1. General

The Central Bureau of Statistics collects monthly data from a sample of approximately 2,200 manufacturing establishments. These data are used to prepare the current manufacturing indices, which are an indicator of the development in manufacturing and in the economy in general.

The current publication presents manufacturing indices for 2007, which were calculated based on data collected according to the sample which was replaced in 2004, and on the base of 2004=100

Manufacturing indices, which are calculated each month, include the following indices:

(1) Manufacturing production indices;

(2) Employment indices (jobs, employee jobs, work hours);

(3) Revenue indices (for the domestic market and for export);

(4) Labour cost indices (wages, supplementary expenditures);

(5) Derived indices (cost and wages per paid work hour, wages per employee job, revenue per job, etc.).

Because the methods of computing manufacturing indices differ from those used to compute all other indices, they are listed in separate sections.

The collected data also provide a basis for summarizing absolute data on the number of employee jobs in manufacturing, as well as data on labour cost and revenue according to industry, sector, and size of the establishment (Tables 1-9).

In addition, Tables 10-11 present data on export intensive establishments – manufacturing establishments whose exports constitute over 50% of the value of their sales, and establishments whose export amount to over NIS 10 million and comprise over 25% of their sales.

Table 12 presents indices of the manufacturing revenue at constant prices, and thus enables the calculation of the real change in manufacturing revenue.

Table 13 presents indices of manufacturing production, number of employee jobs, and indices of actual work hours, according to aggregated groups.

Table 14 presents data on the mobility of workers in manufacturing, which reflect changes in workers absorbed and workers discharged in manufacturing in 2007, compared to 2006.

Tables 15-19 present data on revenue and employment, by technological intensity.

Publication of Indices

As noted, all the indices as of January 2004 are published according to the base: 2004=100. To calculate seasonally adjusted and trend data, and for the convenience of users, the series of manufacturing indices for previous years (as of 1990) were also calculated according to the base 2004=100. The calculation was made by dividing indices prior to 2004 by the mean of the indices for 2004, according to the base 1994=100. The indices (from the *Monthly Bulletin of Statistics*) are posted monthly on the CBS website (www.cbs.gov.il) by industries in the "Manufacturing" chapter. Additionally, a press release on manufacturing indices is posted monthly on the CBS website.

Approximately one month and 20 days after the surveyed month, a preliminary estimate is calculated and published, based on data from approximately 65% of all sample establishments and including most of the large establishments. A second estimate, based on data from approximately 80% of the sample establishments, is published two months and 20 days after the surveyed month. After an additional month, when additional data are obtained, adjusted indices are published. One month after that (i.e., four months and 20 days after the surveyed month) a final index is published, based on data from approximately 95% of all sample establishments.

2. Main Findings

2.1 Production and Revenue

In 2007, the level of manufacturing production in manufacturing establishments with at least one employee job (excluding the diamond industry) was 4.5% higher (at constant prices) than in 2006, following increments of 9.8% in 2006, 3.7% in 2005, and 7.0% in 2004, and continuous declines of 0.4% in 2003, 1.9% in 2002, and 4.9% in 2001.

Manufacturing revenue amounted to NIS 332 billion in 2007, compared with NIS 313 billion in 2006 (a nominal rise of 6%). Sales to the domestic market constituted 59% of manufacturing revenue, and 41% of the export sales.

Revenue at constant prices increased by 4.3% in 2007, compared with 2006.

The industrial production index, whose purpose is to reflect the changes in the value added of the industry, is calculated by weighting the indicators indices that undergo changes that are similar to those of the value added, such as product output, number of work hours invested in production and revenue in fixed prices.

The revenue index at constant prices is computed as follows: The revenue index at current prices is divided by a combined index made up of the index of wholesale prices of manufacturing output for the domestic market and export price indices.

In 2007, the level of exports as a percentage of revenue was high – 71% and 61%, for foreign-controlled and government corporations, respectively (see definitions below).

Establishments whose revenue reached NIS 100 million and over in 2007 constituted 4.2% of all manufacturing establishments, and employed 51% of all workers in manufacturing. The sales of these establishments was 76% of total revenue in manufacturing. In the Electronic Communications Equipment division, the sales of 25% of all establishments amounted to NIS

100 million and over (88% of the total revenue in this division), and 82% of all jobs in the division were in those establishments.

2.2 Inventory

At the end of 2007, the value of manufacturing inventory was 9.7% lower than the inventory recorded at the end of 2006. The data were calculated in constant prices of December 2000. The decrease is due to a decline in the inventory of the electric, electronic and transport industries, as well as in the chemicals, rubber and plastics industries, and in the building inputs industries.

The share of the product inventory in 2005[1] reached 50% of total inventory in manufacturing, corresponding to 11% of the total revenue.

The average material inventory in 2005 was 15.5% of the purchase of materials in manufacturing. Differences were found between divisions, in accordance with production processes. Thus, for example, in the beverage division, the material inventory amounted to 31% of the purchases of materials, whereas in the meat and poultry processing industries, the material inventory amounted to 4% of the purchases of materials.

In most industries, the material inventory corresponded to an average of 1.5 months of consumption. The food industry keeps a one-month material inventory, and the metal industries keep a material inventory for nearly two months.

Table A.- Manufacturing Inventory Indices at the End of 2007 (at Constant Prices)
Base 100 = Last Quarter of 2000

Industry (division)	Total	Materials	Total products	Products in process	Finished products
Total	**92.5**	**100.2**	**84.4**	**83.5**	**85.0**
Food, Beverages and Tobacco Industries	112.5	129.2	93.5	73.4	99.3
Textiles, Clothing and Leather Industries	92.4	117.3	70.9	69.9	71.3
Building Inputs Industries	74.9	83.7	59.9	62.4	58.7
Chemicals, Rubber and Plastics Industries	97.8	110.3	88.1	96.9	85.7
Metal and Machinery Industries	97.7	137.1	65.1	51.1	80.2
Electric, Electronic and Transport Industries	87.3	79.4	95.1	97.8	91.3
Paper, Furniture, Printing, Jewellery and Miscellaneous Industries	79.4	80.9	77.4	64.7	80.0

[1] See: Central Bureau of Statistics, *Manufacturing Survey 2005*. Publication 1353, Jerusalem, 2009.

Table B.- Manufacturing Inventory Indices at the End of 2006 (at Constant Prices)

Base 100 = Last Quarter of 2000

Industry (division)	Total	Materials	Total products	Products in process	Finished products
Total	**102.2**	**108.3**	**96.3**	**91.6**	**99.5**
Food, Beverages and Tobacco Industries	96.7	105.5	86.7	61.8	94.0
Textiles, Clothing and Leather Industries	99.3	130.0	72.7	65.3	75.7
Building Inputs Industries	82.7	89.7	70.5	63.6	73.9
Chemicals, Rubber and Plastics Industries	114.4	142.7	92.4	123.2	84.1
Metal and Machinery Industries	91.3	127.5	61.5	54.8	68.7
Electric, Electronic and Transport Industries	109.6	92.6	126.3	107.0	152.5
Paper, Furniture, Printing, Jewellery and Miscellaneous Industries	78.6	79.3	77.5	73.1	78.4

2.3 Employment and Wages

The number of jobs in manufacturing in 2007 was estimated at an average of 356,000 per month (see the definition of jobs in “Definitions and Explanations” Para. 5.1), compared to 343,000 jobs in 2006 (an increase of 4%). 19,300 workers in manufacturing (5.4%) in 2007 were hired through employment agencies. Regarding the number of actual work hours, there was an increase of 4.2%, so that the product per work hour increased by 0.3% in 2007 compared with 2006.

68.1% of the jobs in manufacturing in 2007 were in private corporations, 9.0% were in cooperatives, 6.8% were in government corporations, 12.9% were in foreign controlled corporations, and 3.3% were in households.

The cost per work hour in manufacturing was NIS 67, compared with NIS 64 in 2006. The highest cost was recorded in establishments with 300 jobs and above – NIS 90 per paid work hour per employee job; and the lowest cost – NIS 30 – was recorded in establishments with 1-4 jobs.

The share of supplementary expenses for wages in 2007 was 18.5%. The highest average annual wages per employee job were recorded in the following divisions: electronic communication equipment (NIS 240,000), industrial equipment for control and supervision, medical and scientific equipment (NIS 222,000), mining and quarrying (NIS 195,000), and transport equipment (NIS 176 thousand), whereas the overall average in manufacturing was NIS 129,000. The lowest average annual wage was recorded in the wearing apparel, leather and leather products, and jewellery and gift items, goldsmiths’ and silversmiths’ articles (NIS 58,000-75,000 per year).

As in previous years, in 2007 government corporations paid the highest annual wages per employee job – NIS 233,000, compared to NIS 102,000 in cooperatives, and NIS 116,000 in

private corporations. This was also a result of differences in the distribution and centralization in the establishments of the different sectors.

Following the process of privatization, the gap in the average jobs per establishment in government corporations versus private corporations increased in 2007 compared with 2006 (an average of 3,008 jobs, versus 33 jobs per establishment in government versus private corporations, respectively). In 2007, there were an average of 131 jobs per establishment in cooperatives.

2.4 Export-Intensive Establishments[1]

96% of the manufacturing export was carried out by 832 export-intensive establishments. These establishments constituted 7.2% of all manufacturing establishments in 2007; they employed 41% of the workers in manufacturing, and their revenue was 55% of the total revenue of manufacturing.

The cost per paid work-hour in export-intensive establishments was 36% higher than the average in manufacturing, and amounted to a total of NIS 91. The revenue per job in these establishments was 34% higher than the corresponding revenue in all manufacturing establishments.

The average number of jobs per establishment in the export intensive establishments was 175, compared to an average of 31 jobs per establishment in all manufacturing establishments. Of the export-intensive establishments, 70% were foreign-controlled corporations, 12% were cooperatives, and 10% were government corporations.

2.5 Mobility of Workers

The increase in employment in 2007 was a result of expanded employment in some establishments, and the opening of new establishments. However, the decrease in the number of workers in 2007 was due to the reduction of employment in existing establishments and the closing of other establishments.

An analysis of worker mobility by establishments reveals that in existing establishments where the number of jobs increased, 19,000 jobs were added in Manufacturing (5% of all jobs in Manufacturing) in 2007. By contrast, in existing establishments where employment declined, 18,000 jobs were eliminated. Moreover, new establishments added 19,000 jobs to manufacturing, whereas establishments that closed during the year eliminated approximately 12,000 jobs.

An analysis of worker mobility by size groups (number of jobs per establishment) revealed that the increase in employment was greater in establishments with 50-99 jobs (8.8%, compared to 2.9% in all establishments). In establishments with 20-49 jobs, employment declined by 3.7%.

Table 14 presents data on the rate of mobility in employment, which is the ratio of absorbed and discharged workers to the total number of workers. The highest mobility rate – 34% – was recorded in small establishments in which there were up to 19 jobs.

Data on mobility of workers exclude workers hired through employment agencies.

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[1] Export-intensive establishments are establishments whose exports constitute over 50% of the value of their sales, and those whose exports amount to over NIS 10 million and comprise over 25% of their sales.

2.6 Technological Intensity

In accordance with the classification recommended by the OECD, the manufacturing industries were divided into four groups, by technological intensity:

a. **High technology** includes the following industries: Electronic Communications Equipment; Office Machinery; Pharmaceuticals; Industrial Equipment for Control and Supervision; Electronic Components; and Aircraft.

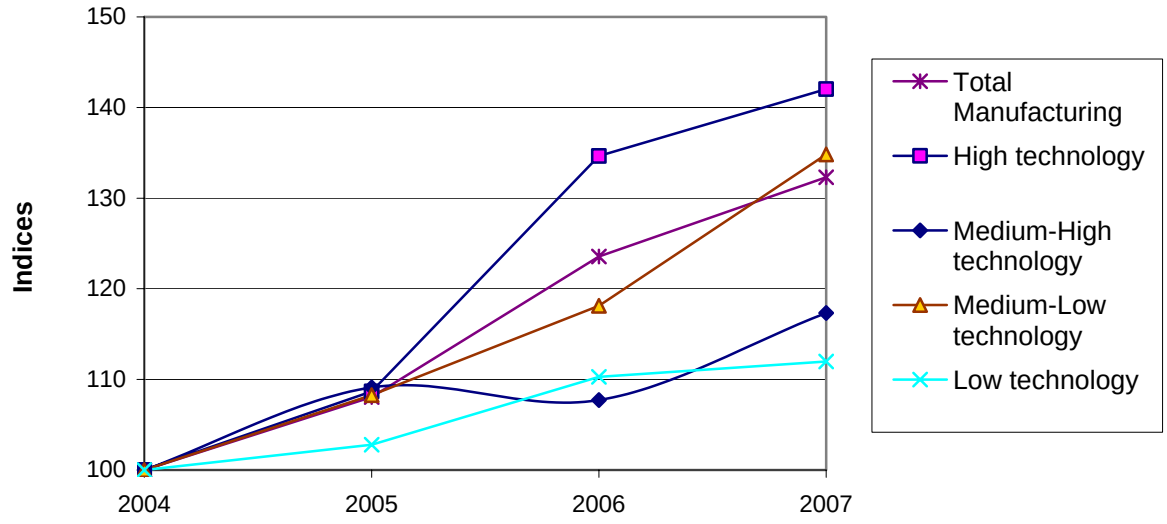
b. **Medium-high technology** includes the following industries: Chemicals and Chemical Products and Refined Petroleum (excluding pharmaceuticals); Machinery and Equipment; Electric Motors and Electric Distribution Apparatus; Motor Vehicles and Transport Equipment.

c. **Medium-low technology** includes the following industries: Mining of Minerals and Quarrying of Stone and Sand; Rubber and Plastics; Non-Metallic Mineral Products; Non-Ferrous and Precious Metals; Metal Products; Ships and Boats; Jewellery and Goldsmiths' and Silversmiths' Articles; and Manufacturing n.e.c.

d. **Low technology** includes the following industries: Textiles; Wearing Apparel (excl. knitting); Footwear, Leather and Leather Products; Food Products; Beverages and Tobacco Products; Paper and Printing; Wood and its Products; and Furniture.

High-technology industries are characterized by their substantial contribution to manufacturing exports. In 2007, half of the manufacturing exports derived from high-technology establishments. All four of the technological intensity groups recorded an increase in imports between 2003 and 2007. However, the most substantial increase was found in the high-technology industries, which had the highest rates of manufacturing exports in the economy.

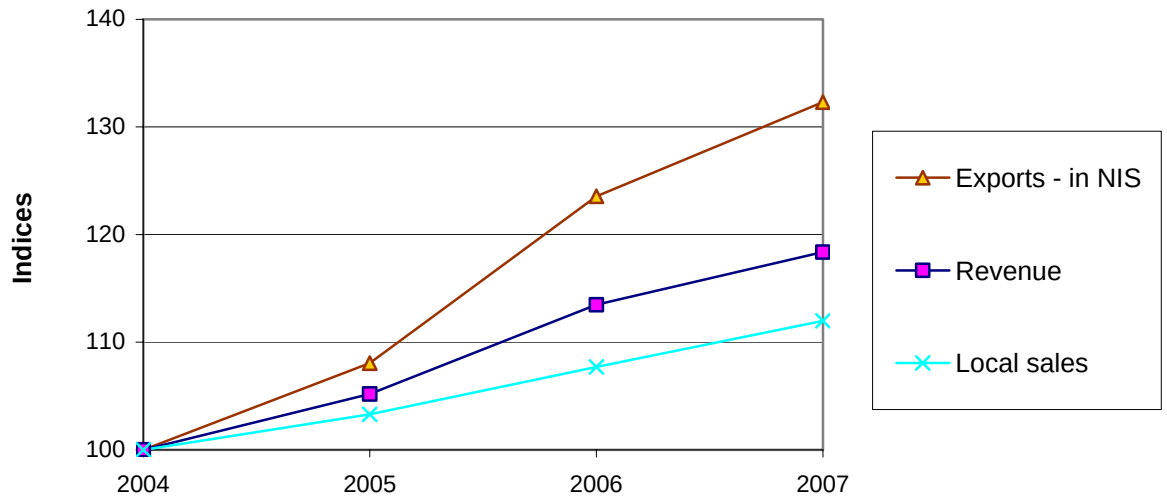
DIAGRAM 1.- EXPORTS OF MANUFACTURING ESTABLISHMENTS, BY TECHNOLOGICAL INTENSITY (IN CONSTANT PRICES) BASE 2004=100



In 2007, the amount of high-technology exports was twice as high as medium-high technology exports, three times as high as medium-low technology exports, and almost six times as high as low-technology exports.

The **domestic** revenue in 2007 amounted to NIS 195 billion – and 38% of it derived from low-technology industries. The growth rate of domestic revenue between 2003 and 2007 was lower than the growth rate of exports.

DIAGRAM 2.- INDICES FOR OVERALL MANUFACTURING: REVENUE, EXPORTS, AND LOCAL SALES (IN CONSTANT PRICES) BASE 2004=100



The **index of manufacturing production** increased by 4.5% in 2007, similar to the change in high technology industries. Medium-high and medium-low technology industries increased at a higher rate, as shown in Table C.

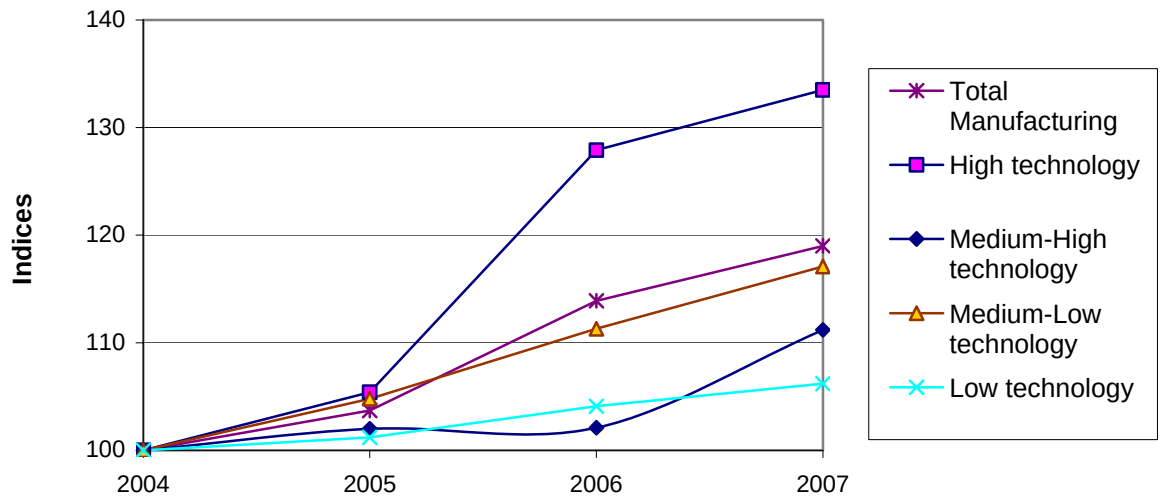
Based on the annual average, the highest level of growth in manufacturing production between 2004 and 2007 was found in high-technology industries, whereas the lowest level of growth was found in low-technology industries. During that period, high-technology industries contributed 60% to the growth in the manufacturing production index.

Table C.- Annual Change in the Production Index, by Technological Intensity

Percentages

	1995-2000	2001-2003	2004	2005	2006	2007	2004-2007
Total manufacturing	4.2	-1.1	6.8	3.7	9.8	4.5	6.0
High technology	11.9	-1.3	15.1	5.4	21.3	4.4	10.1
Medium-high technology	2.2	-0.1	0.3	2.0	0.1	8.9	3.6
Medium-low technology	1.1	0.5	3.4	4.8	6.3	5.2	5.4
Low technology	0.0	-2.7	1.1	0.6	1.4	1.0	2.0

DIAGRAM 3.- MANUFACTURING PRODUCTION INDICES, BY TECHNOLOGICAL INTENSITY
BASE 2004=100



In 2007, one-fourth of the **jobs** in manufacturing were recorded in high-technology industries; and 35% of the jobs in manufacturing were recorded in low-technology industries, which are labour-intensive. A decline in the number of jobs in manufacturing establishments between 2001 and 2003 was followed by an increase in the number of jobs as of 2004 – mainly in high technology industries.

DIAGRAM 4.- JOBS IN MANUFACTURING, BY TECHNOLOGICAL INTENSITY
BASE 2004=100

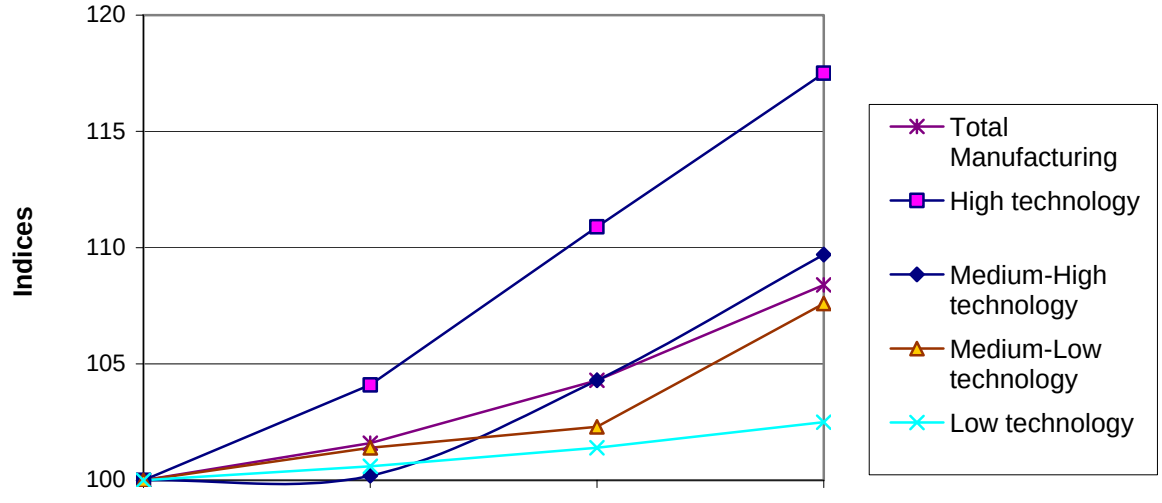


Table D.- Percentage of Change in Manufacturing Production, Number of Employee Jobs and Wages per Employee Job, by Technological Intensity – 1995-2007 (Each Year Compared to the Previous Year)[1]

	Manufacturing – total			High Technology			Medium-High Technology			Medium-Low Technology			Low Technology		
	Production	Employee jobs	Wages per employee job[2]	Production	Employee jobs	Wages per employee job[2]	Production	Employee jobs	Wages per employee job[2]	Production	Employee jobs	Wages per employee job[2]	Production	Employee jobs	Wages per employee job[2]
1996	5.4	1.6	2.6	12.0	3.4	5.6	2.4	0.9	1.1	6.8	4.9	0.0	0.0	-1.1	2.8
1997	1.7	-1.1	4.5	7.3	4.5	2.7	-2.2	-2.3	2.8	-0.2	-0.4	4.5	0.0	-3.5	4.3
1998	2.9	-0.9	3.5	8.9	4.6	4.3	5.8	-1.0	1.1	-1.9	-2.1	2.1	-0.3	-2.7	-0.4
1999	1.4	-1.5	4.3	6.5	2.2	5.4	-0.8	-1.6	0.5	-2.2	-3.9	1.1	0.3	-1.7	2.1
2000	9.9	1.4	7.0	25.6	7.4	9.8	5.9	0.8	5.8	3.2	0.0	4.2	-0.1	-0.9	5.2
2001	-4.9	-2.9	4.2	-7.4	0.1	2.7	-4.9	-2.8	3.0	-2.3	-2.7	2.9	-4.0	-4.9	2.8
2002	-1.9	-4.0	-4.1	-4.6	-5.6	-4.9	1.4	-3.4	-7.5	1.0	-2.3	-4.6	-2.2	-4.5	-1.8
2003	-0.3	-2.5	1.8	2.1	-1.8	-1.2	-1.7	-4.2	3.8	-0.1	-1.1	1.3	-3.3	-3.3	5.4
2004	6.8	1.1	2.8	15.1	4.5	1.5	0.3	-2.1	2.1	3.4	0.0	3.0	2.2	0.7	2.9
2005	3.7	1.6	2.8	5.4	4.1	2.6	2.0	0.2	4.1	4.8	1.8	0.4	1.2	0.5	2.4
2006	9.8	3.2	2.5	21.3	6.5	1.7	0.1	4.4	0.6	6.2	1.8	3.9	2.9	1.2	1.4
2007	4.5	3.9	3.5	4.4	6.1	2.9	8.9	5.4	5.1	5.2	5.5	2.4	2.0	1.1	2.4
2007 compared to 1995															
	45.5	-0.2	41.3	142.7	41.5	37.7	17.8	-6.0	24.3	25.9	1.0	22.8	-1.5	-17.7	33.5

[1] The changes were calculated out of the chained series based on 2004.
[2] Wages per employee job, at constant prices.

3. Methodology for Selecting the Manufacturing Indices Sample

3.1 Survey Population

The survey population includes all businesses that meet two criteria:

Industrial criterion – Establishments belonging to manufacturing industries, as defined in the *Standard Industrial Classification of All Economic Activities 1993*[1]*,* excluding the diamond industry. In the diamond industry, manufacturing activities are combined with commercial activities, and there is no way to obtain reliable data on the aspect of the industry that involves manufacturing (i.e., polishing diamonds).

Economic activity criterion – Establishments with at least one employee job in the business sector, and kibbutz establishments that produce commodities for sale on the market. This population excludes establishments of self-employed proprietors with no employee jobs, non-profit establishments, and auxiliary manufacturing units of kibbutzim that only serve the kibbutz and do not sell their products on the open market (e.g., sewing and metal workshops).

3.2 The Sampling Frame

To derive the sample, it was necessary to obtain a list of all of the establishments belonging to the manufacturing indices survey population (as defined above – henceforth, "the frame").

The frame was constructed on the basis of the business registry in the CBS. The registry is based mainly on combined information from two files:

(a) The VAT file of dealers;

(b) The National Insurance Institute's employers file.

Kibbutz establishments that operated on a profit-making basis but did not hire employees were treated specially.

Businesses in the registry were classified according to the *Standard Industrial Classification of All Economic Activities 1993*[1]*.*

From the business registry, the establishments that met the criteria described in the "Population" section above were chosen for the manufacturing indices frame. Israeli-owned units that operate outside of the country were not included in the frame. For every establishment in the frame, the revenue and number of jobs were determined in order to establish the sampling size. In cases of establishments that submit reports to VAT as partnership, and for whom consolidated VAT reports are maintained, the revenue of each establishment in the partnership was calculated relative to its size in the partnership.

[1] See: Central Bureau of Statistics, *Standard Industrial Classification of All Economic Activities 1993, Second Edition,* Technical Publication no. 63, Jerusalem 2003.

3.3 The Sample

3.3.1 Sampling Method

In the current sample which was extracted in 2004, the following changes were introduced in the sampling method.

(a) It was decided that size groups for each sampling unit would be determined by the revenue and not by the number of jobs, as was the case in previous samples. This change was introduced because it was found that revenue is a more efficient estimate of number of jobs than number of jobs is of revenue, and because revenue data are the main indicator for measuring manufacturing production. It should be emphasized that when units are divided into size strata, the number of jobs is also taken into account.

(b) The sampling method used in previous years was changed from a sample based on probability proportional to size to a sample based on size strata. This change in the sampling method was introduced in order to deal more effectively with the dynamic trends in business over time. According to the previous method, the size of a unit was determined on the basis of the number of jobs, and sampling was proportional to this size in the industry, which is aggregated by size groups. The larger the unit, the greater the sampling probability, to the point of certain sampling. However, in the present sampling method, the size of a unit is determined on the basis of total annual revenue. Every unit in an industry is categorized into a size stratum on the basis of its size, determined by the total annual revenue. In every stratum a simple random sample is drawn with uniform probability.

3.3.2 Base Sample

When the base sample was being planned, the sampling frame included all of the businesses that were active in 2003 in industries that fit the definition of the survey. The division of units in an industry into size strata was carried out by an algorithm that determines the boundaries of the size strata, and allocates a sample size to each stratum. This is done while maintaining the relative sampling error values of the division variable. In the Manufacturing Indices Survey, the division variable is the total annual revenue of the sampling unit. In each size stratum, businesses are sampled with equal probability, according to the allocation of the sample and the number of businesses in the stratum. The top sampling stratum in each industry was the “take-all” stratum of businesses, and the units belonging to those strata were “take-all” units with a sampling probability of “1”. Other size strata are referred to as “take-some” strata.

The sampling probability of business $\boldsymbol{i}$ in size stratum $\boldsymbol{h}$ is:

$$\pi_{hi} = \frac{n_h}{N_h}, \qquad h = 1,\ldots,L-1$$

where N_h and n_h are the number of businesses in size stratum *h* in the frame and in the sample, respectively, and L is the number of size strata. In stratum L, the stratum of “take-all” establishments, $\pi_{Li}=1$ for every i.

For every sampling unit in the frame, a Permanent Random Number (PRN) was assigned, for use throughout its activity period. This number was intended to maintain the long-term continuity of the sample, as far as possible.

3.3.3 Sample of Newborn Business Units and the Process of Renewal

To keep the sample updated and prevent under-coverage of new businesses, a supplementary sample of new businesses is drawn every two months. For that purpose, a frame of newborn business units, which is referred to as an “update”, is compiled every two months. The units in this frame are categorized into strata by industry according to the distribution boundaries established in the base sample, and a simple random sample without replacement is drawn.

The sampling procedure for business updates is “cumulative sampling”, where the number of units in the sample of newborn businesses depends, inter alia, on the sample size accumulated up to the previous update, as well as on the cumulative sample needed for the present update. In this method, the variation in the sample size of the stratum over and above the previous additions to the sample is minimal.

The sample is updated by removing establishments that have closed and adding new establishments that have opened. In addition, the sample is renewed once a year in order to improve the quality of the survey estimates. This process of renewing the sample aims to account for the changes that take place in the establishment, both in terms of the average number of employee jobs and in terms of the annual revenue compared with the original date on which they were sampled.

The frame of establishments is re-examined every year in order to obtain an appropriate representation of establishments for the sample. In that process, the size of an establishment at the original time of sampling is compared to its size at the time that the sample is renewed. Establishments that have grown substantially are sampled again with a higher probability. As a result of that process, the sample of establishments is increased.

3.3.4 The Inflation Factor

The inflation factor of a sampling unit is the inverse of the probability that the unit will be included in the sample, and expresses the number of establishments that it represents in the sample (the inflation factor of a “take-all” establishment is 1).

The inflation factor for size stratum h in an industry is:

$$W_h = \frac{N_h}{n_h} \qquad h = 1, \ldots, L$$

Manufacturing estimates are derived by multiplying data for all of the establishments by the weight of each establishment, and then summing them up at the level of groups, industries, and total manufacturing.

4. Methods of Calculating Bases and Indices

4.1 The Base

It was determined that the base for calculating manufacturing indices in the new sample would be 2004=100 (mean). The total data for establishments in the new sample over the 12 months of 2004, inflated by the inflation factor, constitute the base for calculating the indices.

During the course of the year, revisions are made in the base, due to the need to update historical data in a way that the indices will not be influenced by the revisions. As a result, the data for the previous year are revised according to the ratio of indices multiplied by absolute data for the current year. Because the revisions for the previous year have been introduced at the level of divisions, there may be a lack of correspondence between the sums for total manufacturing obtained according to the various types of categories (e.g., technological intensity).

4.2 Indices of Revenue, Employment and Labour Cost

The indices of revenue, employment, and labour cost at the level of groups, industries, and overall manufacturing are calculated as the ratio of the data on establishments after inflation in the current period, to base data. The derived indices are calculated as the ratio of the indices. Thus, the index of paid work hour labour cost is calculated as the index of the total labour cost divided by the paid-work-hour index.
Additionally, revenue and labour cost indices are also calculated in constant prices. Measures relating to labour cost indices are divided by the Consumer Price Index, whereas the index of revenue in constant prices is calculated by dividing the index of revenue in current prices by the combined index of wholesale manufacturing product prices and export prices.

4.3 Indicators, Weights, and Method of Calculating the Manufacturing Production Index

Manufacturing Production Index

The aim of the manufacturing production index is to reflect monthly changes in the volume of production, which is the added value of manufacturing in each manufacturing industry.

In practical terms, there is no way to obtain monthly reports on changes in the added value for computation of the index. Therefore, other indicators and variables are used, for which the changes are similar to those of the added value. For example: production of commodities, work-hours invested in production, and revenue at constant prices, or a combination of indicators. Indices are calculated for the indicators (the changes in the indicators versus the base period) within the group. The indices of the indicators for each group are weighted by the weights of the indicators, to obtain a production index for the group. Indices for the industry and for total manufacturing are weighted according to the added value of the groups in the industry and overall manufacturing.

Indicators

In the new system, the indicators and their weights for calculating the manufacturing production index every month were updated. The number of groups and their weights by type of indicator are presented in table E below.

Table E.- Indicators and Number of Groups Measured, by Type of Indicator

Type of indicator	New Sample		Old Sample	
	No. of groups	Weights of manufacturing production index	No. of groups	Weights of manufacturing production index
Total	**121**	**100.00**	**121**	**100.00**
Commodities[1]	10	6.26	15	9.95
Commodities[1] + revenue[2]	17	15.14	19	13.33
Revenue[2] + work hours	48	40.62	48	45.90
Revenue[2]	43	32.10	36	28.90
Commodities[1] + work hours + revenue[2]	3	5.88	3	1.92

[1] Amounts of production.
[2] Revenue in constant prices.

Manufacturing Production Weights

When the indices were changed to the new base 2004=100, the weights used to calculate manufacturing indices were updated (the previous sample of the production index was calculated according to the 1994 weights).

The weight of each group is the total added value in 2004, which was calculated as the difference between the estimated outputs and estimated inputs during that year. The base for calculating these estimates was the summaries of inputs and outputs for manufacturing industries in 2002 at 1995 prices, which include imputation for establishments with 1-4 jobs. Two types of adjustments were made to these data:

(a) Inputs and outputs for 2004 were adjusted in 1995 prices, according to the manufacturing production index and on the assumption that the input-output ratios remained stable.

(b) The estimates of inputs and outputs for 2004 were adjusted in current prices, according to input-output price indices for 2004 in 1995 prices. More specifically: indices of production prices in every group were calculated as a weighted index of domestic sales (wholesale price index of manufacturing output) and the index of export prices. The price indices of inputs were calculated as a weighted index of inputs from imports and inputs from domestic production (according to the weight of inputs in the input-output table, 1995). Afterwards, the added value for 2004 was calculated as the difference between output and input. This added value will be referred to henceforth as “extrapolated added value for 2004”.

The summary of data for employee jobs in the new sample reveals that the figures for total manufacturing in the previous sample were about 2.9% higher than those in the new sample. At the level of groups, the differentials were even greater.

Therefore, the weights obtained according to the above list were adjusted according to the proportion of change in the number of employee jobs in each group in the new sample versus the previous sample, and the same proportion in total manufacturing.

Table E presents the new weights for the calculation of the manufacturing production index, by industry, for 2004.

Table F.- Added Value Weights for Manufacturing Industries for 2002 and 2004, in Percentages and Manufacturing Production Index Weights in 2004, by Industry (Division)

Code	Industry (division)	Added Value Weights 2004		Manufacturing Production Index Weights, 2004
		2002 Survey data	Extrapo-lation data for 2004	
	Manufacturing – Total	**100.0**	**100.0**	**100.00**
13	Mining of minerals, and quarrying of stone & sand	2.7	2.8	2.64
14-15	Food products	10.1	11.8	11.94
16	Beverages and tobacco products	1.9	1.7	1.70
17	Textiles	3.2	3.0	2.77
18	Wearing apparel (excl. knitted)	1.2	0.9	0.81
19	Footwear, leather and leather products	0.3	0.3	0.21
20	Wood and wood products (excl. furniture)	0.7	0.6	0.55
21	Paper and paper products	2.1	2.2	2.28
22	Publishing and printing	4.8	4.8	4.86
23-24	Chemicals, chemical products and refined petroleum	12.7	15.5	15.43
25	Plastic and rubber products	5.1	5.3	5.65
26	Non-metallic mineral products	2.9	2.8	2.78
27	Basic metal	1.4	1.6	1.64
28	Metal products	10.6	11.5	10.05
29	Machinery and equipment	3.4	2.1	2.49
31	Electric motors and electric distribution apparatus	1.8	1.8	2.00
32	Electronic components	5.8	5.2	5.15
33	Electronic communication equipment	5.9	4.6	4.64
34	Industrial equipment for control and supervision, medical and scientific equipment	13.6	12.4	12.67
35	Transport equipment	5.7	5.6	5.86
36	Furniture	2.6	2.3	2.30
38	Jewellery, goldsmiths' and silversmiths' articles	0.6	0.4	0.45
39	Manufacturing n.e.c.	0.9	0.9	1.14

Formula for Calculating the Production Index for Groups

To calculate the production index for group Ik-k

$$Ik = \sum Wkj \text{ X Ikj}$$

Where k = group;

j = indicator number;

Ikj = index of indicator j in group k;

Wkj = weight of indicator j in group k;

Where:

$$\sum_j Wkj = 1$$

Formulas for Calculation of the Production Index for an Industry and for Total Manufacturing

The industry index, which is the sum of the groups – mainly industries in manufacturing – is the weighting of indices for groups by the weights of the industries, which add up to 1. More specifically:

(1) Calculation of the production index for industry Ir=R

$$Ir = \sum_k Wrk \text{ X } Ik$$

where Wrk - the group weight in an industry

$$\sum_k Wrk = 1$$

(2) Calculation of the production index for total manufacturing I_T-T

where Wk is the weight of the group and $\sum Wk = 1$

$$I_T = \sum Wk \text{ x Ik} = \sum Wr \text{ x Ir}$$

where Wr is the weight of an industry in total manufacturing

$$\sum Wr = 1$$

5. Definitions and Explanations

5.1 Definitions

Jobs (formerly: employed persons): Employee jobs, owners and unpaid family members, kibbutz members, workers employed through employment agencies (in monthly estimates, jobs are calculated excluding workers employed through employment agencies).

Employee jobs (formerly: employees): All workers on the employee payroll, including members of co-operative societies, as well as workers from Judea, Samaria and the Gaza Area. Unsalaried kibbutz members employed in a kibbutz establishment are considered to be owners. Self-employed persons engaging in piecework for the establishment are not included.

For an explanation on employed persons, employees/jobs, and employee jobs, see: The Central Bureau of Statistics, *Statistical Abstract of Israel 2008*, no. 59, in the Introduction to Chap. 12 "Labour and Wages", p. (500).

Actual work hours: include the overtime hours and do not include paid absence hours (such as sickness days, vacations, etc.), or working hours of proprietors and their family members.

Wages (formerly: wages and salaries): All payments on which income tax is due (before deduction of taxes) appearing in employee payrolls, including: basic salary, and the following increments: cost of living, professional, seniority, and family allowances (excluding employees' children allowance) and travel allowance, premiums, incentive pays and overtime payment, absence (e.g., vacation, sickness, religious holidays), convalescence, professional literature and "13th-month" salary, as well as car allowance (including imputation for a vehicle owned by the employer and used by the employee), telephone, clothing, per diem expenses (on which only income tax is due), and payments in kind (e.g., meals, holiday gifts, and housing), as well as one time payment, shift work, on-call pay, bonuses, proficiency allowance and retirement grants.

Labour cost: Includes, in addition to wages, supplementary expenses for wages and other cost components such as the employer's portion in payments to national insurance, training funds, pension funds, severance pay by the establishment, transport of workers, upkeep of cafeteria, worker training expenses, etc. These data, after "smoothing" the non-recurrent payments (see paragraph 5.2), serve for calculating the index of all payments related to engaging workers – the labour cost index. (See detailed definition in the paragraph "Definitions of Wages, Compensation and Labour Cost" in Chapter 14 – National Accounts – *Statistical Abstract of Israel* 2008, No. 59).

Paid hourly labour cost index – calculated as the ratio of the total labour cost index to the paid-work-hours index for all employees, standardized according to number of work days per month.

Wages per paid-work-hour per employee job index – is obtained by dividing the wages index of employees (except non-recurrent payments and back pay for previous periods) by the paid-work-hours index (these are actual paid work hours and paid hours of absence), standardized according to number of work days per month.

Revenue (sales value) at current prices, includes: the value of sales to the local market, sales for export, income from work (including repairs), and income from products

manufactured by the establishment for its own use; taxes, such as purchase tax, excise duty, and value added tax. Subsidies and export incentives are not included.

Manufacturing industries by technological intensity[1]:

High technology includes the following industries: Electronic Communications Equipment; Office Machinery; Pharmaceuticals; Industrial Equipment for Control and Supervision; Electronic Components; and Aircraft. **Medium-high technology** includes the following industries: Chemicals and Chemical Products and Refined Petroleum (excluding pharmaceuticals); Machinery and Equipment; Electric Motors and Electric Distribution Apparatus; Motor Vehicles and Transport Equipment. **Medium-low technology** includes the following industries: Mining of Minerals and Quarrying of Stone and Sand; Rubber and Plastics; Non-Metallic Mineral Products; Non-Ferrous and Precious Metals; Metal Products; Ships and Boats; Jewellery and Goldsmiths' and Silversmiths' Articles; and Manufacturing n.e.c. **Low technology** includes the following industries: Textiles; Wearing Apparel (excl. knitting); Footwear, Leather and Leather Products; Food Products; Beverages and Tobacco Products; Paper and Printing; Wood and its Products; and Furniture.

Sectors: According to the recommendations of the System of National Accounts 1993, Manufacturing establishments are divided into the following sub-sectors:

- Cooperatives (belonging to the non-financial business corporations sector)
- Private corporations (belonging to the non-financial business corporations sector)
- Foreign-controlled corporations (belonging to the non-financial business corporations sector), including corporations with at least 50% of their stock under foreign ownership and the rest of their stock under Israeli ownership;
- Government corporations include establishments with at least 50% of their stock under government ownership and the rest under private ownership.
- Households include businesses that are owned by households and not incorporated as corporations.

The division of manufacturing into sectors makes it possible to include institutions with similar economic behaviour and goals in the same category. An institution is an economic unit that can have assets, take on obligations, engage in economic activity, and conduct transactions with other economic units. In order to aggregate the institutional units into sectors, it is necessary to classify each unit separately. The classification of each institutional unit into sectors is determined according to control of shares in the company. These accounts presented by sector provide information on the distribution of revenue in Manufacturing, the distribution of employment, etc.

5.2 Explanations of the Data Used for the Estimates

Collection – The data used to prepare the indices are gathered from manufacturing establishments. The data on establishments with up to 10 employee jobs are received from administrative sources: data on the number of jobs and the wages are received from the National Insurance Institute, and the revenue data – from the Value Added Tax system.

Imputation – Data that were not received while calculating the indices were imputed according to the changes in the recorded data.

[1] See: Central Bureau of Statistics, *Standard Classification of All Economic Activities 1993*, Second Edition, Technical Publication No. 63, Jerusalem, 2003.

The “smoothing” system of the non-recurrent payments – Usually, non-recurrent payments and back pay relate to a period of a few months. Since it is impossible to receive from the establishments an accurate data of these payments according to the months they relate to, and since there are serious fluctuations concerning the sum of the non-recurrent payments, it was decided to include in the moving average wages for each month the non-recurrent payments and back pay of the last four months (the reported month and the preceding three months). For some of these establishments, the data received referred to payments which are divided backwards, throughout the entire year.