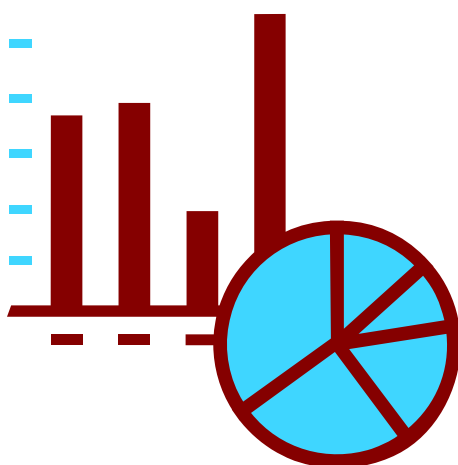# Central Statistical Agency

Quarterly Manufacturing Industry Business Survey, Third Quarter 2000 E.F.Y

Addis Ababa

JUNE 2007

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I. Introduction

Business Surveys are carried out to obtain information for use in monitoring the current business situation and forecasting short-term developments. Information from these surveys has proved of particular value in forecasting turning points in the business cycle. The range of information covered by business tendency surveys goes beyond variables that can easily be captured in conventional quantitative statistics. Qualitative information may be collected for variables that are difficult or impossible to measure by conventional methods. Examples include: capacity utilization, production bottlenecks, plans and expectations for the immediate future and managers' views on overall economic situation.

Hence the Central Statistics Agency (CSA) as the responsible body for statistical information on almost all socio-economic aspects in the country has a significant role to play in meeting the need for short term statistics, mainly current business survey, which is considered as bridging the gap between information demanded by users and information, held by respondents. *A current business survey can be defined as a business cycle analysis of interrelated developments. This kind of survey tries to capture judgments on past, current and future economic developments.*

Thus to meet the demand of short term statistics the CSA has for the fifteenth time, conducted quarterly Manufacturing Industry Business Survey on the Large and Medium Scale Manufacturing Industries.

This Short Term Statistics (Manufacturing Industry Business Survey) tries to answer the following type of questions:-
- In which phase of the economic cycle the manufacturing industry is at present?
- What will be the probable development in the near future?
- Is the manufacturing industry in the continuation of a movement already started (upward or downward) or is it at a turning or reversal point?

Moreover short term statistics are also used to produce monthly or quarterly indicators, and provide statistical information that is necessary to improve the competitiveness and performance of the business community in the country.

II. Objectives of the Survey

The main objectives of the quarterly medium and large scale manufacturing business survey are to:

- compile and produce up-to-date, reliable and comparable information on the activity, competitiveness and performance of the industry,
- assist in economic analysis and forecast the future trend of the sector,
- be used in compiling the various components of quarterly national accounts, which in turn are needed in the calculation of GDP, and
- show the cyclical movement of the sector in terms of major indicators.

Therefore conducting current business survey on dynamic economic sectors like that of the manufacturing sector is an accepted way of availing basic business information to depict the general trend on interrelated developments of the economy. Moreover, it could be a base to examine the nature of the sequence of evolution and future expectations in order to ensure that adequate decisions can be taken today.

Structure of this report

Section II deals with the objectives of the survey. Section III provides an overview of the survey methodology. Section IV presents the background on training of field staff for data collection. Section V discusses concepts and definitions applied in the survey. Section VI describes the steps covered in data entry, editing, cleaning and tabulation of the results. Section VII explores the findings of the survey. Finally Annex I, which describes the estimation procedure and Annex II Coefficient of Variation (CV) for selected variables, are attached at the end of this report.

Dear reader, as we are striving to improve our work and try to satisfy the needs of our users, we would like to hear from you. If you have any comments or suggestions to make, please feel free to do so. Our address is:-

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III. SURVEY METHODOLOGY

3.1 Scope and Coverage

The Quarterly Large and Medium Scale Manufacturing Business Sample Survey was conducted by CSA, covering only those establishments, which engaged 10 persons and above and are using power driven machines to produce their goods. Both public and private holding manufacturing industries of all regions were covered by this quarterly sample survey.

3.2 Sampling Frame

The list of basic values of each and every establishment was obtained from the 2002/03 Large and Medium Scale Manufacturing Industries Census and was used as a frame in order to conduct this quarterly Large and Medium Scale Manufacturing Business Sample Survey.

3.3 Sample Design

A single stage stratified sample design has been implemented in order to select sample establishments. Each establishment was first grouped into a four-digit level International Standard Industrial Classification (ISIC). Each four-digit ISIC was then considered to be a stratum. However, in doing so, the total number of the four-digit level ISICs was found to be too many and the contribution of some of the ISICs to the total basic value was also very low. Hence, a cut-off strategy was adopted for the ISICs that have a contribution of less than 0.6 percent to the overall basic value. Therefore, a total of 33 out of 47 ISICs were finally taken into consideration. Fifteen domains of estimates (reporting levels) are then constructed from the 33 ISICs and major findings of the survey are reported for them. Taking into account resource constraints and the production structure of the manufacturing sector, 130 sample establishments were initially decided to be sufficient to conduct the survey. The spread of basic values across the four-digit ISICs as observed from the frame was, however, uneven. Therefore, a power allocation (with a power of ½), have been employed to distribute the 130 sample establishments among the 33 ISICs since it increases the precision of small strata by slightly decreasing the precision of large strata.

A combination of systematic sampling and probability proportional to size (PPS) selection, size being basic value obtained from the frame, was used in order to select sample establishments from each of the 33 ISIC.

As regards to the ultimate coverage, the survey was not carried out in 11 establishments out of the sampled 130 establishments; 6 establishments due to non-response and 5 establishment due to closure after the end of the first quarter. As a result, the survey succeeded to cover 119 (91.5 percent) establishments throughout the entire regions.

Estimation procedure of totals, ratios, sampling error and the measurement of precision of estimates (CV) are given in Appendix I and II respectively.

IV. Training of Field Staff and Data Collection

The training was conducted in one phase using staff members of the Industry Statistics Team (professionals and statistical technicians) and experienced branch statistical office staff in establishment surveys. Enumerator's manual was prepared for the survey to introduce the participants with the detailed explanations of the basic concepts and how to handle each and every part of the questionnaire.

Since the coverage of the sample is based on industrial groups rather than area coverage, only 15 out of the 25 branch offices of CSA have participated in this survey. 35 field staff participated in the training, of which 15 were assigned for Addis Ababa, while the remaining were drawn from other branch statistical offices. The refreshment training took two days and another ten working days were needed for data collection.

V. Concepts and Definitions

Manufacturing: - is defined here according to International Standard Industrial Classification (ISIC Rev. 3) as "the physical or chemical transformation of materials or components into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or the worker's home, and whether the products are

sold at wholesale or retail. The assembly of the component parts of manufactured products is also considered as manufacturing activities."

An Establishment: - is defined as the whole of the premises under the same ownership or management at a particular address. (e.g. a bakery, sawmill, etc.)

Permanent Workers: - these are employees, (based on the agreement between the workers and employers) engaged to work in the factory for unlimited period of time. These workers are usually found regularly on the payroll of the establishment. Basically, this classification consists of production, administrative and technical employees. According to this definition, unpaid family workers, active partners and working proprietors are excluded.

Seasonal and Temporary Workers: - these include workers who are employed for a whole or part of the year with the agreement that they work for a limited period of time. These workers are not regularly on the payroll of the establishment.

Revenue from Sales: - represents the total sales value of all products and by-products during the reference period valued at market price.

Raw Materials: - include all raw and auxiliary materials, parts and containers which are consumed during the reference period. The value of local raw materials is the value of locally produced raw materials and is the cost at the factory, which includes the purchase price, transport charges, taxes and other incidental costs. The value of imported raw materials is the value of raw materials produced in other countries and obtained directly or from local source and is the cost at the factory which includes the purchase price, transport charges, taxes and other incidental costs.

New Capital Expenditure: - is the cost of new or used capital equipment bought during the reference period by the existing establishments.

Survey Period: Based on the Ethiopian Fiscal Year, Quarters are defined as follows:-

- *First Quarter* – July 8 – October 10
- *Second Quarter* – October 11 – January 8
- *Third Quarter* – January 9 – April 8
- *Fourth Quarter* - April 9 – July 7

VI. Data Processing

Editing, Coding and Verification

A number of quality control steps were taken to ensure the data quality. Instruction manuals on editing were given to personnel involved in the editing process. Briefings on the subject along with the editing manual were put to use, to edit and code the data collected. Finally, the edited and coded questionnaires were checked and verified by another group of professionals.

Data Entry, Cleaning and Tabulation

The data were entered and verified on personal computers using CSPro software. Four CSA data entry staff participated in this purpose for one day, with close supervision of one professional programmer. Then, the data entered were cleaned using a personal computer in combination with manual editing for some serious errors. Finally, the tabulation of the results was processed using the same software by one programmer from the Data Processing Department with technical assistance from the staff of manufacturing Industry Statistics Team.

VII. Summary of Survey Findings

Employment

Survey results shown in Table 1 below indicate that, in the third quarter of 2000 E.F.Y., a total of 93,389 workers were engaged in the manufacturing industry, of which 73,056 (78.2 percent) of the workers were permanent while the remaining 20,333 (21.8 percent) persons were seasonal or temporary employees. Among the industrial groups, manufacture of food products were the major employers like in the previous quarters, where by, they employed around 26.2 percent of the total work force in the sector followed by textile industries which took in around 12.1 percent. On the other hand, tobacco manufacturing establishments contributed 0.8 percent of the total employment, which is the least.

Table 1: Number of Persons Engaged by Major Industrial Groups, Third Quarter 2000 E.F.Y. (2007/08)

Major Industrial Groups	Persons engaged			
	Number of establishments	Permanent	Seasonal	Total
Manufacture of food products.........	169	16,645	7,840	24,485
Manufacture of beverage.................	31	9,148	913	10,061
Manufacture of tobacco products...	1	778	5	783
Manufacture of textiles..................	15	8,736	2,612	11,348
Manufacture of wearing apparel, except fur apparel...........................	104	4,025	990	5,015
Tanning and dressing of leather, manufacture of footwear, luggage and hand bags…………………………….	69	5,360	1,976	7,336
Manufacture of wood and wood products and cork, except furniture………………	11	1,568	166	1,734
Manufacture of paper & paper products.	29	5,645	777	6,422
Manufacture of chemicals and chemical products………………………………	37	3,862	926	4,788
Manufacture of rubber products…….	40	3,049	285	3,434
Manufacture of other non-metallic products………………………………	59	8,150	1,786	9,936
Manufacture of basic iron and steel……	9	1,105	57	1,162
Manufacture of fabricated metal products except machinery and equipment………………………………	98	1,529	1,011	2,540
Manufacture of motor vehicles, trailers and semi-trailers………………………...	4	871	374	1,245
Manufacture of furniture………………	234	2,585	515	3,100
Total Manufacturing	**910**	**73,056**	**20,333**	**93,389**

On the other hand compared with the previous year's same quarter the total employment during the quarter under review has shown an increase of 3.2 percent. In this Year's third quarter the share of seasonal workers has shown in increase as compared to the last quarter.

As a follow-up to the employment situation, respondents were also asked about their expectations on the number of employees in the next quarter. As presented in Table 2 below, 184 establishments responded that they expect a change (upward or downward) in the number of the work force due to different reasons. Out of these establishments, 69 establishments (37.5 percent) forecasted decreases in the number of workers due to shortage of raw material, while 55 establishments (30.0 percent) expected an increase in the number of workers in the next quarter as a result of a growing demand for their products. In addition 34 establishments (18.5 percent) also expected a decrease in the number of workers in the next quarter due to a decreasing demand for their products.

Table 2: Number of Reporting Establishments by Reason for Change
In the Next Quarter's Number of Persons Engaged,
***Third* Quarter 2000E.F.Y (2007/08)**

Reasons for change (from the previous quarter)	Number of establishments	Percentage
High /increasing demand for the products…	55	29.89
Decreasing/low demand for products ……..	34	18.48
Shortage of working capital……………...	-	-
Shortage of raw materials………………….	69	37.50
Others………………………………………	26	14.13
Total	**184**	**100.00**

Revenue Generation and Prospects

A total of 4.5 billion birr was earned as revenue by the manufacturing sector during the third quarter of 2000 E.F.Y, of which 91.8 percent was generated from local sales while the remaining 8.2 percent was generated from exports. Food manufacturing and manufacture of beverage products contributed the largest share to the total revenue generation during the quarter as they generated 24.3 and 18.0 percent of the total revenue, where as, apparel manufacturing industries were at the bottom, with revenue amounting only to 0.3 percent of the total. Similar to previous quarters, most of the establishments supplied their products to local markets, except tanning and leather manufacturing industries and food products

manufacturing which generated 56.0 and 17.5 percent of their revenue from export respectively, as shown in Table 3 below. In addition to that, these two industrial groups together have earned about 90.2 percent of the total export revenue of the large and medium manufacturing industries. This trend indicates that the export performance of Ethiopian manufacturing industries is very low and it is also an affair of very few manufacturing industries.

Table 3: Revenue from Sales by Major Industrial Groups,
Third Quarter 2000E.F.Y (2007/08)

In 000' Birr

Major Industrial Groups	Revenue from sales					
	Local	%	Export	%	Total	%
Manufacture of food products.........	918,603	82.50	194,890	17.50	1,113,493	100.00
Manufacture of beverage.................	823,086	99.73	2,231	.27	825,317	100.00
Manufacture of tobacco products...	118,635	99.66	405	.34	119,040	100.00
Manufacture of textiles..................	342,442	91.21	32,988	8.79	375,430	100.00
Manufacture of wearing apparel, except fur apparel...........................	13,102	100.00	-	-	13,102	100.00 100.00
Tanning and dressing of leather, manufacture of footwear, luggage and hand bags………………………………	114,228	43.96	145,640	56.04	259,868	100.00 100.00 100.00
Manufacture of wood and of products and cork except furniture ……………	24,219	100.00	-	-	24,219	100.00
Manufacture of paper & paper products..	182,508	100.00	-	-	182,508	100.00
Manufacture of chemicals and chemical Products………………………………	304,064	100.00	-	-	304,064	100.00 100.00
Manufacture of rubber products…….	207,658	99.73	560	.27	208,218	100.00
Manufacture of other non-metallic products………………………………	705,454	99.87	953	.13	706,407	100.00
Manufacture of basic iron and steel……	132,714	100.00	-	-	132,714	100.00
Manufacture of fabricated metal products except machinery and equipment………………………………	176,720	100.00	-	-	176,720	100.00 100.00
Manufacture of motor vehicles, trailers and semi-trailers………………………...	97,307	100.00	-	-	97,307	100.00 100.00
Manufacture of furniture……………...	42,976	100.00	-	-	42,976	100.00
Total Manufacturing	**4,203,716**	**91.76**	**377,667**	**8.24**	**4,581,383**	**100.00**

Compared to the pervious quarter, total revenue generated in this quarter increased by 13.1 percent. The significant increase in the total revenue is observed in the manufacture of food products and beverage. On the same note, the total revenue in manufacture of textiles, manufacture of basic iron and steel and, manufacture of paper and paper products has also increase by 105.3, 22.8 and 18.5 over the previous quarter respectively.

The manufacturing establishments surveyed were also asked about the likely direction of their sales revenue in the next quarter. Among the establishments that responded to this question, 257 of them (54.9 percent) expect a future increase in their total revenue due to a growing local and international demand for their products, even though the international demand was insignificant as shown in Table 4 below. On the other hand, around 105 establishments (22.4 percent) and 104 establishments (22.2 percent) expect a future decline in their total revenue due to decreasing demand for their products both locally and internationally, and high cost of inputs.

**Table 4: Number of Establishments by Reason for Change
In Next Quarter's Revenue from Sales,
Third quarter 2000 E.F.Y (2007/08)**

Reasons for Change (from the previous quarter)	Number of establishments	Percentage
Increasing demand for products	257	54.91
Locally……………………………..	247	52.78
Internationally…………………….	10	2.14
Decreasing demand for products	105	22.44
Locally……………………………..	105	22.44
Internationally…………………….	-	-
Cost of inputs…………………………...	104	22.22
Unable to compete with:	1	.21
Local manufactures ……..……….	1	.21
Imported items………………………	-	-
Others………………………………………..	1	.21
Total	**468**	**100.00**

Unlike the previous year's same quarter, the number of establishments which expect a rise in their revenue in the next quarter due to an increase in demand for their products has shown a decline by 24.2 percent. On the other hand, the number of establishments which expect decrease in their revenue due to a decrease in demand for their products in the next quarter increased by 26.5 percent in this quarter, compared to the same quarter of 1999 E.F.Y.

Raw Materials

The majority of the Ethiopian manufacturing establishments are known for their high dependence on imported raw materials in their production activities and this urges one to ask the reason for such a huge dependence. Out of the total responding establishments to this particular question, 445 establishments, which constituted 81.1 percent, reported that unavailability of raw materials locally is the major reason for relying on imported raw materials, as shown in Table 5 below. Lack of sufficient local supply was reported as a major reason by 90 establishments (16.4 percent), where as unreliable of local raw material (2.4 percent) was mentioned as the reasons for relying on imported raw materials. In general, the results shows that the raw material demand by local manufacturing industries couldn't be satisfied from domestic sources due to various reasons mentioned above and these calls for the government and other stakeholders to look into the issue in order to reduce the outflow of the scarce foreign currency.

**Table 5: Distribution of Reporting Establishments by Reason for Using
Imported Raw Materials, Third Quarter 2000 E.F.Y (2007/08)**

Major Industrial Groups	Lack of Sufficient Supply locally		Not available locally		Local supply Is not reliable		Quality of locally available raw material is not reliable	
	No	%	No	%	No	%	No	%
Manufacture of food products........	3	2.59	106	91.38	7	6.03	-	-
Manufacture of beverage...............	3	21.43	11	78.57	-	-	-	-
Manufacture of tobacco products.......	-	-	1	100.00	-	-	-	-
Manufacture of textiles.................	-	-	9	69.23	3	23.08	1	7.69
Manufacture of wearing apparel, except fur apparel.........................	2	2.06	95	97.94	-	-	-	-
Tanning and dressing of leather, manufacture of footwear, luggage and hand bags…………………	3	4.35	66	95.65	-	-	-	-
Manufacture of Wood and of wood products and cork, except furniture..	-	-	11	100.00	-	-	-	-
Manufacture of paper & paper products…………………………..	1	6.67	14	93.33	-	-	-	-
Manufacture of chemicals and chemical products………………	3	14.29	18	85.71	-	-	-	-
Manufacture of rubber products….	-	-	48	100.00	-		-	-
Manufacture of other non metallic Products………………………	-	-	11	100.00	-	-	-	-
Manufacture of basic iron and steel…….	3	33.33	4	44.44	2	22.22	-	-
Manufacture of fabricated metal products except machinery and equipment………	1	4.00	24	96.00	-	-	-	-
Manufacture of motor vehicles, trailers and semi-trailers………….	1	25.00	3	75.00	-	-	-	-
Manufacture of furniture…………	70	73.68	24	25.26	1	1.05	-	-
Total Manufacturing	**90**	**16.39**	**445**	**81.06**	**13**	**2.37**	**1**	**.18**

New Capital Expenditure

New capital expenditure by the existing establishments in the quarter amounted to birr 118.3 million. Of this amount, the share of beverage manufacturing and other non-metallic products industries was birr 49.5 million (41.8 percent) and 20.3 million (17.2 percent), respectively, (Refer to Table 6 below). The establishments have been investing their capital for acquisition of various fixed assets, such that, around birr 59.3 million (50.1 percent) of the total new capital expenditure was spent on acquiring new machinery and equipment, while birr 33.5 million (28.4 percent) of the total capital expenditure was spent on construction of new buildings and building maintenance activities.

Total new capital expenditure in the sector has decreased by more than birr 47.6 million birr (28.7 percent) as compared to the same period last year. Out of the total new capital expenditure most of the expenditure went to machinery and equipment in both periods.

Table 6: Value of New Capital Expenditure on Fixed Assets of the Existing Establishments by Type of Fixed Asset and Major Industrial Group, Third Quarter 2000E.F.Y (2007/08) in birr

Major Industrial Groups	Building	Machinery & equipment	Vehicles	Others	Total
Manufacture of food products.......…..….	5,312,328	5,640,169	2,386,510	2,097,559	15,436,566
Manufacture of beverage.............…....…	5,699,248	34,652,060	7,046,499	2,125,004	49,522,811
Manufacture of tobacco products..…...…	-	8,443	-	1,093	9,536
Manufacture of textiles ....…......….	195,391	149,269	-	16,165	360,825
Manufacture of wearing apparel, except fur apparel.........................	-	-	-	6,480	6,480
Tanning and dressing of leather, manufacture of footwear, luggage and hand bags……………………………..	-	11,736,047	-	43,635	11,779,682
Manufacture of wood and of wood products and Cork, except furniture……………..	-	-	-	-	-
Manufacture of paper & paper products…	86,240	337,346	-	529,714	953,300
Manufacture of chemicals and chemical products……………………………..	-	1,285,994	-	368,976	1,654,970
Manufacture of rubber products …….	5,063,654	-	-	216,802	5,280,456
Manufacture of other non-metallic products…….	11,426,113	1,942,792	6,213,460	796,675	20,379,040
Manufacture of basic iron and steel ……	43,860	13,260	-	-	57,120
Manufacture of fabricated metal products except machinery and equipment………..	-	316,011	1,464,250	10,970	1,791,231
Manufacture of motor vehicles, trailers and semi-trailers……………..	4,229,571	3,117,778	-	2,051,222	9,398,571
Manufacture of furniture…………………	1,522,000	148,103	-	77,050	1,747,153
Total Manufacturing	**33,578,405**	**59,347,272**	**17,110,719**	**8,341,345**	**118,377,741**

Capacity Utilization

In almost all short-term business surveys, capacity utilization is considered as an important variable in studying the efficiency and performance of manufacturing industries overtime. For this reason, two questions were forwarded to the respondents during the survey: the first, regarding the existing level of capacity utilization by the establishments whereas the second question was about the reasons for operating below their full capacity. As shown in Table 7 below, during the quarter, only 53.3 percent of the total capacity is being utilized by the manufacturing industries, while around 46.7 percent of the total capacity remains unexploited. A relatively high degree of capacity utilization was observed in manufacture of wood and wood

products and cork, except furniture (90.5 percent) while a low level of capacity utilization was observed in manufacture of motor vehicles, trailers and semi-trailers (22.7 percent).

Table 7: Distribution of Establishments by Percentage of Capacity Utilization, Third Quarter 2000 E.F.Y (2007/08)

Major Industrial Groups	Number of establishments				
	≤ 25 %	26-50%	51-75%	76-100%	Average
Manufacture of food products.........	23	29	63	11	57.77
Manufacture of beverage.................	-	15	2	14	73.15
Manufacture of tobacco products...	-	-	1	-	68.00
Manufacture of textiles	-	10	5	-	48.73
Manufacture of wearing apparel, except fur apparel...........................	-	9	95	-	58.95
Tanning and dressing of leather, manufacture of footwear, luggage and hand bags…………………………	8	50	7	4	42.37
Manufacture of wood and wood products and cork, except furniture………………	-	-	1	10	90.53
Manufacture of paper & paper products.	-	5	6	18	77.94
Manufacture of chemicals and chemical products…………………………………	3	4	11	6	64.20
Manufacture of rubber products………	-	3	10	35	72.81
Manufacture of other non-metallic products………………………………….	25	16	9	8	42.70
Manufacture of basic iron and steel……	-	3	2	4	67.22
Manufacture of fabricated metal products except machinery and equipment………	-	59	24	1	42.06
Manufacture of motor vehicles, trailers and semi-trailers………………………...	3	1	-	-	22.67
Manufacture of furniture……………….	8	86	-	2	35.05
Total Manufacturing	**70**	**290**	**236**	**113**	**53.27**

As shown in Table 7 among the total manufacturing establishments included in this survey 9.9 percent of them were operating below or equal to 25 percent of their capacity, while around 15.9 percent of the establishments have been operating above 75 percent of their full capacities during the survey period. Most of the establishments (40.9 percent) have been utilizing between 26 and 50 percent of their full capacities whereas 33.3 percent of them were operating between 51 and 75 percent capacity utilization category. In general, the survey results indicate low level of capacity utilization in Ethiopian manufacturing industries.

On the same note, the average level of capacity utilization in the survey quarter was slightly lower compared to the pervious year's same quarter, which was about 54.5 percent. On the other hand, the number of establishments which operated below 25.0 percent of their full capacity has shown an increase in the quarter, against the same period a year ago.

The low level of capacity utilization in the sector would compel one to ask "what was behind this weak level of capacity utilization?" The responses from the establishments which are presented in Table 8, reveal that 36.6 percent reported "lack of market demand" as a major cause for not operating at full capacity. On the other hand, 204 establishments (32.6 percent) reported "problem with shortage of raw material" as a major reason for not utilizing their full capacity. Problem related with "shortage of working capital" is mentioned as major reason for not operating at full capacity by 10.2 percent of the establishments.

Table 8: Number of Establishments by Reason for not working at Full Capacity, Third Quarter 2000 E.F.Y (2007/08)

Reasons for not working at full capacity	Number of Establishments by age of Establishments (years)				Total number of Establishments	Percentage
	< 3yrs	3 -5 yrs	6 - 8 yrs	8 + yrs		
Shortage of raw materials………….……	-	-	67	137	204	32.59
Shortage of spare parts……………..……	-	-	-	15	15	2.40
Shortage of foreign exchange…………....	-	-	-	-	-	-
Lack of demand/market………………….	-	22	8	199	229	36.58
Shortage of working capital……………..	-	-	12	52	64	10.22
Problem with electricity and water …….	-	8	-	35	43	6.87
Repeated breakage of machinery………..	-	-	-	27	27	4.31
Problem with workers…………………...	-	-	-	2	2	.32
Lack of skilled manpower………………	-	-	-	32	32	5.11
Government rules and regulations………	-	-	-	-	-	-
Other reasons……………………………	1	-	-	9	10	1.60
Total	**1**	**30**	**87**	**508**	**626**	**100.00**

Compared to the previous year's same quarter, none of the establishments reported ''Government rules and regulation'' as a problem for not operating at full capacity in this quarter.

APPENDIX

Estimation procedures of total, ratio and sampling errors

To estimate the required variables by reporting levels (domains), the following formulas were used.

1.   Estimate of domain total $\hat{Y}_h$ is given by:

$$\hat{Y}_h = \sum_{i=1}^{n_h} W_{hi} \, y_{hi} \quad \text{---------------------} \quad (1)$$

Where,

$$W_{hi} = \frac{M_h}{n_h M_{hi}} \quad \text{is the basic sampling weight}$$

$M_h =$ Sum of basic values of establishments in stratum h obtained from the sampling frame.

$M_{hi} =$ Basic value of the Ith establishment in stratum h obtained from the sampling frame.

$n_h =$ Number of successfully covered sample establishments in stratum h.

$y_{hi} =$ The observed value of a characteristic y for manufacturing industry i in stratum h.

Note:

- Estimate of total manufacturing characteristic, $\hat{Y}$, is obtained by summing up stratum/domain total estimates.

$$\hat{Y} = \sum_{h=1} \hat{Y}_h \quad \text{--} \quad (2)$$

- During the time of sample selection establishments having a basic value higher than the sampling interval were selected with certainty (with a probability of 1). Hence, the basic sampling weight of those establishments was taken to be 1.

3. Sampling variance of the estimates:

Sampling variance of estimate of stratum total are given by the following formulas:

The variance of domain or reporting total estimate is:

$$V(\hat{Y}_h) = \frac{n_h}{n_h - 1}\left[\sum_{i=1}^{n_h}\left(\hat{Y}_{hi} - \frac{\hat{Y}_h}{n_h}\right)^2\right] \quad\text{---} \quad (3)$$

Where,

$$\hat{Y}_{hi} = W_{hi}\, y_{hi}$$

Other notations are as defined above.

$$V(\hat{Y}) = \sum_h V(\hat{Y}_h) \quad\text{---} \quad (4)$$

$$SE(\hat{Y}_h) = \sqrt{Var(\hat{Y}_h)} \quad\text{--} \quad (5)$$

4. Coefficient of variation and confidence interval

The following formulas were used to calculate coefficient of variation and confidence interval of the domain (reporting level) total.

The coefficient of variation (CV) of domain total in percentage is:

$$CV(\hat{Y}_h) = \frac{SE(\hat{Y}_h)}{\hat{Y}_h} \, x100 \quad\text{--} \quad (6)$$

And

Ninety five percent confidence interval (CI) of domain total is:

$$\hat{Y}_h \pm 1.96 \, x \, SE(\hat{Y}_h) \quad\text{--} \quad (7)$$

5. Ratio estimates:

$$\hat{R}_h = \frac{\hat{Y}_h}{\hat{X}_h} \; and \; \hat{R} = \frac{\hat{Y}}{\hat{X}} \quad \text{--} \quad (8)$$

Where the numerator and the denominator are estimates of domain totals of characteristic y and x, respectively.

$$Var\left(\hat{R}_h\right) = \frac{1}{\hat{X}_h^2}\left[Var\left(\hat{Y}_h\right) + \hat{R}_h^2 \, Var\left(\hat{X}_h\right) - 2\hat{R}_h \, Cov\left(\hat{Y}_h, \hat{X}_h\right)\right]$$

In which

$$Cov\left(\hat{Y}_h, \hat{X}_h\right) = \frac{n_h}{n_h - 1}\left[\sum_{i=1}^{n_h}\left(\hat{Y}_{hi} - \frac{\hat{Y}_h}{n_h}\right)\left(\hat{X}_{hi} - \frac{\hat{X}_h}{n_h}\right)\right]$$

Where,

$$\hat{X}_{hi} = W_{hi} X_{hi}$$

Other notations are as defined above.

Estimates of standard error, coefficient of variation and confidence interval for the ratio estimate can be calculated by adopting formulas 5, 6 and 7.