

**ANALYSIS OF THE DECLINE
IN INDUSTRIAL PRODUCTION
IN 2004**

Final Report

Center for Economic Analysis (CEA)

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INTRODUCTION

The drastic decline of the industrial production index, which first showed in January 2004 and continued during the following months, had alerted the economic departments of the Government of RM to urgently determine the reasons for this phenomenon (see Table 1).

Industrial production indexes

Table 1 - Non-corrected monthly data

Индекси на индустриско производство

Табела 1. Не корегирани месечни подат оци.

XII 2003	I 2004	II 2004	III 2004	IV 2004	V 2004
XII 2002	I 2003	II 2003	III 2003	IV 2003	V 2003
-8.6	-44.8	-30.3	-32.9	-19.1	-26.6

Табела 2. Корегирани месечни подат оци.

XII 2003	I 2004	II 2004	III 2004	IV 2004	V 2004
XII 2002	I 2003	II 2003	III 2003	IV 2003	V 2003
-8.6	-25	-17.1	-32.7	-19.2	-26.6

Кварт ален подат ок.

IQ 2004
IQ 2003
-26,1*

Source: State Statistical Office.

In order to analyze the reasons for the decline, and in compliance with the conclusion of the Government of the Republic of Macedonia passed at its seventh session, a working group was established comprising of the representatives of the Ministry of Economy, the Ministry of Finance, the State Statistical Office, the National Bank of the Republic of Macedonia and the independent research center – Center for Economic Analysis (CEA).

Upon the request of the Ministry of Economy, the role of CEA was to locate the sources of the industrial production decline, by cross-referencing data from national accounts records, exports, the export orientation of companies and the electricity consumption during the first five months of 2003 and 2004.

The analysis has been made at the aggregate and at branch level, analyzing the behavior of the aforementioned variables in the sample and in the statistical population.

CEA would like to express its gratitude for the granted confidence and cooperation by the Ministry of Economy, the Ministry of Finance and the State Statistical Office.

PART ONE

MAIN PRINCIPLES OF MEASURING THE INDUSTRIAL PRODUCTION INDEX

1.1. About the industrial production index ¹

The basic goal of the construction of the production indexes is to measure the production growth during a specific period of time. The index of the physical volume of industrial production does not have the power to present the level of production, but only to register the change of level (increase or decrease). Through this index the effects of seasonal influence, market conditions, labor force market conditions and etc. can be followed. The index is only tied to the volume (quantitative changes), and therefore it does not measure the effects of price variations.

1.2. About industrial statistics

The reporting units for calculating the index of the physical volume of industrial production are the companies or business units in the industry that are registered at the State Statistical Office. The short-term industrial statistics in the Republic of Macedonia are based upon the periodical reports provided by the reporting units (Monthly Report on The Industry - IND 1, about industrial production, inventory and industrial workers). Hereby, the accounting and personnel records (and other documentation) as shown by the reporting units, are used as data sources.

Observation units are enterprises and business units that according to the National Classification of Activities (NACE) are divided into the field of industry and mining, in the sectors: *Mining and Quarrying*, *Manufacturing Industry* and *Electricity, Gas and Water Supply*. The Monthly Report IND 1 covers also those business units that engage in industrial production, but whose parent company does not belong to the field of industry (i.e. in construction).

The data is collected by means of monthly surveys that cover all reporting units with 10 or more employees.

The number of reporting units that report is significantly smaller than the total number of registered units.

1.3. Monthly Report on the Industry IND -1

The aim of the sample is to select the relatively bigger reporting units that will present the industrial sectors and sub-sectors, as well as industrial products that have a significant influence upon industrial growth. This means that the sample for reporting units and the industrial products is not randomly selected, but rather through a selection

¹ More on the methodology in Annex 3 – **Methodology explanations for the estimate of the physical volume of industrial production index** (material submitted to the State Statistical Office).

targeted at a higher proportional coverage of sectors. Thus, based upon the sample, indexes are calculated that reflect to a significant extent the trend in the overall industry. Simply, the index of the physical volume in industrial production should cover that particular industrial segment that has a larger input into the overall industrial production.

1.4. Selection of the sample²

The indexes of industrial production are calculated for the volume of production per product, by means of a cross-referenced selection of the most representative products and most representative reporting units. During the selection, attention is paid so that each reporting unit would have a minimum stake of 0.02 % in the NKD class, and all other enterprises would have a participation of 90.0 % in the branch. Exempt are those cases when in order to incorporate a certain class, it is possible to go with a smaller percentage.

Weights are calculated by enterprise and by product. Weights are needed to enable all product measuring units (liters, kilograms and others) to be brought to a joint denominator. The calculation of the weights is based upon the data for the values on the production from the Annual Industry Report, carried out in 1998.

1.5. Criteria for selecting a quality sample

According to the recommendations of the statistical services of the UN, in those countries where small reporting units do not realize more than 10 % of the total industrial production, the sample has to cover two thirds or more of the net production of large reporting units.

EUROSTAT, on the other hand, recommends that for the preparation of short-term industrial production indicators, the sample should provide 70 % coverage of the statistical population (all registered reporting units in the industry).

² More in:

PART TWO

ANALYSIS OF THE DECLINE OF INDUSTRIAL PRODUCTION IN THE REPUBLIC OF MACEDONIA

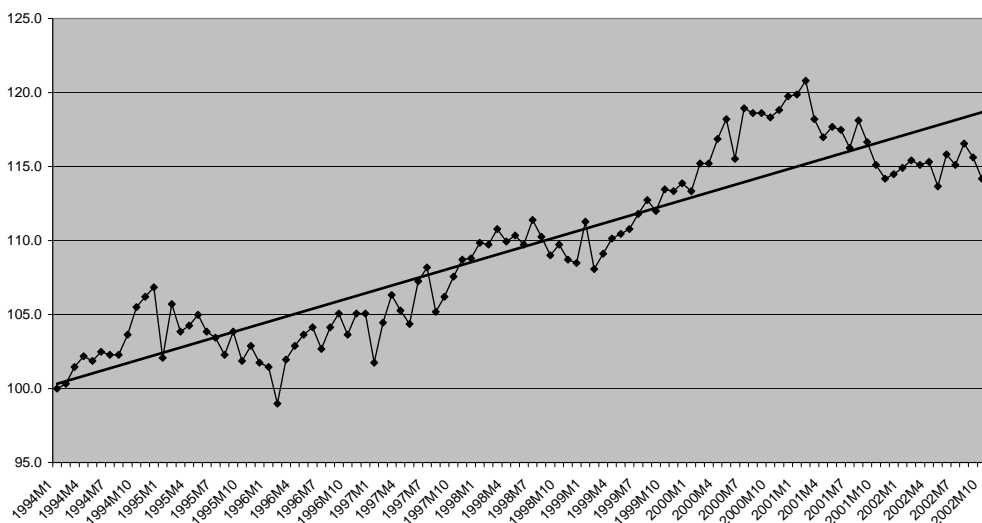
2.1. Analysis at the aggregate level

2.1.1. About the sample

Having in mind the volatility of the Macedonian economy during the transition period (structural changes, vulnerability due to external and internal shocks), the monitoring of industrial production through short-term indicators, as well as the physical volume index, cannot be the same as in developed economies. Because of the aforementioned characteristics of transitional economies, if the sample is not frequently revised, its capacity to represent the population is jeopardized.

To illustrate this, charts on the industrial production index in Germany and Macedonia are presented below (with the same interval on the Y-coordinate). The

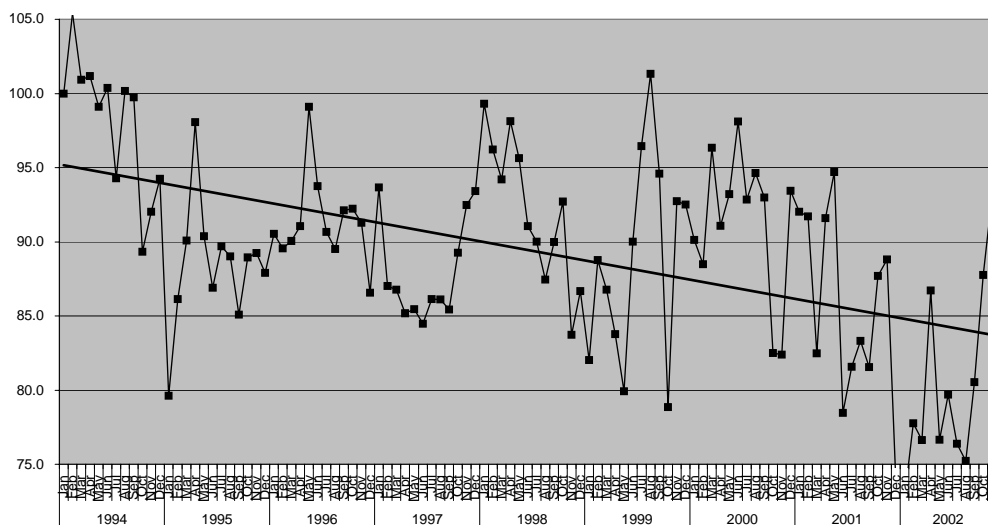
Индустриско производство на Германија; Јан 1994=100
(сезонски прилагодени)



domination of the industrial production trend (i.e. the long-term component) is obvious, as well as large fluctuations (short-term component) in the case of the Macedonian transition economy.³

³ Illustrations of the production index in selected parts for the Republic of Macedonia are shown in Annex 2 of this analysis.

Индустриско производство на Македонија; Јан 1994=100
(сезонски прилагодени)

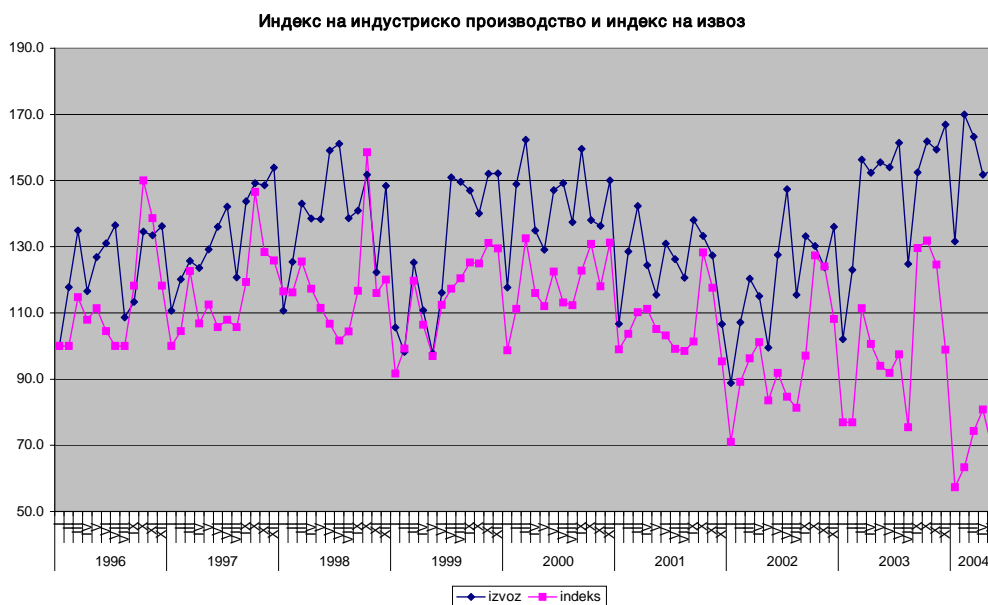


Because of the domination of fluctuations in the population behavior, the sample used for monitoring the index as a short-term indicator should be revised more often. For example, in the Czech Republic and Bulgaria, the sample to monitor the industrial production is revised every two years.

In the Republic of Macedonia, the sample for monitoring the industrial production was revised in 1998 for the last time.

2.1.2. Industrial production and exports

Evidently there is a certain correlation between these two variables, for which we have conducted an econometric research, later in the analysis. Although it is usual to register a smaller total export of goods and lower production in January, compared to the other months, it is indicative that this seasonal effect in January 2004 turned out to be dramatic for industrial production. At the same time, imports registered a seasonal monthly decline, but with a growing trend. Contrary to past years, the industrial production index shows an unusual structural fluctuation since January 2004.



2.1.3. Industrial production and consumption of electricity

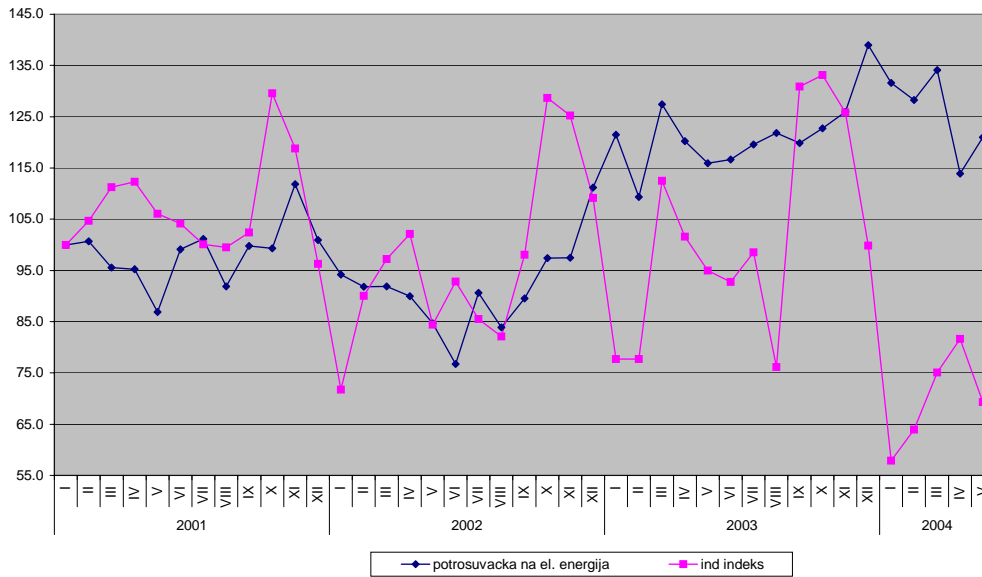
A comparison between the trends in the consumption of electricity and the industrial index was made in this part. For the consumption of electricity, the following power levels have been used:

1. Manufacturers at 35 and 10 kV;
2. Small manufacturers (1 and 2);
3. Direct consumers (15 largest manufacturers).

The following chart shows the trends in two variables for the period from January 2001 to May 2004. The inconsistency between the consumption of electricity and the dramatic decline in industrial production is obvious.

An econometric research of these two variables was performed in the further analysis, as well.

Споредба на потрошена електрична енергија и инд индекс



2.2. Analysis by branches

2.2.1. Contribution of branches in the overall decline in the industrial production index

Table 2 – Contribution of each branch in the overall decline in the industrial production index

Реден број	Оддел	2003	2004	Раст / пад	Придонес во намалувањето
1	27	13069,8	3169,2	-75,75	-20,64
2	23	3485,7	1914,2	-45,08	-3,28
3	15	9072,5	8129,7	-10,39	-1,97
4	31	1827,5	1028,1	-43,75	-1,67
5	40	4195,4	3642,2	-13,19	-1,15
6	36	829,3	299,1	-63,94	-1,11
7	28	1201,0	707,4	-41,10	-1,03
8	35	601,6	186,2	-69,04	-0,87
9	16	2289,6	1992,9	-12,96	-0,62
10	13	215,2	0,0	-100,00	-0,45
11	19	512,2	318,4	-37,84	-0,40
12	20	401,5	237,3	-40,88	-0,34
13	29	201,4	131,8	-34,57	-0,15
14	21	494,4	426,4	-13,76	-0,14
15	26	1903,0	1853,0	-2,63	-0,10
16	37	12,3	11,1	-9,89	0,00
17	30	0,0	0,0	-100,00	0,00
18	10	0,1	0,5	480,45	0,00
19	34	518,6	530,4	2,28	0,02
20	14	211,9	252,1	18,94	0,08
21	25	1250,1	1294,0	3,51	0,09
22	17	905,5	961,0	6,13	0,12
23	24	1617,3	2001,8	23,78	0,80
24	22	377,0	1312,1	248,02	1,95
25	18	2767,2	3949,9	42,74	2,47
Вкупно		47960,27	34348,91	-28,4	-28,4

A conclusion can be made, based on the table, that undoubtedly the largest contribution in the decline was provided by branch 27 (Manufacturing of basic metals), which participates with 20.64 percentage points in the overall decline of the sample mass (28.4 %). This branch is greatly affected by the inactivity of Balkan Stil and Investas.

The influence of these companies will be quantified in the part where the analysis of the firms is presented.

The following table shows the cumulative distribution of participation of the mass in the overall decline in industrial production. Branches that have a decline between 100% and 50% comprise 30.3 % of the sample.

Table 3 - Concentration in the participation of the mass in the decline

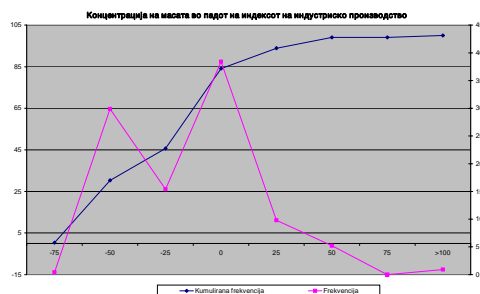
Tabela 3 - Koncentracija na u-estvoto na masata vo padot

НКД оддел	Назив на оддел НКД	Пад / пораст	Учество на маса во 2003
13		-100.0	0.4
32		-100.0	0.0
27		-74.4	26.9
35		-69.0	1.3
36		-66.2	1.7
23		-45.1	7.3
31		-43.2	3.8
20		-37.8	0.9
28		-35.3	1.7
19		-34.3	1.1
29		-32.9	0.5
40		-13.4	8.6
16		-12.9	4.8
15		-10.2	18.9
37		-9.9	0.0
24		-5.1	6.0
26		2.0	3.4
34		2.2	1.0
21		5.2	1.0
17		5.7	3.4
10		6.2	0.1
25		17.4	0.9
14		27.2	0.7
18		45.3	4.5
22		186.6	0.9
30			
33			
		-28.4	100.0

Table 4 - Cumulative frequency

Tabela 4 - Kumulativna frekvencija

Пад / пораст	Кумулира на фреквенција	Фреквенција
-100		
-75	0.4	0.4
-50	30.3	29.9
-25	45.7	15.4
0	84.1	38.4
25	93.9	9.8
50	99.1	5.2
75	99.1	0
>100	100	0.9



The following table shows the contribution in growth (or decline) of industrial production according to the intensity of growth, i.e. the decline of specific groups of occurrence (or products).

Table 5 - Contribution of occurrence (products) in the overall growth/decline of the industrial production index

Types of occurrence (products), according to performance	Number of occurrence (products)	Contribution in the growth/decline
Occurrence (products) that Show a three-digit growth	59	6,23
Occurrence (products) that Show a two-digit growth	106	5,26
Occurrence (products) in companies that Have restarted their production	13	4,44
Occurrence (products) that Show a one-digit growth	29	0,11
Occurrence (products) in companies that Do not have economic activity	160	0
Occurrence (products) that Show a one-digit decline	35	-0,93
Occurrence (products) that Show a two-digit decline	180	-17,74
Occurrence (products) in companies that Have ceased to produce	72	-25,76
Total	654	-28,4

2.2.2. Concentration of the mass and value added

Participation in the gross value added of the sample in the value added of the population for the pure industrial business entities (under NKD, from branch 10 to branch 40) amounts to 80.9 %. It has to be mentioned that in the national accounts, the business entities are classified according to the organizational principle (under the activity for which the business entity is registered), while the sample for calculating the industrial production index embraces reporting units according to predominant activity (business entities are considered that deal in industrial production, even though their parent company does not belong to the industry sector).

Business entities that according to their financial results in 2003 indicate a reduced participation in the gross value added are basically the same ones that have a reduced or even no monthly industrial production in 2004. This draws to the conclusion that the attention needs to be focused on these branches (NKD branches 17, 22, 25, 34, 37), avoiding generalization of this conclusion for the overall industrial production. More in Annex 1.

Tabela 6 - Representativnost of the sample from the aspect of gross value added

2003 ПОПУЛАЦИЈА			2003 ПРИМЕРОК						МАСА			
НКД	Фирми	БДВ	Учество	Фирми	БДВ	Учество	Фирми прим/поп	БДВ прим/поп	2003	2004	Раст	
15	888	6211864	18.07	65	5210083	18.64	7.32	83.87	9072.45	8129.66	-10.4	
18	Total	1021	3800186	11.05	42	1846925	6.61	4.11	48.60	2767.24	3949.89	42.7
40	Total	11	9651506	28.07	2	9242199	33.07	18.18	95.76	4195.39	3642.2	-13.2
27	Total	77	2227969	6.48	9	1885033	6.74	11.69	84.63	13069.8	3169.22	-75.8
24	Total	135	2455680	7.14	6	2138612	7.65	4.44	87.09	1617.26	2001.83	23.8
16	Total	37	1351811	3.93	19	1146393	4.10	51.35	84.80	2289.61	1992.93	-13.0
23	Total	9	188516	0.55	1	156329	0.56	11.11	82.93	3485.7	1914.2	-45.1
26	Total	138	3137385	9.13	21	3068410	10.98	15.22	97.80	1903.03	1853.02	-2.6
22	Total	621	888618	2.58	9	85274	0.31	1.45	9.60	377.026	1312.13	248.0
25	Total	304	585137	1.70	13	165761	0.59	4.28	28.33	1250.12	1293.95	3.5
31	Total	239	1027141	2.99	10	561501	2.01	4.18	54.67	1827.53	1028.07	-43.7
17	Total	333	260532	0.76	17	23128	0.08	5.11	8.88	905.499	961.035	6.1
28	Total	729	1098930	3.20	30	443164	1.59	4.12	40.33	1201.01	707.434	-41.1
34	Total	47	-1694835	- 4.93	1	48062	0.17	2.13	-2.84	518.621	530.423	2.3
21	Total	199	463848	1.35	6	295682	1.06	3.02	63.75	494.419	426.409	-13.8
19	Total	356	221654	0.64	10	209605	0.75	2.81	94.56	512.202	318.394	-37.8
36	Total	465	451409	1.31	16	201414	0.72	3.44	44.62	829.319	299.083	-63.9
14	Total	76	888547	2.58	13	752562	2.69	17.11	84.70	211.948	252.083	18.9
20	Total	652	159458	0.46	12	56202	0.20	1.84	35.25	401.463	237.336	-40.9
35	Total	7	203078	0.59	2	193494	0.69	28.57	95.28	601.551	186.246	-69.0
29	Total	168	406825	1.18	5	208788	0.75	2.98	51.32	201.413	131.794	-34.6
37	Total	93	131836	0.38	8	6090	0.02	8.60	4.62	12.3288	11.1101	-9.9
10	Total	4	-24586	- 0.07	2	4089	0.01	50.00	-16.63	0.08582	0.49812	480.5
13	Total	3	72318	0.21						215.244	0	-100.0
30	Total	95	214409	0.62						0.00697	0	-100.0
Вкупно	6707	34378637	100.00	319	27948801	100.00	0.05	81.30	47960.3	34348.9	-28.4	

2.2.3. Export analysis by branches

Tabela 7 - Representativnost na primerokot od aspekt na koli-inski i vrednosno izrazeniot izvoz

	prim / popul 2003		prim / popul 2004	
	izvoz vo kg	izvoz vo SAD\$	izvoz vo kg	izvoz vo SAD\$
13	60,1	59,8	0,0	0,0
14	61,9	28,4	66,8	24,7
15	63,0	69,3	54,8	62,5
16	634,4	401,6	518,0	360,0
17	15,3	23,3	8,1	13,2
18	20,9	16,9	16,6	14,0
19	11,0	12,4	12,5	14,9
20	643,9	173,9	1032,0	106,3
21	120,3	85,5	133,8	75,1
22	126,2	169,2	37,4	100,6
23	93,4	94,4	87,5	90,2
24	27,2	98,8	65,3	118,0
25	220,5	99,4	153,3	90,7
26	104,2	94,6	111,3	111,2
27	97,7	83,3	60,5	60,3
28	94,4	84,5	61,6	65,2
29	37,8	23,6	68,2	39,6

In order to draw relevant conclusions on the inconsistency between the industrial production decline and overall export growth, a cross-reference of data by branches was made. First we checked the export participation by sample branches, within relevant branches of the statistical population. Parts of the results are indeed illogical, because according to them, the sample indicates larger export than the entire statistical population! Thus, for example, the quantitative export of branch 20 (Timber and wood manufacturing) in the first five months of 2004 is 10 times the statistical population itself,

i.e. the actual realized export in the analyzed period of time (sic!)!?

2.2.4. Cross-referenced data of the sample mass and domestic and foreign market sales (export orientation)

Tabela 8 - Rast (pad) na indeksot na industrisko proizvodstvo i rast (pad) na prodabata doma i vo stranstvo

Оддел	Назив на НКД	Раст на масата	Раст на продажба на	Раст на продажба на	Извозна ориентација
			домашен пазар	странски пазар	
		стапка на раст			во процент и
10	Вадење на јаглен и лигнит	480.5	180.9	-	0.0
22	Издавачка дејност	248.0	19.6	-	0.0
18	Производство на предмети за облека	42.7	-40.9	24.6	82.4
24	Производство на хемикалии	23.8	-6.4	-0.6	26.0
14	Вадење на други руди и камен	18.9	-32.1	-14.0	13.0
17	Производство на текстилни ткаенини	6.1	6.8	-28.0	61.5
25	Производство на гума	3.5	-62.9	-66.2	36.0
34	Моторни возила и приколки	2.3	153.4	16.2	80.4
	Просек (18, 24, 14, 17, 25, 34)	23.6	-11.4	-3.0	25.0
26	Производство на неметални минерали	-2.6	13.0	50.2	2.1
37	Рециклажа	-9.9	37.1	-	0.0
15	Прехранбени производи и пијалоци	-10.4	11.8	-3.7	23.1
16	Тутун	-13.0	-24.6	36.1	56.1
40	Електрична енергија	-13.2	-3.34	-	0.0
21	Производство на целулоза и хартија	-13.8	-10.1	-5.4	28.5
29	Производство на машини	-34.6	-8.2	-13.7	86.8
19	Преработка на кожа	-37.8	-50.0	15.8	85.7
20	Преработка на дрво	-40.9	35.8	0.5	8.4
28	Производство на метални производи	-41.1	10.4	-11.0	42.8
31	Производство на електрични машини	-43.7	-17.0	-13.1	72.7
23	Производство на нафта	-45.1	24.4	-53.3	38.1
36	Производство на мебел	-63.9	-28.3	-14.6	23.8
35	Производство на сообраќајни средства	-69.0	52.0	-100.0	27.0
27	Производство на основни метали	-75.8	-5.6	-47.7	86.3
13	Вадење на руди на метал	-100.0	-100.0	-	0.0
30		-100.0	-100.0	-	0.0
	Просек (сите со пад освен 27, 13, 30)	-22.8	7.2	-5.8	6.2
	Вкупен просек (освен 10, 22, 27, 13, 30)	-12.9	4.4	-4.5	9.7

Table 8 shows that those branches that indicate growth in the mass (for 23.6 % more) have a decrease in domestic sales (for -11.4 %), but also a decline in foreign sales (overall -3.0 %).⁴

Those branches that indicate a decline in the mass (the overall decline is -22.8 %), have a growth in gross domestic market sales (for 7.2 % more), but a gross foreign market sales decline (-5.8 %).⁵

The conclusion is that domestic sales in the first five months in 2004 have not declined, because it manages to absorb the products of these sectors.

However, it is indicative that foreign market sales indicate a decline of 04.5 % (according to the sample), while the overall export of goods (statistical population)

⁴ Here, branches 10 and 22 that have an exceptional (above average) growth, were exempt.

⁵ Here, branches 27 (for the decisive influence of "Balkan stil" and "Investas"), 13 and 30 were exempt.

indicates a 11.7 % growth of the analyzed period of time (January - May 2004 with regard to January – May 2003). This can solely be proven by an eventual export expansion of the other sectors that take part in GDP formation, and which would compensate the export decline of the Macedonian industry. (On the other hand, because of the urgent need of the results and the industry production decline analysis, these data were not taken into consideration).

Those branches that indicate a positive growth rate, at the same time indicate an overall domestic and foreign market sales decline. Here, the explanation was sought within the reserves that were to show a consistency with manufacturing and sales movements.

The cross-referencing of reserves, sales and manufacturing is illustrated in Annex 4. Part of the results, at first glance are illogical, like the Rubber Manufacturing branch (branch 25) which shows manufacturing growth, domestic and foreign market sales decline, and a decrease of reserves! The State Statistical Office will explain the methodology for keeping track of reserves.

2.3. Analysis by branches and enterprises

Analysis of the industrial production decline also took into consideration the influence of firms in several categories: **companies in bankruptcy, loss-making companies and companies from branch 27.**⁶

For the first five months in 2004, the sample mass indicates a decline of 28.4 % and the industrial production index a 26.1 % decline.

Loss-making companies

In the first phase of the research, the following **loss-making companies** were exempt from the sample:

1. Porcelanka;
2. Nokateks;
3. Mikron;
4. MZT FAM;
5. Frinko;
6. Rudnici Zletovo;
7. Rudnici Sasa;
8. Gazela;
9. Iskra.

⁶ The list with the data on the status of these firms was received from the Ministry of Economy.

Without these companies, the decline of the mass is 27.9 % with is for an insignificant 0.5 percent lower than the decline of the sample in official use.

Companies in bankruptcy

In the second phase of the reduced sample (a sample exempt of the loss-making companies) we also excluded the following companies **in bankruptcy procedure**:

1. AD Semkorp;
2. Brako;
3. Interna;
4. TIPO.

Even in this case, the decline in the mass was almost unchanged with regard to the decline of the sample mass, with already excluded loss-making companies.

The list of loss-making companies, which was provided by the Ministry of Economy, also contains other firms, but they are not part of the sample.

Whence, the conclusion is inevitable that through the status of these companies, which influences their activities, the decline of the mass cannot be explained.

Concentration in the stratum (branch 27)

In further analysis of the sample by branches and firms, we have quantified the industrial production decline by excluding the industrial giants Balkan Stil and Investas that in the first five months in 2004 did not have a production. Without them, the decline in the sample mass is 09.2 % that indicates that even 19.2 percentage points of the overall industrial production decline can be explained with the non-working of these two firms!

The conclusion is that in branch 27 (Manufacturing of basic metals) there is a large concentration. CEA recommends that the State Statistical Office conducts a separate analysis of representativeness on strata (ranch) level.

Tabela 9 – Decline in the sample mass with and without
Balkan Stil and Investas

Pad na masata od primerokot	
Vkupno primerok	Bez "Balkan Stil" i "Investas"
-28,4%	-9,2%
Pad na indeksot na industrisko proizvodstvo	
Vkupno primerok	Bez "Balkan Stil" i "Investas"

-26,1%	-8,5%
--------	-------

Other categories to be viewed from the sample

Until the new sample is officialized, we would like to recommend to update the sample by the State Statistical Office in coordination with the Ministry of Economy and other institutions, which would take into consideration the following and other changes of status of firms:

1. Structural change
 - a. Merging;
 - b. Split
2. Reregistering for a new activity;
3. Closing down of firms (where the State Statistical Office is waiting for the deregistration as official document from the court)

THIRD PART

HOW REAL IS THE INDUSTRIAL PRODUCTION DECLINE?

In order to check whether industrial production decline for the beginning of 2004 convincing, we initiated the inspection of the consistency of movements in industrial production with movements of other two indicators that are closely connected with it: *export of goods* and *electricity consumption by manufacturers*.

The Macedonian economy is a small and open economy, therefore we tried, through econometric research, to find the connection between the collapse of industrial production and movements of the export of goods. Besides this, because one of the key inputs of the industrial production is electricity, its decline should correspond to low electricity consumption by the industrial manufacturers.

3.1. Industrial production and export of goods

In this part, we inspect the relation between the aggregate time series of the real industrial production and export of goods in the real rate of the Macedonian denar. Monthly data of the export of goods in US\$ are from the base of the National Bank of the Republic of Macedonia⁷. This data is converted into Macedonian denars, using the average currency rate of the denar to the dollar. The obtained series of export of goods (in nominal MKD) are converted to real series, though deflating the price indexes of industrial manufacturers (PPI).

Quarterly indexes were derived from the monthly data, using three monthly geometric median of the growth rate.

The econometric analysis confirms that there is a statistically significant, positive connection between the industrial production growth and export growth:

	<i>Parametar</i>	<i>Standardna greška</i>	<i>t statistika</i>	<i>P-vrednost</i>
Konstanta	-0.028	0.014	-1.933	0.064
Rast na izvoz	0.144	0.049	2.951	0.006

⁷ Data submitted by the Ministry of Finance

The export growth parameter is statistically significant (with a five percent significance level). In case this regression is used to evaluate (estimate) the industrial production growth in the first three months of this year, the results say that the industrial production growth in the first quarter in 2004 is -2.2 %!

3.2. Industrial production and electricity consumption

The second indicator, closely tied to industrial production is electricity consumption by manufacturers.

In the case of electricity consumption, there is also a positive correlation between the two variables. The estimated regression for these two indicators is:

	<i>Parametar</i>	<i>Standardna greška</i>	<i>t- statistika</i>	<i>P-vrednost</i>
Konstanta	-0.040	0.028	-1.396	0.212
Rast na potroš. na elektr. energija	0.402	0.175	2.294	0.062

The evaluated parameter for electricity consumption is statistically significant (with a five percent significance level). In case the regression is used to forecast the industrial production level in the first three months of this year, the grade for the first quarter in 2004 for the industrial production index will be a -1.7 % growth in the industrial production index. This is very similar to the estimated growth rate of -2.2 % obtained by using the export growth for regression, but still, a much smaller decline rate than the official (-26.1 %)!

	Oficijalen podatak za rastot na indeksot na industriskoto proizvodstvo	Ocenet rast na indeksot na industrisko proizvodstvo (ocenska na CEA)	Razlika (vo procentni poeni)
QI	-26,1	-2,2	-23,9
QII ⁸	-16,9	-1,7	-15,2

Conclusion of the econometric research is that:

⁸ Evaluation of the CEA.

- Industrial production growth is in significant correlation to the growth of export of goods and electricity consumption;
- Growth of export and electricity consumption in the first quarter in 2004 indicates that the industrial production has a mild contraction of around -2 %;
- This is a much lower decline than the official rate of industrial production decline of -26.1 %.

CONCLUSIONS AND RECOMMENDATIONS

The aim of this analysis of the industrial production index decline was not to find the cause of the present state of the Macedonian economy. This implies a different type of research, which is based on fundamental macroeconomic and microeconomic analyses.

Just to illustrate this, the analysis did not take into consideration the influence of legal regulations and their implementation, the efficiency of the judicial system, the politization of the society, external shocks, etc.

At the same time, the influence of the currency rate regime, fiscal policy, money supply, interest rates, etc.

For sure, the microeconomic factors (market regulations, reforms in the enterprise sector, non-investing in functions and business systems, like marketing, management, information technology and following of new trends in technology, information and know-how) are not at all less significant.

This analysis inspected in detail the industrial production index, which is constructed on a sample and based upon which the entire Macedonian industry is judged. This is a key issue, because an inadequate sample, from any aspect, can give wrong signals for occurrence in industry.

4.1. Conclusions regarding the sample

Inadequate sample can derive from:

- Errors in creating the sample;
- Errors connected to collection of data;
- Errors in calculation of the industrial production index.

CEA is on the opinion that the State Statistical Office, besides the error in the calculation the monthly indexes in January and February 2004 (corrected indexes are shown in Table 1), followed the recommendations of foreign experts in creating the already existing sample. This way, errors were neither made in the part for creating the sample, nor in data collection from the reporting units.

But, once created, the sample can reflect the situation in the industry, only for a limited period of time and this is valid to all economies. From this aspect, it is necessary to make a difference between updating the sample (regular annual operation) and revision of the sample (operation performed once in a few years).

The State Statistics Office annually updates the database on industrial production and the sample. In conditions of an unstable economy, the Office has to continue to

update the sample and ponders in a shorter timeframe until the stabilization of the Macedonian economy.

Having in mind the transitional national of the economy, the State Statistical Office in 2004 started justified preparatory activities for selection of a new sample (to revise the sample) and preparation of new production ponders, branches and sections for 2005, in which the basis for the estimate will be the valuable data, in order to prepare the Annual Report for Industry for 2003.

CEA recommends that the Sate Statistical Office in future makes such revision, instead of every 5 years, every 2 (or 3) years.

The revision comprehends the inclusion of new enterprises, based on separate branches, because of a possible halt in work of certain enterprises from the relevant branch, in order to maintain the span. During the inclusion, a check-up is done on the influence of these products on the basic year index. At the same time, those reporting units have to be eliminated that have a small impact on the product, and that product is well presented by other reporting units.

In principle, the recommendations of EUROSTAT would have to be followed consequently, but having in mind the specifics of the Macedonian economy. Her transitional volatility (its liability to fluctuations), the concentration of manufacturing in several companies (at least in the sample) and the weak diversification is a challenge to create a representative sample, as a short-term indicator to follow the trend in the industry.

Having in mind the volatility of the Macedonian economy in the transitional period (frequent and large fluctuations in manufacturing), an additional effort is needed by the Government of the RM and the State Statistical Office to strengthen its institutional capacity.

4.2. Conclusions regarding the industrial production decline

Conclusions on the industrial production decline can be made only based upon the existing sample. The present composition of the sample, according to us, does not include a significant part of activities in the industry. For example, the sample does not cover the information technology. There is a large concentration on a branch level (statistical problem of the strata in the sample). For example, branch 27 (manufacturing of basic metals), only two firms that do not work (Balkan Stil and Investas) carry 73 % on the overall industrial production index decline, registered in January-May 2004 to the same period of time last year. This means that every fluctuation in the activity of not only two firms in the industry give signals for growth or decline of more than two-thirds of the population.

In this sense, CEA recommends the State Statistical Office to seek technical assistance, which, besides the recommendations of EUROSTAT, would also incorporate the Macedonian specifics in creating the sample.

Having in mind that the sample in official use is prepared in 1998, in which the structure of industry significantly differs from the present situation, we would like to welcome the efforts by the State Statistical Office for a forthcoming revision of the sample and a better presentation of short-term movements in the Macedonian industry.

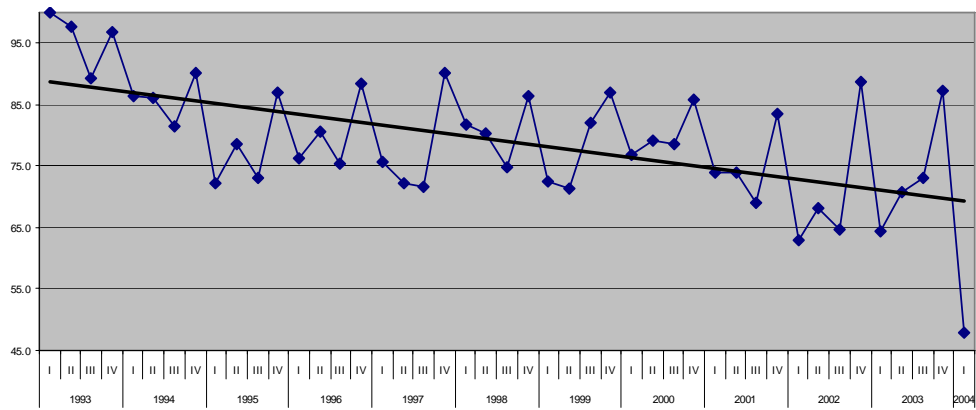
ANNEX 1
Masa na proizvodstvo i dodadena vrednost
od primerokot i populacijata

Учество на Бруто Додадената Вредност на примерокот во популацијата 1)

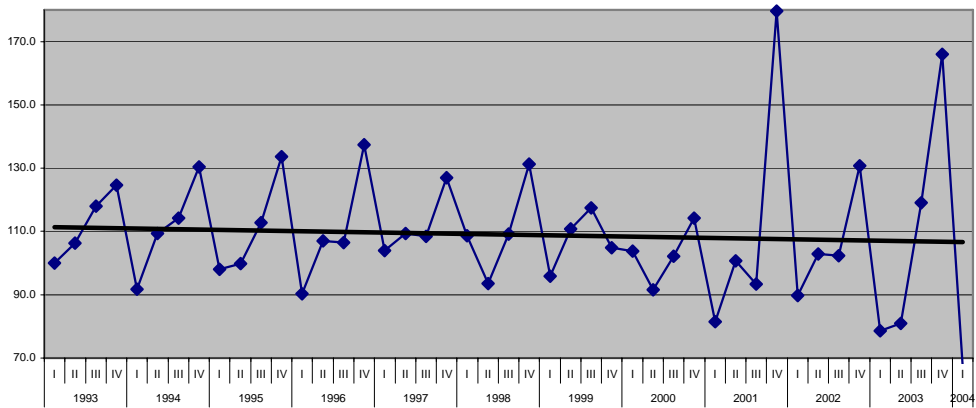
НКД Оддел	Учество на БДВ од примерокот во популацијата (во %)	Број на деловни субјекти во популацијата	Број на деловни субјекти во примерокот
01	26.1	872	9
02	100.8	42	1
05	0.0	25	
Вкупно од '01-'05	59.3	939	10
10	-16.6	4	2
11	0.0	2	
13	0.0	3	
14	84.7	76	13
15	83.9	888	65
16	84.8	37	19
17	8.9	333	17
18	48.6	1021	42
19	94.6	356	10
20	35.2	652	12
21	63.7	199	6
22	9.6	621	9
23	82.9	9	1
24	87.1	135	6
25	28.3	304	13
26	97.8	138	21
27	84.6	77	9
28	40.3	729	30
29	51.3	168	5
30	0.0	95	
31	54.7	239	10
32	20.8	85	1
33	0.0	64	
34	-2.8	47	1
35	95.3	7	2
36	44.6	465	16
37	4.6	93	8
40	95.8	11	2
Вкупно од 10-40	80.9	6858	320
41	6.0	72	1
45	17.7	2733	7
50	0.2	1171	1
51	0.6	1997	1
52	3.2	16483	11
55	3.0	1642	2
60	24.5	3050	2
Вкупно од 41-60	9.7	27148	25
Вкупно од '01-60	51.9	34945	355

ANNEX 2
Квартални ilustracii na proizvodstvo po oddeli
(baza Jan. 1993=100).

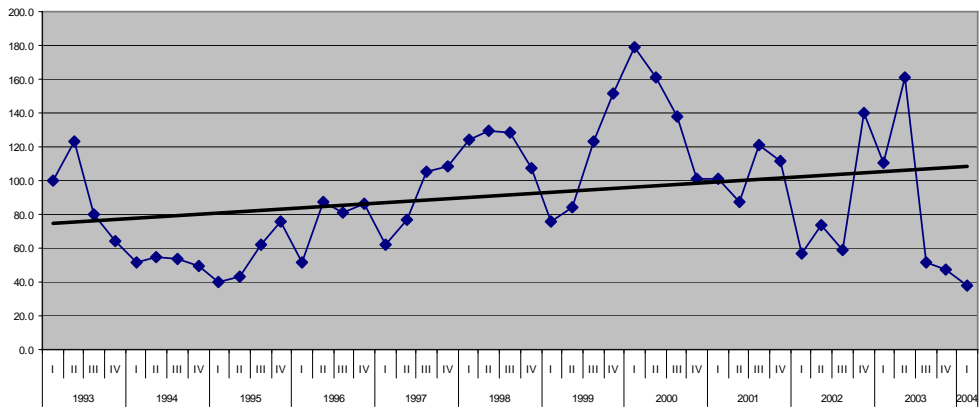
Вкупно индустрија



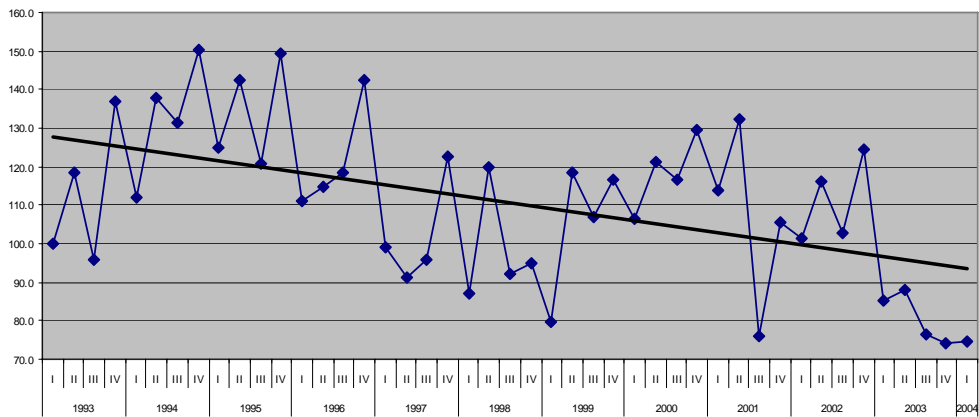
Храна



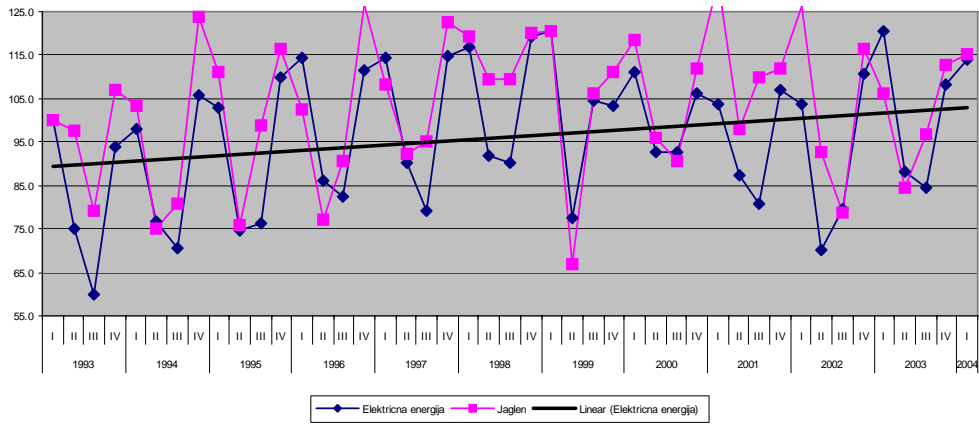
Метална



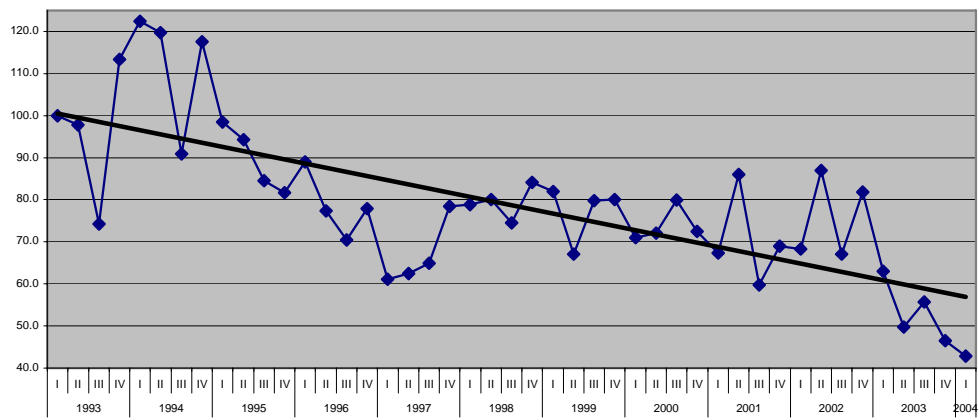
Хемија

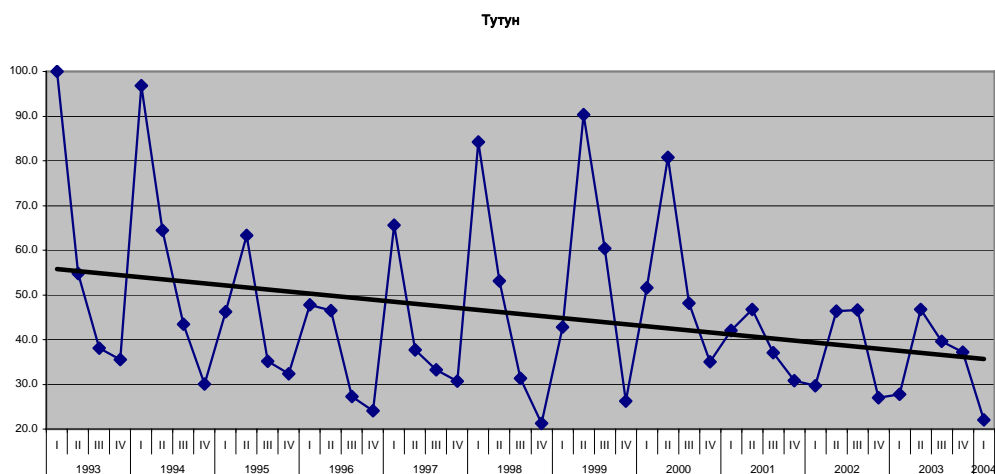


Електрична енергија и јаглен



Текстил





ANNEX 3

Explanations on the methodology to calculate the physical volume index of the industrial production

Formatted

Sources and methods for collecting data

Data sources for the monthly communiqué are the industrial production data collected with the Monthly Report on Industry IND - 1.

The reporting method is used for collecting data. The reporting units submit a monthly report on the industry to the relevant statistical organ in a determined timeframe, based upon the Programme for Statistical research in the R.M. for the determined year.

Observation scope and unit

Observation units are enterprises and business units that according to the National Classification of Activities are classified in the industry and mining branch in the sectors: V- Mining and quarrying, G – Manufacturing industry and D – Electricity, gas and water supply.

Through the Monthly Report on Industry IND 1 business units are covered that engage in industrial production, as well as business units that engage in industrial production, but their parent firm does not belong to the industry but to agriculture, forestry, construction, etc. Enterprises that engage in industrial activity on the territory of two or more municipalities are divided into as many observation units as there are municipalities on whose territories the activities are performed.

Definitions

The monthly report on industry collects quantitative data on production, realization, reserves of manufactured products and the number of industry workers.

The industrial production index for different levels of National Classification of Activities is calculated in two steps: the first step is to calculate the quantity of individual industrial products and the adequate ponderation coefficients.

The industrial production index is calculated with lasper's formula:

$$I = \frac{\sum w_{io} \times q_{it}}{\sum w_{io} \times q_{io}}$$

w_{io} - ponderacionen koeficient za baznata godina
 q_{it} - koli~estvo na proizvodstvo vo tekovната godina
 q_{io} - koli~estvo na proizvodstvo vo baznata godina

Vo vtoriot ~ekor indeksite na oddelni klasi se ponderiraat so soodvetni ponderacioni koeficienti i se presmetuvaat indeksi na povisoki nivoa. Na istiot na~in se presmetuvaat indekse na grupa, oddel, podsektor i sektor.

Primeneti klasifikacii

Pri pribirawe na podatocite vo Mese~niot izve{taj za industriskoto proizvodstvo i objavuvaweto na rezultatite od istiot se koristi Nacionalnata klasifikacija na dejnosti (soglasno odlukata za nacionalnata klasifikacija na dejnosti objavena vo „Slu`ben vesnik na Republika Makedonija„ br. 20/98 godina) i Nacionalnata nomenklatura na industriski proizvodi (soglasno odlukata za utvrduvawe na Nacionalnata nomenklatura na industriski proizvodi objavena vo „Slu`ben vesnik na Republika Makedonija„ br. 47/2000 godina).

Preporaki

Mese~niot izve{taj za industrija IND - 1 se zasniva na preporakite na EUROSTAT i istiot e harmoniziran soglasno Regulativite na Evropskata zaednica broj. 1165/98 godina.

PRILOG 4

Оддел	Назив на НКД	Раст на масата	Раст на залихите	Раст на продажба на	Раст на продажба на	Извозна ориентација
				домашен пазар	странски пазар	
				стапка на раст		во процент и
10	Вадење на јаглен и лигнит	480,5	17,36	180,9	-	0,0
22	Издавачка дејност	248,0	-	19,6	-	0,0
18	Производство на предмети за облека	42,7	-7,42	-40,9	24,6	82,4
24	Производство на хемикалии	23,8	14,68	-6,4	-0,6	26,0
14	Вадење на други руди и камен	18,9	-19,66	-32,1	-14,0	13,0
17	Производство на текстилни ткаенини	6,1	-14,58	6,8	-28,0	61,5
25	Производство на гума	3,5	-0,89	-62,9	-66,2	36,0
34	Моторни возила и приколки	2,3	-58,39	153,4	16,2	80,4
26	Производство на неметални минерали	-2,6	17,53	13,0	50,2	2,1
37	Рециклажа	-9,9	62,90	37,1	-	0,0
15	Прехранбени производи и пијалоци	-10,4	75,65	11,8	-3,7	23,1
16	Тутун	-13,0	-12,56	-24,6	36,1	56,1
40	Електрична енергија	-13,2	-22,42	-3,34	-	0,0
21	Производство на целулоза и хартија	-13,8	27,56	-10,1	-5,4	28,5
29	Производство на машини	-34,6	-3,35	-8,2	-13,7	86,8
19	Преработка на кожа	-37,8	0,33	-50,0	15,8	85,7
20	Преработка на дрво	-40,9	-18,36	35,8	0,5	8,4
28	Производство на метални производи	-41,1	2,79	10,4	-11,0	42,8
31	Производство на електрични машини	-43,7	-7,66	-17,0	-13,1	72,7
23	Производство на нафта	-45,1	-18,92	24,4	-53,3	38,1
36	Производство на мебел	-63,9	-7,60	-28,3	-14,6	23,8
35	Производство на сообраќајни средства	-69,0	0,00	52,0	-100,0	27,0
27	Производство на основни метали	-75,8	10,37	-5,6	-47,7	86,3
13	Вадење на руди на метал	-100,0	0,00	-100,0	-	0,0
30		-100,0	-	-100,0	-	0,0

Оддел	Назив на НКД	
10	Вадење на јаглен и лигнит	ИМА ЛОГИКА (расте п-во, се оди за домашен Пазар и залихи)
22	Издавачка дејност	ИМА ЛОГИКА (расте п-во, се оди за домашен пазар)
18	Производство на предмети за облека	ИМА ЛОГИКА (расте п-во, се оди во извоз)
24	Производство на хемикалии	ИМА ЛОГИКА (расте п-во, трупа залихи)
14	Вадење на други руди и камен	НЕМА ЛОГИКА (расте п-во, а се друго паѓа)
17	Производство на текстилни ткаенини	НЕМА ЛОГИКА (расте п-во, странски ориентиран каде има голем пад, а паѓаат залихи)
25	Производство на гума	НЕМА ЛОГИКА (расте п-во, а се друго паѓа)
34	Моторни возила и приколки	ИМА ЛОГИКА (расте п-во, расте дома и странство, паѓаат залихи)
26	Производство на неметални минерали	НЕМА ЛОГИКА (паѓа п-во, растат залихи, дома и странство)
37	Рециклажа	НЕМА ЛОГИКА (паѓа п-во, растат залихи, дома)
15	Прехранбени производи и пијалоци	НЕМА ЛОГИКА (паѓа п-во, расте дома и растат залихи)
16	Тутун	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, паѓа дома, расте извоз)
40	Електрична енергија	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, паѓа дома)
21	Производство на целулоза и хартија	ИМА ЛОГИКА (паѓа п-во, растат залихи, паѓа дома, паѓа странство)
29	Производство на машини	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, паѓа дома, паѓа странство)
19	Преработка на кожа	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, паѓа дома, расте странство)
20	Преработка на дрво	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, расте дома)
28	Производство на метални производи	НЕМА ЛОГИКА (паѓа п-во, растат залихи, расте дома)
31	Производство на електрични машини	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, паѓа дома, паѓа странство)
23	Производство на нафта	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, паѓа странство, расте дома)
36	Производство на мебел	ИМА ЛОГИКА (паѓа п-во, паѓаат залихи, паѓа дома, паѓа странство)
35	Производство на сообраќајни средства	ИМА ЛОГИКА (ПАЃА, ПРОИЗВОДСТВО И СЕ ОДИ НА МОМАШЕН ПАЗАР, ПАЃА)
27	Производство на основни метали	ИМА ЛОГИКА (паѓа п-во, многу паѓа странство, паѓа дома, малку растат залихите)
13	Вадење на руди на метал	НЕМА АКТИВНОСТ, ИМА ЛОГИКА
30		НЕМА АКТИВНОСТ, ИМА ЛОГИКА

PRILOG 5

BDP po pad na industrisko proizvodstvo od oficijalni statistiki

GROSS DOMESTIC PRODUCT - PRODUCTION APPROACH

	2002				2002	2003				2003	2004				2004
	I	II	III	IV		I	II	III	IV		I	II	III	IV	
Agriculture	4,650	4,748	4,706	4,675	18,779	4,698	4,825	4,886	4,783	19,192	4,740	4,922	4,984	4,873	19,519
	-5.6	-2.5	-1.6	1.8	-2.0	1.0	1.6	3.8	2.3	2.2	0.9	2.0	2.0	1.9	1.7
Industry	10,781	11,604	11,052	14,953	48,390	11,148	12,005	12,647	14,781	50,581	8,238	9,976	13,153	15,372	46,740
	-10.1	-3.5	-1.3	10.2	-0.8	3.4	3.5	14.4	-1.1	4.5	-26.1	-16.9	4.0	4.0	-7.6
Construction	1,870	2,899	2,951	2,644	10,364	1,890	2,914	3,051	3,011	10,866	1,967	3,147	3,280	3,044	11,439
	-7.0	0.7	5.3	1.4	0.6	1.1	0.5	3.4	13.8	4.8	4.1	8.0	7.5	1.1	5.3
Wholesale and retail trade	5,479	5,944	5,821	6,480	23,724	5,719	6,222	6,026	6,785	24,752	5,999	6,583	6,406	7,232	26,220
	5.9	4.7	4.2	6.7	5.4	4.3	4.7	3.5	4.7	4.3	4.9	5.8	6.3	6.6	5.9
Hotels and restaurants	782	897	1,073	974	3,726	844	905	1,127	996	3,872	855	982	1,206	1,056	4,099
	-1.0	16.1	32.2	18.8	16.7	7.9	0.9	5.0	2.2	3.9	1.3	8.5	7.0	6.0	5.9
Transport, and communication	4,008	3,887	4,200	4,372	16,467	4,054	4,144	4,508	4,678	17,384	4,159	4,368	4,729	4,837	18,093
	-3.4	-6.7	-0.5	3.5	-1.8	1.1	6.6	7.3	7.0	5.6	2.6	5.4	4.9	3.4	4.1
FIRE	6,777	6,666	6,626	6,689	26,758	6,697	6,627	6,633	6,680	26,637	6,844	6,793	6,799	6,907	27,343
	-2.8	-4.1	-4.1	-3.7	-3.7	-1.2	-0.6	0.1	-0.1	-0.5	2.2	2.5	2.5	3.4	2.7
Public administration and defense	7,160	7,142	7,214	7,327	28,843	7,357	7,359	7,254	7,378	29,348	7,519	7,514	7,406	7,533	29,972
	10.0	4.7	0.8	-0.8	3.5	2.8	3.0	0.6	0.7	1.8	2.2	2.1	2.1	2.1	2.1
Minus: Imputed banking services	1,115	1,148	1,164	1,149	4,576	1,125	1,073	1,077	1,093	4,368	1,117	1,100	1,109	1,133	4,459
	-2.5	1.7	6.2	2.2	1.8	0.9	-6.5	-7.5	-4.9	-4.6	-0.7	2.5	3.0	3.7	2.1
Residual	116	-40	93	-328	-159	97	-21	-87	-371	-382	558	0	0		558
Value added	40,508	42,599	42,572	46,637	172,316	41,379	43,907	44,968	47,628	177,882	39,764	43,184	46,853	49,722	179,522
	-1.8	-0.9	0.3	3.6	0.4	2.1	3.1	5.6	2.1	3.2	-3.8	-1.6	4.3	4.5	0.9
Indirect taxes	6,976	7,336	7,331	8,032	29,675	7,126	7,561	7,744	8,201	30,632	6,855	7,440	8,077	8,570	30,942
	1.1	2.0	3.2	6.6	3.3	2.1	3.1	5.6	2.1	3.2	-3.8	-1.6	4.3	4.5	1.0
GDP	47,484	49,935	49,903	54,669	201,991	48,505	51,468	52,712	55,828	208,513	46,619	50,624	54,930	58,292	210,464
	-1.3	-0.4	0.8	4.1	0.9	2.1	3.1	5.2	2.1	3.2	-3.9	-1.6	4.2	4.4	0.9

BDP so podatoci za industrijsko proizvodstvo od regresijata
(CEA ocenka)

GROSS DOMESTIC PRODUCT - PRODUCTION APPROACH

	2002				2002	2003				2003	2004				2004
	I	II	III	IV		I	II	III	IV		I	II	III	IV	
Agriculture	4,650	4,748	4,706	4,675	18,779	4,698	4,825	4,886	4,783	19,192	4,740	4,922	4,984	4,873	19,519
	-5.6	-2.5	-1.6	1.8	-2.0	1.0	1.6	3.8	2.3	2.2	0.9	2.0	2.0	1.9	1.7
Industry	10,781	11,604	11,052	14,953	48,390	11,148	12,005	12,647	14,781	50,581	10,903	9,976	13,153	15,372	49,404
	-10.1	-3.5	-1.3	10.2	-0.8	3.4	3.5	14.4	-1.1	4.5	-2.2	-16.9	4.0	4.0	-2.3
Construction	1,870	2,899	2,951	2,644	10,364	1,890	2,914	3,051	3,011	10,866	1,967	3,147	3,280	3,044	11,439
	-7.0	0.7	5.3	1.4	0.6	1.1	0.5	3.4	13.8	4.8	4.1	8.0	7.5	1.1	5.3
Wholesale and retail trade	5,479	5,944	5,821	6,480	23,724	5,719	6,222	6,026	6,785	24,752	5,999	6,583	6,406	7,232	26,220
	5.9	4.7	4.2	6.7	5.4	4.3	4.7	3.5	4.7	4.3	4.9	5.8	6.3	6.6	5.9
Hotels and restaurants	782	897	1,073	974	3,726	844	905	1,127	996	3,872	855	982	1,206	1,056	4,099
	-1.0	16.1	32.2	18.8	16.7	7.9	0.9	5.0	2.2	3.9	1.3	8.5	7.0	6.0	5.9
Transport, and communication	4,008	3,887	4,200	4,372	16,467	4,054	4,144	4,508	4,678	17,384	4,159	4,368	4,729	4,837	18,093
	-3.4	-6.7	-0.5	3.5	-1.8	1.1	6.6	7.3	7.0	5.6	2.6	5.4	4.9	3.4	4.1
FIRE	6,777	6,666	6,626	6,689	26,758	6,697	6,627	6,633	6,680	26,637	6,844	6,793	6,799	6,907	27,343
	-2.8	-4.1	-4.1	-3.7	-3.7	-1.2	-0.6	0.1	-0.1	-0.5	2.2	2.5	2.5	3.4	2.7
Public administration and defense	7,160	7,142	7,214	7,327	28,843	7,357	7,359	7,254	7,378	29,348	7,519	7,514	7,406	7,533	29,972
	10.0	4.7	0.8	-0.8	3.5	2.8	3.0	0.6	0.7	1.8	2.2	2.1	2.1	2.1	2.1
Minus: Imputed banking services	1,115	1,148	1,164	1,149	4,576	1,125	1,073	1,077	1,093	4,368	1,117	1,100	1,109	1,133	4,459
	-2.5	1.7	6.2	2.2	1.8	0.9	-6.5	-7.5	-4.9	-4.6	-0.7	2.5	3.0	3.7	2.1
Residual	116	-40	93	-328	-159	97	-21	-87	-371	-382	558	0	0		558
Value added	40,508	42,599	42,572	46,637	172,316	41,379	43,907	44,968	47,628	177,882	42,428	43,184	46,853	49,722	182,187
	-1.8	-0.9	0.3	3.6	0.4	2.1	3.1	5.6	2.1	3.2	-3.8	-1.6	4.3	4.5	2.4
Indirect taxes	6,976	7,336	7,331	8,032	29,675	7,126	7,561	7,744	8,201	30,632	6,855	7,440	8,077	8,570	30,942
	1.1	2.0	3.2	6.6	3.3	2.1	3.1	5.6	2.1	3.2	-3.8	-1.6	4.3	4.5	1.0
GDP	47,484	49,935	49,903	54,669	201,991	48,505	51,468	52,712	55,828	208,513	49,283	50,624	54,930	58,292	213,129
	-1.3	-0.4	0.8	4.1	0.9	2.1	3.1	5.2	2.1	3.2	1.6	-1.6	4.2	4.4	2.2