FOREIGN TRADE CHANGES AND SECTORAL DEVELOPMENT IN LATVIA: COMPARISON OF THE BALTIC STATES

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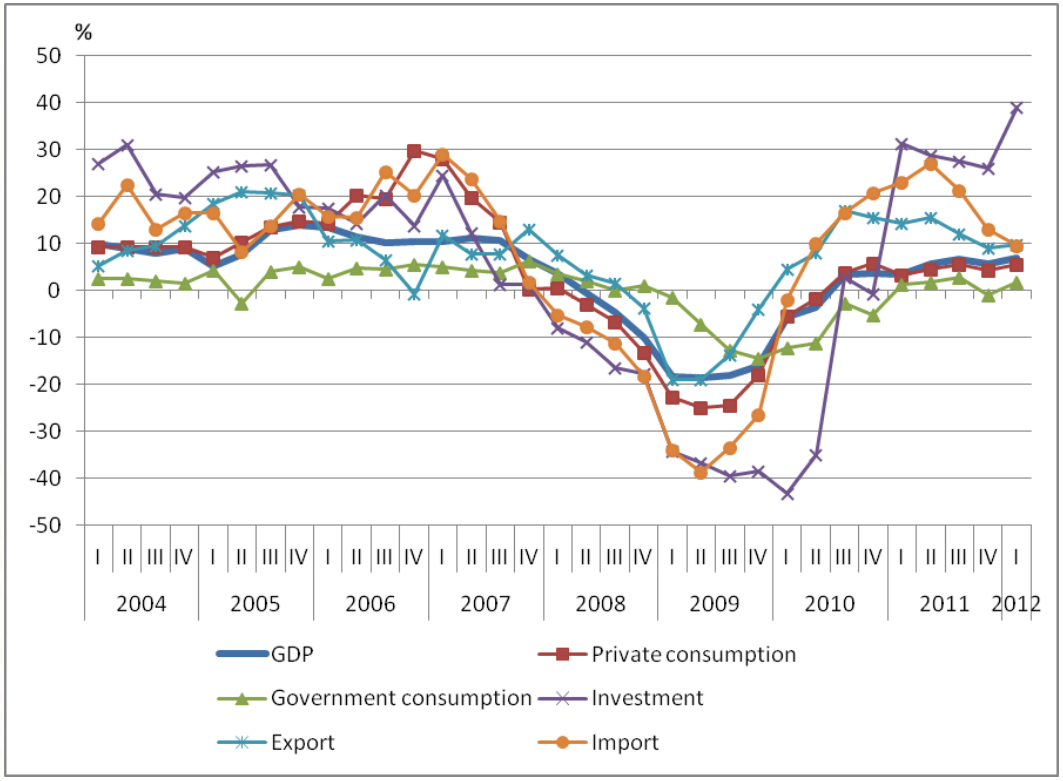
STRUCTURE

- Topicality
- Aim of the research
- Foreign trade data analysis
- I-O tables analysis (productivity, efficiency)
- Results and conclusions

Importance of export in the economy

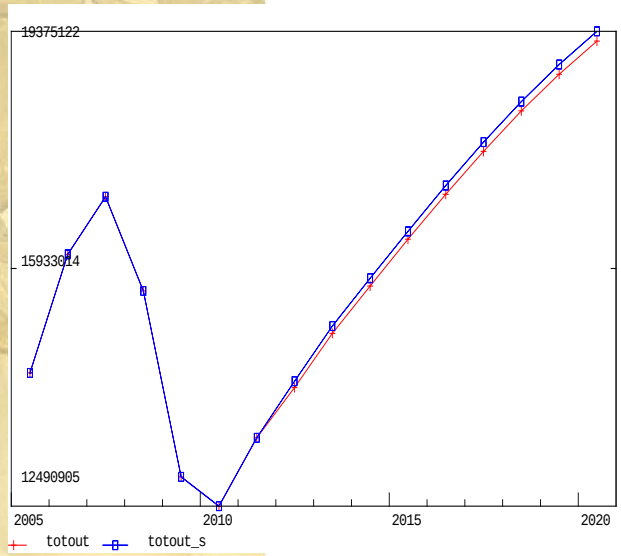
- Export as a driving force;
- Real export growth rates are high;



Data Source: CSB Database

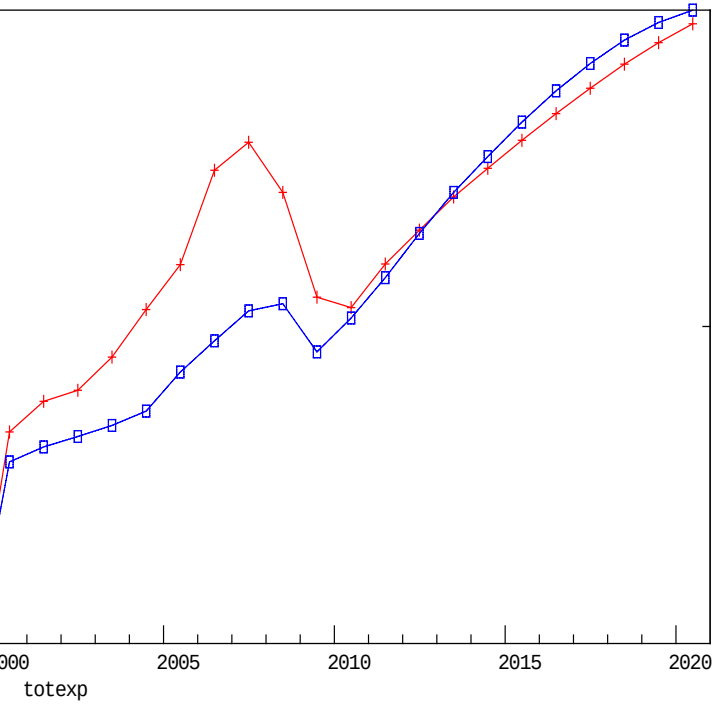
- Annother important (hot) question to be answered: when will the level of 2007 be regained???

- In Latvia: ~-25% (in 3 years recesion (2008-2010))



- Exports are exogenous:
  - Two scenarious
- Imports are endogenos
  - By impsh function

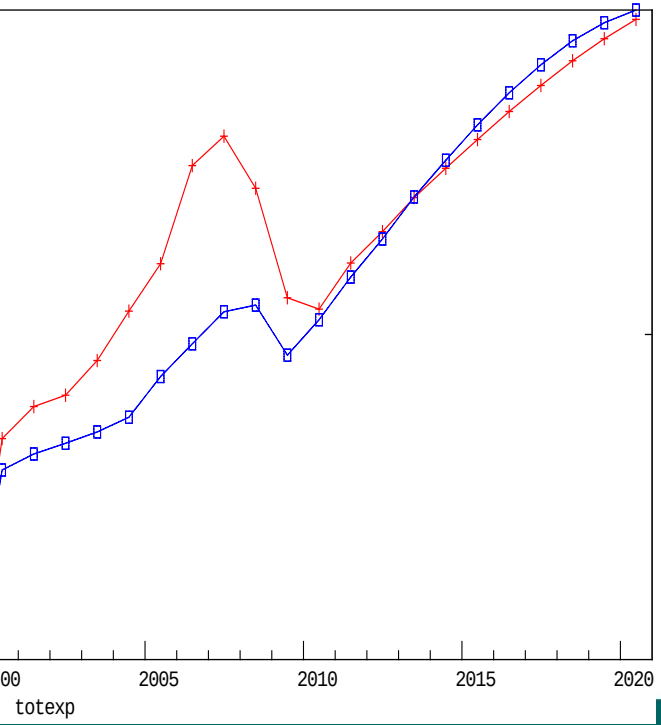
Exports grow faster than imports?!



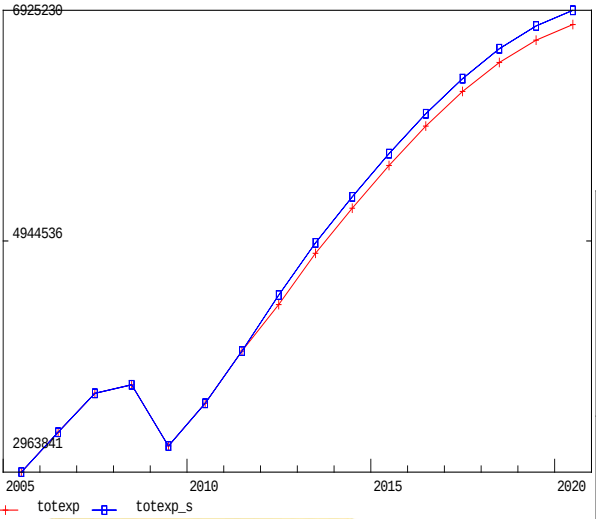
Export	2012	2013	2014	2015	2016	2017	2018	2019	2020
Growth	*1.12*	*1.1*	*1.08*	*1.07*	*1.06*	*1.05*	*1.04*	*1.03*	*1.02*
Thsd.LVL	4479900	4927890	5322122	5694670	6036350	6338168	6591695	6789445	6925234

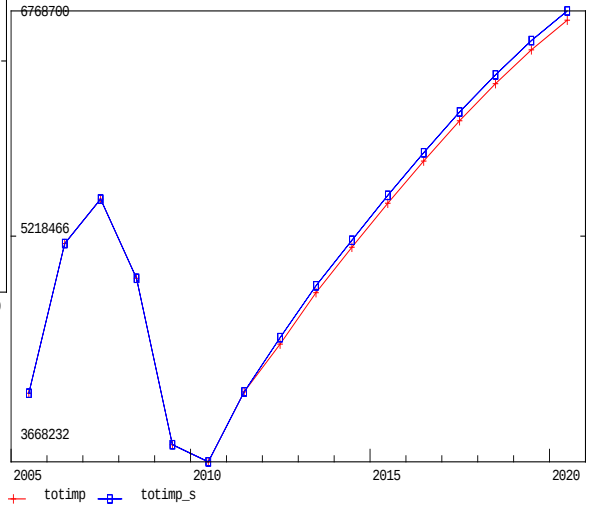
- If the assumptions are slightly less optimistic:

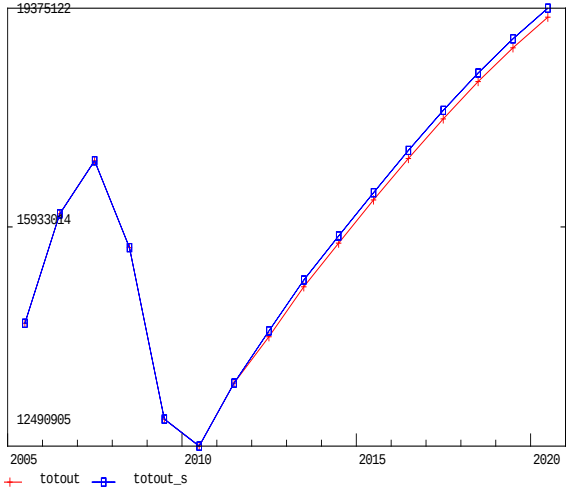
Export	2012	2013	2014	2015	2016	2017	2018	2019	2020
Growth	*1.1*	*1.1*	*1.08*	*1.07*	*1.06*	*1.05*	*1.04*	*1.03*	*1.02*
Thsd.LVL	4399902	4839892	5227084	5592980	5928558	6224986	6473986	6668205	6801569

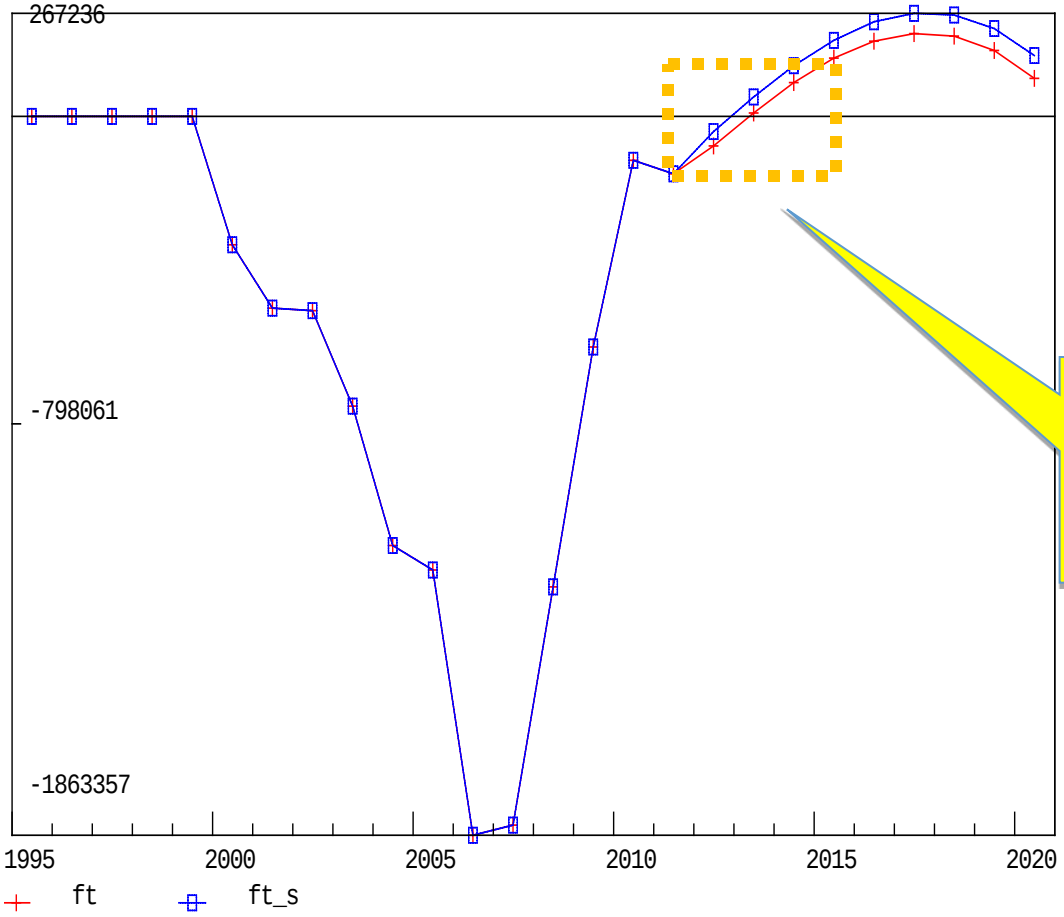


If compared:


6925230
4944536
2963841
2005
2010
2015
2020
totexp
totexp_s


6768700
5218466
3668232
2005
2010
2015
2020
totimp
totimp_s


19375122
15933614
12490905
2005
2010
2015
2020
totout
totout_s



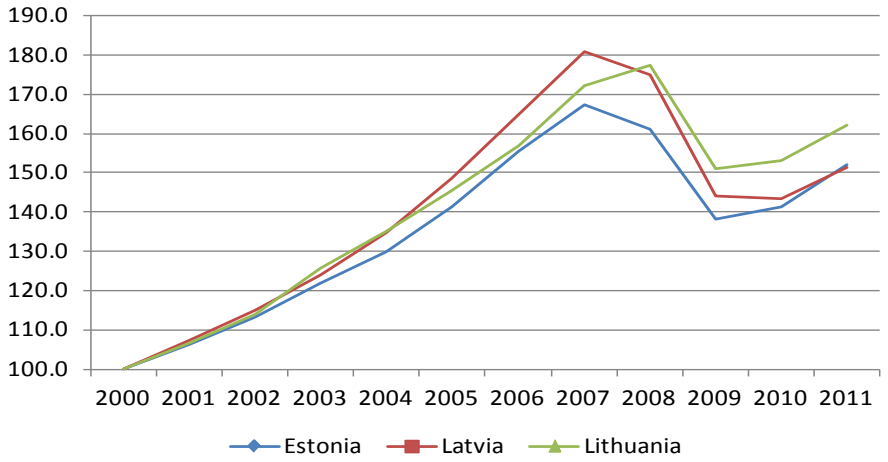
Positive trade balance?

- Foreign trade changes and sectoral development demands deeper and more sophisticated analysis before modelling
  - More plausible scenarious
  - Overall dynamics vs structural changes
  - Anything special connected with crisis?

- The aim of the paper is to reveal structural changes in foreign trade of Latvia, in comparison with Lithuania and Estonia and as well as to obtain detailed and disaggregated information for modeling.

- … The presentation is on pre-modelling stage research.

Real GDP Indexes in the Baltic States (2000 = 100)



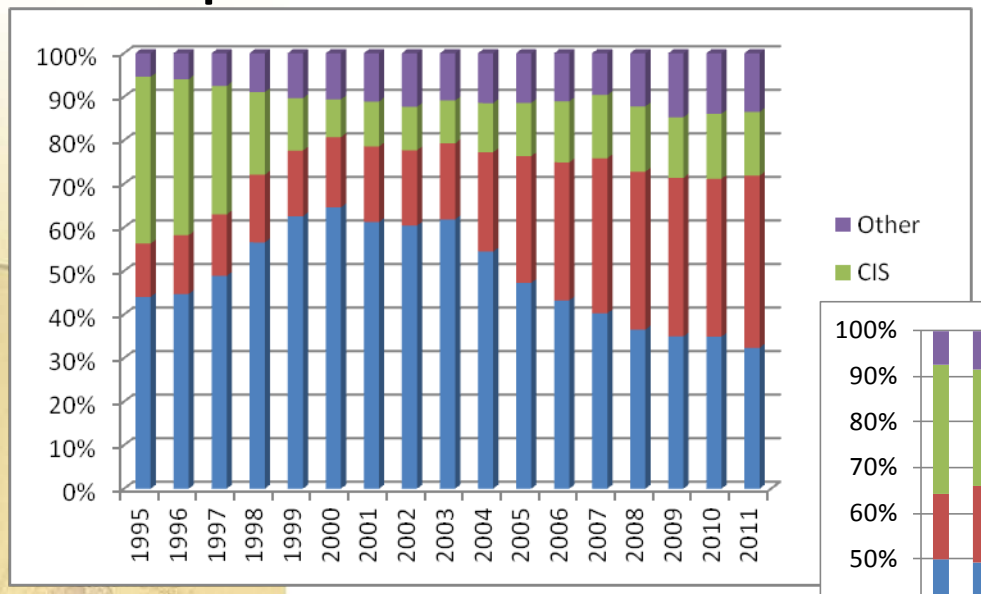
Data Source: Eurostat Database

Important periods:

- 2000 – base year
- 2004 – EU enlargement (incl. the Baltic States)
- 2007/2008 – peak
- 2009 – largest decline
- 2011 – revived growth above 5%

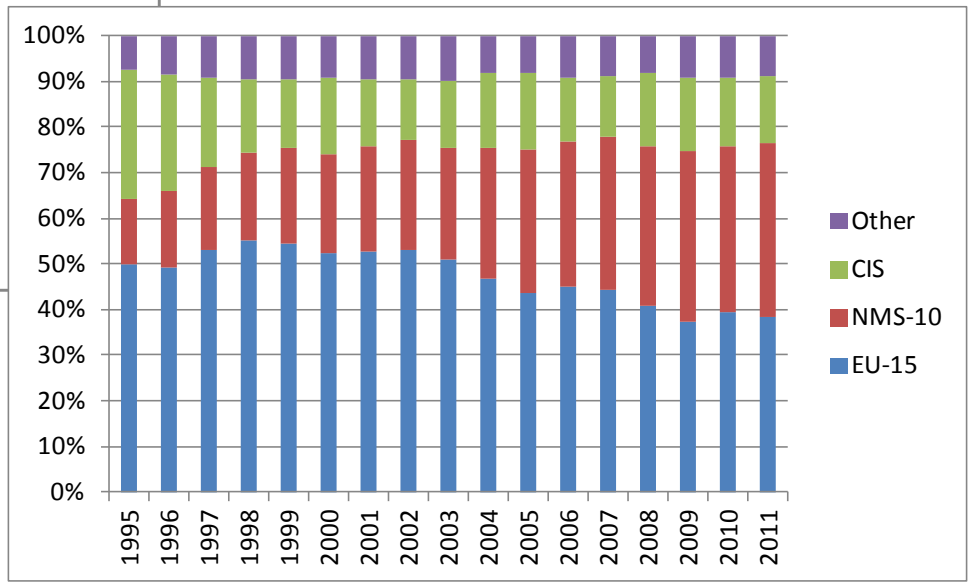
Structure of Export and Import of Goods by Country Groups in Latvia, %

- Export

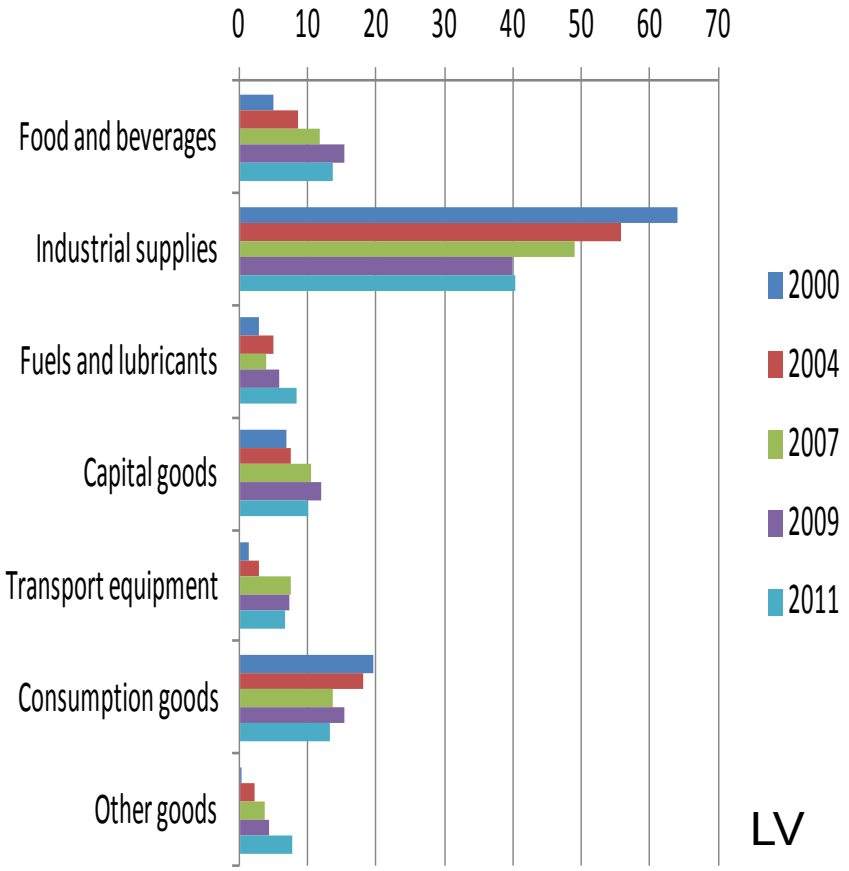


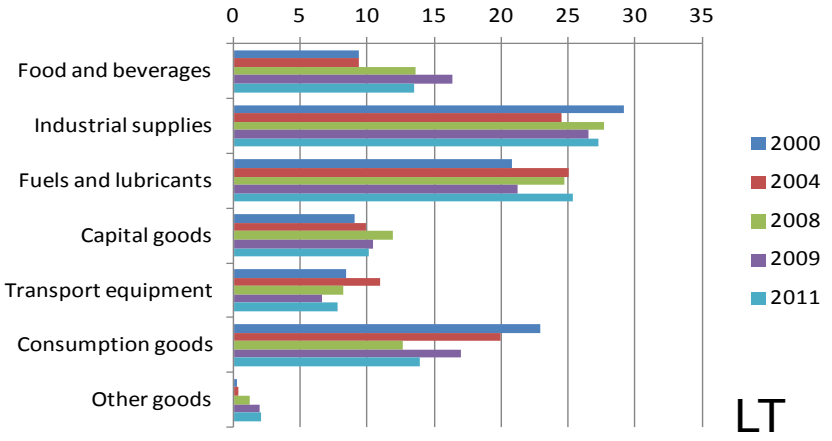
Data Source: CSB Database

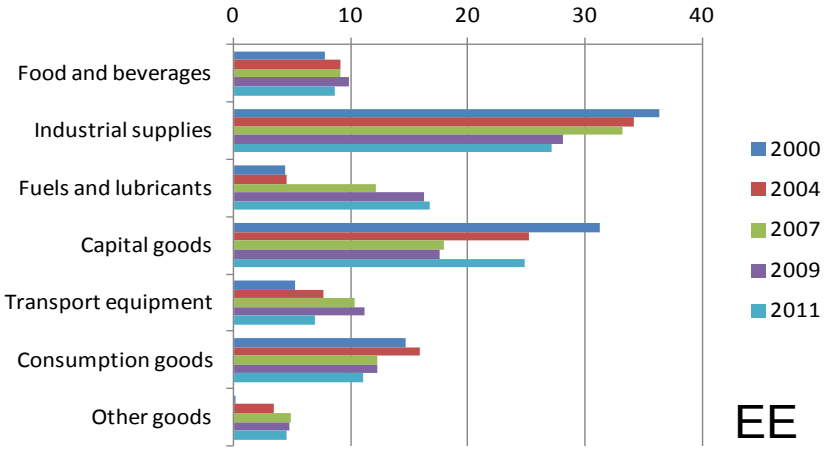
- Import



Structure of Export of Goods by Broad Economic Categories, %

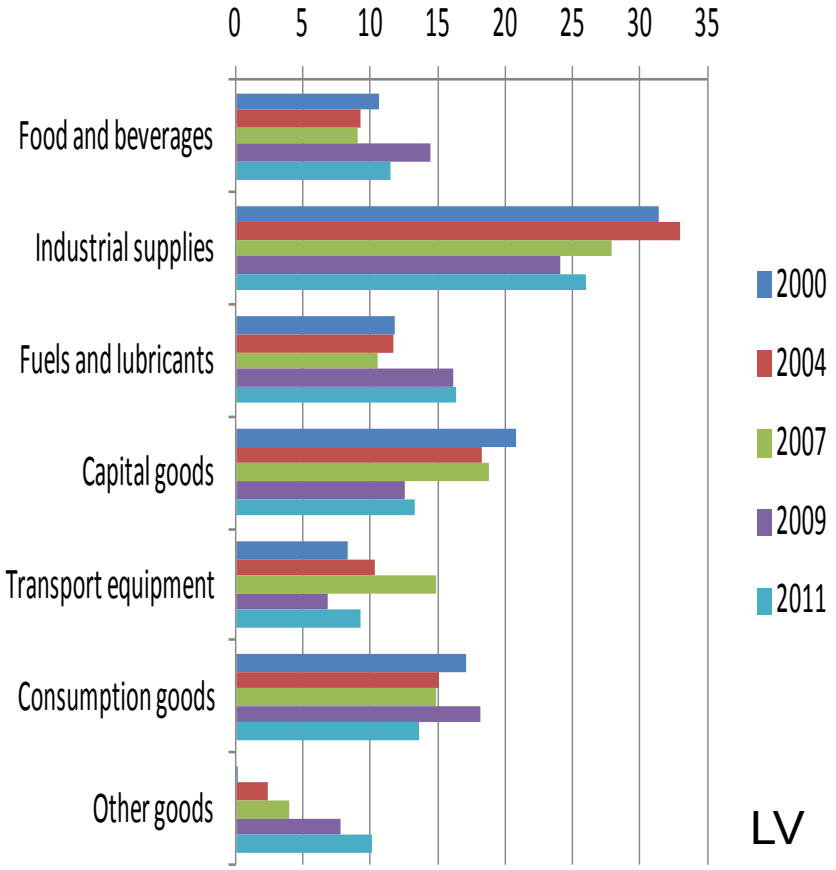


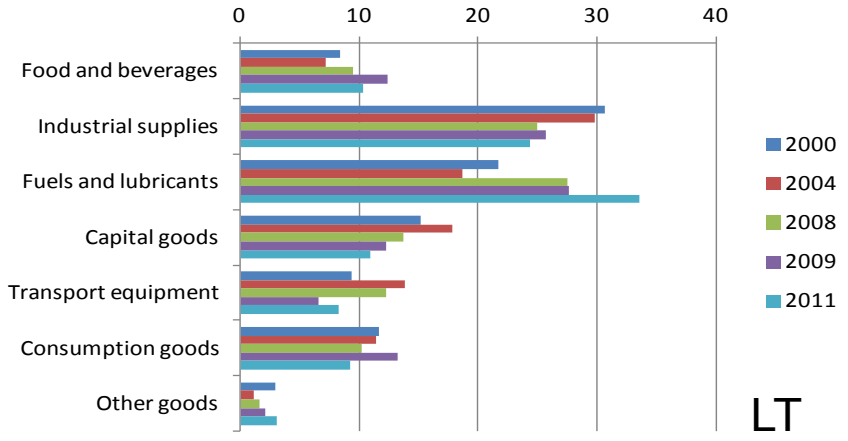


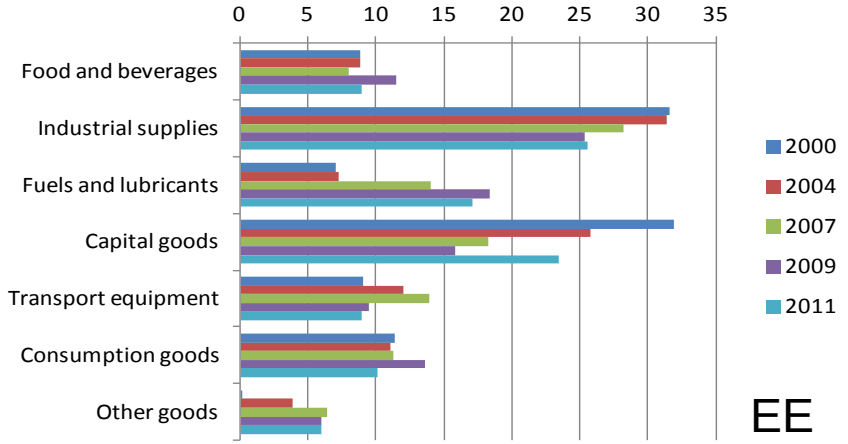


Data Source: Comtrade Database

Structure of Import of Goods by Broad Economic Categories, %

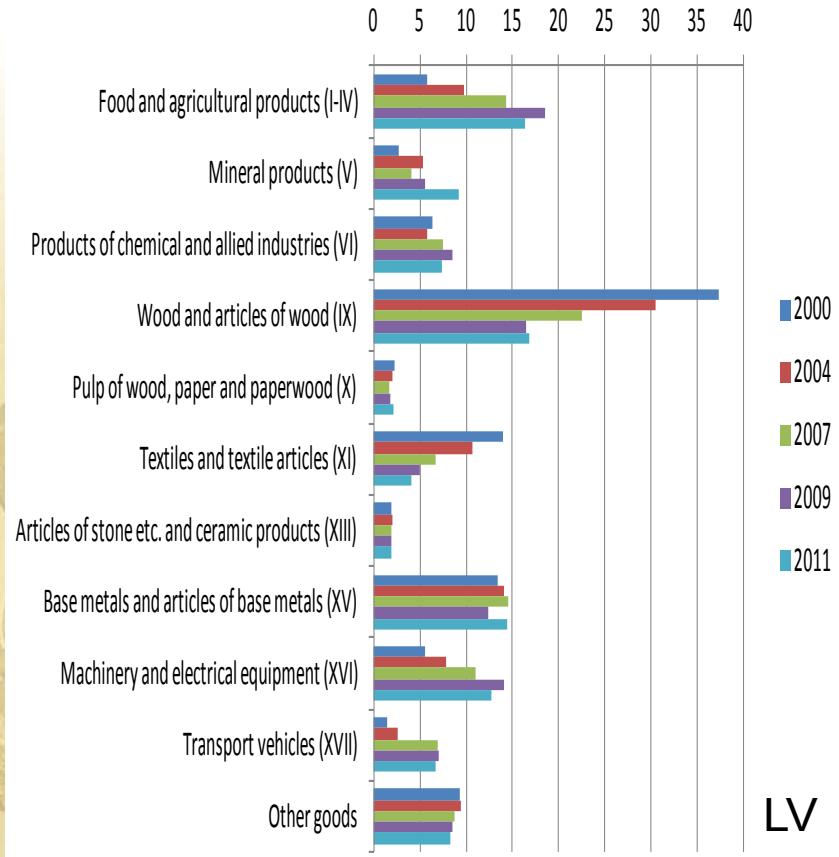


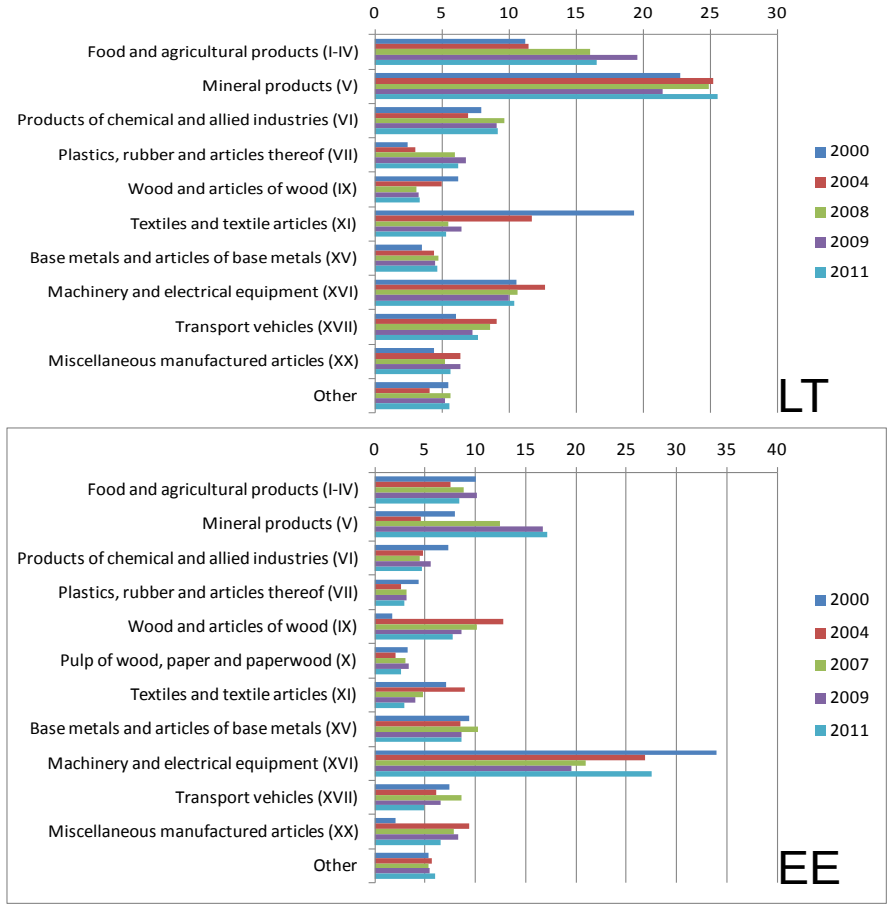




Data Source: Comtrade Database

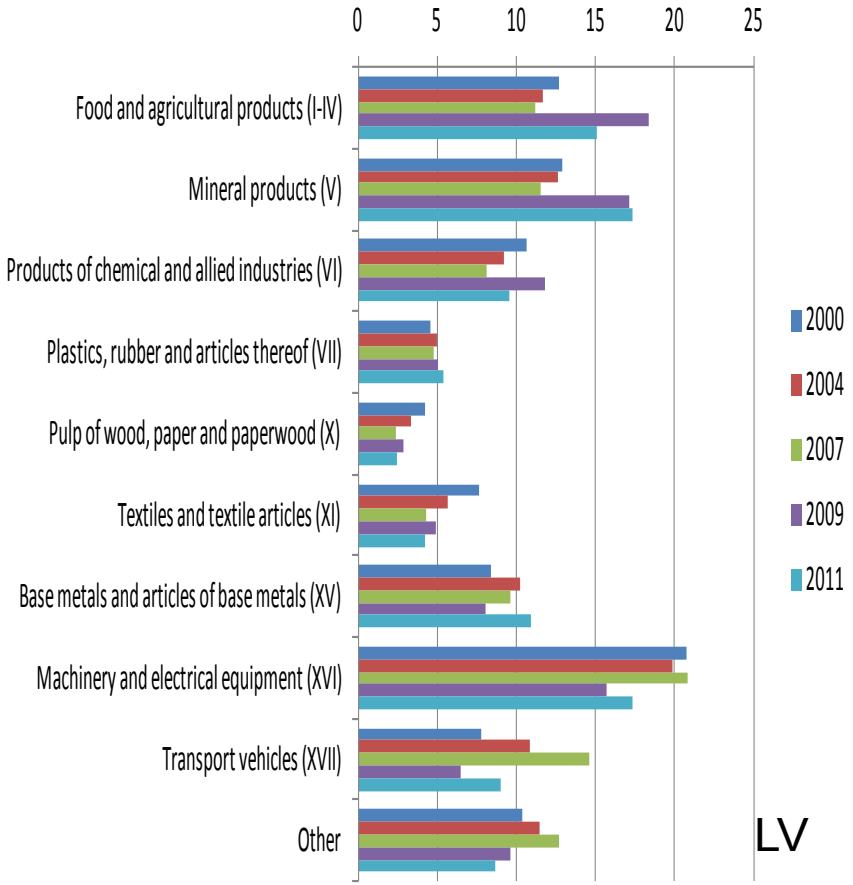
Structure of Export of Goods by Principal Commodity Sections, %

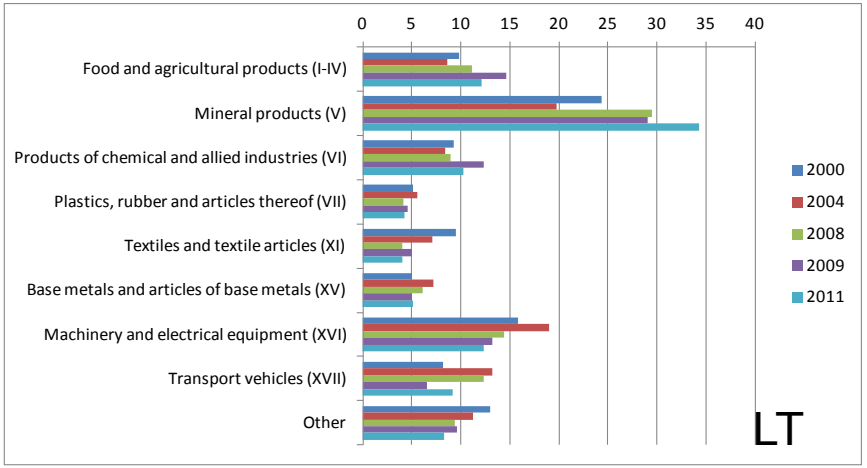


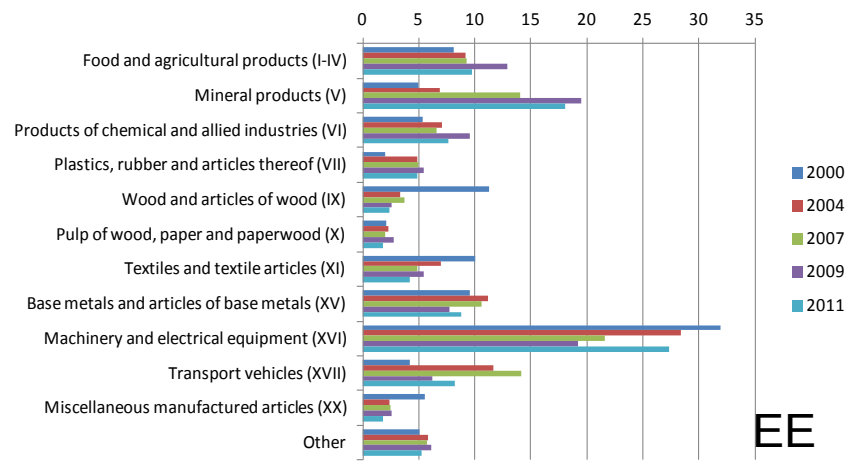


Data Source: CSB Database, Statistics Lithuania Database and Statistics Estonia Database

Structure of Import of Goods by Principal Commodity Sections, %





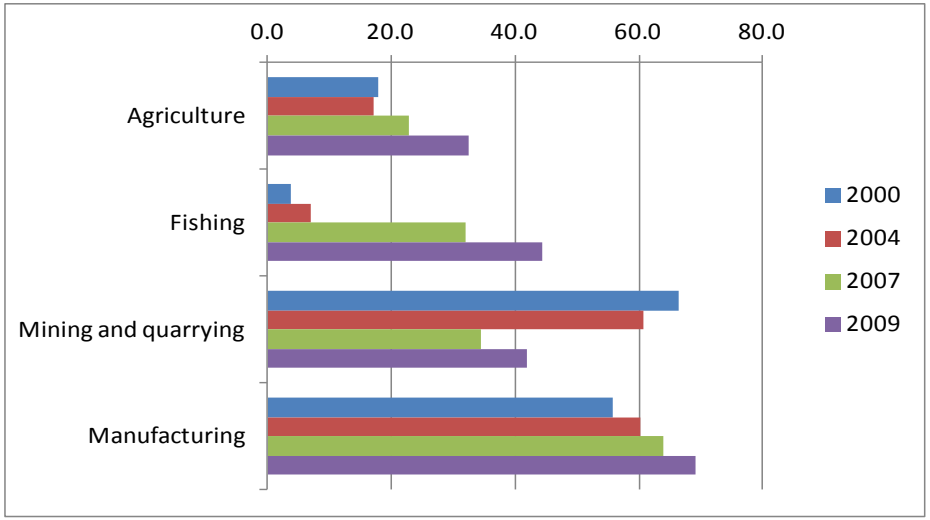


Data Source: CSB Database, Statistics Lithuania Database and Statistics Estonia Database

Export Orientation Ratios in Latvia, %

$$r_{exp} = \frac{exp_i}{x_i},$$

where



Data Source: CSB Database

r_{exp} – export orientation ratio in industry i;

exp_i – export of goods in industry i;

x_i – gross output of industry i.

Import Shares in Latvia, %

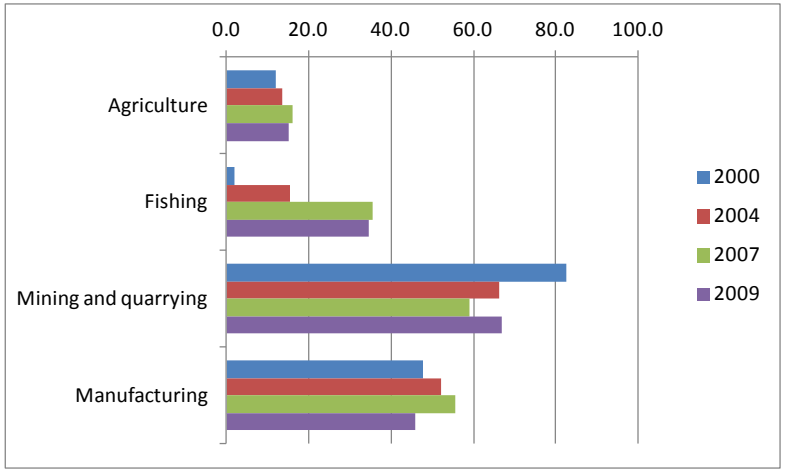
$$impsh = \frac{imp_i}{imp_i + x_i},$$

where

impsh – import share in industry i;

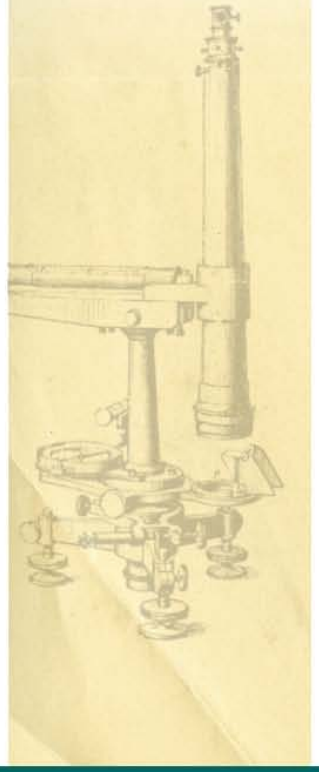
imp_i – import of goods in industry i;

x_i – gross output of industry i.



Data Source: CSB Database

- I-O tables analysis (productivity, efficiency)



- In the study that involved the analysis of input-output data (of Latvia, Lithuania and Estonia), six indicators are computed on the basis of NA and IO table data and analysed:
- gross labour productivity,
- ratio of efficiency of unit spent for labour,
- value added per employed person,
- ratio of value added to compensation of employees,
- ratio of value added to wages and salaries, and
- labour input coefficient.

Data

- The research is based on analysis and computations made on the basis of Input-Output tables of Latvia.
- three IO tables are used – of 1998, 2004, and 2007 (at current prices, national currency),

+

- annual time-series of National Accounts (NA) indicators (1997-2011).

- Economic activity → NACE classification Rev.1.1.

- The data source is Eurostat data base – IO tables; National Accounts aggregates and employment by 60 branch (NACE Rev1.1).

- In the study, main attention is paid to the following NA indicators: *compensation of employees*, *wages and salaries*, *value added* and *gross output* (at basic prices) by sector.

- All ratios analysed are at current prices as ratios and coefficients are computed in order to ensure valid results.

Source: *http://europa.eu/about-eu/countries/index_en.htm*

- As economic performance of Latvia is frequently compared with Estonia and Lithuania, the international comparison is performed according to the methodology and data of IO tables of these countries.

- To detect weather it is national specific or regional trend
- Unique or common?

Labour productivity (thsd.euros per employed person)

Gross labour productivity (thsd. euro)												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TOTAL	**11.6**	**12.9**	**18.0**	**19.5**	**19.9**	**20.3**	**23.0**	**26.4**	**32.2**	**39.3**	**42.7**	**39.1**
A	3.7	4.0	6.0	6.9	6.7	7.2	8.8	10.4	11.5	16.6	20.4	18.2
B	8.3	11.5	32.7	30.8	23.9	19.5	19.7	23.6	26.2	35.6	33.7	35.9
C	19.8	12.4	12.3	17.2	18.1	20.2	24.6	28.9	39.7	54.1	52.4	49.2
D	16.3	15.8	20.7	23.0	23.3	25.3	29.1	33.2	39.8	47.1	47.6	43.4
E	26.1	29.7	39.4	41.2	48.8	50.1	49.0	54.2	77.0	104.1	125.2	138.9
F	16.5	18.1	22.0	22.0	27.8	24.9	30.3	34.9	45.0	52.3	57.4	55.5
G	11.4	13.1	16.4	17.7	17.9	17.3	19.3	21.4	26.7	30.8	29.0	23.9
H	9.4	10.1	12.0	12.3	13.2	9.7	11.1	14.3	18.4	20.3	19.4	16.0
I	21.2	21.6	31.7	32.2	31.5	30.6	36.2	39.4	40.9	48.7	55.2	48.7
J	20.6	35.2	36.0	45.4	43.0	42.1	44.5	51.8	76.5	84.6	87.1	79.1
K	20.8	23.0	27.4	33.7	30.3	31.1	36.7	47.3	55.8	66.3	66.0	64.5
L	10.5	12.1	13.7	15.8	17.5	17.9	18.0	19.0	23.1	28.9	35.9	32.3
M	4.4	5.3	7.2	7.6	8.0	8.7	8.7	9.2	10.8	13.6	16.2	15.1
N	6.1	7.0	8.6	9.5	10.0	10.1	12.0	11.7	13.7	17.1	18.9	17.1
O	8.0	9.3	15.7	16.2	16.2	15.3	19.1	19.5	22.5	26.5	31.9	29.9

Labour productivity (thsd.euros per employed person)

	Difference from average (%)											
A	-68%	-69%	-67%	-65%	-66%	-64%	-62%	-60%	-64%	-58%	-52%	-54%
B	-28%	-11%	81%	58%	20%	-4%	-15%	-10%	-19%	-9%	-21%	-8%
C	71%	-4%	-32%	-12%	-9%	0%	7%	10%	23%	38%	23%	26%
D	41%	23%	15%	17%	17%	25%	26%	26%	24%	20%	12%	11%
E	126%	130%	119%	111%	145%	147%	113%	106%	139%	165%	193%	255%
F	43%	40%	22%	13%	40%	23%	31%	32%	40%	33%	34%	42%
G	-2%	2%	-9%	-9%	-10%	-15%	-16%	-19%	-17%	-21%	-32%	-39%
H	-18%	-22%	-33%	-37%	-34%	-52%	-52%	-46%	-43%	-48%	-55%	-59%
I	83%	68%	76%	65%	58%	51%	57%	49%	27%	24%	29%	25%
J	78%	173%	100%	132%	116%	108%	93%	97%	138%	115%	104%	102%
K	80%	78%	52%	73%	52%	54%	59%	79%	73%	69%	55%	65%
L	-9%	-6%	-24%	-19%	-12%	-12%	-22%	-28%	-28%	-26%	-16%	-17%
M	-62%	-59%	-60%	-61%	-60%	-57%	-62%	-65%	-67%	-65%	-62%	-61%
N	-47%	-46%	-52%	-52%	-50%	-50%	-48%	-56%	-57%	-56%	-56%	-56%
O	-31%	-28%	-13%	-17%	-19%	-24%	-17%	-26%	-30%	-33%	-25%	-24%

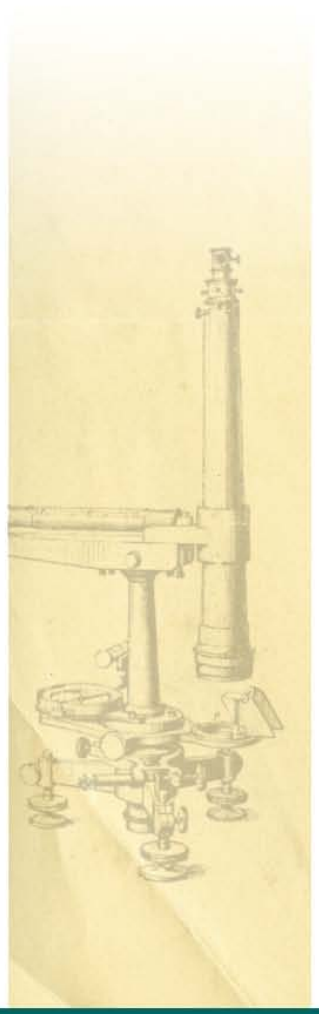
- International comparison’s results
- Productivity in
  - ❖Latvia vs. Estonia
  - ❖Latvia vs. Lithuania

Difference of sectoral productivity in Latvia from Estonia (%)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TOTAL	**-34%**	**-32%**	**-23%**	**-26%**	**-31%**	**-34%**	**-33%**	**-32%**	**-25%**	**-20%**	**-14%**	**-12%**
A	-69%	-66%	-62%	-63%	-63%	-67%	-65%	-63%	-62%	-56%	-53%	-48%
B	-36%	-24%	75%	64%	-5%	-15%	59%	40%	15%	47%	-44%	-63%
C	26%	-21%	-33%	-23%	-31%	-32%	16%	-6%	-6%	14%	12%	13%
D	-32%	-37%	-36%	-36%	-42%	-36%	-32%	-35%	-33%	-22%	-20%	-17%
E	14%	16%	22%	-9%	-10%	-21%	-13%	-4%	20%	3%	4%	9%
F	-22%	-12%	-8%	-19%	-15%	-22%	-14%	-21%	-5%	8%	24%	26%
G	-10%	-6%	1%	-3%	-13%	-29%	-27%	-32%	-21%	-23%	-20%	-25%
H	-21%	-27%	15%	-4%	-7%	-44%	-47%	-25%	-16%	-16%	-18%	-24%
I	-20%	-26%	-19%	-31%	-35%	-39%	-43%	-39%	-37%	-39%	-36%	-39%
J	-31%	0%	-21%	-19%	-28%	-33%	-33%	-40%	-23%	-20%	-4%	25%
K	-36%	-36%	-27%	-30%	-35%	-39%	-43%	-28%	-26%	-23%	-23%	-13%
L	-15%	-16%	-16%	-5%	-6%	-15%	-8%	-14%	-6%	0%	6%	-6%
M	-29%	-28%	-18%	-11%	-7%	-6%	-17%	-18%	-10%	-8%	4%	8%
N	-6%	-15%	-11%	-1%	-4%	-1%	7%	-17%	-11%	-12%	-28%	-26%
O	-19%	-5%	41%	26%	5%	-10%	-6%	-6%	1%	6%	12%	9%

Difference of sectoral productivity in Latvia from Lithuania (%)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
TOTAL	**-1%**	**10%**	**20%**	**13%**	**8%**	**3%**	**5%**	**4%**	**12%**	**19%**	**9%**	**20%**
A	-35%	-21%	12%	10%	9%	27%	26%	9%	1%	6%	-14%	7%
B	20%	133%	675%	340%	-82%	-67%	-55%	-13%	-29%	-8%	26%	15%
C	-10%	-49%	-71%	-68%	-43%	-31%	-33%	-47%	-16%	34%	-5%	21%
D	-4%	-12%	-19%	-25%	-21%	-22%	-28%	-28%	-24%	-16%	-31%	-22%
E	-3%	33%	51%	55%	-1%	-11%	-5%	-16%	15%	54%	68%	50%
F	10%	18%	36%	25%	47%	22%	41%	55%	70%	66%	60%	131%
G	12%	25%	21%	12%	3%	-2%	5%	5%	29%	31%	7%	1%
H	4%	15%	21%	0%	4%	-24%	-8%	10%	53%	29%	28%	9%
I	30%	17%	35%	11%	-6%	-11%	1%	-6%	-17%	-9%	-14%	-14%
J	26%	76%	40%	24%	18%	37%	19%	20%	38%	44%	12%	68%
K	-20%	-25%	-25%	-19%	-14%	-24%	-18%	-8%	11%	-3%	10%	35%
L	-44%	-20%	-26%	-16%	-9%	-17%	-18%	-15%	-19%	4%	5%	10%
M	0%	16%	48%	37%	19%	24%	18%	24%	15%	38%	33%	21%
N	24%	27%	32%	54%	55%	53%	64%	32%	45%	45%	23%	8%
O	14%	11%	33%	27%	18%	9%	33%	40%	37%	42%	42%	41%



Ratio of output to compensation to employees by sector

	2004	2007		
Code	Latvia	Latvia	Estonia	Lithuania
01	15,0	7,3	6,4	8,5
02	7,9	11,7	7,6	3,4
05	7,5	10,5	9,2	6,8
10	4,6	5,0	:	6,8
14	5,5	5,2	5,2	6,5
15	8,4	7,0	7,2	6,9
17	5,4	4,5	4,5	5,8
18	4,7	3,9	3,4	4,6
19	5,7	4,3	3,8	5,7
20	8,6	6,4	6,9	5,7
21	8,9	6,0	7,9	5,7
22	5,3	4,5	4,0	4,6
24	5,0	4,5	10,5	9,6
25	8,8	6,8	6,0	5,4
26	10,5	6,3	6,0	5,3
27	13,8	10,3	6,6	5,5
28	6,1	6,0	6,1	4,8
29	4,7	4,5	4,1	4,6
31	6,6	5,0	6,1	6,0
34	7,4	6,7	5,7	5,4
35	4,5	4,7	4,7	4,4
36	4,8	8,3	4,5	5,0
40	7,1	10,3	9,6	6,4
41	3,5	4,9	5,2	4,5
45	9,3	5,9	4,5	3,7
50	5,8	4,4	3,3	2,9
51	6,0	4,4	3,8	3,2
52	3,0	2,7	2,9	2,6
55	4,7	3,0	3,5	2,3
60	5,2	5,3	4,6	5,3
63	9,5	8,9	8,9	8,1
64	6,4	5,8	7,3	5,6
65	5,7	4,0	4,0	4,5
66	2,8	3,1	5,3	4,4
67	1,5	4,2	6,4	2,9
70	10,6	12,6	16,3	15,7
71	4,6	9,1	7,9	6,7
72	3,4	2,6	2,5	3,1
73	2,2	3,0	1,9	2,7
74	3,9	3,3	2,9	3,0
75	2,4	2,2	1,9	2,4
80	1,4	1,4	1,6	1,3
85	2,3	1,8	1,9	1,6
90	2,8	2,8	4,4	1,7
91	5,1	3,3	2,4	4,7
92	3,6	3,0	3,3	3,2

: no data.
Sectors 11, 12, 13, 16, 23, 30, 32, 33, 37, 61, 62 are excluded due to no data.

Ratio of value added to compensation to employees by sector

	Latvia			Estonia	Lithuania	Difference in 2007 (%)	
	1998	2004	2007	2007	2007	from Estonia	from Lithuania
01	3,1	5,8	2,5	2,7	3,3	-9%	-24%
02	1,7	2,4	5,0	3,4	1,9	48%	159%
05	2,4	2,2	5,1	3,4	1,5	52%	242%
14	1,4	4,5	2,3	2,9	3,0	-23%	-24%
15	1,7	1,8	1,7	1,6	2,0	6%	-17%
17	1,3	1,1	1,4	1,3	2,0	4%	-31%
18	1,4	1,8	1,3	1,2	2,0	9%	-37%
19	0,7	1,4	1,5	1,1	2,0	37%	-27%
20	1,8	1,8	1,7	1,7	2,0	2%	-17%
21	3,2	2,0	1,8	2,1	2,0	-14%	-13%
22	1,5	1,8	1,6	1,5	2,0	7%	-21%
24	1,2	1,7	1,7	2,6	2,0	-34%	-17%
25	1,9	1,9	1,7	1,5	2,0	15%	-16%
26	2,0	2,1	1,8	2,4	2,0	-23%	-10%
27	1,1	3,4	2,3	1,4	2,0	56%	11%
28	1,9	1,7	2,0	1,6	2,0	28%	-2%
29	0,9	1,7	2,0	1,4	2,0	40%	-4%
31	1,1	0,7	1,8	1,5	2,0	17%	-12%
34	0,7	1,1	1,7	1,6	2,0	2%	-18%
35	1,1	1,2	1,5	1,3	2,0	16%	-27%
36	1,4	1,9	2,6	1,4	2,0	87%	26%
40	2,3	2,5	3,1	3,8	2,8	-19%	9%
41	2,8	1,4	3,4	3,3	2,8	2%	20%
45	2,1	2,2	1,3	1,7	1,8	-28%	-31%
50	2,8	3,0	2,3	1,7	1,8	35%	24%
51	3,7	3,6	2,1	2,1	2,1	1%	-1%
52	2,1	2,1	1,5	1,7	2,0	-14%	-25%
55	1,6	2,4	1,4	1,4	1,4	1%	-6%
60	1,5	1,5	2,2	1,7	3,0	29%	-25%
63	2,5	6,0	2,0	2,5	3,8	-19%	-48%
64	2,6	3,5	2,9	3,3	3,7	-13%	-22%
65	2,6	2,9	2,5	2,3	3,2	10%	-22%
66	1,5	1,2	1,6	2,3	1,9	-32%	-17%
67	4,8	1,3	2,2	3,3	1,6	-33%	40%
70	2,3	8,0	7,2	12,1	10,9	-40%	-34%
71	3,7	2,9	5,0	4,6	4,1	9%	21%
72	2,5	1,7	1,3	1,5	1,9	-8%	-28%
73	1,0	1,2	1,3	1,1	1,8	18%	-23%
74	2,4	1,8	1,5	1,6	1,8	-6%	-19%
75	1,2	1,4	1,5	1,2	1,6	23%	-7%
80	1,1	1,1	1,1	1,1	1,0	-3%	4%
85	1,3	1,2	1,2	1,2	1,0	-2%	13%
90	1,8	1,5	1,3	2,0	1,1	-34%	23%
91	1,0	1,3	1,2	1,1	1,5	10%	-18%
92	1,9	2,0	1,7	1,7	1,5	0%	13%
93	1,4	3,7	1,8	2,3	2,2	-23%	-18%
Total	1,8	2,3	1,9	1,9	2,1	-2%	-10%

: no data.
Sectors 11, 12, 13, 16, 23, 30, 32, 33, 37, 61, 62 are excluded due to no data.

Ratio of value added to wages and salaries by sector

	Latvia	Latvia	Estonia	Lithuania	Difference (%)	
Code	2004	2007	2007	2007	from Estonia	from Lithuania
01	6,9	2,8	3,6	3,9	-28%	-41%
02	2,7	6,0	4,4	2,4	26%	59%
05	2,6	7,5	4,4	1,9	41%	75%
10	2,1	2,2	:	3,9	:	-73%
14	5,4	2,5	3,9	3,9	-58%	-57%
15	2,2	1,9	2,1	2,6	-10%	-33%
17	1,4	1,6	1,8	2,6	-9%	-57%
18	2,1	1,5	1,6	2,6	-6%	-74%
19	1,6	1,7	1,4	2,6	16%	-47%
20	2,2	1,9	2,2	2,6	-14%	-33%
21	2,5	2,0	2,7	2,6	-33%	-25%
22	2,1	1,8	2,0	2,6	-8%	-41%
24	2,1	1,9	3,4	2,6	-77%	-33%
25	2,3	2,0	2,0	2,6	-1%	-30%
26	2,5	2,1	3,1	2,6	-49%	-21%
27	4,2	2,6	1,9	2,6	28%	3%
28	2,0	2,3	2,1	2,6	10%	-11%
29	2,1	2,3	1,9	2,6	19%	-11%
31	0,9	2,1	2,0	2,6	3%	-23%
34	1,3	1,9	2,1	2,6	-11%	-32%
35	1,5	1,7	1,7	2,6	0%	-51%
36	2,2	3,0	1,8	2,6	39%	14%
40	3,1	3,8	5,0	3,7	-31%	4%
41	1,8	4,2	4,4	3,7	-5%	12%
45	2,6	1,4	2,3	2,3	-67%	-69%
50	3,6	2,6	2,2	2,3	14%	11%
51	4,2	2,4	2,7	2,7	-14%	-13%
52	2,5	1,7	2,2	2,4	-34%	-43%
55	2,9	1,5	1,7	1,8	-14%	-16%
60	1,9	2,6	2,1	3,7	16%	-46%
63	7,2	2,3	3,3	4,8	-41%	-106%
64	4,3	3,4	4,4	4,8	-31%	-41%
65	3,6	3,1	3,0	4,4	3%	-43%
66	1,5	1,9	3,1	2,5	-64%	-30%
67	1,4	2,6	4,4	2,2	-69%	16%
70	9,6	8,1	15,9	13,7	-96%	-68%
71	3,5	5,7	5,8	5,2	-3%	8%
72	2,1	1,5	1,9	2,3	-25%	-53%
73	1,4	1,7	1,5	2,2	11%	-30%
74	2,2	1,6	2,0	2,2	-24%	-38%
75	1,8	2,0	1,7	2,2	14%	9%
80	1,4	1,4	1,5	1,4	-3%	6%
85	1,4	1,5	1,6	1,4	-5%	6%
90	1,8	1,5	2,6	1,6	-75%	-5%
91	1,6	1,5	1,5	1,9	3%	-23%
92	2,3	2,0	2,3	2,1	-12%	-2%
93	4,3	2,0	3,0	2,6	-50%	-29%
Total	2,7	2,2	2,5	2,6	-14%	-20%

: no data.
Sectors 11, 12, 13, 16, 23, 30, 32, 33, 37, 61, 62 are excluded due to no data.

Labour input coefficient

	2004	2007				Difference from average (%)			2007 /1998
Sector	LV	LV	EE	LT	Average	LV	EE	LT	LV
01	0,07	0,14	0,16	0,12	0,14	0%	13%	-14%	1,6
02	0,13	0,09	0,13	0,30	0,17	-50%	-23%	73%	0,4
05	0,13	0,09	0,11	0,15	0,12	-19%	-7%	26%	0,6
10	0,22	0,20	:	0,15	:	:	:	:	0,5
14	0,18	0,19	0,19	0,15	0,18	8%	7%	-14%	0,6
15	0,12	0,14	0,14	0,15	0,14	0%	-2%	2%	0,8
17	0,19	0,22	0,22	0,17	0,21	8%	8%	-16%	0,9
18	0,21	0,26	0,30	0,22	0,26	0%	15%	-15%	1,3
19	0,18	0,23	0,26	0,18	0,22	5%	17%	-21%	0,9
20	0,12	0,16	0,14	0,18	0,16	-1%	-9%	11%	0,9
21	0,11	0,17	0,13	0,17	0,16	7%	-19%	12%	1,4
22	0,19	0,22	0,25	0,22	0,23	-3%	9%	-6%	0,9
24	0,20	0,22	0,10	0,10	0,14	58%	-32%	-26%	1,1
25	0,11	0,15	0,17	0,18	0,17	-11%	1%	11%	1,0
26	0,10	0,16	0,17	0,19	0,17	-7%	-3%	10%	0,8
27	0,07	0,10	0,15	0,18	0,14	-33%	6%	27%	0,9
28	0,16	0,17	0,16	0,21	0,18	-7%	-9%	16%	1,0
29	0,21	0,22	0,24	0,22	0,23	-2%	7%	-5%	0,6
31	0,15	0,20	0,17	0,17	0,18	13%	-7%	-6%	0,9
34	0,14	0,15	0,18	0,19	0,17	-13%	4%	9%	1,0
35	0,22	0,21	0,21	0,23	0,22	-2%	-2%	4%	0,5
36	0,21	0,12	0,22	0,20	0,18	-33%	23%	10%	0,6
40	0,14	0,10	0,10	0,16	0,12	-19%	-12%	31%	0,4
41	0,28	0,21	0,19	0,22	0,21	0%	-7%	7%	0,8
45	0,11	0,17	0,22	0,27	0,22	-23%	1%	22%	0,9
50	0,17	0,23	0,30	0,34	0,29	-22%	4%	18%	1,2
51	0,17	0,23	0,26	0,32	0,27	-16%	-2%	18%	1,7
52	0,34	0,37	0,35	0,38	0,37	1%	-6%	4%	1,4
55	0,21	0,33	0,29	0,43	0,35	-6%	-18%	24%	1,6
60	0,19	0,19	0,22	0,19	0,20	-5%	9%	-5%	0,6
63	0,11	0,11	0,11	0,12	0,12	-3%	-3%	6%	0,7
64	0,16	0,17	0,14	0,18	0,16	6%	-16%	10%	0,7
65	0,18	0,25	0,25	0,22	0,24	5%	3%	-8%	0,9
66	0,36	0,32	0,19	0,23	0,25	31%	-23%	-7%	1,8
67	0,67	0,24	0,16	0,35	0,25	-4%	-37%	41%	1,5
70	0,09	0,08	0,06	0,06	0,07	17%	-10%	-7%	0,4
71	0,22	0,11	0,13	0,15	0,13	-15%	-1%	16%	0,6
72	0,30	0,38	0,40	0,33	0,37	4%	9%	-12%	1,5
73	0,45	0,33	0,52	0,37	0,41	-20%	28%	-9%	0,5
74	0,26	0,30	0,34	0,33	0,32	-8%	5%	3%	1,3
75	0,41	0,46	0,52	0,42	0,47	-1%	11%	-9%	1,0
80	0,74	0,71	0,62	0,75	0,69	2%	-10%	8%	1,1
85	0,43	0,56	0,52	0,64	0,57	-2%	-10%	12%	1,2
90	0,35	0,36	0,23	0,57	0,39	-7%	-42%	48%	1,3
91	0,20	0,31	0,41	0,21	0,31	-1%	32%	-31%	0,6
92	0,28	0,33	0,31	0,31	0,32	5%	-3%	-2%	1,0
93	0,20	0,27	0,20	0,29	0,25	8%	-22%	14%	0,9
Total	**0,20**	**0,22**	**0,23**	**0,25**	**0,23**	**-5%**	**-1%**	**7%**	0,9

: no data.
Sectors 11, 12, 13, 16, 23, 30, 32, 33, 37, 61, 62 are excluded due to no data.

Ratio of export to total use (by branches)

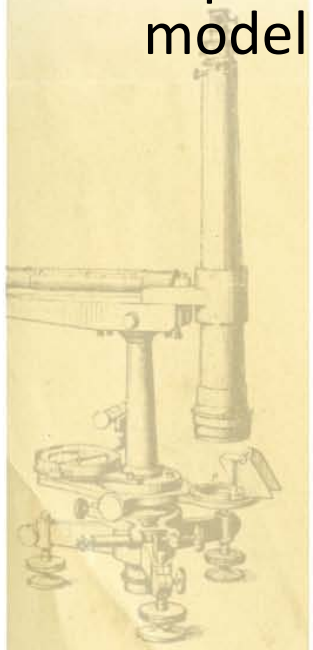
	2004			2007		
Sector	LV	EE	LT	LV	EE	LT
01	0,036	0.026	0,097	0,101	0,099	0,236
02	0,212	0,236	0,192	0,177	0,201	0,306
05	0,267	0,327	0,015	0,267	0,293	0,042
10	0.560	:	0,267	0,666	:	0,348
11	0,030	0,117	0,022	0,000	0,127	0,026
14	0,017	0,070	0,030	0,008	0,069	0,071
15	0,116	0,179	0,183	0,157	0,196	0,228
17	0,367	0,436	0,343	0,359	0,408	0,465
18	:	0,465	0,644	0,310	0,372	0,399
19	0,117	0,231	0,176	0,089	0,231	0,129
20	0,639	0,522	0,371	0,519	0,483	0,359
21	0,147	0,243	0,171	0,215	0,373	0,251
22	0,036	0,102	0,057	0,089	0,139	0,108
24	0,202	0,257	0,429	0,187	0,288	0,362
25	0,158	0,187	0,231	0,183	0,244	0,309
26	0,099	0,194	0,116	0,105	0,198	0,119
27	0,324	0,364	0,392	0,509	0,456	0,425
28	:	0,215	0,180	0,155	0,240	0,240
29	0,162	0,203	0,200	0,130	0,307	0,296
31	:	0,318	0,356	0,196	0,491	0,367
34	0,142	0,239	0,300	0,178	0,300	0,301
35	:	0,318	0,470	0,240	0,390	0,362
36	0,329	0,433	0,365	0,155	0,393	0,439
40	0,010	0,075	0,073	0,007	0,100	0,031
41	0,000	0,000	0,000	0,000	0,000	0,000
45	0,015	0,035	0,010	0,005	0,036	0,009
50	0,001	0,003	0,000	0,000	0,009	0,000
51	0,048	0,803	0,512	0,296	0,796	0,462
52	0,000	0,009	0,000	0,000	0,030	0,000
55	0,132	0,014	0,000	0,000	0,012	0,188
60	0,551	0,166	0,446	0,454	0,204	0,638
63	0,226	0,431	0,336	0,204	0,386	0,300
64	0,062	0,090	0,068	0,060	0,101	0,079
65	0,182	0,083	0,032	0,283	0,130	0,042
67	:	0,055	0,000	0,250	0,227	0,002
70	0,006	0,006	0,000	0,000	0,004	0,000
71	0,143	0,235	0,019	0,136	0,145	0,035
72	0,173	0,173	0,154	0,163	0,269	0,054
73	0,149	0,168	0,123	0,178	0,189	0,223
74	0,157	0,113	0,090	0,167	0,142	0,051
75	0,008	0,009	0,007	0,008	0,019	0,013
80	0,000	0,002	0,000	0,000	0,001	0,000
85	0,000	0,001	0,003	0,002	0,002	0,007
90	0,002	0,003	0,000	0,003	0,003	0,000
91	0,000	0,000	0,000	0,000	0,000	0,000
92	0,012	0,034	0,024	0,023	0,027	0,055
93	0,000	0,038	0,003	0,000	0,048	0,003
95	:	0,000	0,000	0,000	0,000	0,000
Total	**0,160**	**0,216**	**0,208**	**0,147**	**0,217**	**0,221**

: no data.
Sectors 11, 12, 13, 16, 23, 30, 32, 33, 37, 61, 62 are excluded due to no data.

- The values of labour input coefficient by logics should and are different for various industries. However, it is worth to stress that on average in the economy the value of this coefficient is 0.22-0.25. And the evidence indicates that more intersectoral differences are observed rather than international differences. Another important point is that despite significant changes, labour input coefficients have not changed by such an extent.
- The analysis of labour input coefficients and labour productivity is notable element in labour demand analysis and forecasting. During the time period when the economic growth is accompanied with corresponding productivity growth it can lead to a situation when high unemployment arises and sustains for years. As free movement of labour force is one of the EU foundations, short-term or long-term emigration and immigration gradually balance the labour market and labour supply.

- The analysis of export by branches using input-output data (use tables) of the Baltic States indicates that the importance of export by branch varies significantly from one branch to another (in most cases, goods-producing industries show larger export ratio values rather than service industries).
- The branches that are more oriented to export in Latvia are Manufacture of wood and wood products, Manufacture of basic materials. At the same time, a considerable large number of service sector's branches have the value close to zero due to no export or very low level of export (especially, in public services).
- Nevertheless, if two reference years are compared (2004 and 2007), it is observable that not so notable changes had took place.

- The obtained results are valuable and applicable in updating process of Latvia's INFORUM-type model and its data base as foreign trade is modeled within the model or exogenous (import by branches are modeled by import shares, but export by branches are exogenous). Latvia's INFORUM-type model is not linked to other INFORUM models



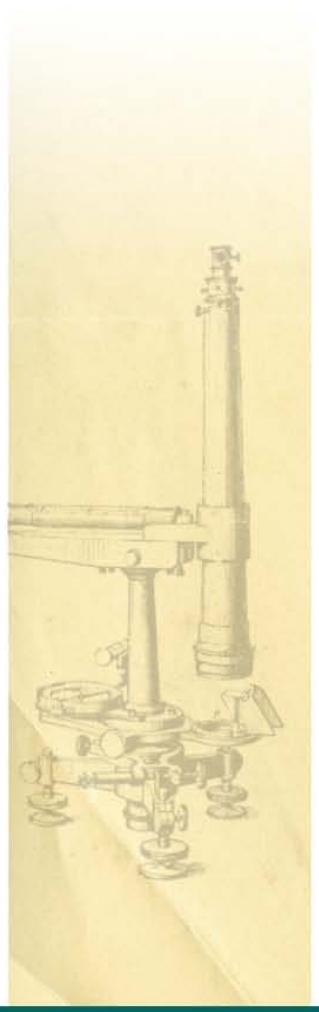
Conclusions

- The evidence of foreign trade analysis shows that the export structure in three Baltic States are different, therefore also structural changes differ. However, in all countries the years of faster development brought by the most significant changes in export structure and the EU enlargement was a significant driver of change. Notable changes can be observed also during recession. However, the revived growth did not have much influence on export structure in Latvia, while there were significant changes in Lithuania and Estonia.
- The findings about import structure show that, in Latvia, the recent crisis brought significant changes in import structure, however, in other Baltic States import structure is more influenced by the process of transition from a centrally planned economy to a free market, which is completed now.

Conclusions (cont.)

- The evidence of sectoral data analysis on basis of IO tables shows that relative indicators (ratios) more correctly represent the sectoral specifics and latest trends. On the basis of international comparison with Estonia and Lithuania, it is concluded that a convergence is observable to Estonia's level. It is also concluded that despite notable changes regarding the values of indicators, labour input coefficients have not changed by such an extent and difference from the level in neighboring countries is relatively low. At the same time, the results of ratio of export and total use indicate that export-orientation significantly varies among the branches within the economy. This trend is observed in all Baltic countries that were studied. The obtained results are valuable and applicable in updating process of Latvia's INFORUM-type model and its data base.

Thank You for Attention!



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- Since mid- and late 1990s many European economies (including Latvia) experienced sharp economy growth.

- Economic growth → sharp → for years
- Economic growth → various speed growth by sectors
- Service sector boosted
- Structural changes

- Economic growth → demand for labour → wages → productivity

- However, economic growth didn't lead to complete convergence with the average EU level (wages; productivity).

- At the same time, previously & at the moment
- Wages and productivity are < the average EU (in same branches dramatically, in some quite close)

- Other studies → considerable number of researches and publications has been devoted to productivity and related issues applying input-output analysis and modelling.

- Productivity issues → one of the most frequently analysed and investigated issues.

- Especially productivity is studied in economic conditions when are a pressure to optimize production processes, for instance, when spending cuts in all levels – macro and micro level – are being introduced.

- The aim of the research is to reveal actual sectoral trends in high level of disaggregation.

- As aggregate - GDP growth rate – mostly is used/analysed/applied.

- Leads to ? → How in sectors?

- Methodology

- Indicator of gross labour productivity by sector is computed by the following formula:

$$p_i = \frac{x_i}{e_i} \qquad (1)$$

where pi – gross labour productivity of sector i;

xi –gross output of sector i;

ei – number of employed persons in sector i.

- Ratio of productivity of unit spent on labour (gross output per unit spent on labour) p_ui is computed by the following formula:

$$p\_u_i = \frac{x_i}{c_i} \qquad (2)$$

where ci – compensation of employees in sector i;

This indicator shows how many units of output (in money terms) are generated by one unit spent on labour.

- Value added per employed person is computed by the following formula:

$$pv_i = \frac{va_i}{e_i} \qquad (3)$$

- According to the general confidence, the higher the valued added by employee, the better for the economy.

- Ratio of value added to compensation of employees pv_ui is computed by the following formula:

$$pv\_u_i = \frac{va_i}{c_i} \qquad (4)$$

Ratio of value added to compensation of employees is important indicator that embodies the ability of one unit spent on labour to generate one unit of value added. As value added and consequently gross domestic product are major economic outcome estimation indicators, the higher value of this ratio indicated higher potential to generate larger value added. In general, the larger the value added in the economy in general and per capita, the better. Consequnetly, the higher value of this ratio, the better for the economy.

- In order to reveal the economic effect of labour to generate value added, the modified ratio – the ratio of value added to wages and salaries pv*_ui - is computed by the following formula:

$$pv\_u_i^* = \frac{va_i}{w_i} \qquad (5)$$

Labour input coefficient li of sector i is computed by the following formula:

$$l_i = \frac{c_i}{x_i} \qquad (6)$$