are widely used in financial intermediation, transport and trade. The most often used ones are eBanking services. There are plans to introduce sophisticated systems in health care (telemedical treatment or eHealth care services, for

instance, distance consultancy based on cardiogram taken by patient at home), e-education (international lectures from distance) and others. Private companies provide content for large number of Internet domains, concerning politics, creation of civil society etc. The supply from the private sector rapidly expands.

Specialists consider that for the time being content problem is important in order to gain customers' confidence and increase Internet use. They think that for a Latvian customer more information in Latvian must be provided.

In general institutional capacities, regulatory background and provision with IS may be assessed as satisfactory. Institutional background of IS is prepared in general. At the government level implementation of relevant measures is rather fast within the magnitude and scope of different tasks, which interpose all-embracing transformation of the economy. From the business side implementation of IS infrastructure is hampered by lack of finances. However, the whole development of Latvian economy promotes and urges IS, and improvement of its constituents is only a question of time.

Effectiveness of investment in IS is a more complicate question. According to our observations the state administered information systems are not mutually co-ordinated and this weakens their efficiency. The government institutions often modernise their information systems, because systems are gradually implemented, and every new system is more updated and inconsistent with the previous. The process is expensive and ineffective at the first sight, however neither contemporaneous implementation of the entire state information system, nor lagging behind updated systems is possible.

We did not observe excess expenditures or low efficiency of information systems in the business sector, but empirical judgement of this hypothesis is impossible due to poor investment data and the complexity of impacts in conditions of massive modernisation.

Institutional restrictions for implementation of IS are not existing. Regulatory background is liberal. Only public telecommunication services are regulated, however telecommunication markets are also fully liberalized with liquidation of the natural monopoly status of public service provider – former state enterprise Lattelekom.

II.7. Development of ICT industries

Finally we analyse the development of ICT industries in Latvia. ICT sector have different roles with regard to IS. On the one hand, ICT is the main infrastructure element in IS, and some ICT business units are necessary to ensure infrastructure working and improve it. On the other hand, ICT business is an independent sector, working towards all possible markets, not connected with local IS. The feasibility of IS depends on the strength of ICT business, as well as strength of ICT business depends on the development of IS.

ICT and telecommunications are among the fast growing sectors. Both industries provide modern services and technologies and have high development capacity. According to recent research of International Trade Centre, competitiveness of Latvian IT sector is very high – it was given mark 8 from 10, while unused export potential is assessed by mark 6.7 from 10[176].

For the time being ICT is based strongly on the local demand, great part of which is government procurement. The whole sector has remarkably grown since 1996, and in particular in 2001 and 2002. The fastest growth in all aspects is fixed in manufacture of office machinery and equipment, wholesale of office machinery and equipment, telecommunication and computers and related services.

[176] Global Technology Markets. Inforemation technology. Country Profile – Export Potential. Latvia: 2002. International Trade Centre. UNCTAD/WTO, 2002, p.188

The largest sector in terms of the number of enterprises is computers and related activities, manufacture of office machinery and computers and telecommunications.

Latvia's ICT sector does not produce any hardware parts for ICT, it deals only with assembling systems from imported parts. From this point of view Latvia is a strong importer.

It is known that ICT is an attractive zone for FDI, still precise figures concerning the entire sector are not available. Foreign investors show interest in the development of the sector "Office equipment and computer production" in Latvia, the majority of investment is made by US and Estonian businesses.

Major actors of ICT industry in Latvia are fixed and mobile telecommunication operators. Latvijas Mobilais Telefons, first and by that moment largest (by number of clients, by size of infrastructure and by financial indicators) mobile operator is also Top 1 enterprise in Latvia. Lattelekom, a fixed telecommunications operator is the market leader, as the monopoly on fixed telecommunications was closed only by May 2003.

The second largest group of major actors of ICT industry are ICT whole-sellers – GNT Latvia, ELKO Riga and others.

Software producers also play a serious role in ICT industry. DATI grupa, Tilde, DataPro, Tieto Enator and Exigen Group should be mentioned in this chapter.

Fast growing and taking more and more market shares are Internet Service Providers – Delfi, Apollo (part of the Lattelekom) and Latnet.

Regarding to the hardware industry, Microlink group is one of the most important players.

SCENARIOS FOR FUTURE DEVELOPMENT

Scenario - business as usual

The "baseline scenario" suggests that current fast development of business legislation and legislation concerning IS implementation continues, but proposed measures are partially implemented.

I. Public policies

I.1. Political issues

Latvia continues its integration to the EU, NATO and other international structures.

Political relations with Russia, the Baltic Countries and CEC remain at the present status. Special measures aimed at improving Latvian-Russian relations, as well as increasing activity in CE countries and special programs in framework of Baltic co-operation are not applied.

Society integration policies (ethnic integration, social integration, gender integration) are formal.

I.2. Economic development policy

Macroeconomic policy remains unchanged. Latvia joins EMU in 2006 - 2007.

Integration in EU and NATO is unconditional from Latvia's side, monitoring and assessment of the impacts and consequences of integration are absent.

The fast progress in creating institutional basis for economic development continues and it is aimed at development of high value added production (regardless of the sector of national economy in which it might appear). Economic development policies are neutral to particular sectors, based on cluster's approach. The government focuses on establishing conditions for development of high value added (understood as knowledge based) production rather than supporting particular industries – potential producers of high value added.

Competition rules are fair. Product and market regulation systems are adjusted to EU approved principles, expected to be as liberal as possible.

The government declares its business support policy, including fiscal policy (tax schemes), principles of the state support, business support institutions, government participation in creation of business support institutions, export and import policies, state guarantees system etc. The state support is aimed at promotion of innovation and R&D in business enterprises.

The implementation of the envisaged policy is not fully realistic due to the drastic fiscal constraints, high social needs, and consolidation of economic and political powers. Still the government uses every opportunity, including FDI and loans, to allocate for facilitating of high value production as much as possible. Financing of economy is kept in conformity with stability considerations.

The government introduces clear foreign trade promotion strategy, but it does not have sufficient funding and its implementation is slow and partial.

Efforts are made to improve the quality of professional education and the content of education. The government introduces measures aimed at raising enrolment in natural sciences.

The government provides moderate financing of innovation policy, but it promotes development of innovation processes in business enterprises (declaring government policies aimed at the development of high value added production, supporting innovation and training, creating necessary financial institutions). The government sets an ultimate goal to increase financing of innovation process to 1% of GDP in 2050 and 2% of GDP in 2010.

The government tries to keep low tax burden in order to facilitate returns and investment. Tax policy favours foreign trade, investment and development of high-tech industries.

It is expected to support development by effective use of EU structural funds.

I.3. Sector development policies

The government elaborates sector development policies in line with EU strategies. Sector development policies are based on cluster's approach to national economy; they are expected to be coherent with sector policies in related industries. Sector representatives participate in elaboration of sector policies.

Sector policies are not based on local economic research. Assessment of every sector is optimistic from the competition point of view.

Monitoring of sector development is the competence of Ministry of Economics; adjustment of adopted development strategies to changing circumstances is not common practice.

I.4. Investment

The government continues investment promotion policy with tax deduction for large investments. Investment promotion policy is general and not restrictive; nevertheless indirect management of investment flows (through clear sector policies, stability and market promotion policies) aimed at accumulation of investment in high value producing sectors is applied.

I.5. Social development

The government implements social policy measures according to the principle of "easier solution". Social policy and systems are made secure and stable. Social insurance benefits slowly increase, but remain low compared with living costs during the whole period. Social policy is not a priority, but some measures are implemented in order to eliminate social tension. It is assumed that better economic development will soften social problems.

Special national level income policy does not exist. The government sets higher income normative, but it is difficult to provide their implementation.

Following the course on optimisation of social expenses, the government implements insurance principles in main social systems (pension insurance, health care insurance, fully credit based education).

I.6. Labour supply

Demographic policy remains passive.

Industrial relations develop in line with EU common policies, and this enlarges labour market resources. The government does not implement special measures aimed at better involvement of women, graduates and population in pension age or near to that.

I.7. IS development policies and legislation

The government understands the significance of information and communication in the emerging economy, but is not able to allocate the necessary resources.

It elaborates lacking legislative basis and continues implementation of state-level information systems.

Established responsible institution and regulating institutions are effective.

II. Consequences of applied policies

II.1. Political situation

In 2004 Latvia becomes a full-right member of European Union and NATO.

Political situation is stable. Integration into EU and NATO stabilises Latvia's international position. Relations with the CIS countries develop on the basis of economic cooperation. Tension in Latvian-Russian international relations remains and is reflected in internal politics, but real political or economic actions against Latvia are not applied.

Internal political situation is stable. Despite some turbulence in the government, the overall political course does not change.

Public integration policies do not contribute to real integration, there are still on the basis of improving welfare, internal political situation stabilises. Efforts to fight corruption and other negative phenomena are formal, and consolidation of economic and political powers continues.

II.2. Economic development policies

Integration into international structures improves economic and political stability.

Macroeconomic situation is stable with moderate state debt and fiscal deficit. Latvia is obliged to fulfil stability criteria of EMU and it does so.

Disregarding of integration impacts endangers competitiveness of local producers, but this does not harm economic development as a whole.

The fast progress in creating institutional basis for economic development facilitates economic development, but partly implementation of adopted policies eliminates potential gains. Neutral economic policies place all sectors equal and provide the most effective selection of growing sectors – on the basis of competition.

Even partially implemented, the measures aimed at promotion of high value added (knowledge based) production and innovation-focused state support policy facilitates restructuring. Exports of high value added production increases, but also imports increase at the beginning of the period.

Financing of innovation process increases to 1% of GDP in 2005 and 2% of GDP in 2010. Funding of R&D from the state budget gradually increases - to 0.5% of GDP in 2005 and 0.8% of GDP in 2010. R&D activities are substantial components in projects subject to financing from the EU funds.

Facilitating of exports is reflected in higher exports. During the first years of the period imports increase. Foreign trade balance fluctuates around its current value for some years and then slowly improves.

The expected annual economic growth would be 5-7%.

II.3. Sector development policies

Proclaimed sector policies improve stability of the economy. Clear sector policies and stable macroeconomic environment promote entrepreneurs to undertake more risky business and to enter high value added sectors.

The development of such businesses will face lack of workforce and innovation ideas, unless they are organised on the basis of FDI. Partial implementation of the state support schemes and institutions makes newly created businesses vulnerable to risks. Also lack of precise knowledge about market opportunities, sector development and hyper-optimistic expectations about their competitiveness and markets increase probability of failures

Cluster approach promotes coordinated development of sectors, yet determinate time is needed to engage lacking supporting structures.

The importance of traditional industrial sectors (wood, textiles, food and steel production) and transit-based services remains at least for some 5-7 years. Traditional industries develop towards better quality and higher value added production. Better export perspectives are seen for electronic and electro-technical industry, which develops on the basis of FDI or close co-operation with foreign enterprises.

The growth is expected in service sector. Local transportation services companies may lose competition with transportation operators from EU countries.

In the sector of knowledge-based services, IT services remain dominant. ICT services serve local market. Without special promotion actions, other knowledge-based services (commercial, legal, education, hospital services) remain neutral to exports and serve mainly local market. In legal and commercial services FDI-based enterprises dominate.

II.4. Investment

If governmental economic and sector policy and supportive measures are clear and promoting, investment grows. Also economic development contributes to investment.

It is expected that FDI might grow with integration into the EU. Also clear sector policies promote FDI. Larger FDI is expected in high value added industries, if these industries enjoy state support. The appearance of large multinational enterprises in Latvia is doubtful.

II.5. Social development

Social development depends on economic development. Income levels increase slower than the economy.

Without specific social assistance measures, polarisation of population continues and even increases.

The share of paid education and health care services increases. The unfavourable demographic situation deepens the generation conflict.

II.6. Labour supply

Demographic situation remains critical. Low taxes eliminate the capacity of social policies and demographic trends remain reverse. On the other hand economic development favour slow increase of birth rates. The number of population declines yet at a slower speed.

Emerging economic structure imposes qualitative rather than quantitative changes in labour demand, still more labour force is also needed. At the beginning of the period, education level of population is high, but education is inadequate to market demand. The highest unemployment remains in early and late age groups.

The education system adjusts to labour market demand after 5-7 years.

Labour supply remains a critical issue at least 5-6 years (equal to study length). Without special measures involvement of women, graduates and population in pension age or near to that remains low.

Immigration increases and may increase ethnic tension.

II.7. IS development

The need for IS remains high and this promotes the development of telecommunication services and trade and services sectors within ICT industry.

Establishing of state information systems promote investment in ICT and trade and software sectors of ICT industry. ICT industry transforms to new product developments, yet its export capacity remains moderate. IT industry serves mainly internal market.

Public funding for development of IS infrastructure is low; some part of the EU structural funds is allocated for this purpose.

The possibility of significant digital divide is low.

III. "WILDCARDS"

Taking into account the high resistance of a small economy to external and internal shocks we do not indicate any factor that could mirror a shock in the Latvian economy.

Some turbulence could be caused if:

- economic decline in main markets continues
- Latvian-Russian relations worsen
- There are substantial changes in the current government economic policy or delays in its implementation
- imbalance between growing demand for high quality labour and supply of such labour, weakness of local education system
- poor social integration complemented by immigration that encourages ethnic tension and conflicts

POLICY RECOMMENDATIONS

Policy recommendations are divided into two categories: promotion of economic development and promotion of IS development

I. Promotion of economic development

The priority of economic development policy is to promote competitiveness of the Latvian economy, which includes creation of external and internal environment that is favourable for business development and orientation on knowledge intensive industries and services.

I.1. Macroeconomic aspect

Continue integration into the EU and NATO thus creating stable external environment.

Develop medium-term plans for implementation of the Long-term Economic Strategy of Latvia and achieving its goals:

- creation of favourable conditions for functioning of the economy,
- promoting creation of effective and competitive branch structure,
- lessening of economic disproportion and risks.

Continue to maintain stable macroeconomic environment.

Provide effective functioning of market rules in economy; ensure effective and fair competition.

Provide effective foreign policy to expand markets (including Eastern markets), where priority is given to such directions:

- improve economic and political relations with Russia,
- ensure real Baltic co-operation,
- increase activities in CEC markets.

Provide higher labour productivity and competitiveness.

Provide balanced regional development.

Provide effective demographic policy.

Provide effective income policy that allows narrowing social and economic disproportion.

Develop economic research on a regular basis, extend funding to orders focussed on research of national economy.

Improve the management process of EU structural instruments.

Implement effective state budget formation process to ensure targeted, co-ordinated, transparent and outcomes oriented use of available resources.

Continue fighting corruption and reduce possibilities of operating of a grey economy sector

Harmonise the legislative framework of the business activity.

Provide effective use of internal investment resources and loans by promoting investment in industry, using special tax regime (nil or lower corporate tax rate to corporate income proportionally to investment in industry).

Promote the development of high tech and high value added industries – support to development of economic clusters (especially education and R&D components),

implementation of the National Innovation Program, state contribution to financing of innovation process.

Improve market access for Latvian enterprise – implementation of National Foreign Trade Promotion Concept and relevant programs, establishing foreign trade promotion organizations: agencies, research, economic attached services in foreign countries.

Develop basic infrastructure.

Improve statistical reporting and analysis of processes in fields of development of high-tech industries and innovation in order to elaborate proper state policies.

I.2. Sector aspects

I.2.1. Medium term intensive structural reforms

The priority of medium term structural policy is to increase share of knowledge intensive industries thus promoting production of higher value added

Assess sector development trends in the main markets and forthcoming important structural changes on the basis of fast technological development that may lead to:

- accelerating and massive vendor consolidation cycle followed by further ramification of this, giving new ability to regain pricing power in several technology sectors,
- challenge of new productivity gains through the replacement or greatly diminished role of entire industries.

Elaborate lacking sector policies (attention must be paid on knowledge intensive service sectors) on the basis of these assessments.

Stimulate public-private partnership in innovation.

Provide effective basis for development of knowledge intensive industries by development of education and science.

Provide fair competition in selection of perspective sectors and enterprises.

Elaborate research based monitoring of sector development and reasonable flexibility of policies towards new challenges.

Encourage concessions (attraction of private capital to state functions) as a method to improve public services and infrastructure.

Support SMEs.

Elaborate state funded support institutions and systems that help business to acquire quality standards and conformity assessment.

I.2.2.Investment

The priority of investment policy is to promote investment directly in the knowledge intensive industries and industries and sectors that support the development of such industries.

Promote investment in industry, knowledge intensive industries.

Develop investment-supporting institutions (investment funds, credit guarantee agencies, special credit lines).

Develop risk capital institutions.

I.2.3. Foreign trade

The priority of foreign trade policy is to promote market for industries and services producing high value added and provide favourable conditions for imports.

Elaborate of export promotion strategy for knowledge-based industries and services.

Improve institutional basis of foreign trade (promotion institutions, customs, statistics).

Activate trade activities in Baltic economic area, Eastern markets (Russia, Byelorussia, Ukraine) and the rest of world.

Establish permanent research-based monitoring of foreign trade developments.

Enhance market growth through attracting FDI in knowledge intensive sectors.

I.2.4. Innovation

The priority of innovation policy is to create knowledge-based environment that is necessary for development on knowledge intensive industries, which means creation of harmonised innovation system and providing its operation.

Continue to improve regulatory framework for innovations and the corresponding financial incentives.

Clearly define the roles and responsibilities (including financial) of policy-making institutions in innovation and the ICT sector.

Provide full liberalisation of telecommunication markets in order to favour the development of knowledge intensive services and overall development of society on the basis of information.

Implement measures to improve the prestige of science.

Activate work to increase the students uptake of science at second and third levels of education and to promote positive attitude to careers in science, engineering and technology (special programs, awards, National Science Days and Science Weeks, TV series for children and students.

Establish a culture of scientific and technological innovation and increased R&D activity.

Concentrate science promotion measures into a single National Program for science promotion.

I.2.5. Labour supply

The priority of the labour policy is to improve labour supply to the economy as a whole and especially to knowledge intensive industries which includes improvement of demographic situation (impact quality and quantity) and education (quality).

Activate policies that facilitate improvement of demographic situation.

Improve professional education.

Adjust unemployment training to market demand

Improve labour qualification in rural areas (by using compensation of study credit for graduates who stay for work in rural areas).

Provide better involvement of postgraduates and people in pension age and near to that by creating special mechanisms.

Develop special employment plans for elimination of employment in rural territories, including research, training and other measures.

Involve NGOs in developing entrepreneurship skills and fighting unemployment in less developed territories.

I.2.6. Education

Improve financing of education.

Improve quality of education at all forms and levels.

Restore exact subjects (physics, chemistry, mathematics) in mandatory school programs

Restore subjects that develop intellectual skills (music, arts) – so called "interest subjects" in programs of basic education,

Improve teachers' qualification and technical provision of schools.

In professional education: adjust education to potential labour market need

Improve quality of professional education, measured as employment of graduates.

Improve education in natural science; improve interconnection between research at university level education and business.

Implement interface institutions that develop business skills of graduates.

Replace current practice that full time students have business activities with study practices at enterprises.

Increase market orientation in adult education and unemployed training.

Strengthen education of managerial talents and skills in secondary schools.

Address the continually declining number of students choosing science subjects at second and third level.

Increase science activities and science attractiveness for young people.

Assess and adjust to forthcoming skills shift within the IT workforce to areas such as broadband, wireless, Linux, content management, real-time analytics, data mining, security, middleware, certification skills, business intelligence and knowledge management and others.

I.2.7. Research and development

The priority of innovation policy is to create knowledge that is necessary for development on knowledge-intensive industries.

Develop industrial cluster approach in establishing a knowledge-based industry, where R&D is a necessary component.

Increase understanding in private companies about the need to invest in R&D in order to generate greater rewards from their future business activities.

Create shared R&D infrastructure that is made available to public and private research institutions and private enterprises.

Consolidate efforts of public and private institutions in creation of such infrastructure.

Improve commercial application of research results, establish privately run research centres adjacent to the research institutes that would be part-funded by the private sector, serving the

role of an avenue for the staff of the research institutes and universities to take part in applied research and contribute to the creation of companies and products.

Increase access to risk capital.

Incorporate measures favouring creation of information society into utilising the EU structural adjustment funds.

I.2.8. Social issues

The priority of social policy is elimination of social disparities.

Elaborate income policy aimed at lessening of income differences.

Continue increasing of minimal wage.

Provide stability of social insurance systems, including pensions.

Improve health care.

II. Promotion of IS development[177]

The priority of policy measures promoting IS development is to improve availability of information and information technologies, as well as increase supply of information systems in order to facilitate modernisation of the economy on the basis of wider use of information and ICT and its competitiveness.

II.1. General policy measures

The priority of general policy measures is to elaborate clear and comprehensive IS policy and to provide its implementation.

Elaborate the national IS strategy, which accounts close interconnection of IS and economic development in the way that IS is a precondition of a dynamic economic development and innate satellite of modern knowledge based and open economy.

Establish precise and realistic objectives in implementation of IS, such as eGovernment, eProcurement by government and local governments, eHealth, cyber security and privacy, the school-room in the future, the work-place in the future.

Adopt public-private partnership as means for implementation of the national IS strategy.

Adopt electronic communication sector policy (Guidelines of the Electronic Communication Sector Policy, 2004-2008), including the legislative documents, institutional settings, responsibilities and financial provision necessary for its implementation.

II.2. Sector level

II.2.1. Development of infrastructure

The priority of infrastructure development is to increase availability of information technologies and information for business and population.

Increase state participation in building of technologically advanced electronic connection network (broadband) to every home in order to make basic IS infrastructure affordable regardless of economic conditions of the population and business and bridge forthcoming digital divide.

[177] On the basis of proposals for facilitating of Internet use - by Association of Internet of Latvia, The Ministry of Transport and Communications of Republic of Latvia, Department of Informatics

Promote Internet connections in the civil sector; install Internet connection in new and renovated local government apartment buildings.

Promote liberalization of telecommunication market and optimisation of telecommunication prices on the basis of fair competition.

Use licensing and tariff policy as instruments for promotion development of infrastructure.

Introduce a third mobile telecommunication operator as soon as possible.

Establish two state fixed telecommunication networks – consolidation of networks of state enterprises Latvenergo (energy provider), Latvijas Dzelzcels (railway), The State Radio and Television Centre ant The State Information Network Agency.

Attract Global Internet service providers to Latvia, which will have a positive effect on the decline of prices for international Internet.

Promote computerisation of enterprises by increasing offer of electronic services in public sector and services.

Continue elaboration of projects which promote installation and use of computers in local governments and state sector.

Organize campaigns of new and used computer equipment sell-outs together with computer technology enterprises.

Elaborate a state program which promotes private persons to buy computers with tax discounts.

Implementation of digital signature and eCommerce to be enacted for secure services.

II.2.2. Development of information content

Establishment of a high quality government portal to provide information on policies and services of the government.

Involve local governments in Internet content development, they should provide information about tourism and history, gathering information on a special web portal,

Encourage use of the Latvian language and terminology in the electronic means of communication.

Develop Public Library Information system - all libraries should be connected in one network with a common database; also all information available in libraries should be transferred into electronic format,

Promote broadening of existing digital information by being involved in EU projects,

Elaborate education materials in electronic form by involving schools and higher education institutions,

Improve existing distance learning programs and develop new programs for a wide range of population.

II.2.3. Education and development of skills

Ensure compulsory teaching of information sciences in comprehensive schools,

Enhance training of new professions of IT sector in comprehensive schools and higher education institutions,

Enhance and renovate existing educational programs for comprehensive schools and high schools,

Increase adult training for computer and Internet usage,

Increase training for computer skills for unemployed persons.

II.2.4. Increasing effectiveness of ICT application

The priority is to ensure use of implemented systems and to increase their effectiveness.

Establish monitoring of ICT use and its effectiveness,

Popularise the significance of information and computer use in modern economy,

Popularise Internet advantages in increasing of enterprise work effectiveness by developing special training programs for small and medium size enterprises,

Activate IT and Internet usage in development and enhancing of enterprise work by increasing offers for electronic communication in the public sector and services,

Organize common interest clubs and groups for pensioners,

State institution should arrange information campaigns about their activities by making informative brochures and by organizing events in the mass media,

Organize workshops for local governments and enterprises from regions and inform them about usage of Internet to popularise their region, optimise work of enterprise and organize marketing activities,

Improve and develop SME management knowledge about Internet and IT usage in business development,

Form TV programs for improvement of population knowledge about computer and Internet usage,

Attract politicians to inquire about acquiring and usage of positive experience from other counties in development of Internet framework of Latvia.

II.2.5. Institutional basis

Policy proposals in this chapter finalize the creation of the institutional basis of IS.

Strengthen and activate responsible institutions for implementation of IS,

Elaborate lacking legislative acts,

Fully implement legislation concerning personal data protection and intellectual property rights protection.

References

Building knowledge economies: opportunities and challenges for EU accession countries. Final report of the knowledge economy forum, Paris, February 19-22, 2002. WB, EC, OECD, EBRD, EIB, Mayn2002, 29 pp

ECommerce and development report 2001. United Nations, 2001. 252 pp

Eglite, Parsla (1996). Emigration of Latvias' scientists: the facts and forecasts. *Proceedings of the Latvian Academy of Sciences*, A, 50, No. 1, pp. 64-78 (in Latvian)

Employment and labour market in Central European countries, Theme 3: Population and social conditions, European Communities, 2003, 64 pp

European governance: rebuilding trust in science. Euroabstracts Vol.41 –3/2002. Published by the European Commission, Innovation/SMEs programme, June 2002, 24

European Innovation Scoreboard: Technical Paper No 2., 2002. Candidate Countries. European Commission. Enterprise Directorate-Generale, November 26, 2002, 48 pp

European Trend Chart on Innovation. Trend Chart Benchmarking Workshop: Innovation policies in Candidate Countries papers. Luxembourg 24-25 June 2002.

Global Technology Markets. Information Technology. Country Profile – Export Potential. Latvia: 2002. International Trade Centre, UNCTAD/WTO (ICT), Geneva: ICT, 2003, 202 pp

High tech in Latvia, 1999. LLA, 1999, 52 pp

Indicators for the Information Society in the Baltic Region. Action line 6. Northern eDimension. Action Plan. Statistics Denmark, July 2003, 85 pp

Information and Communication Technologies. Enlargement Futures Report Series 05. European Commission Joint Research Centre, IPTS, March 2002, 88 pp

Innovation policy in Europe 2001. European Trend Chart on Innovation. A publication from the Innovation/SMEs programme. European Commission, DG for Enterprise, European Communities, 2002, 51 pp

Innovation policy in seven candidate countries: the challenges. Study commissioned by the Enterprise Directorate General of the European Commission, June 2002

Innovation policy in seven candidate countries: the challenges. Final report, Volume 1, March 2003, European Communities, 2003, 153 pp

Innovation policy in six candidate countries. European Commission, DG Enterpriser, A publication from the Innovation/SMEs programme of the EU 5th research FP.32 pp

Innovation policy issues in six candidate countries: the challenges. A publication from the Innovation/SMEs programme. European Commission, DG for Enterprise, European Communities, 2001, 189 pp

Karnite R. Software industry in Latvia. Final report for EC Phare ACE DIFEBALT research project "Infrastructure policies for sustained growth in the Baltic Countries", Riga, April 1997.

Kristapsons J., Martinson H., Dagyte I. Baltic R&D systems in transition. Expperiences and future prospects. Riga, 2002, pp.85-86

Latvijas Ekonomikas attīstības iespējamie scenāriji, iestājoties vai neiestājoties Eiropas Savienībā (Eventual development scenarios of Latvia, entering or no-entering EU), Konsorts, Riga 2003, 72 pp

Latvia Human development Report, Riga, 1999, 140 pp

Latvia in EU 5th Framework Programme (1999-2000), Ministry of Education and Science of the Republic of Latvia, 2003, 95 p.

Nacionālo izglitibas politiku analize Latvija. Izglitiba visiem. (Analysis of the national education policy, Latvia. education for all). Phare, OECD, 1999, 169 pp (published in Latvian and France)

R&D in Latvia. Research and development in the Republic of Latvia (improved edition 2002), "Augsburgas Instituts", 2002, 73 p

Regular report on Latvia's progress towards accession. Commission of the European Communities. Brussels, 13.11.2001, SEC(2001) 1749

Reģionu attīstība Latvijā (Regional Development in Latvia), 2003. VSIA "Reģionu attīstība", 2003, 76 pp (in Latvian).

Stradins Janis (1999). Science in Latvia: trends, topics, traditions. In: *Academia Scieniarum Fennica Year Book*, Helsinki, pp. 63-74.

Structural Indicators of European Economic Reform: Measuring Europe's Progress. HM Treasury, February 2003, 48 p.

The Global Information Technology Report. Towards an Equitable Information Society. Editors Soumitra Dutta, Bruno Lanvin, Fiona Paua, World Economic Forum, New York, Oxford University Press, 2004, 308 p.

The monopoly challenger. Presenting our views on fixed telephony subscription, carrier pre-selection, MVNO and ADCL. Presented to the European Commissioner for Enterprise and Information Society Erkki Liikanen, September 26, 2003, Prepared by TELE2, 35 pp

3rd Report on Monitoring of EU Candidate Countries (Telecommunication Services Sector), IBM Business Consulting Services, 16 June 2003, Version 3.2, ECSC – EC – EAEC, Brussels – Luxemburg (2002), 124 pp

5th EU – Latvia Association Committee, Brussels, 12 June 2002, 145 pp

Internet resources

Latvian Development agency, www.lda.gov.lv.
The Ministry of Transport and Communications of Republic of Latvia, www.sam.gov.lv.
Ministry of economy, Republic of Latvia, www.em.gov.lv.
Latvian Internet association, www.lia.lv.
Latvian Information technologies and Telecommunications association, www.litta.lv.
Lattelekom Ltd.www.lattelekom.lv.
EITO, 2001, European Information Technology Observatory.
www.worldbank.org
Information Society Website, http://europa.eu.int/ISPO/.
eBaltics web site, www.ebaltics.com.
eEurope+, http://europa.eu.int/information_society/eeurope/index_en.htm.

ANNEX – TABLE OF CONTENTS

A. NATIONAL AND REGIONAL ECONOMY

Table A11.: Economic growth (ECU until December 1998/EURO yearly average rate)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
Real GDP growth, % (previous period, at average prices of 2000)	106.8	102.9	87.4	67.9	88.6	102.2	99.1	103.7	108.4	104.8	102.8	106.8	107.9	106.1	107.4
Nominal GDP level(at current prices), LVL million	51.46	62.44	143.33	1004.6	1467	2042.6	2329.42	2807.3	3269.5	3592.2	3889.7	4348.3	4812.6	5194.7	4196.8
Nominal GDP level (at average prices of 2000), LVL million	6140.97	6319.06	5523.2	3749.2	3321.3	3394.1	3362.0	3485.7	3777.7	3957.5	4069.8	4348.3	4693.4	4978.1	3957.0
Nominal GDP level (current prices), mln.EUR	n.a.	n.a.	n.a.	1082.5	1850.0	3085.4	3415.6	4068.5	4976.4	5426.2	6223.5	7764.9	8548.1	8910.2	6506.7
Nominal GDP level (average prices of 2000), ECU/EUR million	n.a.	n.a.	n.a.	4040	4188	5127	4930	5052	5750	5978	6512	7765	8336	8539	6135
PPP GDP (at current prices), in billion of purchasing power standards	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	12.4	13.5	14.5	16.6	18.5	19.8	n.a.
Nominal GDP level (at average prices of 1995), LVL million	4602.3	4736.58	4243.4	2764.2	2353.2	2368.4	2349.22								
Real GDP growth, % (previous period, at average prices of 2000	106.8	102.9	89.6	65.1	85.1	100.6	99.2								

Table A21.1: Supply side of growth contribution - changes in major sector - NACE Code
GDP (1990-1994 at average prices of 1994, 1995-2003 at average prices of 2000 in LVL)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
A: Agriculture, hunting, forestry		418.4	411.2	293.61	240.29	204.33	165.47	153.46	168.28	162.42	153.43	171.29	185.28	193.07	155.7
B: Fishing		2.85	2.77	1.35	1.09	1.04	15.9	14.99	11.29	10.94	14	15.12	12.96	11.25	9.8
A+B		421.25	413.97	294.96	241.38	205.37	181.37	168.45	179.57	173.36	167.43	186.41	198.24	204.32	165.5
C: Mining and quarryng		12.88	11.37	6.24	4.24	6.04	3.61	3.7	4.02	4.35	4.78	5.16	6.02	6.48	5.3
D: Manufacturing		1425.9	1436.5	741.86	507.01	458.77	440.2	458.23	536.61	558.04	525.13	560.88	618.09	662.34	531.9
E: Electricity, gas and water suply		183.42	178.83	126.66	102.76	101.91	163.79	160.67	159.55	162.32	153.81	147.69	158.41	165.74	109.2
C+D+E: Total industry		1622.2	1626.7	874.76	614.01	566.72	607.6	622.6	700.18	724.71	683.72	713.73	782.52	834.56	646.4
F: Construction		802.23	478.13	197.3	100.75	113.64	165.5	174.27	188.6	220.66	238.5	258.04	273.77	303.33	252.7
C+D+E+F: Total industry and construction		2424.43	2104.9	1072.1	714.76	680.36	773.1	796.87	888.78	945.37	922.22	971.77	1056.3	1137.9	899.1
G..O: Services		1314.69	1163.7	1006.3	1080.7	1164.6	1989.82	2084.8	2244.4	2358.7	2498.5	2675.5	2896.6	3067.6	2451.7
D.21: Taxes on products		582.34	566.16	394.46	319.31	321.07	434.19	451.16	480.49	497.31	503.43	535.81	559.97	586.01	n.a.
D.31: Subsidies on products		6.14	5.34	3.64	3.01	2.98	16.5	15.59	15.57	17.27	21.74	21.14	17.7	17.7	n.a.
Taxes less subsidies		576.2	560.82	390.82	316.3	318.09	417.69	435.57	464.92	480.04	481.69	514.67	542.27	568.31	440.7
B.1g GDP		4736.57	4243.4	2764.2	2353.2	2368.4	3361.98	3485.7	3777.7	3957.4	4069.8	4348.3	4693.4	4978.1	3957

Table A21.2: Structure in GDP (calculated from Table A21.1)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
A: Agriculture, hunting, forestry		8.8	9.7	10.6	10.2	8.6	4.9	4.4	4.5	4.1	3.8	3.9	3.9	3.9	3.9
B: Fishing		0.1	0.1	0.0	0.0	0.0	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2
A+B		8.9	9.8	10.7	10.3	8.7	5.4	4.8	4.8	4.4	4.1	4.3	4.2	4.1	4.2
C: Mining and quarryng		0.3	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
D: Manufacturing		30.1	33.9	26.8	21.5	19.4	13.1	13.1	14.2	14.1	12.9	12.9	13.2	13.3	13.4
E: Elacticity, gas and water suply		3.9	4.2	4.6	4.4	4.3	4.9	4.6	4.2	4.1	3.8	3.4	3.4	3.3	2.8
C+D+E: Total industry		34.2	38.3	31.6	26.1	23.9	18.1	17.9	18.5	18.3	16.8	16.4	16.7	16.8	16.3
F: Construction		16.9	11.3	7.1	4.3	4.8	4.9	5.0	5.0	5.6	5.9	5.9	5.8	6.1	6.4
C+D+E+F: Total industry and construction		51.2	49.6	38.8	30.4	28.7	23.0	22.9	23.5	23.9	22.7	22.3	22.5	22.9	22.7
G..O: Services		27.8	27.4	36.4	45.9	49.2	59.2	59.8	59.4	59.6	61.4	61.5	61.7	61.6	62.0
D.21: Taxes on products		12.3	13.3	14.3	13.6	13.6	12.9	12.9	12.7	12.6	12.4	12.3	11.9	11.8	n.a.
D.31: Subsidies on products		0.1	0.1	0.1	0.1	0.1	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	n.a.
Taxes less subsidies		12.2	13.2	14.1	13.4	13.4	12.4	12.5	12.3	12.1	11.8	11.8	11.6	11.4	11.1
B.1g GDP		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table A21.3: Volume changes on Y-o-Y basis (calculated from Table A21.1)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
A: Agriculture, hunting, forestry			-1.7	-28.6	-18.2	-15.0	-23.8	-7.3	9.7	-3.5	-5.5	11.6	8.2	4.2	n.a.
B: Fishing			-2.8	-51.3	-19.3	-4.6	842.3	-5.7	-24.7	-3.1	28.0	8.0	-14.3	-13.2	n.a.
A+B			-1.7	-28.7	-18.2	-14.9	-19.4	-7.1	6.6	-3.5	-3.4	11.3	6.3	3.1	n.a.
C: Mining and quarryng			-11.7	-45.1	-32.1	42.5	-12.3	2.5	8.6	8.2	9.9	7.9	16.7	7.6	n.a.
D: Manufacturing			0.7	-48.4	-31.7	-9.5	15.9	4.1	17.1	4.0	-5.9	6.8	10.2	7.2	n.a.
E: Elacticity, gas and water suply			-2.5	-29.2	-18.9	-0.8	7.2	-1.9	-0.7	1.7	-5.2	-4.0	7.3	4.6	n.a.
C+D+E: Total industry			0.3	-46.2	-29.8	-7.7	14.1	2.5	12.5	3.5	-5.7	4.4	9.6	6.7	n.a.
F: Construction			-40.4	-58.7	-48.9	12.8	122.4	5.3	8.2	17.0	8.1	8.2	6.1	10.8	n.a.
C+D+E+F: Total industry and construction			-13.2	-49.1	-33.3	-4.8	32.2	3.1	11.5	6.4	-2.4	5.4	8.7	7.7	n.a.
G..O: Services			-11.5	-13.5	7.4	7.8	110.5	4.8	7.7	5.1	5.9	7.1	8.3	5.9	n.a.
D.21: Taxes on products			-2.8	-30.3	-19.1	0.6	n/a	3.9	6.5	3.5	1.2	6.4	4.5	4.7	n.a.
D.31: Subsidies on products			-13.0	-31.8	-17.3	-1.0	n/a	-5.5	-0.1	10.9	25.9	-2.8	-16.3	0.0	n.a.
Taxes less subsidies			-2.7	-30.3	-19.1	0.6	38.5	4.3	6.7	3.3	0.3	6.8	5.4	4.8	n.a.
B.1g GDP			-10.4	-34.9	-14.9	0.6	67.1	3.7	8.4	4.8	2.8	6.8	7.9	6.1	n.a.

Table A21.4: Contribution to growth (calculated from Table A21.1)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
A: Agriculture, hunting, forestry			-0.2	-2.8	-1.9	-1.5	-2.1	-0.4	0.4	-0.2	-0.2	0.4	0.3	0.2	-0.8
B: Fishing			0.0	0.0	0.0	0.0	0.4	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0
A+B			-0.2	-2.8	-1.9	-1.5	-1.7	-0.4	0.3	-0.2	-0.1	0.5	0.3	0.1	-0.8
C: Mining and quarryng			0.0	-0.1	-0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D: Manufacturing			0.2	-16.4	-8.5	-2.0	3.1	0.5	2.2	0.6	-0.8	0.9	1.3	0.9	-2.6
E: Elacticity, gas and water suply			-0.1	-1.2	-0.9	0.0	0.3	-0.1	0.0	0.1	-0.2	-0.2	0.2	0.2	-1.1
C+D+E: Total industry			0.1	-17.7	-9.4	-2.0	3.4	0.4	2.2	0.6	-1.0	0.7	1.6	1.1	-3.8
F: Construction			-6.8	-6.6	-3.5	0.5	5.9	0.3	0.4	0.8	0.5	0.5	0.4	0.6	-1.0
C+D+E+F: Total industry and construction			-6.7	-24.3	-12.9	-1.5	9.2	0.7	2.6	1.5	-0.6	1.2	1.9	1.7	-4.8
G..O: Services			-3.2	-3.7	2.7	3.6	54.3	2.8	4.6	3.0	3.5	4.4	5.1	3.6	-12.4
D.21: Taxes on products			-0.3	-4.0	-2.7	0.1	#VALUE!	0.5	0.8	0.4	0.2	0.8	0.6	0.6	n.a.
D.31: Subsidies on products			0.0	0.0	0.0	0.0	#VALUE!	0.0	0.0	0.0	0.1	0.0	-0.1	0.0	n.a.
Taxes less subsidies			-0.3	-4.0	-2.7	0.1	5.2	0.5	0.8	0.4	0.0	0.8	0.6	0.6	-2.6
B.1g GDP			-10.4	-34.9	-14.9	0.6	67.1	3.7	8.4	4.8	2.8	6.8	7.9	6.1	-20.5

Table A22.1: Demand side of growth: contribution (1990-1994 at average prices of 1995, 1995-2002 at average prices of 2000, LVL) - SNA Code

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
P.3: Final consumption expenditure (S.14:Final consumption expenditure of households and of non-profit institutions serving households + S.15:Final consumption expenditure of general government)		4240.87	3251.9	2088.1	1971	2011.1	2880.17	3099.9	3214.7	3291.2	3381.8	3550.5	3763.7	3976.7	3123.6
P.5:Gross capital formation (P.51 Gross fixed capital formation + P.52, P.53: Changes in inventories and acquisition less disposals of valuables		1741.33	1465.5	1099.6	378.46	442.78	608.85	658.74	753.46	1148.1	1167.3	1174	1464.9	1522.9	1340.3
P.6: Exports of goods and services		1907.3	1293.5	1485.6	1153.1	1056.1	1326.22	1594.7	1804	1891.6	1771.2	1983.8	2121.1	2254.3	1773.5
P.7 Less: Imports of goods and services		3152.92	1767.5	1909.2	1149.3	1141.6	1453.26	1867.6	1994.4	2373.4	2250.5	2360	2656.4	2775.8	2280.4
Enet		-1245.6	-474.01	-423.54	3.72	-85.44	-127.04	-272.91	-190.41	-481.8	-479.3	-376.2	-535.3	-521.5	-506.9
Total		4736.58	4243.4	2764.2	2353.2	2368.4	3361.98	3485.7	3777.7	3957.5	4069.8	4348.4	4693.4	4978.1	3957.0

Table A22.2: Structure in GDP (calculated from Table A22.1)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
P.3: Final consumption expenditure (S.14:Final consumption expenditure of households and of non-profit institutions serving households + S.15:Final consumption expenditure of general government)		89.5	76.6	75.5	83.8	84.9	85.7	88.9	85.1	83.2	83.1	81.7	80.2	79.9	78.9
P.5:Gross capital formation (P.51 Gross fixed capital formation + P.52, P.53: Changes in inventories and acquisition less disposals of valuables		36.8	34.5	39.8	16.1	18.7	18.1	18.9	19.9	29.0	28.7	27.0	31.2	30.6	33.9
P.6: Exports of goods and services		40.3	30.5	53.7	49.0	44.6	39.4	45.7	47.8	47.8	43.5	45.6	45.2	45.3	44.8
P.7 Less: Imports of goods and services		66.6	41.7	69.1	48.8	48.2	43.2	53.6	52.8	60.0	55.3	54.3	56.6	55.8	57.6
Enet		-26.3	-11.2	-15.3	0.2	-3.6	-3.8	-7.8	-5.0	-12.2	-11.8	-8.7	-11.4	-10.5	-12.8

Table A22.3: Volume changes on Y-o-Y basis (calculated from Table A22.1)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
P.3: Final consumption expenditure (S.14:Final consumption expenditure of households and of non-profit institutions serving households + S.15:Final consumption expenditure of general government)			-23.3	-35.8	-5.6	2.0	55.3	7.6	3.7	2.4	2.8	5.0	6.0	5.7	n.a
P.5:Gross capital formation (P.51 Gross fixed capital formation + P.52, P.53: Changes in inventories and acquisition less disposals of valuables			-15.8	-25.0	-65.6	17.0	202.7	8.2	14.4	52.4	1.7	0.6	24.8	4.0	n.a
P.6: Exports of goods and services			-32.2	14.9	-22.4	-8.4	67.9	20.2	13.1	4.9	-6.4	12.0	6.9	6.3	n.a
P.7 Less: Imports of goods and services			-43.9	8.0	-39.8	-0.7	99.8	28.5	6.8	19.0	-5.2	4.9	12.6	4.5	n.a
Enet			-61.9	-10.6	-100.9	-2396.8	493.3	114.8	-30.2	153.1	-0.5	-21.5	42.3	-2.6	n.a
Total			-10.4	-34.9	-14.9	0.6	67.1	3.7	8.4	4.8	2.8	6.8	7.9	6.1	7.4

Table A22.4: Contribution to growth (calculated from Table A22.1)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
P.3: Final consumption expenditure (S.14:Final consumption expenditure of households and of non-profit institutions serving households + S.15:Final consumption expenditure of general government)			-20.9	-27.4	-4.2	1.7	47.0	6.5	3.3	2.0	2.3	4.1	4.9	4.5	-17.1
P.5:Gross capital formation (P.51 Gross fixed capital formation + P.52, P.53: Changes in inventories and acquisition less disposals of valuables			-5.8	-8.6	-26.1	2.7	37.9	1.5	2.7	10.4	0.5	0.2	6.7	1.2	-3.7
P.6: Exports of goods and services			-13.0	4.5	-12.0	-4.1	30.3	8.0	6.0	2.3	-3.0	5.2	3.2	2.8	-9.7
P.7 Less: Imports of goods and services			-29.2	3.3	-27.5	-0.3	48.1	12.3	3.6	10.0	-3.1	2.7	6.8	2.5	-10.0
Enet			16.3	1.2	15.5	-3.8	-17.8	-4.3	2.4	-7.7	0.1	2.5	-3.7	0.3	0.3
Total			-10.4	-34.9	-14.9	0.6	67.1	3.7	8.4	4.8	2.8	6.8	7.9	6.1	-20.5

Table A31.1: Changes in employment

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
A31: Rate of unemployment, annual average, % (non working persons registered with the State Employment Board as % of economically active population)		n.a.	n.a.	0.9	4.6	6.4	6.4	7	7.5	7.6	9.7	8.5	7.8	8.9	8.6
The rate of jobseekers, annual average, % (non working jobseekers as % of economically active population) - according to Labour Force Survey data		n.a.	0.6	3.9	8.7	16.7	18.1	20.6	15.1	14.1	14.3	14.4	13.1	12	10.7 (2003 VII-IX

Table A31.2: Rate of unemployment, annual average, % (non working persons registered with the State Employment Board as % of economically active population) - by regions

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total						6.4	6.4	7.0	7.5	7.6	9.7	7.8	7.7	8.5	8.6
Riga region								3.5	3.7	3.9	5.8				
Riga						2.9	2.5	3.3	3.5	3.6	5.3	3.7	3.6	4.6	4.4
Jurmala						4.4	4.7	4.9	6.4	6.8	9.8	8.2	9.1	8.9	8.0
Riga district						4.6	4.0	5.1	5.0	5.2	7.9	6.6	6.6	5.6	5.3
Vidzemes region								7.4	8.6	8.5	10.0				
Aluksnes district						10.8	10.2	11.4	12.6	11.1	11.1	9.0	9.0	8.7	10.5
Cesu district						5.3	4.7	5.9	7.5	7.2	8.1	6.8	7.4	7.6	7.5
Gulbenes district						9.4	7.9	9.1	10.6	10.1	10.3	8.9	9.6	8.6	9.6
Limbazu district						6.0	5.2	5.3	6.0	8.1	12.8	6.9	7.0	7.6	7.7
Madonas district						15.1	13.7	13.2	13.8	12.4	13.3	11.4	11.4	12.9	13.8
Ogres district						3.1	3.0	4.1	4.4	4.7	7.1	5.3	6.2	5.8	6.2
Valkas district						5.8	5.2	4.6	6.9	7.9	9.6	7.0	7.3	8.7	10.2
Valmieras district						6.2	6.1	7.6	9.5	8.6	9.8	7.5	7.5	7.8	7.8
Kurzemes region								6.2	6.6	7.8	11.7				
Liepaja						7.0	8.8	8.0	7.7	9.8	15.3	11.4	10.4	13.5	12.8
Ventspils						2.3	1.9	2.4	3.1	4.7	8.4	6.5	6.1	7.9	8.1
Kuldigas district						11.2	6.8	5.8	6.8	6.4	8.0	8.4	8.8	9.2	11.0
Liepajas district						10.5	11.0	11.3	11.3	11.7	14.1	11.6	12.7	11.3	11.7
Saldus district						3.5	2.0	3.2	4.7	5.5	6.3	6.5	5.9	5.4	5.5
Talsu district						8.2	5.9	5.1	5.4	6.7	12.2	7.3	8.1	6.9	8.6
Ventspils district						4.5	4.6	5.7	8.2	7.5	10.4	8.9	8.9	6.4	6.2
Zemgales region								9.1	9.8	9.5	11.0				
Jelgava						4.0	5.4	7.9	8.6	8.7	10.0	7.9	7.2	8.6	8.1
Aizkraukles district						12.7	10.6	10.4	11.0	10.6	11.9	9.1	9.5	9.8	10.2
Bauskas district						6.8	4.8	5.6	7.1	7.7	9.4	8.9	9.0	9.4	9.5
Dobeles district						7.7	8.2	9.5	10.8	10.0	11.5	10.6	10.7	11.1	10.9
Jelgavas district						4.2	5.6	8.3	10.1	9.8	12.0	11.3	10.9	9.0	8.0

Table A31.2: Rate of unemployment, annual average, % (non working persons registered with the State Employment Board as % of economically active population) - by regions
(continued)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Jekabpils district						14.3	17.5	17.1	16.7	13.7	14.8	12.6	12.5	11.2	12.7
Tukuma district						4.6	4.0	5.0	5.4	6.2	8.7	6.8	7.1	6.0	6.0
Latgales region								15.5	16.2	15.7	17.8				
Daugavpils						7.2	8.4	8.4	8.5	8.6	11.4	10.4	8.7	11.1	9.8
Rezekne						10.6	12.7	13.3	13.0	12.3	15.0	11.4	10.8	12.9	11.7
Balvu district						20.2	21.1	22.2	22.7	22.0	23.3	21.8	21.6	24.7	25.1
Daugavpils district						17.6	15.0	15.2	14.9	15.2	20.1	17.1	16.8	20.5	22.7
Kraslavas district						23.9	24.2	14.5	25.6	22.1	23.3	21.8	21.1	18.5	19.1
Ludzas district						12.0	14.0	14.3	17.0	19.3	20.3	19.3	19.9	23.8	26.6
Preilu district						21.8	23.4	22.6	23.2	22.4	23.1	20.1	20.2	20.3	21.3
Rezeknes district						21.6	25.9	27.6	29.8	28.0	28.3	25.6	26.5	26.2	27.8

Table A31.3: The rate of jobseekers, annual average, % (non working jobseekers as % of economically active population)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total								19.4	14.8	14	14.4	13.2			
Riga region								16.4	11.3	10.4	10.8	9.2			
Riga								16.1	11	10.1	10.5	8.8			
Jurmala								18.9	14.5	13.3	13.8	12.7			
Riga district								17.6	12.5	11.6	11.9	10.8			
Vidzemes region								19.9	15.9	15.2	15.6	14.7			
Aluksnes district								23.6	19.4	19.4	19.6	18.4			
Cesu district								18.5	15	14.3	14.9	13.6			
Gulbenes district								21.6	17.9	17.2	17.4	16.4			
Limbazu district								18	13.8	12.7	13.3	15.2			
Madonas district								25	21	20.2	20.4	18.9			
Ogres district								17.3	11.7	10.9	11.4	10.3			
Valkas district								17.4	14.5	13.8	14.6	13.1			

Table A31.3: The rate of jobseekers, annual average, % (non working jobseekers as % of economically active population)
(continued)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Valmieras district								19.9	16.5	15.5	15.7	14.7			
Kurzemes region								18.4	14	13	13.4	13.6			
Liepaja								20	14.6	13.9	14.2	15.7			
Ventspils								15.1	10.7	9.6	10.1	8.8			
Kuldigas district								18	15	13.7	13.8	12.9			
Liepajas district								22.9	17.9	16.8	17.5	16.4			
Saldus district								15.6	12.9	11.8	12	11.3			
Talsu district								17.5	13.2	12.3	12.4	14			
Ventspils district								17.7	14.8	14.8	15	13.3			
Zemgales region								21.2	17	16.1	16.6	15.4			
Jelgava								20.4	15.7	14.7	15.1	14			
Aizkraukles district								21.9	18.7	17.7	17.9	16.7			
Bauskas district								18.3	14.3	13.5	14	12.7			
Dobeles district								21.5	17.5	16.6	17.3	15.8			
Jelgavas district								20.6	18	17.3	17.5	16.5			
Jekabpils district								28.2	22.9	22.1	22.7	21.5			
Tukuma district								17.5	13.1	12.3	12.8	11.7			
Latgales region								27	23	22.2	22.5	21.5			
Daugavpils								20.3	15.8	15	15.4	14.1			
Rezekne								24.8	19.9	18.8	19.1	18			
Balvu district								32.3	28.9	28.1	28.3	27.7			
Daugavpils district								25.8	23	21.8	21.9	21.4			
Kraslavas district								34.9	31	29.9	30.1	29.6			
Ludzas district								28.2	25.1	24.7	25.3	23.6			
Preilu district								33.3	28.9	28.9	28.9	27.7			
Rezeknes district								38.5	36.3	35.3	35.7	34.9			

Table A31.4: Share of different age groups of the total number of the unemployed, at the end of year

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
15-19							8.6	7.7	4.3	3.6	2.7	2.8	2.7	2.3	
20-24							11.6	12.3	13.9	12.8	12.1	11.9	11.9	11.6	
25-29											12.8	12.8	12.6	12.2	
30-49											53.7	52.4	52	51.7	
50-54											12.8	13.0	12.8	13.4	
55-59											5.9	6.9	7.4	8.1	
over 25							79.8	80	81.8	83.6	85.2	85.3	84.8	85.4	
Total							100.0	0.0	100.0	100.0	100.0	99.8	99.4	99.3	
Or															
age under 18				1.9	1.9	1.7									
age over 18				98.1											
18-25					15.5	16.6									
age over 25					82.6	81.7									
Total				100.0	100.0	100.0									

Table A32: Changes in labour supply

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Resident population, thsd.population, at beginning of year	2666	2668	2658	2643	2585	2541	2500	2469	2445	2421	2399	2377	2364	2346	2331
Economically active population, thsd.population, annual average		1416	1405	1367	1320	1300	1276	1196	1167	1149	1130	1100	1107	1123	n.a.
Participation ratio,%		53.1	52.9	51.7	51.1	51.2	51.0	48.4	47.7	47.5	47.1	46.3	46.8	47.9	n.a.

Table A33: Changes in labour productivity in manufacture

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Employed persons (annual average) in manufacturing, thsd persons (since 1996 - according to Labour force Survey data)		373	356	321	269	232	208	183	183	183	170	170	156	167	197.5
Manufacture output, at average prices of 1995 (1990-1994) and 2000 (1995 - 2003), million LVL		3401.7	3374.1	2066.2	1419.6	1285.3	1456.3	1516	1775.2	1846.3	1737.1	1858.7	2046.7	2193.2	n.a.
Manufacture GDP, at average prices of 1995 (1990-1994) and 2002 (1995 - 2003), million LVL		1425.9	1436.5	741.9	507.01	458.77	440.2	458.23	536.61	558.04	525.13	560.88	618.09	662.34	641.13
Labour productivity, thsd. LVL - output		9.1	9.5	6.4	5.3	5.5	7.0	8.3	9.7	10.1	10.2	10.9	13.1	13.1	n.a.
Labour productivity, thsd LVL - GDP		3.8	4.0	2.3	1.9	2.0	2.1	2.5	2.9	3.0	3.1	3.3	4.0	4.0	3.2
Growth rate - output			3.9	-32.1	-18.0	5.0	26.4	18.3	17.1	4.0	1.3	7.0	20.0	0.1	n.a.
Growth rate - GDP			5.6	-42.7	-18.5	4.9	7.0	18.3	17.1	4.0	1.3	6.8	20.1	0.1	n.a.

Table A51: Financial account (ECU/EUR mln)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
Financial account	n.a.	-185.4	267.2	517.1	261.0	216.3	474.5	562.6	534.7	715.0	741.5	454.9
Direct investment	n.a.	41.7	233.3	189.2	302.8	456.5	268.4	308.8	434.2	168.5	412.4	193.5
Abroad	n.a.	4.1	53.5	51.3	-2.4	-5.4	-48.6	-15.6	-10.4	-13.7	-9.2	-23.5
in Latvia	n.a.	37.6	179.8	137.9	305.2	461.8	317.0	324.4	444.6	182.1	421.6	221.6
Portfolio investment	n.a.	0.0	-18.9	-28.0	-112.3	-506.9	-5.8	255.9	-350.4	139.8	-245.8	-242.5
Assets	n.a.	0.0	-18.9	-28.0	-131.4	-478.4	-29.6	53.0	-376.8	-65.3	-235.5	-272.3
Equity securities	n.a.	0.0	-10.6	-4.4	9.9	-100.7	7.4	71.4	-43.8	6.7	-3.0	n.a.
Debt securities	n.a.	0.0	-8.3	-23.5	-141.3	-377.7	-36.9	-18.4	-333.0	-72.0	-232.6	n.a.
Liabilities	n.a.	0.0	0.0	0.0	19.1	-28.5	23.7	202.9	26.4	205.1	-10.3	29.7
Equity securities	n.a.	0.0	0.0	0.0	-2.0	5.6	26.7	6.1	-8.2	0.8	25.3	n.a.
Debt securities	n.a.	0.0	0.0	0.0	21.0	-34.2	-3.0	196.7	34.6	204.3	-35.6	n.a.
Financial derivatives	n.a.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.1	13.7	-14.6
Assets	n.a.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	3.8	-7.8	-4.0
Liabilities	n.a.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.3	-2.7	21.5	4.9
Other investment	n.a.	0.0	137.0	330.8	219.1	325.1	246.7	154.4	440.0	747.9	559.5	582.8
Assets	n.a.	0.0	-323.1	-21.7	-171.2	-290.9	65.7	-202.1	-394.6	-74.9	-512.8	-367.0
Monetary authorities	n.a.	0.0	4.0	0.6	-0.8	0.0	0.0	34.1	0.0	0.2	-0.2	0.2
General government	n.a.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-7.5	6.8	-1.1
Banks	n.a.	0.0	-334.3	78.5	-209.1	-226.1	60.4	-258.9	-405.2	-120.3	-335.2	-319.0
Other sectors	n.a.	0.0	7.2	-100.7	38.8	-64.8	5.3	22.7	11.0	52.7	-12.6	-47.1
Liabilities	n.a.	0.0	460.1	352.5	390.3	616.0	181.0	340.6	834.7	822.8	1072.3	949.7
Monetary authorities	n.a.	0.0	-4.4	-0.2	-20.6	-32.2	-22.1	-8.2	-10.8	-9.5	-11.8	-6.6
General government	n.a.	0.0	46.0	42.8	35.8	17.3	40.6	13.2	-8.3	8.2	-3.3	-19.3
Banks	n.a.	0.0	228.5	67.1	307.8	496.2	59.7	332.2	788.3	596.5	1031.1	902.4
Other sectors	n.a.	0.0	151.3	245.0	67.2	134.6	102.8	3.5	65.5	227.6	56.3	73.1
Reserve assets	n.a.	0.0	-84.1	25.1	-148.6	-58.3	-34.7	-140.5	8.7	-342.2	1.7	-79.7

References: 1998-2002: Latvia's balance of payments, #3/2003, The Bank of Latvia, 2003, p. 24; 1993-1998: Latvia's balance of payments, #3/1999, The Bank of Latvia, 2003, p. 12; 2003 I-IX: Monthly Bulletin of Latvian Statistics, 12(115) 2003, CSB, January 2004, p.46

Table A53.1: Exports and Imports (ECU/EUR mln)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-XI
Exports	617.1	852.0	836.0	1009.4	1152.4	1479.1	1614.6	1613.3	2020.2	2231.6	2416.47	2155.66
Imports	583.5	806.1	1049.2	1407.1	1852.4	2408.5	2841.8	2758.3	3453.5	3910.4	4283.7	4199.22

References: 2003 I-XI: Monthly Bulletin of Latvian Statistics 12(115) 2003, CSB, January 2004, p.20,21

Table A53.2: Trade flows in the sectors of information, communication and technology. Global trade in ICT products (mln USD)

	1996	1997	1998	1999	2000
Total imports	202	258	341	328	332
Total exports	45	71	63	43	49
Trade deficit	157	187	-278	-285	-283
Exports + Imports	247	329	404	371	381
YoY change - total		1.33	1.23	0.92	0.97
Imports		1.28	1.32	0.96	1.01
Exports		1.58	0.89	0.68	1.14
Trade deficit		1.19	-1.49	1.03	0.99
Imports/exports	4.49	3.63	5.41	7.63	6.78

References: Global Technology markets. Information technology. Country Profile- Export potential Latvia: 2002, International Trade Centre, UNCTAD/WTO, p.28-31, primar source: ITC/PCTAS database 1996-2000

Table A53.3: Breakdown by product category of Latvia's exports of ICT products (USD mln)

	1996	1997	1998	1999	2000
Exports, total	45	71	63	43	49
Semiconductors	1	4	1	3	3
Electronic data processing	8	11	12	6	6
Office equipment	0	0	0	0	0
Telecommunication	15	12	10	7	7
Other components	16	25	23	7	8
Scientific equipment	5	19	17	20	25
Imports, total	202	258	341	328	332
Semiconductors	1	6	4	4	6
Electronic data processing	54	76	87	80	87
Office equipment	4	4	6	6	5
Telecommunication	63	77	120	114	110
Other components	40	51	67	59	58
Scientific equipment	40	44	57	65	66
Imports/exports	4.48889	3.6338	5.4127	7.62791	6.77551
Semiconductors	1.00	1.50	4.00	1.33	2.00
Electronic data processing	6.75	6.91	7.25	13.33	14.50
Office equipment		Zero exports			
Telecommunication	4.20	6.42	12.00	16.29	15.71
Other components	2.50	2.04	2.91	8.43	7.25
Scientific equipment	8.00	2.32	3.35	3.25	2.64

References: Global Technology markets. Information technology. Country Profile- Export potential Latvia: 2002, International Trade Centre, UNCTAD/WTO, p.28-31, primar source: ITC/PCTAS database 1996-2000

Table A53.4: Exports of ICT products by destination, 2000 (USD mln)

Product	Semiconductors	EDP	Office equipment	Telecoms	Other components	Scientific equipment	Total
Finland		1			2		3
Germany				1	1	1	3
Denmark					1		1
Sweden					1	3	4
USA						1	1
Lithuania	1	2		1	1	3	8
Poland						1	1
Estonia		1			1	10	12
Russia	1	1		1		4	7
Ukraine				1		1	2
Others	1	1		3	1	1	7
Total	3	6	0	7	8	25	49

References: Global Technology markets. Information technology. Country Profile- Export potential Latvia: 2002, International Trade Centre, UNCTAD/WTO, p.28-31, primar source: ITC/PCTAS database 1996-2000

Table A53.5: Imports of ICT products by destination, 2000 (USD mln)

Product	Semiconductors	EDP	Office equipment	Telecoms	Other components	Scientific equipment	Total
Finland	1	30	1	26	7	4	69
Germany		8	1	12	12	18	51
Denmark	1	5		4	2	1	13
UK		2		8	2	2	14
Sweden		3		9	4	9	25
USA		5		7	1	3	16
Lithuania		4		2	2	2	10
France		1		6	2	2	11
Netherlands	2	12	1	3	1	3	22
Poland					5		5
Taiwan		3					3
Ireland		5		4			9
Estonia		3		2	2	1	8
Israel		1		5			6
Korea				2	2		4
Turkey				2	2		4
Others	2	5	2	18	14	21	62
Total	6	87	5	110	58	66	332

References: Global Technology markets. Information technology. Country Profile- Export potential Latvia: 2002, International Trade Centre, UNCTAD/WTO, p.28-31, primar source: ITC/PCTAS database 1996-2000

C. INDUSTRIAL DEVELOPMENT AND COMPETITIVENESS

Table C11.1: Structure of industrial production - industrial production - current price, by sectors, EUR million

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total industry	n.a.	n.a.	1326.33	1625.45	1777.52	n.a.	n.a.	n.a.	n.a.	3395.07	3869.33	4110.57	
Minning and quarring (C)	n.a.	n.a.	4.59	9.00	9.66	n.a.	n.a.	n.a.	n.a.	30.77	34.65	45.39	
Manufacturing (D), including	n.a.	n.a.	1045.50	1299.20	1442.14	n.a.	n.a.	n.a.	n.a.	2830.32	3261.23	3484.92	
Food products and beverages (15)	n.a.	n.a.	392.23	505.15	556.19	n.a.	n.a.	n.a.	n.a.	875.05	981.24	980.31	
Textiles (17)	n.a.	n.a.	71.41	80.48	85.98	n.a.	n.a.	n.a.	n.a.	153.54	170.14	130.87	
Wearing apparel; dressing and dyeing of fur (18)	n.a.	n.a.	17.52	24.32	28.53	n.a.	n.a.	n.a.	n.a.	105.80	111.10	119.02	
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (19)	n.a.	n.a.	33.08	24.68	17.10	n.a.	n.a.	n.a.	n.a.	5.45	6.89	5.06	
Wood and of products of wood and cork, except furniture; manufacture of articles of straw and plainting materials (20)	n.a.	n.a.	53.23	100.95	149.63	n.a.	n.a.	n.a.	n.a.	589.68	652.79	738.08	
Pulp, paper and paper products (21)	n.a.	n.a.	7.41	7.10	8.91	n.a.	n.a.	n.a.	n.a.	51.59	60.18	66.48	
Publishing, printing and reproduction of recorded media (22)	n.a.	n.a.	15.12	30.73	55.56	n.a.	n.a.	n.a.	n.a.	143.14	167.41	170.27	
Chemicals, chemical products and man-made fibres (24)	n.a.	n.a.	85.12	94.77	109.59	n.a.	n.a.	n.a.	n.a.	85.95	112.31	110.67	
Rubber and plastic products (25)	n.a.	n.a.	4.99	9.24	12.11	n.a.	n.a.	n.a.	n.a.	53.59	70.21	85.78	
Other non-metalic mineral products (26)	n.a.	n.a.	32.90	40.42	38.26	n.a.	n.a.	n.a.	n.a.	81.00	107.21	132.57	
Fabricated metal products, except machinery and equipment (28)	n.a.	n.a.	11.77	18.72	30.81	n.a.	n.a.	n.a.	n.a.	99.52	125.44	131.73	
Machinery and equipment (29)	n.a.	n.a.	51.41	60.56	71.19	n.a.	n.a.	n.a.	n.a.	79.86	93.06	104.72	
Electrical machinery and apparatus n.e.c. (31)	n.a.	n.a.	32.09	34.41	32.70	n.a.	n.a.	n.a.	n.a.	49.02	65.58	79.98	

Table C11.1: Structure of industrial production - industrial production - current price, by sectors, EUR million
(continued)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Radio, television and communication equipment and apparatus (32)	n.a.	n.a.	22.48	27.30	23.43	n.a.	n.a.	n.a.	n.a.	11.46	15.72	19.97	
Motor vehicles, trailers and semi-trailers (34)	n.a.	n.a.	53.56	38.90	28.77	n.a.	n.a.	n.a.	n.a.	7.95	10.34	11.75	
Other transport equipment (35)	n.a.	n.a.	32.01	62.66	69.68	n.a.	n.a.	n.a.	n.a.	76.61	96.82	108.87	
Furniture n.e.c.(36)	n.a.	n.a.	38.78	49.35	48.96	n.a.	n.a.	n.a.	n.a.	118.39	139.31	159.57	
Electricity, gas and water supply (E)	n.a.	n.a.	276.25	317.27	325.73	n.a.	n.a.	n.a.	n.a.	534.00	573.45	580.26	

Table C11.2: Structure of industrial production - industrial production - current price, by sectors, %

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total industry	100	100	100	100	100	n.a.	n.a.	n.a.	n.a.	100	100	100	n.a.
Minning and quarring (C)	0.4	0.3	0.3	0.6	0.5	n.a.	n.a.	n.a.	n.a.	0.9	0.9	1.1	n.a.
Manufacturing (D), including	96.2	87.5	78.8	79.9	81.1	n.a.	n.a.	n.a.	n.a.	83.4	84.3	84.8	n.a.
Food products and beverages (15)	26.3	31.8	29.6	31.1	31.3	n.a.	n.a.	n.a.	n.a.	25.8	25.4	23.8	n.a.
Textiles (17)	14.3	8.1	5.4	5.0	4.8	n.a.	n.a.	n.a.	n.a.	4.5	4.4	3.2	n.a.
Wearing apparel; dressing and dyeing of fur (18)	4.7	2.1	1.3	1.5	1.6	n.a.	n.a.	n.a.	n.a.	3.1	2.9	2.9	n.a.
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (19)	2.9	2.6	2.5	1.5	1.0	n.a.	n.a.	n.a.	n.a.	0.2	0.2	0.1	n.a.
Wood and of products of wood and cork, except furniture; manufacture of articles of straw and plainting materials (20)	2.3	3.5	4.0	6.2	8.4	n.a.	n.a.	n.a.	n.a.	17.4	16.9	18.0	n.a.
Pulp, paper and paper products (21)	1.9	1.4	0.6	0.4	0.5	n.a.	n.a.	n.a.	n.a.	1.5	1.6	1.6	n.a.

Table C11.2: Structure of industrial production - industrial production - current price, by sectors, %
(continued)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Publishing, printing and reproduction of recorded media (22)	1.4	0.6	1.1	1.9	3.1	n.a.	n.a.	n.a.	n.a.	4.2	4.3	4.1	n.a.
Chemicals, chemical products and man-made fibres (24)	7.8	9	6.4	5.8	6.2	n.a.	n.a.	n.a.	n.a.	2.5	2.9	2.7	n.a.
Rubber and plastic products (25)	0.8	0.5	0.4	0.6	0.7	n.a.	n.a.	n.a.	n.a.	1.6	1.8	2.1	n.a.
Other non-metalic mineral products (26)	3.7	3.8	2.5	2.5	2.2	n.a.	n.a.	n.a.	n.a.	2.4	2.8	3.2	n.a.
Fabricated metal products, except machinery and equipment (28)	1.6	1.2	0.9	1.2	1.7	n.a.	n.a.	n.a.	n.a.	2.9	3.2	3.2	n.a.
Machinery and equipment (29)	19.1	16.4	3.9	3.7	4.0	n.a.	n.a.	n.a.	n.a.	2.4	2.4	2.5	n.a.
Electrical machinery and apparatus n.e.c. (31)	1.6	0.6	2.4	2.1	1.8	n.a.	n.a.	n.a.	n.a.	1.4	1.7	1.9	n.a.
Radio, television and communication equipment and apparatus (32)	6.4	2.7	1.7	1.7	1.3	n.a.	n.a.	n.a.	n.a.	0.3	0.4	0.5	n.a.
Motor vehicles, trailers and semi-trailers (34)	1.5	3.5	4.0	2.4	1.6	n.a.	n.a.	n.a.	n.a.	0.2	0.3	0.3	n.a.
Other transport equipment (35)	0.5	0.5	2.4	3.9	3.9	n.a.	n.a.	n.a.	n.a.	2.3	2.5	2.6	n.a.
Furniture n.e.c.(36)	1.6	1.7	2.9	3.0	2.8	n.a.	n.a.	n.a.	n.a.	3.5	3.6	3.9	n.a.
Electricity, gas and water supply (E)	3.4	12.2	20.8	19.5	18.3	n.a.	n.a.	n.a.	n.a.	15.7	14.8	14.1	n.a.

Table C11.3: Structure of industrial production - output per employee, thsd EUR

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total industry	n.a.	n.a.	n.a.	n.a.	9.82	n.a.	n.a.	n.a.	n.a.	20.54	22.91	24.53	n.a.
Minning and quarring (C)	n.a.	n.a.	n.a.	n.a.	4.99	n.a.	n.a.	n.a.	n.a.	14.64	17.23	19.21	n.a.
Manufacturing (D), including	n.a.	n.a.	n.a.	n.a.	8.94	n.a.	n.a.	n.a.	n.a.	19.29	21.67	23.33	n.a.
Food products and beverages (15)	n.a.	n.a.	n.a.	n.a.	15.84	n.a.	n.a.	n.a.	n.a.	26.61	28.60	29.33	n.a.
Textiles (17)	n.a.	n.a.	n.a.	n.a.	6.30	n.a.	n.a.	n.a.	n.a.	15.36	16.16	14.58	n.a.
Wearing apparel; dressing and dyeing of fur (18)	n.a.	n.a.	n.a.	n.a.	3.23	n.a.	n.a.	n.a.	n.a.	7.68	7.46	8.06	n.a.
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (19)	n.a.	n.a.	n.a.	n.a.	3.96	n.a.	n.a.	n.a.	n.a.	5.00	8.17	7.03	n.a.
Wood and of products of wood and cork, except furniture; manufacture of articles of straw and plainting materials (20)	n.a.	n.a.	n.a.	n.a.	9.24	n.a.	n.a.	n.a.	n.a.	19.82	21.49	25.04	n.a.
Pulp, paper and paper products (21)	n.a.	n.a.	n.a.	n.a.	5.28	n.a.	n.a.	n.a.	n.a.	29.64	36.23	40.31	n.a.
Publishing, printing and reproduction of recorded media (22)	n.a.	n.a.	n.a.	n.a.	8.80	n.a.	n.a.	n.a.	n.a.	18.75	21.49	22.64	n.a.
Chemicals, chemical products and man-made fibres (24)	n.a.	n.a.	n.a.	n.a.	12.76	n.a.	n.a.	n.a.	n.a.	21.43	27.53	28.30	n.a.
Rubber and plastic products (25)	n.a.	n.a.	n.a.	n.a.	6.60	n.a.	n.a.	n.a.	n.a.	26.96	27.35	28.99	n.a.
Other non-metalic mineral products (26)	n.a.	n.a.	n.a.	n.a.	5.57	n.a.	n.a.	n.a.	n.a.	19.11	26.82	27.62	n.a.
Fabricated metal products, except machinery and equipment (28)	n.a.	n.a.	n.a.	n.a.	7.18	n.a.	n.a.	n.a.	n.a.	11.43	17.94	18.01	n.a.
Machinery and equipment (29)	n.a.	n.a.	n.a.	n.a.	5.72	n.a.	n.a.	n.a.	n.a.	12.32	13.50	14.75	n.a.
Electrical machinery and apparatus n.e.c. (31)	n.a.	n.a.	n.a.	n.a.	5.72	n.a.	n.a.	n.a.	n.a.	16.79	23.62	29.16	n.a.

Table C11.3: Structure of industrial production - output per employee, thsd EUR
(continued)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Radio, television and communication equipment and apparatus (32)	n.a.	n.a.	n.a.	n.a.	2.93	n.a.	n.a.	n.a.	n.a.	10.71	13.32	17.15	n.a.
Motor vehicles, trailers and semi-trailers (34)	n.a.	n.a.	n.a.	n.a.	9.53	n.a.	n.a.	n.a.	n.a.	16.25	19.01	22.98	n.a.
Other transport equipment (35)	n.a.	n.a.	n.a.	n.a.	6.60	n.a.	n.a.	n.a.	n.a.	15.00	16.87	18.87	n.a.
Furniture n.e.c.(36)	n.a.	n.a.	n.a.	n.a.	5.57	n.a.	n.a.	n.a.	n.a.	12.68	13.68	14.92	n.a.
Electricity, gas and water supply (E)	n.a.	n.a.	n.a.	n.a.	18.91	n.a.	n.a.	n.a.	n.a.	31.25	34.81	36.36	n.a.

Table C12.1: Industrial production by regions - value of production (at current prices, thsd ECU (until December 1998)/EURO (yearly average exchange rate))

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total	n.a.	n.a.	n.a.	n.a.	n.a.	2135.0	2761.5	2929.3	2816.3	3396.0	3869.3	n.a.	n.a.
Riga region	n.a.	n.a.	n.a.	n.a.	n.a.	1243.2	1676.6	1796.5	1739.7	2093.8	2418.2	n.a.	n.a.
Vidzemes region	n.a.	n.a.	n.a.	n.a.	n.a.	209.0	264.7	269.7	286.0	366.1	398.8	n.a.	n.a.
Kurzemes region	n.a.	n.a.	n.a.	n.a.	n.a.	252.3	336.1	376.0	352.6	414.8	463.1	n.a.	n.a.
Zemgales region	n.a.	n.a.	n.a.	n.a.	n.a.	190.1	224.2	244.9	259.1	317.9	351.5	n.a.	n.a.
Latgales region	n.a.	n.a.	n.a.	n.a.	n.a.	240.3	259.9	242.3	178.9	202.3	237.7	n.a.	n.a.

Table C12.2: Industrial production by regions - volume indices (% change y-on-y)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	29.3	6.1	-3.9	20.6	13.9	n.a.	n.a.
Riga region	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	34.9	7.1	-3.2	20.4	15.5	n.a.	n.a.
Vidzemes region	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	26.6	1.9	6.0	28.0	8.9	n.a.	n.a.
Kurzemes region	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	33.2	11.9	-6.2	17.6	11.7	n.a.	n.a.
Zemgales region	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	17.9	9.2	5.8	22.7	10.6	n.a.	n.a.
Latgales region	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	8.1	-6.8	-26.2	13.1	17.5	n.a.	n.a.

Table C21.1: Declining and rising sectors of industry and services in GDP (% change y-on-y)
GDP growth (1990-1994 at average prices of 1994, 1995-2003 at average prices of 2000 in LVL)

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
C: Mining and quarryng		-11.86	-45.12	-32.05	42.45	-40.23	2.49	8.65	8.21	9.89	7.95	16.67	7.64	-18.21
D: Manufacturing		0.75	-48.36	-31.66	-9.51	-4.05	4.10	17.10	3.99	-5.90	6.81	10.20	7.16	-19.69
E: Electricity, gas and water suply		-2.49	-29.17	-18.87	-0.83	60.72	-1.90	-0.70	1.74	-5.24	-3.98	7.26	4.63	-34.11
Total industry		0.28	-46.23	-29.81	-7.70	7.21	2.47	12.46	3.50	-5.66	4.39	9.64	6.65	-22.55
Construction		-40.40	-58.74	-48.94	12.79	45.64	5.30	8.22	17.00	8.08	8.19	6.10	10.80	-16.69
Total industry and construction		-13.18	-49.07	-33.33	-4.81	13.63	3.07	11.53	6.37	-2.45	5.37	8.70	7.73	-20.99
Services, total		-11.48	-13.52	7.39	7.76	70.86	4.77	7.66	5.09	5.93	7.09	8.26	5.90	-20.08
G: wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods		-31.35	-20.16	21.09	16.72	125.65	0.80	13.91	19.87	10.38	9.39	10.59	12.74	-17.70
H: hotels and restaurants		-29.89	-40.62	-33.16	35.94	3.74	5.26	1.05	5.99	8.11	7.05	13.59	0.00	-10.80
I: transport, storage and communications		-10.58	-27.18	8.89	14.98	21.27	13.60	7.41	-2.80	0.24	6.99	9.54	2.44	-17.48
J: financial intermediation		-0.29	39.94	5.46	6.77	76.05	-7.99	3.97	-0.77	5.08	9.39	7.28	5.11	-22.33
K: real estate, renting and busines activities		-3.98	-18.34	5.62	-10.29	125.81	6.82	9.27	8.02	17.76	13.37	13.91	5.67	-25.26
L: public administration and defence; compulsory social security		13.89	51.22	18.73	8.99	110.83	6.82	5.90	0.82	1.36	-0.12	2.68	3.53	-24.05
M: education		-7.25	5.35	-5.36	2.78	87.15	2.07	1.01	2.60	0.24	0.54	1.21	1.34	-23.09
N: health and social work		-3.16	3.84	19.15	-6.31	55.88	-4.87	1.98	-2.51	-0.91	0.34	-0.08	1.26	-19.34
O: other community, social and personal service activities		12.77	-24.92	-3.47	-3.28	76.09	11.65	11.11	6.12	7.94	6.71	3.51	4.56	-18.17

Table C21.1: Declining and rising sectors of industry and services in GDP (% change y-on-y)
GDP (1990-1994 at average prices of 1994, 1995-2003 at average prices of 2000 in LVL)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
C: Mining and quarryng	12.9	11.37	6.24	4.24	6.04	3.61	3.7	4.02	4.35	4.78	5.16	6.02	6.48	5.3
D: Manufacturing	1425.9	1436.53	741.86	507.01	458.77	440.2	458.23	536.61	558.04	525.13	560.88	618.09	662.34	531.9
E: Electricity, gas and water suply	183.4	178.83	126.66	102.76	101.91	163.79	160.67	159.55	162.32	153.81	147.69	158.41	165.74	109.2
C+D+E: Total industry	1622.2	1626.73	874.76	614.01	566.72	607.6	622.6	700.18	724.71	683.72	713.73	782.52	834.56	646.4
F: Construction	802.2	478.13	197.3	100.75	113.64	165.5	174.27	188.6	220.66	238.5	258.04	273.77	303.33	252.7
C+D+E+F: Total industry and construction	2424.4	2104.86	1072.06	714.76	680.36	773.1	796.87	888.78	945.37	922.22	971.77	1056.29	1137.89	899.1
G..O: Services	1314.7	1163.72	1006.34	1080.73	1164.61	1989.82	2084.82	2244.44	2358.67	2498.45	2675.49	2896.57	3067.58	2451.7
G: wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	237	162.7	129.9	157.3	183.6	414.3	417.6	475.7	570.2	629.4	688.5	761.4	858.4	706.5
H: hotels and restaurants	92	64.5	38.3	25.6	34.8	36.1	38	38.4	40.7	44	47.1	53.5	53.5	47.72
I: transport, storage and communications	469.9	420.2	306	333.2	383.1	464.6	527.8	566.9	551	552.3	590.9	647.3	663.1	547.2
J: financial intermediation	68.3	68.1	95.3	100.5	107.3	188.9	173.8	180.7	179.3	188.4	206.1	221.1	232.4	180.5
K: real estate, renting and busines activities	140.8	135.2	110.4	116.6	104.6	236.2	252.3	275.7	297.8	350.7	397.6	452.9	478.6	357.7
L: public administration and defence; compulsory social security	46.8	53.3	80.6	95.7	104.3	219.9	234.9	248.77	250.8	254.2	253.9	260.7	269.9	205
M: education	108.9	101	106.4	100.7	103.5	193.7	197.7	199.7	204.9	205.4	206.5	209	211.8	162.9
N: health and social work	72.7	70.4	73.1	87.1	81.6	127.2	121	123.4	120.3	119.2	119.6	119.5	121	97.6
O: other community, social and personal service activities	78.3	88.3	66.3	64	61.9	109	121.7	135.22	143.5	154.9	165.3	171.1	178.9	146.4

Table C3.1: Changes in structure of services in GDP (%)
GDP (1990-1994 at average prices of 1994, 1995-2003 at average prices of 2000 in LVL)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 I-IX
G..O: Services	1315	1163.72	1006.3	1080.7	1164.6	1989.8	2084.8	2244.4	2358.7	2498.5	2675.5	2896.6	3067.6	2451.7
G: wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	237	162.7	129.9	157.3	183.6	414.3	417.6	475.7	570.2	629.4	688.5	761.4	858.4	706.5
H: hotels and restaurants	92	64.5	38.3	25.6	34.8	36.1	38	38.4	40.7	44	47.1	53.5	53.5	47.72
I: transport, storage and communications	469.9	420.2	306	333.2	383.1	464.6	527.8	566.9	551	552.3	590.9	647.3	663.1	547.2
J: financial intermediation	68.3	68.1	95.3	100.5	107.3	188.9	173.8	180.7	179.3	188.4	206.1	221.1	232.4	180.5
K: real estate, renting and busines activities	140.8	135.2	110.4	116.6	104.6	236.2	252.3	275.7	297.8	350.7	397.6	452.9	478.6	357.7
L: public administration and defence; compulsory social security	46.8	53.3	80.6	95.7	104.3	219.9	234.9	248.77	250.8	254.2	253.9	260.7	269.9	205
M: education	108.9	101	106.4	100.7	103.5	193.7	197.7	199.7	204.9	205.4	206.5	209	211.8	162.9
N: health and social work	72.7	70.4	73.1	87.1	81.6	127.2	121	123.4	120.3	119.2	119.6	119.5	121	97.6
O: other community, social and personal service activities	78.3	88.3	66.3	64	61.9	109	121.7	135.22	143.5	154.9	165.3	171.1	178.9	146.4

Table C3.2: Structure of services (calculated from Table C3.1)

G..O: Services	100	100	100	100	100	100	100	100	100	100	100	100	100	100
G: wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	18.0	14.0	12.9	14.6	15.8	20.8	20.0	21.2	24.2	25.2	25.7	26.3	28.0	28.8
H: hotels and restaurants	7.0	5.5	3.8	2.4	3.0	1.8	1.8	1.7	1.7	1.8	1.8	1.8	1.7	1.9
I: transport, storage and communications	35.7	36.1	30.4	30.8	32.9	23.3	25.3	25.3	23.4	22.1	22.1	22.3	21.6	22.3
J: financial intermediation	5.2	5.9	9.5	9.3	9.2	9.5	8.3	8.1	7.6	7.5	7.7	7.6	7.6	7.4
K: real estate, renting and busines activities	10.7	11.6	11.0	10.8	9.0	11.9	12.1	12.3	12.6	14.0	14.9	15.6	15.6	14.6
L: public administration and defence; compulsory social security	3.6	4.6	8.0	8.9	9.0	11.1	11.3	11.1	10.6	10.2	9.5	9.0	8.8	8.4
M: education	8.3	8.7	10.6	9.3	8.9	9.7	9.5	8.9	8.7	8.2	7.7	7.2	6.9	6.6
N: health and social work	5.5	6.0	7.3	8.1	7.0	6.4	5.8	5.5	5.1	4.8	4.5	4.1	3.9	4.0
O: other community, social and personal service activities	6.0	7.6	6.6	5.9	5.3	5.5	5.8	6.0	6.1	6.2	6.2	5.9	5.8	6.0

Table C6: Major sectors of innovation activities (%) Density of innovative enterprises by kind of activity in per cent of total number of total number of enterprises in the group, 1999-2001

NACE	Inovative enterprises	Product innovators	Process innovators	Product innovators only	Process innovators only	Net turnover million LVL- all enterprises	Net turnover - non-innovative enterprises enterprises	Net turnover - innovative enterprises enterprises	Share of innovative enterprises	Share of industry in total turnover
Total	19.26	13.78	14.03	5.23	5.48	6268.81	3680.73	2588.08	41.3	100.00
C: Mining and quarrying, total	29.41	26.47	26.47	2.94	2.94	18.57	11.81	6.76	36.4	0.30
10 - Mining of coal and lignite;extraction of peat	25	25	21.43	3.57		14.86	10.69	4.17	28.1	0.24
14 - Other mining and quarrying	50	33.33	50		16.67	3.71	1.12	2.59	69.8	0.06
D: Manufacturing, total	22.98	18.62	16.42	6.56	4.36	1900.36	856.84	1043.52	54.9	30.31

Table C6: Major sectors of innovation activities (%) Density of innovative enterprises by kind of activity in per cent of total number of total number of enterprises in the group, 1999-2001
(continued)

NACE	Inovative enterprises	Product innovators	Process innovators	Product innovators only	Process innovators only	Net turnover million LVL- all enterprises	Net turnover - non-innovative enterprises enterprises	Net turnover - innovative enterprises enterprises	Share of innovative enterprises	Share of industry in total turnover
15-16 - Food products and beverages and tabacco products	32.88	29.25	20.41	12.47	3.63	626.75	248.06	378.69	60.4	10.00
17 - Textiles	24.2	20	21.43	2.86	4.29	93.26	22.96	70.3	75.4	1.49
18 - Wearing apparel; dressing and dyeing of fur	10.53	7.6	8.19	2.34	2.92	63.21	48.53	14.68	23.2	1.01
19 -Tanning and dressing of leather; manufacture of luggage, etc	3.85	3.85	3.85			4.21	3.99	0.22	5.2	0.07
20 - Wood and wood products	13.25	8.95	10.84	2.41	4.3	383.6	216.91	166.69	43.5	6.12
21- Pulp, paper and paper products	34.38	31.25	31.25	3.13	3.13	33.26	16.13	17.13	51.5	0.53
22 - Publishing, printing and reproduction of recorded media	18.67	10.24	13.25	5.42	8.43	99.53	42.34	57.19	57.5	1.59
23-24 - Chemicals and chemical products	52.17	47.83	39.13	13.04	4.35	70.78	16.28	54.5	77.0	1.13
25 - Rubber and plastic products	32.14	30.36	32.14		1.79	32.27	20.28	11.99	37.2	0.51
26- Other non-metalic mineral products	28.81	22.03	18.64	10.17	6.78	56.07	21.47	34.6	61.7	0.89
27 - Basic metals	33.33	33.33	33.33			110.75	36.15	74.6	67.4	1.77
28- Fabricated metal products, except machinery and equipment	21.99	17.73	10.64	11.35	4.26	72.94	55.8	17.14	23.5	1.16
29 - Machinery and equipment n.E.C.	31.17	31.17	18.18	12.99		50.22	20.25	29.97	59.7	0.80
31- Electrical machinery and apparatus n.E.C.	48.15	48.15	33.33	14.81		37.17	5.8	31.37	84.4	0.59

Table C6: Major sectors of innovation activities (%) Density of innovative enterprises by kind of activity in per cent of total number of total number of enterprises in the group, 1999-2001
(continued)

NACE	Inovative enterprises	Product innovators	Process innovators	Product innovators only	Process innovators only	Net turnover million LVL- all enterprises	Net turnover - non-innovative enterprises enterprises	Net turnover - innovative enterprises enterprises	Share of innovative enterprises	Share of industry in total turnover
32 - Radio, TV and communication equipment and apparatus	62.5	56.25	56.25	6.25	6.25	9.99	2.16	7.83	78.4	0.16
33 - Medical precision and optical instruments, watches and clocks	36	36	32	4		8.23	3.26	4.97	60.4	0.13
34 - Motor vehicles, trailers and semitrailers	25	25	12.5	12.5		6.87	4.86	2.01	29.3	0.11
35 - Other transport equipment	24.49	20.41	16.33	8.16	4.08	50.59	13.31	37.28	73.7	0.81
36 - Furniture, manufacturing n.E.C.	22.01	12.58	16.35	5.66	9.43	79.27	47.44	31.83	40.2	1.26
37 - Recycling	14.29	14.29	14.29			8.37	7.84	0.53	6.3	0.13
Services, total	15.38	8.75	11.45	3.94	6.64	4358.69	2820.89	1537.8	35.3	69.53
40 - Electricity, gas, steam and hot water supply	15.25	2.54	16.1		12.71	377.35	127.77	249.58	66.1	6.02
41- Collection, purification and distribution of water	50	25	37.5	12.5	25	4.73	0.49	4.24	89.6	0.08
51 - Trade	13.22	6.61	10.2	2.92	6.61	2535.12	2098.31	436.81	17.2	40.44
60 - Land transport; transport via pipelines	7.37	5.67	6.52	0.85	1.7	286.38	138.68	147.7	51.6	4.57
62 - Air transport	12.5		12.5			35.58	35.23	0.35	1.0	0.57
63 - Supporting and auxiliary transport activities; travel agencies	10.34	4.98	5.75	4.6	5.36	368.7	222.63	146.07	39.6	5.88
64- Post and telecommunications	38.1	28.57	21.43	16.67	9.52	337.47	51.55	285.92	84.7	5.38
65 - Financial intermediation	51.92	28.85	32.69	19.23	23.08	247.8	47.02	200.78	81.0	3.95
66 - Insurance and pension funding	43.48	43.48	21.74	21.74		30.06	9.89	20.17	67.1	0.48

Table C6: Major sectors of innovation activities (%) Density of innovative enterprises by kind of activity in per cent of total number of total number of enterprises in the group, 1999-2001
(continued)

NACE	Inovative enterprises	Product innovators	Process innovators	Product innovators only	Process innovators only	Net turnover million LVL- all enterprises	Net turnover - non-innovative enterprises enterprises	Net turnover - innovative enterprises enterprises	Share of innovative enterprises	Share of industry in total turnover
67 - Activities auxiliary to financial intermediation	25	15	20	5	10	8.82	2.55	6.27	71.1	0.14
72 - Computer and related activities	28.72	16.6	17.02	11.7	2.13	65.16	46.95	18.21	27.9	1.04
73 - Research and development	40	35	37.5	2.5	5	7.34	2.88	4.46	60.8	0.12
742 - Architectural and engineering activities and related technical consultancy	18.27	2.88	16.35	1.92	15.38	37.56	22.65	14.91	39.7	0.60
743 - Technical testing and analysis	14.82	11.11	3.7	11.11	3.7	10.83	8.5	2.33	21.5	0.17

Reference: Innovation survey results 2003, CSB, 2003, p.30

Table C6.1: Density of innovative enterprises by number of employees

Number of employees	Inovative enterprises	Product innovators	Process innovators	Product innovators only	Process innovators only	Number of enterprises
Manufacturing total	22.98	18.62	16.42	6.56	4.36	2180
10-49	16.95	13.7	11.07	5.88	3.25	1599
50-249	35	28.33	26.46	8.54	6.67	480
more than 250	61.39	50.5	53.47	7.92	10.89	101
Services total	15.38	8.75	11.45	3.94	6.64	2184
10-49	12.18	6.55	8.9	3.28	5.62	1831
50-249	28.36	18.02	21.02	7.34	10.34	300
more than 250	52.83	33.96	43.4	9.43	18.87	53

D. PRESENCE OF THE MOST RELEVANT ECONOMIC ACTIVITIES FOR IST APPLICATIONS

*Table D21: Breakdown of Patent Applications by IPC**

		A- Human necessities	B- Performing operations; Transporting	C- Chemistry	D- Textiles; Paper	E- Fixed constructions	F- Mechanical engineering	G- Physics	H- Electricity	Total
1992	Domestic	89	20	87	1	9	14	17	15	252
	Foreign	42	11	57	2	10	11	1	12	146
	Total	131	31	144	3	19	25	18	27	398
	%	32.9	7.8	36.2	0.8	4.8	6.3	4.5	6.8	100
1993	Domestic	70	35	76	1	15	26	29	31	283
	Foreign	79	49	121	4	18	27	14	18	330
	Total	149	84	197	5	33	53	43	49	613
	%	24.3	13.7	32.1	0.8	5.4	8.6	7.0	8.0	100
1994	Domestic	60	23	27	1	8	27	4	29	179
	Foreign	73	46	55	3	18	31	8	32	266
	Total	133	69	82	4	26	58	12	61	445
	%	29.9	15.5	18.4	0.9	5.8	13.0	2.7	13.7	100
1995	Domestic	57	36	49	4	5	15	19	22	207
	Foreign	96	57	103	7	22	21	25	29	360
	Total	153	93	152	11	27	36	44	51	567
	%	27.0	16.4	26.8	1.9	4.8	6.3	7.8	9.0	100
1996	Domestic	58	20	28	1	16	27	18	29	197
	Foreign	108	36	98	3	27	37	28	37	374
	Total	166	56	126	4	43	64	46	66	571
	%	29.1	9.8	22.1	0.7	7.5	11.2	8.1	11.6	100
1997	Domestic	95	32	71	4	14	22	20	13	271
	Foreign	57	19	28	4	7	19	18	10	162
	Total	152	51	99	8	21	41	38	23	433
	%	35.1	11.8	22.9	1.8	4.8	9.5	8.8	5.3	100

Table D21: Breakdown of Patent Applications by IPC
(continued)

		A- Human necessities	B- Performing operations; Transporting	C- Chimestry	D- Textiles; Paper	E- Fixed constructions	F- Mechanical engineering	G- Physics	H- Electricity	Total
1998	Domestic	48	38	53	2	11	17	15	11	195
	Foreign	24	6	42	2	4	3	6	3	90
	Total	72	44	95	4	15	20	21	14	285
	%	25.3	15.4	33.3	1.4	5.3	7.0	7.4	4.9	100
1999	Domestic	30	10	17	0	4	7	14	9	91
	Foreign	25	4	37	2	8	6	7	2	91
	Total	55	14	54	2	12	13	21	11	182
	%	30.2	7.7	29.7	1.1	6.6	7.1	11.5	6.0	100
2000	Domestic	23	16	19	1	7	11	13	8	98
	Foreign	22	5	34	0	6	3	5	5	80
	Total	45	21	53	1	13	14	18	13	178
	%	25.3	11.8	29.8	0.6	7.3	7.9	10.1	7.3	100
2002	Domestic	42	27	30	1	7	16	15	12	150
	Foreign	24	15	22	0	0	1	2	0	64
	Total	66	42	52	1	7	17	17	12	214
	%	30.8	19.6	24.3	0.5	3.3	7.9	7.9	5.6	100

References: Patent office of The Republic of Latvia
*1992-1997 Foreign: without re-registered applications of former USSR, extended European patent applications and re-registered applications under Latvian-USA agreement.

Table D22: Number of patents and applications per million population in 2001

Country	Patent Co-operation Treaty (PCT) applications	European Patent Office (EPO) patents	USA Patent and Trademark Office (USPTO) patents
Estonia	11	6.9	2.2
Latvia	8	2.5	0.8
Lithuania	2	1.1	1.4
EU-15	161	154	80.1

References: Kristapsons J., Martinson H., Dagyte I. Baltic R&D systems in transition. Experiences and future Prospects, Riga, p.123. Original source: European Patent Office

Table D22: Amount spent on R&D (EUR, mln)

	2000	2001	2002
Business enterprise sector	15.18	13.68	16.98
Business enterprises' funds	5.71	5.33	6.00
Government funds	0.89	0.36	3.43
Foreign funds	8.57	7.99	7.55
Government sector	8.39	7.99	7.72
Business enterprises' funds	2.32	0.89	1.20
Government funds	4.29	4.97	4.63
Foreign funds	1.79	2.13	1.89
Higher education sector	13.93	15.81	16.64
Business enterprises' funds	4.46	4.09	1.72
Government funds	8.93	9.95	9.61
Foreign funds	0.54	1.78	5.32
Private non-profit sector	0.00	0.00	0.00
Government funds	0.00	0.00	0.00
Gross Domestic Expenditure on R&D (GERD)	37.50	37.48	41.34
Business enterprises' funds	12.50	6.93	8.92
Government funds	14.11	18.65	17.67
Foreign funds	10.89	11.90	14.75
R&D expenditure as per cent of GDP	0.5	0.44	0.46

References: 2000-2002: Statistical Yearbook of Latvia 2003, CSB 2003, p. 97

Table D24: R&D investment level in ICT sector (EUR, mln), 2001

NACE	Intramural R&D	Extramural R&D	Total
D: Manufacturing, total			
31 - Electrical machinery and apparatus n.E.C.	0.47	1.72	2.19
32 - Radio, television and communication equipment and apparatus	0.07		0.07
33 - Medical, precision and optical instruments, waches and clocks	0.10		0.10
Services, total			
51- Trade	0.14	0.07	0.21
64 - Post and telecommunications	0.17	0.29	0.47
72 - Computer and related activities	3.64	0.84	4.48

References:

G. EDUCATIONAL SECTOR AND LABOUR FORCE SUPPLY

Table G11.1: Number of students (thsd.)

Year	Enrolment, total	General schools	Vocational schools	Higher education institutions and colleges
1990/91	465	352	67	46
1991/92	458	349	63	46
1992/93	434	337	56	41
1993/94	424	336	50	38
1994/95	424	340	45	39
1995/96	437	348	42	47
1996/97	453	354	43	56
1997/98	471	360	46	65
1998/99	485	362	46	77
1999/2000	499	361	48	90
2000/2001	510	360	49	101
2001/2002	511	352	48	111
2002/2003	506	340	47	119

Reference: Statistical Yearbook of Latvia 2003, CSB, 2003, p.89

Table G11.2: Graduates of vocational schools by area of study, thsd

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total	9.28	7.89	7.04	18.23	17.17	16.73	45.6	18.17	18.53	18.44	13.32	13.4
General education							0.71	0.46	0.07	0.69	0.61	0.45
Humanities and art	0.47	0.48	0.47	1.63	1.66	1.55	1.98	0.54	0.97	0.87	0.54	0.74
Social sciences, business and law	1.99	1.52	1.67	3.76	2.69	3.7	6.45	2.93	2.95	3.2	2.38	2
Physical sciences and matemathics								0.02	0.29	0.35	0.09	0.06
Engineering and manufacturing	3.48	2.77	2.33	3.54	3.78	3.7	22.18	8.43	7.71	7.64	5.57	5.84
Agriculture	1.4	1.25		3.94	3.33	2.83	4.62	1.48	0.81	0.53	0.55	0.41
Health and welfare	1.37	1.36	0.73	2.23	1.69	1.44	1.56	0.97	1.21	1.23	0.78	0.78
Services	0.59	0.51	1.28	3	3.33	3.11	8.17	3.05	3.87	3.91	2.8	3.13

Reference: Statistical Yearbooks of Latvia, relevant years

Table G11.3: Enrolment in higher education institutions and colleges by field of study at the beginning of the school year, thsd (1991 - 1993 - graduates

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total	5.8	6.84	7.88	33.81	43.52	50.64	64.95	76.65	89.5	101.27	110.5	118.94
Social sciences, business and law	1.15	1.31	1.55	8.45	10.03	11.99	27.42	34.99	42.62	51.26	56.39	62.73
Teachers training and education sciences				7.49	11.03	12.81	12.73	15.59	17.79	18.48	17.86	18.01
Engineering and technology	1.49	1.8	2.22	4.89	5.34	4.64	10.65	11.35	9.3	10.13	11.32	14.4
Humanities and art	1.88	2.4	2.42	3.61	4.08	4.47	5.49	5.44	6.89	6.87	7.79	8.18
Natural sciences and matemathics	0.57	0.49	0.76	2.03	3.21	5.76	3.26	3.4	5.76	6.59	7.91	6.09
Health and welfare		0.42	0.38	2.06	2.31	2.29	2.46	2.49	2.43	3.09	3.94	4.17
Services				2.19	1.78	1.75	0.84	0.67	3.04	3.05	3.27	3.21
Agriculture	0.45	0.41	0.47	2.73	3.53	4.19	2.11	2.22	1.67	1.79	2.02	2.11

Table G11.4: Number of students in life-long training by area of training, thsd

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total	n.a.	n.a.	n.a.	n.a.	112.16	100.8	120.91	201.91	210.78	196.16	204.86	210.74
Teacher training	n.a.	n.a.	n.a.	n.a.	9.5	6.33	10.23	10.77	21.71	21.99	18.21	23.83
Humanities, art and religion	n.a.	n.a.	n.a.	n.a.	11.58	1.76	2.06	2.44	24.44	21.62	27.83	27.69
Languages	n.a.	n.a.	n.a.	n.a.	7.38	8.8	13.09	15.02	21.6	17.91	24.43	24.46
Social sciences, business and law	n.a.	n.a.	n.a.	n.a.	31.89	18.57	22.43	51.14	39.6	41.09	49.9	60.81
Computer training	n.a.	n.a.	n.a.	n.a.	8.76	5.59	8.22	14.84	15.34	12.9	14.84	13.53
Engineering science and technologies	n.a.	n.a.	n.a.	n.a.					8.59	8.39	7.66	8.75
Agriculture	n.a.	n.a.	n.a.	n.a.	2.38	2.32		14.68	14.52	12.43	12.55	13.86
Health care and social work	n.a.	n.a.	n.a.	n.a.	3.61	14.32	21.46		45.21	44.47	29.35	30.98
Services	n.a.	n.a.	n.a.	n.a.	0.14	0.53			40.43	32.68	24.71	24.12
Other	n.a.	n.a.	n.a.	n.a.		26.95	27.5	78.34	0.94	0.59	16.65	29.8
Management, organisation of work	n.a.	n.a.	n.a.	n.a.				13.05				

Table G11.5: Number of graduated in secondary and tertiary education

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Secondary schools	14.1	12.1	7.6	10.2	11.5	13.3	14	15.1	16.6	17.6	20.1	20.5
Full time	11.8	10.3	5.9	8.6	9.6	9.6	11	11.2	11.9	13.2	16.3	16.5
Evening	2.3	1.8	1.7	1.6	1.9	1.9	2.3	2.8	3.2	3.4	3.8	4
Vocational schools	15.7	11.3	9.2	9.8	13.6	12	11.7	12.4	11.7	12.8	13.3	13.4
Higher education institutions and colleges	5.85	6.84	7.88	6.86	8.33	8.19	8.88	9.35	12.09	15.01	20.31	18.92
Full time studies	3.63	4.28	5.55	5.15	6.43	6.41	6.7	6.73	8.34	10.04	10.8	12.24
Part time studies	0.44	0.48	0.35	0.23	1.9	1.78	2.18	2.61	3.75	4.97	9.51	6.67
Correspondence	1.78	2.09	1.98	1.49								

References for G11: 1991-1994: Statistical Yearbook of Latvia 1995, CSB, 1995, p. 135, 138; 1995, 2000-2002: Statistical Yearbook of Latvia 2003, CSB, 2003, p. 90, 93 1996-1999: Statistical Yearbook of Latvia 2000, CSB, 2000, p.91, 94; 1995-2002: Statistical Yearbook of Latvia 2003, CSB, 2003, p. 94; 1991-1994: Statistical Yearbook of Latvia 1995, CSB, 1995, p. 142;

Table G11.6: Number of college and university applications (new enrolees)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Higher education institutions and colleges					12.98	16.21	18.53	27.6	34.15	32.95	37.28	40.99
Full time studies					9.52	10.99	11.66	16.79	18.52	21	23.51	26.51
Part time studies					3.45	5.23	6.86	10.81	15.63	11.95	13.77	14.48

Reference: 1995-2002: Statistical Yearbook of Latvia 2003, CSB, 2003, p. 94

Table G32: Iissues of technology transfer and innovation

Source of information	Degree of importance (%)			
	high	medium	low	not used
Within the enterprise	38.33	38.63	7.36	15.68
Other enterprises within the enterprise group	7.83	3.64	2.23	86.3
Suppliers of equipment, materials, components or software	24.07	40.11	14.74	21.08
Clients or customers	26.32	36.36	12.95	24.37
Competitors and their enterprises from the same industry	14.69	34.28	20.7	30.33
Universities or other higher education institutions	2.32	8.15	15.44	74.09
Government or private non-profit research institutes	1	7.27	10.82	80.91
Professional conferences, meetings, journals	12.83	36.11	21.19	29.87
Fairs, exhibitions	15.33	38.42	19.19	27.06

H. NATIONAL AND REGIONAL DEMOGRAPHIC DATA AND PROSPECTIVE

Table H1.: Age distribution (beginning of year, thsd people)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
0-4								133.9	120.6	108.8	100.8	96.2	93.2	95.1	96.6
5-9								188.1	180.4	170.8	158.4	146.1	132	118.8	107
10-14								187	191.4	193.7	192.8	189.8	183.5	176.6	169
15-19								165.4	165.7	168.7	174.6	180.3	180.7	184.3	187.3
20-24								170.4	165.8	163.4	162.9	162.2	161.2	161.8	164.7
25-29								175.6	177.9	177.2	174.8	172.4	163.8	161.6	160
30-34								183.2	177.6	173.2	170.8	170.2	160	160.7	161.6
35-39								188.8	190.9	190.3	188.1	184.5	170.6	164.7	160.3
40-44								168.4	169.4	172.2	176.8	179.8	176.9	178.7	178.4
45-49								154.9	158.8	160.1	159.2	158.8	157	157.6	160.6
50-54								144.6	135.4	132.4	134.3	139.8	143.9	147.8	149.1
55-59								163.7	163.9	159.5	151.6	142.6	134.2	125.4	122.6
60-64								136.2	135.7	136.6	140.7	145.8	148.3	148.7	144.7
65-69								129.3	129.3	127.9	124.5	120.6	119.1	118.7	120.2
70-74								93.5	97.7	102.1	104.5	106.3	108	107.7	249.4
75-79								48.7	51.9	57.2	62.5	67.1	71.7	74.7	
80+								69.9	67.3	64.2	62.1	61.4	61.9	62.7	

References: 1989-2002:Statistical Yearbook of Latvia, 2002, Central Statistical Bureau, Riga, 2002, p.37

Table H1.1: Age distribution (beginning of year, In percent of total)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
0-4			7.5	7.2	6.8	6.3	5.9	5.4	4.9	4.4	4.1	4.0	3.9	4.1	4.1
5-9			7.4	7.6	7.7	7.7	7.6	7.5	7.3	6.9	6.5	6.0	5.6	5.1	4.6
10-14			6.6	6.6	6.8	7.0	7.3	7.5	7.7	7.9	7.9	7.8	7.8	7.5	7.3
15-19			6.7	6.5	6.5	6.5	6.5	6.6	6.7	6.9	7.2	7.4	7.6	7.9	8.0
20-24			7.0	7.0	7.0	6.9	6.9	6.8	6.7	6.6	6.7	6.7	6.8	6.9	7.1
25-29			7.5	7.2	7.0	6.8	6.9	7.0	7.2	7.2	7.2	7.1	6.9	6.9	6.9
30-34			7.7	7.8	7.7	7.6	7.5	7.3	7.2	7.0	7.0	7.0	6.8	6.8	6.9
35-39			6.9	7.0	7.1	7.3	7.4	7.5	7.7	7.7	7.7	7.6	7.2	7.0	6.9
40-44			6.4	6.6	6.7	6.7	6.6	6.7	6.8	7.0	7.2	7.4	7.5	7.6	7.7
45-49			5.9	5.6	5.6	5.7	6.0	6.2	6.4	6.5	6.5	6.6	6.6	6.7	6.9
50-54			6.8	6.9	6.8	6.5	6.1	5.8	5.5	5.4	5.5	5.8	6.1	6.3	6.4
55-59			5.8	5.8	5.9	6.2	6.4	6.5	6.6	6.5	6.2	5.9	5.7	5.3	5.3
60-64			5.7	5.8	5.8	5.7	5.5	5.4	5.5	5.6	5.8	6.0	6.3	6.3	6.2
65-69			4.3	4.6	4.8	5.0	5.1	5.2	5.2	5.2	5.1	2.0	5.0	5.1	5.2
70-74			2.5	2.7	3.0	3.3	3.5	3.7	3.9	4.2	4.3	4.4	4.6	4.6	10.7
75-79			2.5	2.3	2.1	2.0	1.9	1.9	2.1	2.3	2.6	2.8	3.0	3.2	0.0
80+			2.8	2.8	2.7	2.8	2.9	2.8	2.7	2.6	2.5	2.5	2.6	2.7	0.0

References: 1989-2002:Statistical Yearbook of Latvia, 2002, Central Statistical Bureau, Riga, 2002, p.37

Table H21: Population dinamics

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Resident population, thsd.population, at beginning of year	2666	2668	2658	2643	2586	2541	2500	2469	2445	2421	2399	2377	2364	2346	2331
Population dinamics		100.1	99.6	99.4	97.8	98.3	98.4	98.8	99.0	99.0	99.1	99.1	99.5	99.2	99.4
Resident population as in statistics of relevant years before sensus							1172.04	2501.66	2479.87	2458.4	2439.44	2424.15	2366.13		

References: 1989-2002:Statistical Yearbook of Latvia, 2002, Central Statistical Bureau, Riga, 2002, p.37

Table H3.1: Changes in employment structures (by NACE)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 III
Employed, total (annual average, according to Labour Force Survey data), thsd population,	1409	1397	1345	1245	1205	1189	949	990	986	968	941	962	989	1027
A: Agriculture, hunting, forestry	233	236	262	232	224	214	159	208	183	156	134	143	147	n.a.
B: Fishing	12	12	7	8	8	6	5	5	5	4	2	2	6	n.a.
A+B	245	248	269	240	232	220	164	213	188	160	136	145	153	146.4
C: Mining and quarryng	4	4	3	2	3	3	2	1	1	1	2	1	3	n.a.
D: Manufacturing	373	356	321	269	232	208	183	183	183	170	170	156	167	n.a.
E: Electricity, gas and water suply	14	11	16	16	18	17	21	21	24	22	21	19	22	n.a.
C+D+E: Total industry	391	371	340	287	253	228	206	205	208	193	193	176	192	197.5
F: Construction	136	130	89	68	62	71	51	51	54	58	56	68	60	73.6
C+D+E+F: Total industry and construction	527	501	429	355	315	299	257	256	262	251	249	244	252	271.1
G: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	109	119	138	155	162	164	117	132	145	142	145	160	148	180.9
H: Hotels and restaurants	61	59	49	32	36	27	16	16	18	21	22	22	24	n.a.
I: Transport, storage and telecommunication	106	107	105	108	106	105	84	82	79	82	79	78	86	100.2
J: Financial intermediation	7	7	10	10	12	20	14	11	12	12	12	14	13	55.2
K: Real estate, renting and business activities	81	78	65	60	61	57	32	26	34	41	45	41	39	n.a.
L: Public administration and defence; compulsory social security	21	24	37	44	50	56	60	58	67	74	71	68	68	273.3
M: Education	101	94	101	94	92	104	95	92	84	87	87	88	88	n.a.
N: Health and social work	68	66	70	80	74	74	58	53	52	52	48	50	60	n.a.
O: Other community, social and personal service	83	94	72	64	65	63	50	48	44	44	44	49	53	n.a.
G..O: Services	637	648	647	647	658	670	526	518	535	555	553	570	579	609.6
Total	1409	1397	1345	1242	1205	1189	947	987	985	966	938	959	984	1027.1

Table H3.2: Structure in total employed (calculated from Table H3.1)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 III
A: Agriculture, hunting, forestry	16.5	16.9	19.5	18.7	18.6	18.0	16.8	21.1	18.6	16.1	14.3	14.9	14.9	n.a.
B: Fishing	0.9	0.9	0.5	0.6	0.7	0.5	0.5	0.5	0.5	0.4	0.2	0.2	0.6	n.a.
A+B	17.4	17.8	20.0	19.3	19.3	18.5	17.3	21.6	19.1	16.6	14.5	15.1	15.5	14.3
C: Mining and quarryng	0.3	0.3	0.2	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.3	n.a.
D: Manufacturing	26.5	25.5	23.9	21.7	19.3	17.5	19.3	18.5	18.6	17.6	18.1	16.3	17.0	n.a.
E: Elacticity, gas and water suply	1.0	0.8	1.2	1.3	1.5	1.4	2.2	2.1	2.4	2.3	2.2	2.0	2.2	n.a.
C+D+E: Total industry	27.8	26.6	25.3	23.1	21.0	19.2	21.8	20.8	21.1	20.0	20.6	18.4	19.5	19.2
F: Construction	9.7	9.3	6.6	5.5	5.1	6.0	5.4	5.2	5.5	6.0	6.0	7.1	6.1	7.2
C+D+E+F: Total industry and construction	37.4	35.9	31.9	28.6	26.1	25.1	27.1	25.9	26.6	26.0	26.5	25.4	25.6	26.4
G: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	7.7	8.5	10.3	12.5	13.4	13.8	12.4	13.4	14.7	14.7	15.5	16.7	15.0	17.6
H: Hotels and restaurants	4.3	4.2	3.6	2.6	3.0	2.3	1.7	1.6	1.8	2.2	2.3	2.3	2.4	n.a.
I: Transport, storage and telecommunication	7.5	7.7	7.8	8.7	8.8	8.8	8.9	8.3	8.0	8.5	8.4	8.1	8.7	9.8
J: Financial intermediation	0.5	0.5	0.7	0.8	1.0	1.7	1.5	1.1	1.2	1.2	1.3	1.5	1.3	5.4
K: Real estate, renting and business activities	5.7	5.6	4.8	4.8	5.1	4.8	3.4	2.6	3.5	4.2	4.8	4.3	4.0	n.a.
L: Public administration and defence; compulsory social security	1.5	1.7	2.8	3.5	4.1	4.7	6.3	5.9	6.8	7.7	7.6	7.1	6.9	26.6
M: Education	7.2	6.7	7.5	7.6	7.6	8.7	10.0	9.3	8.5	9.0	9.3	9.2	8.9	n.a.
N: Health and social work	4.8	4.7	5.2	6.4	6.1	6.2	6.1	5.4	5.3	5.4	5.1	5.2	6.1	n.a.
O: Other community, social and personal service	5.9	6.7	5.4	5.2	5.4	5.3	5.3	4.9	4.5	4.6	4.7	5.1	5.4	n.a.
G..O: Services	45.2	46.4	48.1	52.1	54.6	56.3	55.5	52.5	54.3	57.5	59.0	59.4	58.8	59.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table H3.3: Volume changes on Y-o-Y basis (calculated from Table H3.1)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 III
A: Agriculture, hunting, forestry		1.3	11.0	-11.5	-3.4	-4.5	-25.7	30.8	-12.0	-14.8	-14.1	6.7	2.8	n.a.
B: Fishing		0.0	-41.7	14.3	0.0	-25.0	-16.7	0.0	0.0	-20.0	-50.0	0.0	200.0	n.a.
A+B		1.2	8.5	-10.8	-3.3	-5.2	-25.5	29.9	-11.7	-14.9	-15.0	6.6	5.5	-4.3
C: Mining and quarryng		0.0	-25.0	-33.3	50.0	0.0	-33.3	-50.0	0.0	0.0	100.0	-50.0	200.0	n.a.
D: Manufacturing		-4.6	-9.8	-16.2	-13.8	-10.3	-12.0	0.0	0.0	-7.1	0.0	-8.2	7.1	n.a.
E: Elacticity, gas and water suply		-21.4	45.5	0.0	12.5	-5.6	23.5	0.0	14.3	-8.3	-4.5	-9.5	15.8	n.a.
C+D+E: Total industry		-5.1	-8.4	-15.6	-11.8	-9.9	-9.6	-0.5	1.5	-7.2	0.0	-8.8	9.1	2.9
F: Construction		-4.4	-31.5	-23.6	-8.8	14.5	-28.2	0.0	5.9	7.4	-3.4	21.4	-11.8	22.7
C+D+E+F: Total industry and construction		-4.9	-14.4	-17.2	-11.3	-5.1	-14.0	-0.4	2.3	-4.2	-0.8	-2.0	3.3	7.6
G: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods		9.2	16.0	12.3	4.5	1.2	-28.7	12.8	9.8	-2.1	2.1	10.3	-7.5	22.2
H: Hotels and restaurants		-3.3	-16.9	-34.7	12.5	-25.0	-40.7	0.0	12.5	16.7	4.8	0.0	9.1	n.a.
I: Transport, storage and telecommunication		0.9	-1.9	2.9	-1.9	-0.9	-20.0	-2.4	-3.7	3.8	-3.7	-1.3	10.3	16.5
J: Financial intermediation		0.0	42.9	0.0	20.0	66.7	-30.0	-21.4	9.1	0.0	0.0	16.7	-7.1	n.a.
K: Real estate, renting and business activities		-3.7	-16.7	-7.7	1.7	-6.6	-43.9	-18.8	30.8	20.6	9.8	-8.9	-4.9	n.a.
L: Public administration and defence; compulsory social security		14.3	54.2	18.9	13.6	12.0	7.1	-3.3	15.5	10.4	-4.1	-4.2	0.0	n.a.
M: Education		-6.9	7.4	-6.9	-2.1	13.0	-8.7	-3.2	-8.7	3.6	0.0	1.1	0.0	n.a.
N: Health and social work		-2.9	6.1	14.3	-7.5	0.0	-21.6	-8.6	-1.9	0.0	-7.7	4.2	20.0	n.a.
O: Other community, social and personal service		13.3	-23.4	-11.1	1.6	-3.1	-20.6	-4.0	-8.3	0.0	0.0	11.4	8.2	n.a.
G..O: Services	0	1.7	-0.2	0.0	1.7	1.8	-21.5	-1.5	3.3	3.7	-0.4	3.1	1.6	5.3
Total	0	-0.9	-3.7	-7.7	-3.0	-1.3	-20.4	4.2	-0.2	-1.9	-2.9	2.2	2.6	4.4

Table H4.1: Long term migration

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 III
Immigration, thsd. persons	32.29	14.68	52.17	41.16	42.83	42.06	42.11	42.13	41.85	38.8	36.62	33.23	32.84	45
of which internal migration			45.97	37.05	39.78	39.27	39.36	39.22	38.73	36.98	34.99	31.78	31.41	44.01
% of total	0	0	88.1	90.0	92.9	93.4	93.5	93.1	92.5	95.3	95.5	95.6	95.6	97.8
Emigration, thsd persons	32.8	25.48	99.1	69.04	61.64	55.78	52.31	51.65	47.7	42.97	42.12	38.38	34.67	45.69
of which internal migration			45.97	37.05	39.78	39.27	39.37	39.22	38.73	36.98	34.99	31.78	31.41	44.08
% of total	0	0	46.4	53.7	64.5	70.4	75.3	75.9	81.2	86.1	83.1	82.8	90.6	96.5
Net migration, thsd persons (into and outside Latvia)	-0.51	-10.8	-46.93	-27.88	-18.81	-13.71	-10.2	-9.5	-5.85	-4.18	-5.5	-5.2	-1.83	-0.69
Lithuania			-0.55	-0.19	-0.15	-0.25	-0.15	-0.16	-0.13	-0.12	-0.08	-0.06	-0.01	n.a.
Estonia			-0.06	0.04	0.04	0.02	0.02	-0.03	-0.006	0.001	-0.02	-0.03	-0.06	n.a.
CIS			-44.26	-25.7	-17.3	-11.66	-7.96	-7.31	-3.44	-1.99	-3.21	-2.99	n.a.	n.a.
Other countries			-2.32	-2.02	-1.41	-1.83	-2.05	-2.03	-2.28	-2.04	-2.2	-2.07	-1.76	-0.69

Table H5: Changes in income distribution

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 III
Gini coefficient	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.31	0.32	0.31	0.34	0.34	0.34	n.a.
Average net wages and salaries of employees, EUR	n.a.	n.a.	23.2	51.7	90.6	107.0	114.5	133.9	146.5	164.8	194.6	204.3	212.7	215.5
Public sector, EUR	n.a.	n.a.	n.a.	n.a.	95.2	112.9	120.3	141.6	157.1	182.4	217.9	229.1	245.3	248.1
Private sector, EUR	n.a.	n.a.	n.a.	n.a.	86.1	101.2	107.2	126.3	139.0	152.0	176.8	188.3	192.1	196.9
Public sector/private sector	n.a.	n.a.	n.a.	n.a.	110.5	111.6	112.2	112.0	113.0	120.0	123.2	121.7	127.7	126.0
Trend in wages and salaries of employees - per cent of the previous year	n.a.	186.3	716.7	219.7	147	121	107	112	110	105	106	106	108	112
Consumer price index	n.a.	272.2	1051.2	209.2	136	125	118	108	105	102	103	103	102	103
Trends in real wages and salaries of employees	n.a.	68.4	68.2	105	108	97	91	104	105	103	103	104	106	108
Average size of old-age pensions of pensioners under the social welfare system, EUR	n.a.	n.a.	8.5	18.9	39.3	44.0	55.1	63.9	77.0	92.8	103.6	103.0	106.3	99.2
Value of minimum consumer basket of goods and services (complete) per capita, EUR	n.a.	n.a.	20.0	47.9	78.5	93.8	107.2	120.2	123.9	132.8	150.0	154.5	152.7	n.a.
Average net wages /MCB	n.a.	172.41	115.78	107.89	115.38	114.06	106.76	111.39	118.29	124.1	129.76	132.18	139.33	n.a.
Old age pensions/MCB	n.a.	46.552	42.596	39.474	50	46.875	51.351	53.165	62.195	69.88	69.048	66.667	69.663	n.a.

Table H5.1: Changes in income distribution

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 III
In EUR														
Hosehold disposable income (in cash and kind)*	n.a.	n.a.	n.a.	n.a.	n.a.	72.3	74.7	84.4	94.2	103.6	123.6	n.a.	137.2	n.a.
Compensation for labour	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	37.7	43.6	52.5	58.2	6.3	n.a.	84.0	n.a.
Net income from entrepreneurial activity and self employment	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	9.0	8.2	9.0	6.3	29.2	n.a.	12.0	n.a.
Transfers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	20.5	23.8	24.2	30.1	33.7	n.a.	39.5	n.a.
of which pensions	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16.9	19.7	20.6	25.6	29.2	n.a.	27.4	n.a.
Other income	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	7.4	8.8	8.5	8.9	11.6	n.a.	1.7	n.a.
In per cent														
Hosehold disposable income (in cash and kind)*	100	100	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	n.a.	100.0	n.a.
Compensation for labour	72.4	62.2	64.3	63.0	67.0	n/a	50.4	51.7	55.8	56.2	5.1	n.a.	61.3	n.a.
Net income from entrepreneurial activity and self employment	6.1	5.8	7.3	5.4	5.4	n/a	12.1	9.8	9.5	6.1	23.6	n.a.	8.8	n.a.
Transfers	11.2	20.9	17.9	20.3	17.4	n/a	27.5	28.2	25.7	29.1	27.3	n.a.	28.8	n.a.
of which pensions	n.a.	n.a.	n.a.	n.a.	n.a.	n/a	22.7	23.4	21.9	24.7	23.6	n.a.	20.0	n.a.
Other income	10.3	11.1	10.5	11.3	10.2	n/a	10.0	10.4	9.0	8.6	9.4	n.a.	1.3	n.a.

Table H5.2: Changes in consumption patterns

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 III
Household consumption expenditure, % *	100	100	100	100	100	100	100	100	100	100	100	100	100	n.a.
Food and non-alcohoilic beverages	37.7	n.a.	n.a.	47.7	45.9	44.2	50.9	46.8	41	38.2	36.5	36.4	35.2	n.a.
Alcoholic beverages and tobacco	4.8	n.a.	n.a.	6.5	5.6	5.6	5.1	5	5.4	4.8	5.5	3.1	3.4	n.a.
Clothing and footwear	19.2	n.a.	n.a.	8.4	7.6	8.1	5.7	5.7	6.9	6.5	6.5	6.4	6.8	n.a.
Housing, water, electricity, gas and other fuels	4	n.a.	n.a.	15.3	13.9	14.1	14.3	15	16.6	17.3	16.3	14.3	13	n.a.
Furnishings, household equipment and routine household maintenance	6.9	n.a.	n.a.	2.7	2.8	2.9	2.5	3	4	4.9	4.8	4.3	4.4	n.a.
Health	2.1	n.a.	n.a.	2	3.2	3.3	3.7	3.8	3.4	3.7	4	3.9	3.2	n.a.
Transport (1990-1995: transport and commmuynication)	7.5	n.a.	n.a.	7.2	7.2	7.8	6	7	6.7	7.4	7.5	9.4	9.7	n.a.
Communication		n.a.	n.a.	n.a.	n.a.	n.a.	1.4	2	3.1	4.2	5.2	5.3	5.9	n.a.
Recreation and culture (1990-1995: including education and hotels, restaurants)	8.8	n.a.	n.a.	4.9	6.4	6.3	4.1	4.6	5.5	5.6	6.2	6.2	6.5	n.a.
Education		n.a.	n.a.	n.a.	n.a.	n.a.	0.8	0.8	1	0.9	1	1.5	1.5	n.a.
Hotels, restaurants		n.a.	n.a.	n.a.	n.a.	n.a.	2.4	2.6	2.4	2.2	2.4	4.9	5.6	n.a.
Miscelleneous goods and services	9	n.a.	n.a.	5.3	7.4	7.7	3.1	3.7	4	4.3	4.1	4.3	4.8	n.a.