

Part II

Chapter 5 Development Plan for Current Production Statistics

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5.1 General Outline of the Development Plan for Current Production Statistics

Based on the results of basic study and Trial Surveys (including the Pre-Survey) conducted under the present study, this chapter proposes a development plan for current production statistics that should be formalized in Vietnam. In addition, a development plan for industrial production indices is presented in Chapter 6.

5.1.1 Design Principle

At present, the GSO is conducting the “Monthly Industrial Sample Survey”^{*1} for the purpose of monitoring economic trends. This is a national-scale statistical survey covering mining, manufacturing, and electricity/gas/water supply sectors, but its primary purpose is to show macroeconomic trends and it does not allow the user to understand production activities in detail, especially at industry and commodity levels. On the other hand, current production statistics that are proposed under the Study have the primary purpose of showing micro-level industry trends and integrated macro-level industry trends with its at micro-level. Therefore, the design principle for “current production statistics” is to establish a new statistical base that allows the understanding of commodity-based production activities and that provides data and information on production activities of Vietnamese industries in an accurate and prompt manner for not only policymakers but individual companies and investors as well, with a ultimate goal to promote industrial development on a national scale.

Meanwhile, there are strong needs for current production statistics for the purpose of industrial and regional development at regional levels, for they are viewed as a basic source of information that can be used for regional economic analysis and thus becomes a powerful tool for public administration and policymaking to meet the local needs effectively. Generally, the primary purpose of current production statistics is to make data that depict characteristics relating to industry and commodity available to the public. In consideration of the strong needs for regional statistics, however, the development plan for current production statistics in Vietnam envisages system design that takes into account the need for region- or province-level data processing. In particular, the following goals are set as the basic design principles:

- (1) To conduct quantitative surveys on a commodity basis;

^{*1} The GSO’s Monthly Industrial Sample Survey covers all of state enterprises and foreign-affiliated companies (FDIs) and sampled non-state enterprises and “households (household industries).

- (2) To report monthly production activities and trends of the “Vietnamese industry”^{*2} with reliability and promptness; and
- (3) To compile current production statistics in internationally comparable terms;
- (4) To tabulate and disseminate statistical data at national and local (administrative unit) levels;
- (5) To develop indices according to applicable international standards and by applying modern calculation techniques; and
- (6) To design a statistical system that takes into account the needs for minimization of statistical survey costs and reduction of burdens on survey subjects (establishments).

5.1.2 Official Name of the Current Production Statistics Survey

The current production statistics survey to be implemented under the plan is formally entitled “Monthly Survey of Major Industrial Products (MSMIP).”

5.1.3 Survey System and Organization

5.1.3.1 Implementation Bodies

The current production statistics survey will be conducted by GSO’s Industrial and Construction Statistics Department, with actual field work to be performed GSO’s network of organizations (GSO, PSOs and DSOs), and under supervision of the MSMIP Supervisory Board (tentatively named).

(1) Organization of the MSMIP Supervisory Board

The MSMIP Supervisory Board will consist of six members who are representatives of the following organizations. Each member may designate a person to attend at the board meeting on his or her behalf.

- | | |
|---------------------------|--|
| 1) Chairman: | Director General of General Statistics Office |
| Vice chairman: | Director of Department of Industrial Economy, MPI |
| Vice chairman: | Director of Industrial and Construction Statistics Department, GSO |
| Member: | Director of Research Department, PMO |
| Member: | Director of Planning Department, MOI |
| Member/secretary general: | Deputy Director of Industrial and Construction Statistics Department |

^{*2} The definition of “industry” in Vietnam covers the following three sectors under VSIC two-digit classification (equivalent to ISIC’s sub-division), namely “mining and quarrying,” “manufacturing” and “electricity, gas and water supply.” The definition applies to “industry” referred to in this plan.

2) Role of MSMIP Supervisory Board

The supervisor board will assume the following duties. It will be convened by the secretariat under the direction of the chairman for the purpose of fulfilling any of the following duties.

- i) Planning of statistical surveys, modification of questionnaires, and approval of amendment to rules and regulations
- ii) Approval of reviewing and updating of surveyed industry sector, commodities and establishments
- iii) Guidance and recommendation for administration and management relating to statistical surveys

(2) Role of GSO Industrial and Construction Statistics Department, PSOs and DSOs

As explained earlier, the Industrial and Construction Statistics Department will be the lead organization within the GSO and will be responsible for building a statistical system to utilize organizations, staff and resources of the PSOs and the DSOs. The Industrial and Constructional Statistics Department, the PSOs, and the DSOs will assume the following duties.

GSO Industrial and Construction Statistics Department

- 1) Planning and design of the “current production statistics” survey
- 2) Development of questionnaires and manuals, and distribution to the PSOs
- 3) Guidance for PSO and DSO enumerators
- 4) Supervision of field survey activities
- 5) Final tabulation and analysis of statistical data
- 6) Dissemination of statistical data
- 7) Budget control relating to the current production statistics survey

PSOs

- 1) Presentation and guidance to survey subjects (establishments) in each province
- 2) Distribution and collection of questionnaires
- 3) Examination of collected questionnaires
- 4) Data input to the computer and tabulation
- 5) Analysis and compilation of province-level data to be published
- 6) Management of data dissemination at provincial level
- 7) Work management relating to enumerators

DSOs

The DSOs will be responsible for, under the direction of the PSO, distribution of questionnaires to survey subjects (mainly non-state enterprises and households), collection, examination of collected questionnaires, and work management relating to enumerators at municipality and district level. They will submit collected questionnaires to the PSOs by the specified day but will not be engaged in computer input work.

5.1.3.2 Survey Objects

The survey objects of the current production statistics survey will essentially consist of establishments and companies that manufacture commodities specified in questionnaires.

“Establishments” for the purpose of the current production statistics survey mean business establishments that are managed by a specific person (owner) and operate for more than three months and at the same location in Vietnam. They are usually factories (including processing shops).

(1) Cases when a surveyed establishment is unable to report

If a surveyed establishment is unable to make a report by submitting a questionnaire, a company owning or operating the establishment will be requested to do it on behalf of the establishment. This will happen largely in the following cases:

- 1) When it is very difficult for a surveyed establishment to make such report on survey items in relation to the management system for the company to which it belongs; or
- 2) When a specific establishment other than the surveyed one (such as the company’s head office) is responsible for reporting production data and related survey items relating to all establishments.

The form of ownership is not questioned when surveyed companies are selected.

5.1.3.3 Method for Selecting Survey Objects

Survey design will be made by GSO Industry and Construction Statistics Department according to the following principles.

(1) Selection of industry to be surveyed

The MSMIP will cover the Industry Sector defined in Vietnam. Also, surveyed industries will be selected from VSIC four-digit classification. The selection process will start in the pre-survey stage in 2006, on the basis of the following selection criteria, and a final listing of industries for the current production statistics survey will be made by January 2008. The composition of the listing will be properly reviewed by GSO. While the primary selection factor is the out-put value of industry as a whole, it may not be used as criteria for specific industries that are considered by the MSMIP Supervisory Board to require special consideration.

1) Selection criteria for industries to be surveyed

Selection criteria for industries are the out-put value of 20 trillion VND per industry (VSIC four-digit level) with an ultimate coverage rate of over 90% of national production. The standard value will be reviewed every three years, starting in 2008. (Note that the review interval will be formally decided by the MSMIP Supervisory Board.)

Reason for the selection criteria (20 trillion VND per industry (VSIC four-digit level) with an ultimate coverage rate of over 90%)

To grasp production activities accurately at microeconomic levels and develop indices representing macroeconomic trends, the statistical survey does not need to cover every industry sector and commodity. Rather sample surveys are desirable from the viewpoint of efficiency, while reviewing industries and commodities to reflect the change of the times. In the case of the Vietnamese industrial sector, 90% of national industrial production in 2003 are accounted for by 55 out of 128 industries (VSIC four-digit)^{*3}, and the remaining 10% by 73 industries, each of which is fairly small and represents minimal share of total industrial production. Thus they are not representative industries in the country's manufacturing sector and their data are not statistically significant in terms of influence on the overall data. Besides, it takes extra cost and manpower to survey all companies in these small industries every month, having negative impacts in terms of cost and benefit. In 2003 data, the industry that ranked 57th from the top accounts for slightly over 90% (90.47%) of total industrial production, while annual sales per industry amount to around 20 trillion VND. For this reason, the selection criteria in the first year of the MSMIP are set at 20 trillion VND in the out-put value and the 90% coverage rate.

2) Reviewing of surveyed industries

The selection criteria and composition of surveyed industries will be reviewed once a year periodically. As the Vietnamese industry, especially the manufacturing sector, changes very rapidly in recent years, efforts should be made to establish statistics that can reflect the changes as close as possible. Foreign-affiliated companies (FDIs) have a profound impact on production trends in Vietnam. With such a perspective, each PSO shall keep close contact with people's committee to grasp the investment trends. Furthermore, annual production of surveyed industries used as selection criteria is determined on the basis of MSMIP data up to the previous year and the enterprise census data in the previous year.

3) Reviewing of surveyed industries according to ISIC revision

The United Nations Statistics Division reviews and revises International Standard Industrial Classification (ISIC) as needs arise. At present, the reviewing of ISIC Rev.3.1

^{*3} Under ISIC, there are 127 four-digit industries, and 130 under VSIC, of which 128 industries are reportedly conducting production activities, one way or another, in Vietnam.

has been completed and draft ISIC Rev.4 is publicized. As VSIC is based on ISIC Rev.3, GSO Department of Standards and Methodology is revising VSIC to reflect changes enacted in ISIC Rev.4. Thus, MSMIP that will be launched in January 2007 will be considered to use VSIC Rev.4.

Based on the above criteria, the number of industries covered by the survey is expected to be 70 sectors in total including 7 mining sectors, 60 industry sectors, and 3 electricity/gas/water sectors in January 2007 and approximately 75 sectors in January 2008.

(2) Selection of commodities to be surveyed

Based on the industrial commodity classification made by GSO Industrial and Constructional Statistics Department, commodities covered by the survey will be selected with reference to the latest version of Vietnamese Central Product Classification (VCPC) (five-digit) to facilitate international comparison. Commodities so selected will include finished products - finished consumer goods - and intermediate goods that are distributed in the market. For some industries, it is impossible to cover all commodities produced locally. To compensate for this, composition of commodities for each industry should be designed to account for over 80% of the total value of production by the industry. To be ready for the case when diverse commodities are made by a specific industry, two or more questionnaires will be used for each industry instead of one questionnaire for one industry.

1) Selection criteria for commodities

Selection will be made from VCPC's five-digit commodities and no quantitative criteria such as production will not be used, because there is a large variation between commodities. Selection will be made according to the following procedures.

- (a) A list of commodities for each industry is prepared on the basis of JICA's trial surveys up to 2005 and the list of commodities prepared for the pre-survey in 2006 (basically covering 48 industries selected for the pre-survey and those to be added in 2007).
- (b) For industries to be newly added, classification (also unit) of commodities that are deemed to be major commodities for each of the industries will be made on the basis of VCPC five-digit classification and information obtained from related industries.

VCPC is based on international classification standards and does not necessarily accord with Vietnam's actual commodity structure. Also, some commodity names may be too long to be accommodated in the questionnaire. For these reasons, commodity classifications so selected may not agree with VCPC five-digit classifications. Here, care should be taken to reflect the country's commodity structure effectively and to group commodities in such way to allow surveyed establishments to respond with ease.

- (c) In addition to selection of commodities, the unit of production for each commodity is determined.
- (d) For industries and commodities to be newly added, final adoption will be made after trial surveys for the period of one year to check a detailed production status and trend.
- (e) For commodities that are formally selected for the statistical survey, their definition and scope of coverage is made into a separate document, which is distributed to enumerators upon approval of the MSMIP Supervisory Board.
- (f) For selection of commodities and their units, obtaining relevant information from large establishments and trade associations is very important and the pre-survey is conducted as required.

2) Reviewing of commodities

Based on the above commodity classification, questionnaires will be designed and trial surveys will be conducted for a specific period (one year) to collect statistical data. Upon the end of the trial period, the commodity classification will be reviewed and finalized for formal questionnaire design. As there is the absence of commodity-based data in Vietnam, the MSMIP is expected to be the first step to collect such data on a full scale. In the future, it is expected to build up a system to allow periodical reshuffling of commodities by establishing quantitative selection criteria on the basis of statistical data obtained by the MSMIP, industry information, and market analysis.

The reviewing of surveyed commodities will be carried out in a similar manner to that of industries. In particular, drastic changes in economic conditions in recent years are expected to cause emergence of new commodities and a sharp increase in production. To keep abreast of such changes, new commodities will be identified through analysis of enterprise census data in the previous year, MSMIP data, and interviewing of industrial sources, and possibility of adding them to the list will be examined.

3) Adaptation to new VSIC classification

While the periodical reviewing of commodities will be carried out as discussed above, the reshuffling of commodities will also be required due to the reorganization of surveyed industries, which will be necessitated by the MSMIP based on the new VSIC, which will start in 2007. As a result, the commodity list will be revised on the basis of the comparison table for old and new VSIC classifications (or the one for ISIC Rev.3.1 and Rev.4 published by the UN Statistics Division). This should be done as promptly as possible after final selection of industries, while the results will be reflected in questionnaires. All the activities will be completed by October, 2006.

Based on the above principle for selection of commodities, the number of commodities covered by the survey is expected to be 550 at maximum in January 2007 and 630 in January 2008.

(3) Selection of establishments (companies) to be surveyed

Basically, companies to be surveyed must be establishments that manufacture commodities specified in questionnaires. In Vietnam, however, there is no comprehensive list of establishments that specifies commodities that they produce. Thus, prior to selection of establishments, companies that have establishments need to be selected. The list of establishments is scheduled to be compiled on the basis of the 2007 census of business establishments, but it can be made ready for the MSMIP before the pre-survey is started in 2006. For this reason, the plan assumes that selection of companies is made on the basis of the previous company lists and selection/recommendation by PSOs and DSOs.

At the same time, however, the industry sector in Vietnam (mining, manufacturing, electricity/gas/water supply) has 18,198 companies (according to the 2004 enterprise census). If households^{*4} are added to this, the population size will be too large for monthly surveys. Thus, while maintaining the purpose of developing current production statistics, it has been decided to select establishments that hold significant share of the respective industry (commodity) as until a certain level of representation is reached. More precisely, companies in each of VSIC four-digit industries will be selected in order of the value of production until the accumulated total production reaches 75% (representation rate), and all companies in the selected industries will be included in the formal survey, i.e., culling by the overall representation rate.

It should be noted, however, that state enterprises (both central and local) and foreign-affiliated companies will be 100% surveyed in order to maintain statistical continuity from the ongoing monthly industry sample surveys that also cover all of these companies. (Note that, for the representation rate of 75%, all of state enterprises and foreign-affiliated companies would be included.) On the other hand, non-state enterprises and households will be covered so far as they are included in the industries represent 75% of the total.

Then, names, addresses, main products and others of selected companies will be compiled and tabulated in the MSMIP establishment list stored in the computer and the final list of surveyed establishments will be made.

^{*4} Households in the mining and manufacturing sectors are said to total around 780,000. For instance, if the sampling rate for the monthly industry sample survey is applied to this case, the sample size will be approximately 12,000 establishments.

Based on the above selection criteria, the number of establishments covered by the survey and that achieves the representation rate of 75% is 4,000 – 4,500 in January 2008 (Whole country base).

Yet, if local needs are to be taken into account, more non-state enterprises and households should be added. In this case, the final number of surveyed establishments will depend much on how many non-state households and will be included. It is important to decide on the overall size by taking into account processing capacity and cost burden of the GSO (including PSOs and DSOs) as well as other relevant factors.

5.1.4 Survey Items

For the purpose of studying production activities on a commodity basis, the following six survey items are selected as they constitute basis elements of current production statistics.

- (1) Quantity of production
- (2) Quantity of shipments
- (3) Quantity of internal consumption
- (4) Inventories at the end of month
- (5) Value of shipments (invoice basis)
- (6) Quantity of production expected for the following month

The necessity of “Total Net Turnover of Enterprise” for every month as a question item will be discussed and determined with major statistics users based on the result of the Pre-Survey.

(1) Quantity of production

This represents quantity of products made by surveyed companies in Vietnam and during the survey period, including those made under contract manufacturing and processing, and products input or consumed within the same establishment for the purpose of manufacturing other products (not including work-in-process).

(2) Quantity of shipments

This represents quantity of products that are covered by the survey and are actually shipped, during the survey period, by the surveyed subject or from a warehouse or a place of storage rented under the name of the surveyed subject. Note that the following cases should be included in calculation of this survey item.

- 1) Shipments to other factory of the same company, which makes products that belong to the same category of commodity
- 2) Shipments as raw materials to other factory of the same company

- 3) Shipments as raw materials for contract manufacturing
- 4) Shipments of contract manufactured products to customers
- 5) Internal use for sample, gift, exhibition or testing purposes

(3) Quantity of internal consumption

Of products made by the survey subject during the survey period (as commodity specified in the questionnaire), those consumed as raw materials and processing within the establishment are indicated in quantity, except for quantity of international use in (2) 5) above.

(4) Inventories at the end of month

This shows quantity of products (as commodity specified in the questionnaire) made by the survey subject and kept by the survey subject or at a warehouse or a place of storage rented under the name of the surveyed subject, as of the end of the survey month.

(5) Value of shipments

This represents the total value of products shipped by the surveyed establishment (factory) (on an inventory basis) during the survey period. Note that the value of shipments for products that are machined or otherwise processed by the surveyed establishment using raw materials furnished by the customer (thus only the processing charge is paid by the customer) is calculated as if said raw materials were purchased at the market price when they were furnished by the customer.

(6) Quantity of production expected for the following month

This should indicate the quantity of products that are expected to be made in the month following the survey month.

5.1.5 Form of Questionnaire

A questionnaire containing the above survey items will be prepared in a single sheet (A4 size). As shown in the next page, the front side has been revised in comparison to the form used for Trial Survey 2.

Back Sheet

INSTRUCTION

Please follow the instruction below.

1-1. Name of Enterprise

Please write down the name of enterprise as in business license.

1-2. Name of Establishment

In case the target unit is establishment under the enterprise, please write down the name of establishment as in Establishment Decision.

2. Tax code

Please write down the 10-digit tax code in case of enterprise and 13-digit tax code in case of establishment as granted by tax office.

3. Address

Please write down address of the establishment (street, commune, district, province/city)

4. Type of Enterprise

Please select the type of enterprise.

5. Respondent

Please write the name of person who filled in this questionnaire.

6. Phone Number

Please write the telephone number of the respondent (area code, direct number).

7. Reference Month

Please write the month referred for this questionnaire.

8. Production Quantity of reference month

Please report the quantity of production for the reference month for each listed products (excluding work-in-process). The item includes products directly produced by establishment with its own material. It also includes products that establishment produced for other establishments.

9. Shipment Quantity of reference month

Please report the quantity of shipment for the reference month for each listed products. The item only includes quantity of products directly shipped by establishment that are produced in the establishment and does not include the quantity of products directly shipped by establishment that are produced by other establishments with survey establishment's material. Please note shipment quantity does NOT include the internal consumption.

11. Ending Inventory Quantity of reference month

Please report the quantity of ending inventory at the end of reference month for each listed products (excluding work-in-process and products which are produced by other establishments by survey establishment's material). The item only includes finished products that exists in warehouses or other stockyards owned or rented by the establishment.

12. Shipment value of reference month (Million Dong)

Please report shipment value of each listed finished products. The shipment value is the shipment quantity multiplied by the shipment price where the definition of shipment quantity. The shipment value is calculated on the basis of sale invoice (excluding VAT).

13. Projected Production Quantity for the ensuing month

Please report the quantity of projected production for the next month of reference month for each listed products. Please refer the explanation for the aboved Item No 8 "Production Quantity".

II. Total Net Turnover of the Establishment (Million VND)

Please report the total net turnover of the establishment. It is total economic value that the industrial establishments achieved from their production and business activities (excluding tax). It includes (1) receipts from selling goods done by the establishment, (2) Receipts for goods sold as purchased, (3) receipts for services, (4) Receipts from interest, copyright, dividend.

Please report the total net turnover, of which the value from only industrial activities.

III. Remarks (Please describe if there were any causes resulting in differences comparing with the previous month.)

Please describe the specific causes which reflect the main factors of abnormal values comparing with the previous month.

14. Respondent's Signature

Please provide a signature of the respondent.

15. Signature of the Head of Establishment

Please provide a signature of the head of establishment.

16. Date signed by the Head of Establishment

Please provide the date signed by the head of establishment.

For any inquiries, please contact at:

General Statistics Office
Room 333, 02 Hoang Van Thu Street, Hanoi
Phone: (04) 8463483

CONFIDENTIAL

Information collected from this survey will be strictly confidential and will be published only in consolidated form.

Description of Products

Commodity 1:

Processed seafood preserved by ice or in the refrigerator at 0°C.

Commodity 2:

Processed seafood preserved at - 45°C.

Commodity 3:

Salted, dried or smoked aquatic products whether or not cooked before or during the salting, drying or smoking process. It includes smoked roes, anchovies, and shark fin.

Commodity 4-1:

Canned tuna.

Commodity 4-2:

Other canned fish and seafood.

Commodity 5:

Seafood of all kinds preserved after grinding, mincing such as fish paste, shrimp paste, etc.

Commodity 6-1:

Dried fish sauce.

Commodity 6-2:

Fish sauce of all kinds (except dried fish sauce).

Commodity 7:

Other processed seafood and aquatic products such as: well cooked products used as instant foods, sausage, ham, processed seafood for making animal feeds and other processed n.e.c.

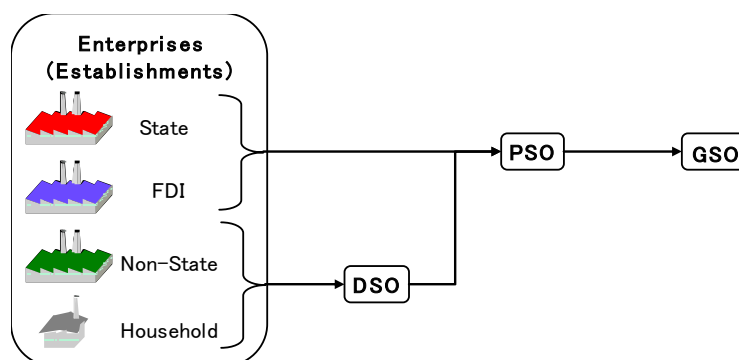
Remark:

5.1.6 Methodology for the Current Production Statistics Survey

5.1.6.1 Questionnaire Distribution Channels

The MSMIP will be conducted using survey networks of PSOs and DSOs, which are GSO's local offices. In principle, the PSOs will take care of state enterprises, foreign-affiliated companies, and some non-state enterprises, while the DSOs will be responsible for non-state enterprises and households. The DSOs will conduct field work under direct supervision of each PSO.

The questionnaire distribution channels are shown below.



5.1.6.2 Distribution and Collection of Questionnaires

(1) Distribution and collection methods

Questionnaires will be distributed by PSO and DSO enumerators twice per year (December and June), each covering six months from the next month. In the pre-survey stage or in the initial stage of the permanent survey, detailed presentation needs to be made to survey subjects (establishments). In addition, efforts should be made to establish close communication with them, depending on each PSO's judgment.

Collection of questionnaires will be made in the same manner as done for GSO's ongoing monthly industry sample survey. In other words, state enterprises and foreign-affiliated companies bring questionnaires to the PSOs by applying the reporting system. On the other hand, enumerators will visit non-state enterprises and households to collect questionnaires. They can be submitted by facsimile or online, while mail is not acceptable if the present postal situation is considered.

(2) Deadline for submission of questionnaires

The submission deadline will be set on the 11th of each month from the DSO to the PSO and on the 12th from surveyed companies to the PSO. If either date falls on Saturday or

Sunday, Monday in the following week will become the deadline. Thus, the submission deadline at the PSO will be the 14th at the latest.

5.1.6.3 Handling and Management of Questionnaires

(1) Examination

The examination on collected questionnaires will be performed by PSO or DSO enumerators who have collected them. Key checkpoints include omissions, accuracy of numbers, and the balance between related items. Any error found or doubt raised by an enumerator will be referred to the company for confirmation.

(2) Confirmation and reminding

A company that fails to submit the questionnaire before the deadline will be contacted by the PSO or DSO enumerator for reminding. Reminding should be started at least two days before the deadline, although the exact date may be set by each PSO/DSO.

(3) Data input

Data input from questionnaires that have received the examination will be conducted at each PSO, which collects questionnaires collected and examined by DSOs. Data so inputted at each PSO will be sent to the GSO where data from all over the country are compiled and tabulated. (See Chapter 6 for details of data input activity.)

(4) Management of collected questionnaires

Questionnaires from which data input has been completed will be kept by each PSO for three years.

5.2 Dissemination

5.2.1 Dissemination Policy

Essentially, statistics compiled by government's statistics bureau are public goods and their dissemination method and content are considered to be very important. In particular, current production statistics that are based on monthly data lose their significance and value if dissemination is delayed, and thus promptness as well as accuracy is highly critical. In other words, they have to be compiled and published in such way to satisfy their users in terms of timeliness, in addition to the dissemination method and content. The plan therefore sets forth the following policy for dissemination of current production statistics.

- (1) Dissemination is made promptly unless it adversely affects statistical reliability.
- (2) Dissemination is made in a fair manner to all users.
- (3) Dissemination is made on the day fixed and announced in advance.
- (4) Dissemination is made separately and independent of opinions of related ministries.
- (5) Dissemination contains analysis and explanation that is appropriate or required for convenience of users.
- (6) Dissemination contains explanation on statistical techniques employed, including the survey and data processing methods.
- (7) Dissemination is accompanied by organized user service, such as responding to questions.

Naturally, almost all of the above policies are already practiced or aimed at by statistical bureaus in most countries, including the GSO. In Vietnam, the Statistics Law enacted in 2003 and the "Guideline for Statistical Development toward 2010" announced in 2002 set forth similar policies. Thus, the dissemination system for current production statistics including indices will be established by putting the above policies into practice as far as possible in the processing of building up the statistical system by 2008.

5.2.2 Dissemination Rules and Procedures

Dissemination will be made according to the following rules and procedures. Specific dates relating to dissemination, as mentioned below, will be determined by the MSMIP Supervisory Board.

- (1) Results of the current production statistics survey are published at the end of the month following the survey month and final results in a specified month each year.
- (2) Dissemination dates for quick report and definite report are fixed in advance and dissemination is made on the dates as far as possible.
- (3) Current production statistics on a national level and indices, both quick and definite reports, are published on the GSO's Web site and by printed reports. Also, the gist of final results

is published on the GSO's Web site and detailed data by province form of ownership, company size, and other attributes are published in printing matters.

- (4) National-level data, both quick and definite reports, are published in Vietnamese and English.
- (5) The GSO is responsible for dissemination of national and regional statistics (eight economic divisions) and the PSO publishes provincial and municipal statistics. Note that the method and content of provincial and municipal statistics is determined through the detailed assessment of the local needs and prior consultation with the GSO.

While dissemination is expected to start formally in February 2007 upon an official announcement of the premiere's decree on the MSMIP, the GSO is expected to establish the ability to publish the new statistics timely and accurately by gaining experience in informal dissemination during the pre-survey period, provided that such dissemination should be made by specifying that current production statistics so published are in the development stage and do not meet all the requirements for official statistics.

5.2.3 Items to be Disseminated

In light of the fact that statistics are public goods, dissemination covers all survey items, provided that an item - which dissemination violates confidentiality under the Statistics Law – is excluded from the dissemination list. Specific items to be published and related rules are summarized as follows.

- (1) Total data on production, shipment, inventory, and production forecast for each commodity subject to the statistical survey, both quick and definite, constitute basic survey items, provided that data on any commodity that lacks appropriate representative are excluded from the dissemination item.
- (2) Based on the survey results, indices relating to production (including forecast), shipment and inventory are published in both quick and definite reports. The base period is January 2006 for the pre-survey and the annual average for 2006 in 2007 and afterwards when the official survey is scheduled to be conducted. It should be noted, however, that the base period will be determined by the GSO by the end of 2006 after the difference in surveyed industries and commodities between the pre-survey and the official survey, and industries and commodities covered by the official survey will be proposed by the GSO and will be evaluated and approved by the MSMIP Supervisory Board.
- (3) For official dissemination, descriptive analysis of major trends as well as numerical data is presented.

- (4) From the viewpoint that statistics are public goods, dissemination covers all survey items. However, any item which is confidentiality may be violated, including the request for non-disclosure by a survey subject, is excluded from dissemination. A final decision is made by the MSMIP Supervisory Board, in due consideration to previous practice and ruling in Vietnam.
- (5) In the future, dissemination of detailed data by each of the eight regional blocks, form of ownership, and size of employment will be considered.
- (6) Dissemination of results of household enterprise survey to be conducted during the pre-survey will be decided by the GSO after evaluation of the survey results (statistical data) in terms of accuracy and reliability.

5.2.4 Dissemination Procedures

Just like any other statistics, dissemination of current production statistics should be done after a close examination on their accuracy in order to ensure reliability of government statistics. For current production statistics, reliability assured by a close examination is as important as promptness. To meet these requirements, the following general rules are set as to dissemination procedures.

- (1) Dissemination of both quick and definite reports is made upon approval by the MSMIP Supervisory Board. Web site dissemination is made by the division in charge of Web site maintenance, also subject to the board's approval.
- (2) Dissemination at provincial and municipal levels is made upon examination by each PSO and under the supervision of the GSO. Dissemination may be adjusted to meet the local needs under responsibility of the PSO.
- (3) In addition of periodical dissemination of quick report (monthly) and definite report (annually) results, the reviewing and reshuffling of surveyed industries and commodities is carried out as required to reflect dynamic changes in the country's production activities. Likewise, the calculation basis for indices is reviewed and revised from time to time in order to ensure use of adequate weights.

5.2.5 Sample Disseminations

Sample disseminations on the GSO's Web site and printed materials, which are extracted from the results of Trial Survey 2, are presented below. The format and content will be reviewed and revised as required by the GSO after the pre-survey and upon implementation of the official survey.

(1) Sample dissemination on the GSO Web site

<Top Page>



GENERAL STATISTICS OFFICE OF VIETNAM

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 - Local news
 - The statistics activities
 - International cooperation
- ▶ Press release
- ▶ Statistical Data
- ▶ Statistical Censuses & Surveys
- ▶ Databases
- ▶ Statistical Methodology
- ▶ Legal documents




MONTHLY STATISTICAL INFORMATION

09 ▼ 2005 ▶



INTERNATIONAL COOPERATION

The Trial Result for the Monthly Survey of Major Industrial Products (30/12/2005)

The Trial Survey for the Monthly Survey of Major Industrial Products (MSMIP) have been conducted for 3 months from October to December of the year 2005. This is the first trial survey applying quantity based statistics in order to reflect the movement of industrial activity with higher reliability and timeliness based on the international standard. The survey also aims to calculate a trial version of the Indexes of Industrial Production (IIP).

This survey has been conducted under "the Study on the Development of Industrial Statistics in Vietnam" with the cooperation of the General Statistics Office of Vietnam, supported by the Japan International Cooperation Agency (JICA) and the Ministry of Economy, Trade and Industry (METI) of the Government of Japan.

See More Detail At:

- > [Background of the Survey](#)
- > [Survey Objective](#)
- > [Outline of the Survey](#)
- > [Survey Result for October and November 2005](#)

- ▶ Special subject of analysis
- ▶ Statistical science activities
- ▶ GDSS
- ▶ Figures and Events Journal
- ▶ Publications

Exchange Rate (19/10/2005)		
	Buy	Sell
USD	15911,00	15913,00
JPY	136,39	138,56
HKD	2038,63	2063,26
SGD	9314,16	9484,38
EUR	18875,44	19103,32
GBP	27600,51	28095,27

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<2nd Page>

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- Introduction
- News - events
 - Socio-economic news
 - Local news
 - The statistics activities
 - International cooperation
- Press release
- Statistical Data
 - Statistical Censuses & Surveys
 - Databases
 - Statistical Methodology
 - Legal documents

MONTHLY STATISTICAL INFORMATION

09 2005

INTERNATIONAL COOPERATION

The Trial Result for the Monthly Survey of Major Industrial Products (30/12/2005)

Survey Result for October and November 2005

ATTENTION: The information in this material is the summary of data acquired through the Second Trial Survey. It should be noted that the Second Trial Survey is a sampling survey for 48 manufacturing industries at the VSIC 4 level conducted in 9 major cities and provinces covered the months of October, November and December 2005. The readers should notice this information is only tentative and does not represent the entire industrial activity of Vietnam.

(1) Production Index
The production index with value-added weight increased gradually from 100.00 in October to 102.74 in November and 108.46 in December. The production index with production value weight also increased gradually from 100.00 in October to 104.97 in November and 111.37 in December. Both indexes were increased largely in "Manufacture of fabricated metal products, except machinery and equipment (VSIC 28)", and Manufacture of furniture; manufacturing N.E.C (VSIC 36)".

(2) Shipment Index
The shipment index increased from 100.00 in October to 104.80 in November and 115.33 in December. In November, "Manufacture of fabricated metal products, except machinery and equipment (VSIC 28)" and "Manufacture of furniture; manufacturing N.E.C (VSIC 36)" increased most largely. In December, "Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (VSIC 19)", "Manufacture of other non metallic mineral products (VSIC 26)", "Manufacture of electrical machinery and apparatus N.E.C (VSIC 31)" increased most largely.

(3) Inventory Index
The inventory index decreased from 100.00 in October to 97.15 in November and increased to 99.72 in December. In November, "Tobacco products (VSIC 16)" and "Manufacture of motor vehicles, trailers and semi-trailers (VSIC 34) decreased the most significantly. In December, "Manufacture of furniture; manufacturing N.E.C (VSIC 36)" and "Manufacture of chemicals and chemical products (VSIC 24)" increased most largely.

Index Calculation Results

VSIC	Industry	Item	Index(Oct. 2005=100)		
			Oct.	Nov.	Dec.
D	Manufacturing (48 Industries) @	Production Index (Value-added weight)	100.00	102.74	108.46 p
		Production Index (Prod. value weight)	100.00	104.97	-
		Shipment Index	100.00	104.80	-
		Ending Inventory Index	100.00	97.15	-

[See the Results in detail HERE.](#)

For further inquiries , please contact:
General Statistics Office
Industrial and Constructional Department,
02 Hoang Van Thu Street, Hanoi
Phone: (04) 8463483

See More Detail At:
[> Background of the Survey](#)
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- Special subject of analysis
- Statistical science activities
- GDDS
- Figures and Events Journal
- Publications

Exchange Rate (19/10/2005)

	Buy	Sell
USD	15911.00	15913.00
JPY	136.39	138.59
KRW	2038.63	2063.25
SGD	9314.16	9464.38
EUR	18875.44	19103.32
GBP	27600.51	28095.27

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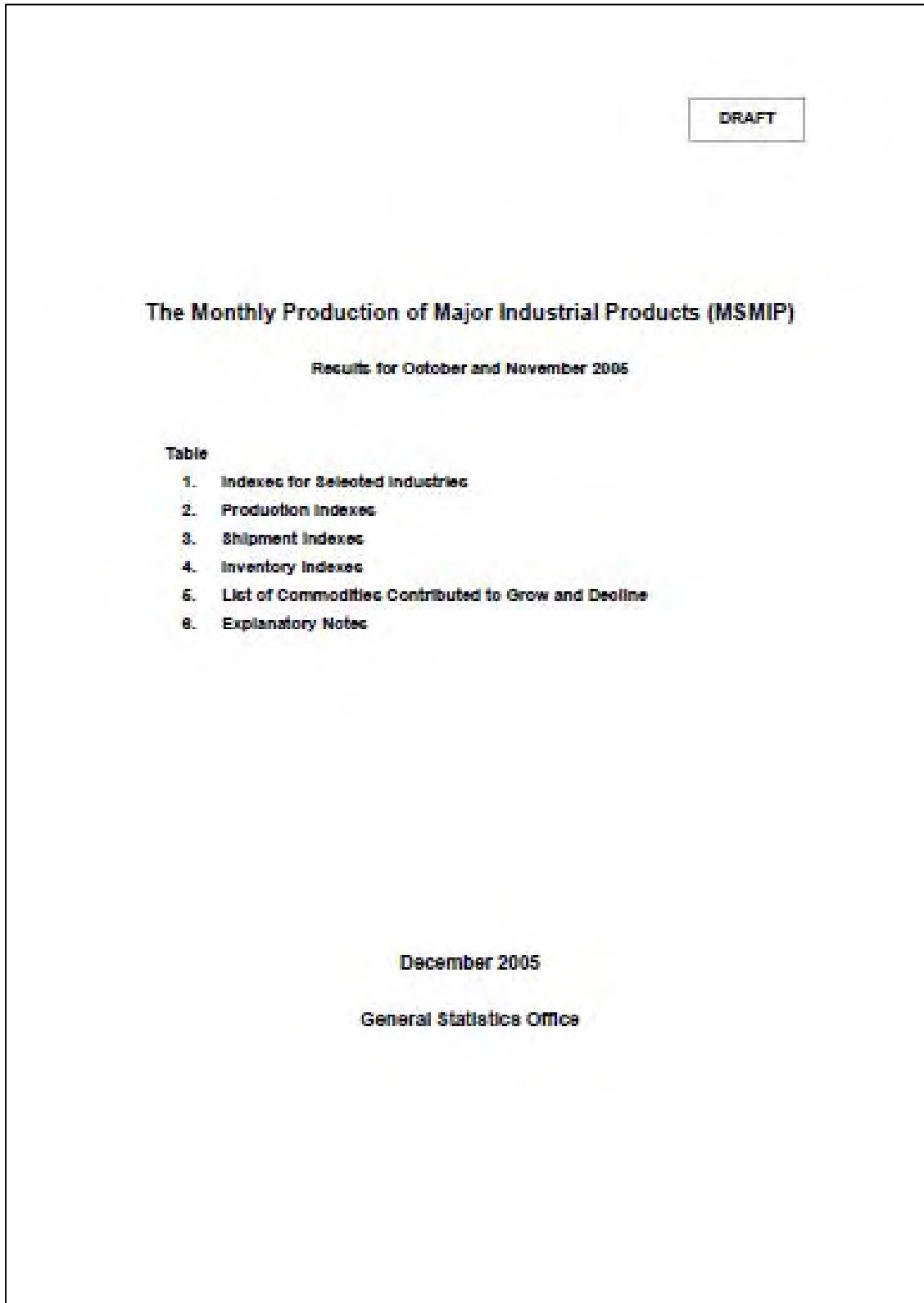
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Search

5 - 19

(2) Sample disseminations of the printed materials

<Top Page>



<1st Page>

Indexes for Selected Industries

VSIIC	Item	Index (October 2005=100)			
		October	November	December	January
D	Production Index (Value Added Weight)	100.0	120.9	123.5	124.9 p
	Production Index (Production Value Weight)	100.0	116.6	120.4	-
	Shipment Index	100.0	316.4	333.8	-
	Inventory Index	100.0	135.1	123.1	-

Production Indexes for Selected Industries (Value Added Weight)

VSIIC	Industry	Index (October 2005=100)			
		October	November	December	January
15	Manufacture of food products and beverages	100.0	120.7	143.0	91.1 p
16	Manufacture of tobacco products	100.0	108.6	79.1	100.8 p
17	Manufacture of textiles	100.0	85.6	85.1	121.3 p
18	Manufacture of wearing apparel, dressing and dyeing of fur	100.0	170.9	131.2	186.5 p
19	Tanning and dressing of leather, manufacture of luggage, handbags, saddlery, harness and footwear	100.0	130.9	230.7	127.3 p
20	Manufacture of wood and of products of wood and cork, except furniture	100.0	199.3	214.3	174.5 p
21	Manufacture of paper and paper products	100.0	109.5	91.7	157.3 p
22	Publishing, printing and reproduction of recorded media	100.0	1.8	76.3	17.7 p
24	Manufacture of chemicals and chemical products	100.0	159.7	156.8	117.9 p
25	Manufacture of rubber and plastic products	100.0	86.5	109.5	76.3 p
26	Manufacture of other non	100.0	172.8	84.7	211.1 p
27	Manufacture of basic metals	100.0	104.3	102.0	73.7 p
28	Manufacture of fabricated metal products, except machinery and equipment	100.0	80.2	113.4	90 p
29	Manufacture of machinery and equipment n.e.c.	100.0	86.1	122.2	131.9 p
30	Manufacture of office and computing machinery	100.0	50.5	32.0	44.4 p
31	Manufacture of electrical machinery and apparatus n.e.c.	100.0	81.1	104.0	67.1 p
32	Manufacture of radio, television and communication equipment and apparatus	100.0	152.3	161.9	167.8 p
34	Manufacture of motor vehicles, trailers and semi	100.0	152.9	126.9	105.2 p
35	Manufacture of other transport equipment	100.0	36.5	35.7	101.8 p
36	Manufacture of furniture, manufacturing n.e.c.	100.0	113.4	89.1	86.4 p

5.3 Development Schedule

To establish a formal system for current production statistics in the next two years (May 2006 ~ June 2008), its development schedule (work items and time schedule) is presented as follows (see Fig.5-2). The development process is divided into the following three stages, and activities required for each stage will be carried out under the leadership of the GSO's Industry and Construction Statistics Division.

- (1) Preparation period for formalization (May 2006 - January 2007)
- (2) First year of the official survey (February 2007 - January 2008)
- (3) Second year of the official survey (February 2008 and after)

5.3.1 Preparation Period for Formalization (May 2006 - January 2007)

This period allows for the formal procedures relating to the MSMIP, including legislation, and preparation for implementation of the official survey, following the completion of the JICA development study. At the same time, the GSO will implement a pre-survey covering selected areas and industries. As the pre-survey will be conducted concurrently with the ongoing Monthly Industrial Sample Survey, the preparation work will create significant workloads for the GSO, especially the Industry and Construction Statistics Division. Thus, it needs to be carefully planned and implemented according to an elaborate schedule.

Major work items

- (1) Establishment of the secretariat for MSMIP preparation to coordinate activities within the GSO and at related ministries
- (2) Procedures for issuance of Prime Minister's decree (development of a basic development plan, etc.)
- (3) Coordination with related ministries for the launching of MSMIP (including the budget request procedure)
- (4) Reviewing and selection of surveyed industries and commodities for the official survey
- (5) Correction and updating of the establishment list for the official survey
- (6) Redesign of questionnaires for the official survey and revision of manuals
- (7) Guidance for enumerators and establishment in newly selected areas
- (8) Construction of the dissemination system
- (9) Improvement of data analysis capability (through workshops based on the pre-survey results)

To launch the MSMIP in February 2007, the premiere's decree designating it as official statistics must be issued by the end of 2006, not to mention the establishment of the system and organization within the GSO and the securing of the necessary budget. Furthermore, the guidance to enumerators and establishments are significantly important in above major work items, and the assurance of sufficient budget and time shall be obtained to accomplish it.

5.3.2 Implementation of the Official Survey - First Year (February 2007 - January 2008)

The formalization procedure will be completed by the end of 2006 and the MSMIP as official statistics designated by law will be launched in February 2007 (the survey month will start in January 2007). While the MSMIP will replace the ongoing Monthly Industrial Sample Survey, whether the survey will be able to cover all 64 provinces from the beginning depends on the ability to complete the preparation work by the end of 2006. To ensure smooth implementation of the statistical system, the basic development plan as proposed here envisages a staged increase in coverage and an entire coverage of 64 provinces in the second year. As a result, the first year of implementation will require activities relating to formalization, as continued from the preparation period, which are summarized as follows.

Major work items

- (1) Establishment of the MSMIP Supervisory Board
- (2) Educational and promotion activities for potential users (including private enterprises)
- (3) Reviewing and selection of surveyed industries and commodities for completion of the MSMIP
- (4) Correction and updating of the establishment list for completion of the MSMIP
- (5) Redesign of questionnaires and revision of manuals for completion of the MSMIP
- (6) Guidance for enumerators and establishment in newly selected areas
- (7) Improvement and construction of the dissemination system
- (8) Improvement of data analysis capability

5.3.3 Implementation of the Official Survey - Second Year (February 2008 and later)

The second year will constitute the final completion stage for the MSMIP. If it is not feasible to cover all 64 provinces in the first year (2007) of the official survey, the second year will aim at perfection of the current production statistics survey. Thus, the most important task in the second year is the establishment of the entire survey process up to dissemination.

Major work items

- (1) Educational and promotion activities for potential users (including private enterprises)
- (2) Reviewing of industries and commodities covered by the MSMIP and completion of the commodity list for GSO industrial statistics
- (3) Correction and updating of the establishment list for the MSMIP and preparation of a master sample list
- (4) Guidance for enumerators and establishment in newly selected areas
- (5) Improvement and construction of the dissemination system
- (6) Improvement of data analysis capability
- (7) Awareness survey of potential users of current production statistics

5.4 Operating Budget

The operating budget for the MSMIP will mainly consist of survey costs covering non-state enterprises and households that are required for management of the survey system, while the existing reporting system will be fully utilized. Also, the budget should allow for costs relating to preparation for formalization up to 2008, startup and full-fledged operation in the first two years, including promotional activities. Based on the above principles, the annual operating budget is established as follows.

(1) Training program for enumerators	\$15,400
(Including training costs for a total of 400 persons, including facility, accommodation, transportation and documentation costs)	
(2) Questionnaire and manuals (printing)	\$36,500
(Questionnaires: \$0.6/sheet x 5,000 sheets x 12 months = \$36,000)	
(Printing of enumerator manual: \$1.0 x 500 = \$500)	
(3) Survey management	\$216,000
(\$4.0/questionnaire sheet x 4,500 sheets x 12 months = \$216,000)	
(4) Commissioning to IT Center	\$9,600
(\$800 x 12 months = \$9,600)	
(5) General administration (including educational/promotion activities)	\$2,000
<hr/>	
Total	\$279,500

The above estimates are based on the assumption that the survey covers 4,500 establishments (questionnaires) per month. As pointed out earlier, the current production survey is designed to collect statistical data on a provincial and municipal basis, in addition to commodity-based data, necessitating an increase in coverage of non-state enterprises and households and thus creating an additional cost accordingly. Secondly, the operating budget includes costs relating to the enumerator training program and educational and promotional activities for current production statistics. Furthermore, the survey management cost includes costs relating to the use of the ongoing reporting system for collection of questionnaires from state enterprises and foreign companies. Thus, it may be reduced in certain cases.

The GSO's 2006 budget allocates 320 million VND (\$201,000) for the Monthly Industrial Sample Survey that will be replaced with the MSMIP. At present, the survey covers approximately 18,000 establishments (of which 64% are households) each month, which constitutes an estimation basis different from the above. However, if the special factors mentioned earlier are added, the budget allocated to the Monthly Industrial Sample Survey seems to take care of full-scale implementation of the MSMIP effectively. While it takes the form of budget appropriation, the budgeting procedure requires a formal approval as a new program budget. Thus, it is important to review the basic development plan in the first half of

2006 and ensure a prompt coordination on the operating budget with related ministries and organizations.

Chapter 6 Fundamental Designing for the
Development of the Index of
Industrial Production (IIP)

Chapter 6 Fundamental Designing for the Development of the Index of Industrial Production (IIP)

6.1 Outline of Current Indexes in Vietnam

The Index of Industrial Production (the IIP) represents an overall picture of industrial activities in a country or a district, which is typically expressed in time series data. Since the IIP provides a general description of industrial activity in a timely manner, it is generally used as a key figure in industrial and economic analysis.

There are a number of methods for calculating the IIP. The most common method is the application of the Laspeyres formula that is a weighted average of production quantity evaluated at the price of a base period. For instance, Japan compiles the Laspeyres index using value-added in the year 2000 as the weight. Compilation involves modification of commodity selections and weight calculation in every five years. Other than the Laspeyres formula, the Paasche formula and the Fischer formula are used in some countries to reflect local conditions. The Paasche formula applies a weighted average of production quantity evaluated at the price of the current period, and the Fisher formula applies a geometric average of the Laspeyres and Paasche indexes.

In order to develop the IIP for Vietnam, it is imperative to focus on the capability of source data collection and international comparability as well as the accuracy of statistics. The following section explains the methodology of index calculation currently applied in Vietnam, discussed the issues to concern in the current index, and describes a new methodology for the IIP compilation.

6.1.1 Index Calculation for Statistics in Vietnam and Major Issues

6.1.1.1 Index Calculation for Statistics in Vietnam

The index calculation in Vietnam is made using the “constant price method”. This method has been implemented since 1961, and modified four times in 1970, 1982, 1989 and 1994. As shown below, the production index currently used in Vietnam is a growth rate of production values expressed in constant price.

➤ Production Index of Vietnam at time t:

$$I_t = \frac{\sum P_0 Q_t}{\sum P_0 Q_{t-1}} \times 100 \dots\dots\dots (1)$$

where

- I_t = Production Index at time t
 P_0 = Constant price
 Q_t = Production quantity at time t
 Q_{t-1} = Production quantity at time t-1

It should be noted that the production value expressed in constant price is reported by enterprises surveyed. Thus, the statistics offices at the central and regional levels do not obtain production quantity (Q), but only production value in constant price ($\sum P_0 Q_t$).

The production index of Vietnam, as stated above, is a growth rate of production value at constant price. In principle, it is theoretically identical to the Laspeyres formula shown below because it applies a weight of the base period.

$$\text{Laspeyres Production Index} = \frac{\sum P_0 Q_t}{\sum P_0 Q_0} \times 100$$

The difference between the standard Laspeyres index and the Vietnamese index is the time of comparison. That is, the standard Laspeyres index sets the production quantity of the base period at the denominator. On the other hand, the Vietnamese index uses the production quantity of the previous time period as the denominator. This implies that the deduction of 100 from the standard Laspeyres index provides a growth rate between the current and base time periods, while the one of Vietnamese indexes provides a growth rate between the current and previous time periods. If one calculates a factorial of Vietnamese index from the base time to the current time, it is identical to the standard Laspeyres index as shown below.

Factorial of Vietnamese index from the base time to the current time period

$$\begin{aligned}
 &= \frac{\sum P_0 Q_t}{\sum P_0 Q_{t-1}} \times \frac{\sum P_0 Q_{t-1}}{\sum P_0 Q_{t-2}} \times \dots \times \frac{\sum P_0 Q_1}{\sum P_0 Q_0} \\
 &= \frac{\sum P_0 Q_t}{\sum P_0 Q_0} \quad (\text{Standard Laspeyres Index})
 \end{aligned}$$

6.1.1.2 Major Issues to be Addressed

Theoretically, the Vietnamese index can be viewed as a derivation of the Laspeyres index, which is widely used in other countries including Japan. It is also noteworthy that the Vietnamese index is convertible to the standard Laspeyres index by taking a factorial from the base time to the current time. However, the weakness of the Vietnamese index lies in several issues listed below.

(1) Application of Constant Price in 1994

In the questionnaire, each enterprise is requested to consult with the 1994 Constant Price Table in order to calculate the production value in constant price. This table was prepared in 1995 and contains more than 850 commodities. The problem arises because this table has not been updated since 1995. Especially, there are cases that enterprise cannot find new commodities such as IT products to fill out the questionnaire. Thus, there is a possibility that the index cannot accurately reflect the changes in overall production as it may not clearly reflect the production of new commodities.

(2) Lack of Integrity in Constant Price

The production value at constant price is calculated by each enterprise. When commodities are listed in the price table, each enterprise can simply apply the listed price in the calculation. However, when it is not the case, each enterprise may calculate the constant price by himself/herself by taking a weighted average of similar commodities. This entails an extremely complicated process in selection of similar commodities, calculation of weighted average, and reflection of the price in new commodities. This may create a risk of miscalculation of the constant price. Also the constant price for new commodities may deviate among enterprises due to the fact that the selection of similar commodities is separately made by each enterprise even if they calculate the price for the same commodity.

(3) International Comparability

The compilation method used in Vietnam differs significantly from those used in other countries. As shown in the list below, most countries use 100 as an index in the base year. On the other hand, the Vietnamese index uses 100 for the last month. As the representation style of the Vietnamese index is not very common in other countries, there is a risk of resulting in the misuse of the index, which may sacrifice international comparability.

Reference: IIP Calculation Methods

Country	Calculation Formula	Year /Month set at 100	Weight
Argentina	Laspeyres	1997	Value added
Australia	Chained Laspeyres	Last year	Value added
Austria	Laspeyres	2000	Value added
Belgium	Laspeyres	2000	Value added
Brazil	Laspeyres	1985	Value added
Bulgaria	Laspeyres	2000	Value added at factor costs
Canada	Chained Fisher	-	Value added
Chile	Laspeyres	1989	Value added
Colombia	Laspeyres	2001	-
Costa Rica	Laspeyres	1991	Value added
Croatia	Laspeyres	2000	Gross value added
Czech	Laspeyres	2000	Value added
Denmark	Laspeyres	2000	Value added cost at factor cost
Ecuador	Laspeyres	1993	Production at basis prices
El Salvador	Laspeyres	1990	Gross industrial value of production
Estonia	Chained Paasche	1995	Value of production
Finland	Chained Laspeyres (partly modified)	2000	Value added
France	Laspeyres	2000	Value added
Germany	Laspeyres	2000	Net output values
Greece	Laspeyres	1995	Gross Value added at factor cost
Hong Kong	Chained Laspeyres	2000	Value added
Hungary	Chained Paasche	1992	Gross output
Iceland	Laspeyres	1990	Value added at factor cost
India	Laspeyres	1993-94	Gross value added
Indonesia	Discrete Divisia	1993	Value of production
Israel	Laspeyres .	1994	Gross value added at factor cost
Italy	Laspeyres .	2000	Value added at factor costs
Japan	Laspeyres	2000	Value added in production, shipment value and inventory value
Kazakhstan	Laspeyres	December 2001	Output
Kirghiz	Laspeyres	2003	Value added
Korea	Laspeyres	2000	Value added
Latvia	Laspeyres	2000	Value added
Lithuania	Paasche (Constant Price) Laspeyres (Constant Price)	1) Last month 2) Year 2000 3) Same month in the last Year	
Malaysia	Laspeyres	1993	Census Value added
Mexico	Laspeyres	1993	Value added

Country	Calculation Formula	Year /Month set at 100	Weight
Netherlands	Quasi-Laspeyres	2000	Value added
Norway	Laspeyres	1995	Value added at factor cost
Peru	Laspeyres	1994	Value added
Philippines	Chained Laspeyres	1994	Value of goods produced
Poland	Laspeyres	1995	-
Portugal	Laspeyres	1995	Gross value added
Singapore	Laspeyres	2003	Value added
Slovak	Laspeyres	2000	Value added
Slovenia	Chained Laspeyres	2000	Value added
Spain	Laspeyres	2000	Value added
Sweden	Laspeyres	2000	Value added
Switzerland	Laspeyres	1995	Value added at factor costs
Thai	Laspeyres	1995	Value added
Tunisia	Laspeyres	1990	Value added
Ukraine	Laspeyres	2001	Output value
United Kingdom	Laspeyres	2001	Gross value added at factor cost
United States	Fischer	1992	Unit value added

Reference: IMF Dissemination Standards Bulletin Board

6.2 Index Calculation by New Methodology

6.2.1 New Methodology

In order to address the issues above, it is important to: (1) collect information on production quantity in the survey questionnaire to avoid the issues of constant price; and (2) apply a methodology widely employed among other countries to ensure international comparability. It is also important to keep in mind that the purpose of current Vietnamese index is to get information on industrial activity without considering an effect of price fluctuation. Thus, the new methodology is also expected to fulfill the same role as the current index. To address these issues, it is desirable to employ a “quantity index”, which expresses the changes in production quantity by using the method commonly applied in other countries. In general, methodologies to calculate the quantity index include application of the Laspeyres formula, the Paasche formula, and the Fisher formula. The Laspeyres formula, as explained earlier, sums up quantities based on the price of the base time. The Paasche formula sums up quantities based on the price of the current time. The Fischer formula is a geometric average of these two indexes in order to share their advantages indexes. Other indexes may include a chain index that continuously links an index of the current time to the previous time in order to avoid the biases in the weight.

$$\text{Laspeyres Formula: } \frac{\sum P_0 Q_t}{\sum P_0 Q_0} \times 100$$

$$\text{Paasche Formula: } \frac{\sum P_t Q_t}{\sum P_t Q_0} \times 100$$

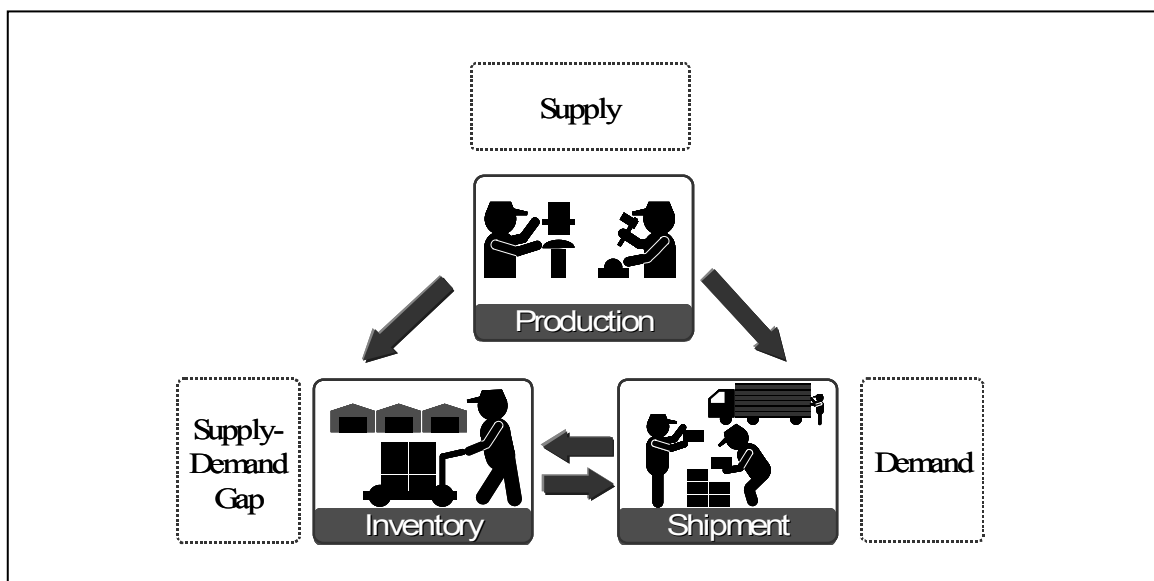
$$\text{Fischer Formula: } \sqrt{\frac{\sum P_0 Q_t}{\sum P_0 Q_0} \times \frac{\sum P_t Q_t}{\sum P_t Q_0}} \times 100$$

As stated above, there is a variety of methods in index calculation. One should note, however, that the Paasche, Fischer and/or Chain indexes involve prices at the current time period. This requires a number of tasks in index compilation as it is complex to get synthesized data between quantity and price. In addition, the Enterprise Census, which is used as a source data for index calculation, has been disseminated two years later than the reference year. Thus, these methods are not the most appropriate in order to undertake monthly compilation. On the other hand, the Laspeyres formula simply requires prices and quantities of the base time and quantities of the current time. It should also be noted that most of other countries apply the Laspeyres formula, which would provide international comparability for statistics users. Thus, it is desirable to apply the Laspeyres formula to the calculation of the Vietnamese index.

6.2.2 Items to Calculate Indexes

Currently, the Vietnamese index covers only production. In the actual industrial process, however, each production unit carries out a series of economic activities on a regular basis. This includes: (1) production by using necessary materials; (2) shipment or sales of the commodities to customers; and (3) storage of unsold commodities in inventory. These activities can be regarded as fundamental elements of economic activity: (1) supply of commodities; (2) demand of commodities; and (3) a supply-demand gap. These activities are essential in obtaining a good understanding of industrial activity.

Figure 6-1 Concepts of Index Items



Taking these factors into account, it is desirable to compile the “shipment index” and the “inventory index” in addition to the “production index” for the items to calculate indexes. Among indexes them, it is important to point out that the combination of these indexes provide a strong analytic tool in the “inventory-cycle analysis”, which provides a good indicator of the economic cycle. It should be also noted that “projected production index”, which is contained in the questionnaire items of the Monthly Industrial Survey, is also desirable especially in the phase of economic expansion. The other indicators such as capacity utilization index, production capacity index, or material consumption index might be valuable. These indicators, however, should be compiled in relation to the limits of human resources and budget. At this stage, the four indicators above mentioned should be prioritized as they have greater significance for the use of industrial statistics.

Among the four indicators, the most difficult indicator to compile is the inventory index. This comes from the fact that bookkeeping systems, especially those of small enterprises, often

lack accuracy in inventory, which may lead the complexity in filling into the questionnaire. It is derived from the business environment that inventory management has not been sufficiently organized as a business strategy in small enterprises. To address this issue, there is an alternative method to estimate the quantity of inventory from the balance of production and shipment. However, there are cases that the estimation does not accord with the actual numbers. It is therefore desirable to ask enterprises to directly enter the quantity of inventory and then to use it for index calculation rather than making an unreliable estimation for the sake of the accuracy of the inventory index.

Compilation of the Laspeyres index entails selection of weights in appropriate manner. Among the four indicators, the production index generally uses value-added or production value as the weight. Value added is used to compile an index to reflect a single series of production activity. The production value, on the other hand, is used to compile an index to make comparison with shipment and/or inventory indexes. The shipment index and the inventory index generally use the turnover and the inventory values respectively so that they can precisely reflect the share of industry.

These indicators are required to disseminate meeting with the convenience of users. This implies the representation of these indexes should be made in VSIC 1-digit and 2-digit level as a minimum requirement. It is also important to note that the dissemination should attach the weight table in order to enhance the convenience of users. In that case, extra care should be taken in order to avoid rounding error when the users make analysis by using the weight.

The paragraph below explains purpose, representation style, weight and equations used for calculation of new indexes.

Table 6-1 Items to Calculate Indexes

Index Items	Purpose	Representation	Weight
Production Index (Value-added Weight)	Representation of production or supply trend	VSIC 1 and 2 digit	Value added
Production Index (Production Value Weight)	Representation of production trends with comparison to shipment and inventory index	VSIC 1 and 2 digit	Production Value
Shipment Index	Representation of demand for commodities	VSIC 1 and 2 digit	Turnover
Inventory Index	Representation of inventory level	VSIC 1 and 2 digit	Inventory Value
Projected Production Index	Representation of production in the next reference month	VSIC 1 and 2 digit	Value added

➤ Formula for Production Index, Shipment Index, Inventory Index, and Projected Production Index

$$I_t = \frac{\sum P_0 Q_t}{\sum P_0 Q_0} = \sum \frac{P_0 Q_t}{\sum P_0 Q_0} = \sum \frac{P_0 Q_t}{\sum P_0 Q_0} \frac{Q_0}{Q_0} = \sum \frac{P_0 Q_0}{\sum P_0 Q_0} \frac{Q_t}{Q_0} = \sum \frac{W_0}{\sum W_0} \frac{Q_t}{Q_0}$$

where

- I_t : Index at time t
 P_0 : Price at base time
 Q_0 : Quantity at base time
 Q_t : Quantity at time t
 W_0 : Weight ($W_0 = P_0 Q_0$)

6.2.3 Weight Calculation

(1) Weight at Industry Level

The source data for weight calculation can be obtained from the Enterprise Census. This census provides data on value-added, production value, turnover, and inventory value of each province under all 127 industries at the VSIC 4-digit level. On the other hand, the new monthly survey does not cover all industries. This implies the sum of VSIC 4-digit in the new survey would not be identical to the VSIC 2-digit in the Enterprise Census and, hence, to VSIC 1-digit code industry.

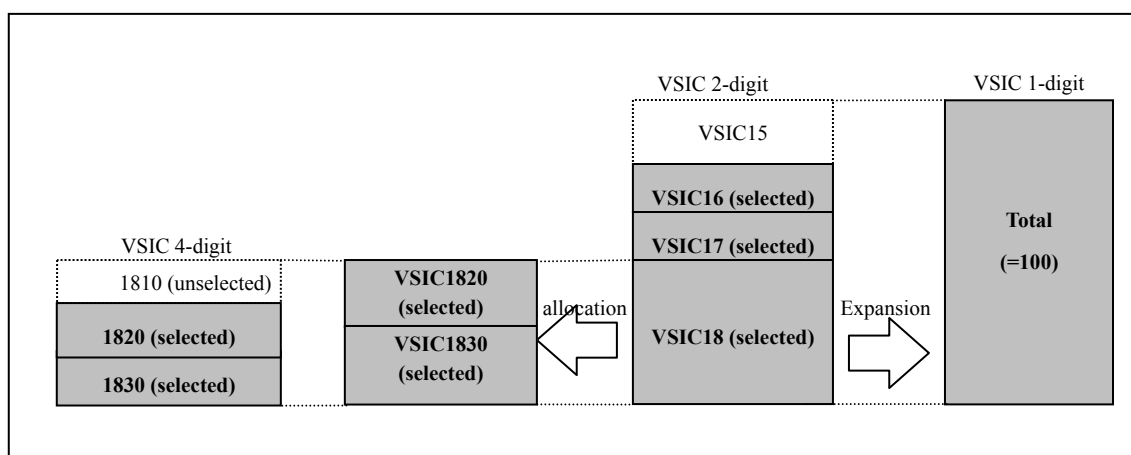
In order to deal with this situation, there are several methods to calculate the weight. One is a method called “expansion”. This method calculates a weighted share of selected industries so that they can represent the share of unselected industries. By using “expansion”, the sum of weight for VSIC 2-digit level industry becomes identical to the weight for the VSIC 1-digit level industry. Thus, it is more convenient for the users to apply the expansion method when they conduct analysis by using the index.

The weight at VSIC 4-digit level is determined by allocating the expanded weight at VSIC 2-digit level to the VSIC 4-digit level in order to harness the expanded weight at the VSIC 4-digit level. More specifically, the expansion from VSIC 2-digit level to the VSIC 1-digit level, and the allocation of expanded weight into the VSIC 4-digit level is conducted by the following equation.

$$\begin{array}{l} \text{Expanded Weight} \\ \text{of Selected Industry} \\ \text{(VSIC 2)} \end{array} = \frac{\text{Weight for the Industry (VSIC 1)}}{\text{Sum of Weight for the Selected Industry (VSIC 2)}} \times \begin{array}{l} \text{Weight for the} \\ \text{Selected Industry} \\ \text{(VSIC 2)} \end{array}$$

$$\text{Weight of Selected Industry (VSIC 4)} = \frac{\text{Expanded Weight for the Industry (VSIC 2)}}{\text{Sum of Weight for the Selected Industry (VSIC 4)}} \times \text{Weight for the Selected Industry (VSIC 4)}$$

Figure 6-2 Concept of Expansion



As mentioned above, the purpose of the expansion method is to calculate the weight so that the selected industries represent general trends in unselected industries. Now, the major issue is whether: (1) unselected industries should be grouped as one single industry and expand the selected industries by a unique expansion ratio, or (2) unselected industries should be grouped with similar industries and expand the selected industries differently by type of industry. The former would be more appropriate when there is no industry similar to the selected industry. The latter, on the other hand, would be more appropriate when the content of the unselected industry is obviously known. Therefore, it should be noted that the expansion method should be decided by taking into consideration these circumstances.

(2) Weight at Commodity Level

The Enterprise Census contains the data on value-added, production value, turnover, and inventory value at the VSIC 4-digit level. This Census, however, does not contain the individual commodity data. Thus, in order to calculate the weight for each commodity, it is imperative to use the allocation of values of each commodity such as the shipment value, and to apply them into each VSIC 4-digit level. The process involves: (1) estimation of price by dividing the shipment value by the shipment quantity; (2) estimation of production and inventory value by multiplying the price to the production quantity and the inventory quantity; and (3) application of the commodity share to the respective VSIC 4-digit data from the Enterprise Census. The summary of the weight calculation procedures for each commodity is shown below.

Value-Added Weight for Each Commodity in Production Index

$$\text{Value-Added Weight for Each Commodity} = \frac{\text{Value-added at VSIC 4 Level (Enterprise Census)} \times \text{Production Value for Each Commodity (New Survey)}}{\text{Sum of Production Value for each Commodity in VSIC 4 Level (New Survey)}}$$

where

$$\text{Production Value for Each Commodity (New Survey)} = \frac{\text{Shipment Value for Each Commodity (New Survey)}}{\text{Shipment Quantity for Each Commodity (New Survey)}} \times \text{Production Quantity for Each Commodity (New Survey)}$$

Production Value Weight for Each Commodity in Production Index

$$\text{Production Value Weight for Each Commodity} = \frac{\text{Production Value at VSIC 4 Level (Enterprise Census)} \times \text{Production Value for Each Commodity (New Survey)}}{\text{Sum of Production Value for each Commodity in VSIC 4 Level (New Survey)}}$$

where

$$\text{Production Value for Each Commodity (New Survey)} = \frac{\text{Shipment Value for Each Commodity (New Survey)}}{\text{Shipment Quantity for Each Commodity (New Survey)}} \times \text{Production Quantity for Each Commodity (New Survey)}$$

Weight for Each Commodity in Shipment Index

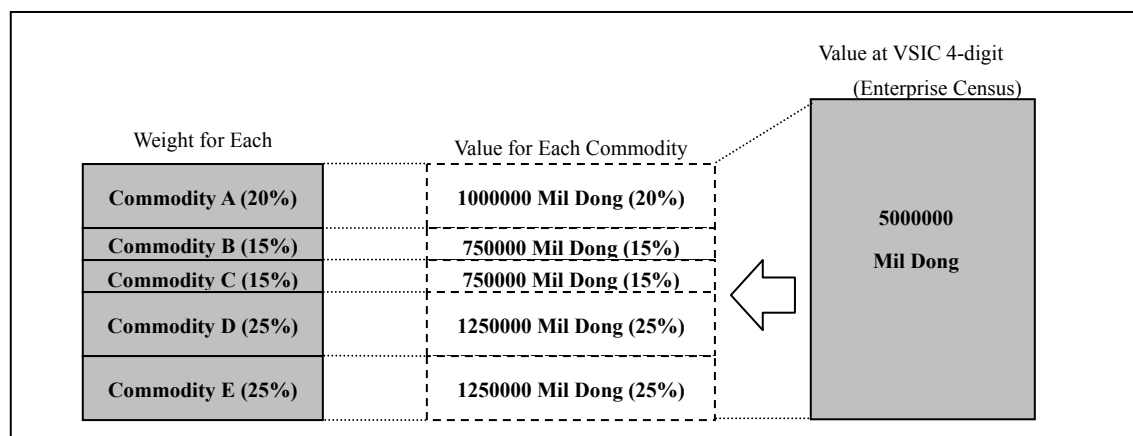
$$\text{Net Turnover Weight for Each Commodity} = \frac{\text{Net Turnover at VSIC 4 Level (Enterprise Census)} \times \text{Shipment Value for Each Commodity (New Survey)}}{\text{Sum of Shipment Value for Each Commodity (New Survey)}}$$

Weight for Each Commodity in Inventory Index

$$\text{Inventory Value Weight for Each Commodity} = \frac{\text{Inventory Value at VSIC 4 Level (Enterprise Census)} \times \text{Inventory Value for Each Commodity (New Survey)}}{\text{Sum of Inventory Value for each Commodity in VSIC 4 Level (New Survey)}}$$

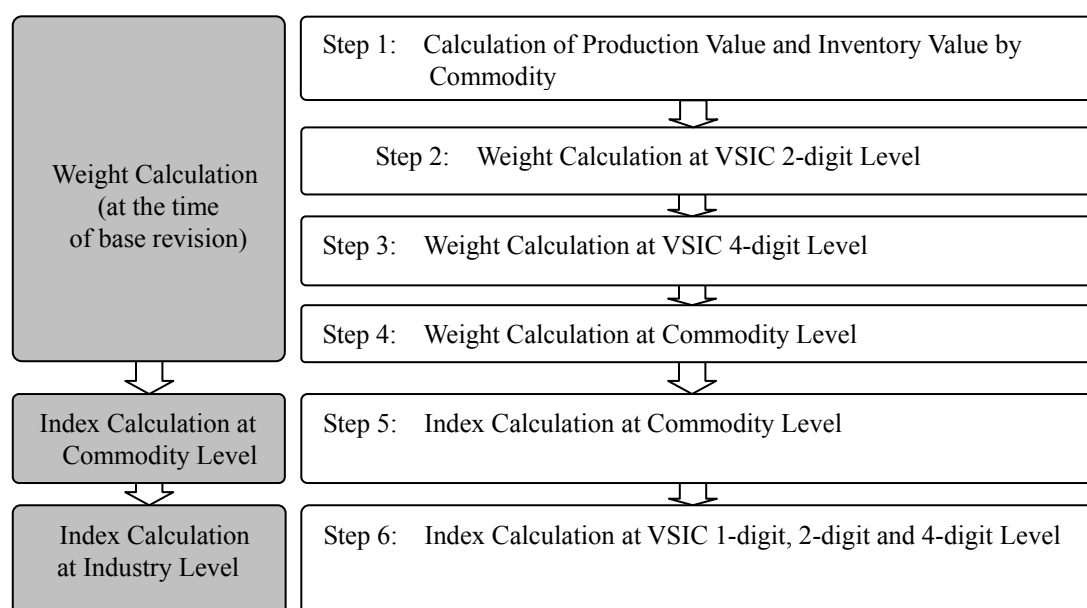
where

$$\text{Inventory Value for Each Commodity} = \frac{\text{Shipment Value for Each Commodity (New Survey)}}{\text{Shipment Quantity for Each Commodity (New Survey)}} \times \text{Inventory Quantity for Each Commodity (New Survey)}$$

Figure 6-3 Weight Calculation for Commodity**6.2.4 Data Compilation Flow for Index Calculation**

Index calculation follows six steps listed below such as weight calculation, index calculation at commodity level, and index calculation at industry level. Among them, the weight calculation is conducted only once at the time of base revision, while index calculation at commodity and industry levels is conducted every month.

The calculation may apply any computer software such as spreadsheet, database or statistics package. The calculation steps, in any case, should follow the steps mentioned below whatever the type of software applied. The chart below explains the compilation flow of index calculation.

Figure 6-4 Compilation Flow of Index Calculation

6.2.5 Index Calculation Procedure

The Trial Surveys conducted under this Study used Foxpro for data management and Excel for index calculation. These software programs are used because Foxpro has already been widely used by the statistics offices of Vietnam and that Excel has been installed in most of the PSOs, which provides advantages in the versatility. It is planned to utilize SQL Server that has high scalability to respond for dramatically increasing data volume in the Pre-Survey and the Official Survey. In such case, it is considered that whatever software is applied, there will be no differ on results if the calculation follows the basic steps.

In passing, the data for weight and index calculation should be obtained each time of calculation. For example, the Foxpro in the Trial Survey contains original commodity data such as quantities of production, shipment, ending inventory, projected production in the next month, and shipment value as in the following table. This step may be omitted when the database is set directly to calculate the index.

Example: Foxpro Output

VSIC	Code	Production			Shipment			Ending Inventory			Projected Production in the Next Month			Shipment Value (Million Dong)		
		T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12
1512	1-1	6173.3	273.5	8628.1	8543.6	8652.2	4882.3	1314.7	4166.8	3973.6	6399.8	5023.8	821.5	9974.4	536.1	7016.9
1512	2-1	4983.1	1249.3	1030.3	876.1	6051.3	2347.7	8908.7	4000.6	2056.1	4689.2	5117.1	6848.1	7148.5	7852.0	6557.6

Step 1: Calculation of Production Value and Inventory Value by Commodity

In the first step, calculate production value and inventory value. Shipment price is applied for the calculation of each value where shipment price is obtained from shipment value divided by shipment quantity. More specifically, the calculation follows the equation below.

$$\begin{aligned} \text{Production Value} &= \text{Shipment Value} / \text{Shipment Quantity} \times \text{Production Quantity} \\ \text{Inventory Value} &= \text{Shipment Value} / \text{Shipment Quantity} \times \text{Inventory Quantity} \end{aligned}$$

Example (Calculation of Production Value):

	Base Period			Calculation of Production Value at Commodity Level		Base Period	
	Production Quantity	Shipment Quantity	Shipment Value				Production Value
Commodity A (VSIC1512)	100	100	1000		Commodity A (VSIC1512)	1000	
Commodity B (VSIC1512)	50	10	100		Commodity B (VSIC1512)	500	
Commodity C (VSIC1514)	20	30	3000		Commodity C (VSIC1514)	2000	
Commodity D (VSIC1810)	50	60	6600		Commodity D (VSIC1810)	5500	

Step 2: Weight Calculation at VSIC 2-digit Level

Using data from the Enterprise Census, calculate weight at VSIC 2-digit level by applying the “expansion” explained in Section 6.2.3. More specifically, the calculation follows the equation below.

$$\text{Expanded Value Added Weight at VSIC 2-digit} = \frac{\text{Value Added at VSIC 1-digit}}{\text{Sum of Value Added at VSIC 2-digit Covered in the Survey}} \times \text{Value Added of the Industry at VSIC 2-digit}$$

$$\text{Expanded Production Value Weight at VSIC 2-digit} = \frac{\text{Production Value at VSIC 1-digit}}{\text{Sum of Production Value at VSIC 2-digit Covered in the Survey}} \times \text{Production Value of the Industry at VSIC 2-digit}$$

$$\text{Expanded Turnover Weight at VSIC 2-digit} = \frac{\text{Turnover at VSIC 1-digit}}{\text{Sum of Turnover at VSIC 2-digit Covered in the Survey}} \times \text{Turnover of the Industry at VSIC 2-digit}$$

$$\text{Expanded Inventory Weight at VSIC 2-digit} = \frac{\text{Inventory Value at VSIC 1-digit}}{\text{Sum of Inventory Value at VSIC 2-digit Covered in the Survey}} \times \text{Inventory Value of the Industry at VSIC 2-digit}$$

Example (Calculation of Value Added Weight):

	Data from Enterprise Census	Expansion at VSIC 2 digit		
Total Manufacturing (VSIC D)	5000000			Total Manufacturing (VSIC D)	5000000
Value added of VSIC 15	300000	Value added of VSIC 15 (Expanded)		1500000
Value added of VSIC 18	700000	Value added of VSIC 18 (Expanded)		3500000

Step 3: Weight Calculation at VSIC 4-digit Level

Using the expanded weight at VSIC 2-digit level above, allocate them into VSIC 4-digit level by using the equation below.

$$\text{Value Added Weight at VSIC 4-digit} = \text{Expanded value added at VSIC 2-digit} \times \frac{\text{Value Added of the Industry at VSIC 4-digit}}{\text{Sum of Value Added at VSIC 4-digit Covered in the Survey}}$$

$$\text{Production Value Weight at VSIC 4-digit} = \text{Expanded Production Value at VSIC 2-digit} \times \frac{\text{Production Value of the Industry at VSIC 4-digit}}{\text{Sum of Production Value at VSIC 4-digit Covered in the Survey}}$$

$$\text{Turnover Weight at VSIC 4-digit} = \text{Expanded Turnover at VSIC 2-digit} \times \frac{\text{Turnover of the Industry at VSIC 4-digit}}{\text{Sum of Turnover at VSIC 4-digit Covered in the Survey}}$$

$$\text{Inventory Weight at VSIC 4-digit} = \text{Expanded Inventory Value at VSIC 2-digit} \times \frac{\text{Inventory Value of the Industry at VSIC 4-digit}}{\text{Sum of Inventory Value at VSIC 4-digit Covered in the Survey}}$$

Example (Calculation of Value Added Weight):

	Data from Enterprise Census
Value added of VSIC 1512	100000
Value added of VSIC 1514	50000
Value added of VSIC 1810	300000

Total Manufacturing (VSIC D)	5000000
Value added of VSIC 15 (Expanded)	1500000
Value added of VSIC 18 (Expanded)	3500000

Allocation at VSIC 4 digit		Expanded value added
		Expanded value Added of VSIC 1512
		1000000
		Expanded value added of VSIC 1514
		500000
		Expanded value added of VSIC 1810
		3500000

Step 4: Weight Calculation at Commodity Level

Using the weight at VSIC 4 digit, calculate the weight at commodity level by allocating the share of each value as following.

$$\text{Value Added Weight at Commodity} = \text{Value Added Weight at VSIC 4-digit} \times \frac{\text{Production Value of Commodity}}{\text{Sum of Production Value of Commodities under the VSIC 4-digit}}$$

$$\text{Production Value Weight at Commodity} = \text{Production Value Weight at VSIC 4-digit} \times \frac{\text{Production Value of Commodity}}{\text{Sum of Production Value of Commodities under the VSIC 4-digit}}$$

$$\text{Turnover Weight at Commodity} = \text{Turnover Weight at VSIC 4-digit} \times \text{Shipment Value of Commodity} \div \frac{\text{Sum of Shipment Value of Commodities under the VSIC 4-digit}}{\text{VSIC 4-digit}}$$

$$\text{Inventory Weight at Commodity} = \text{Inventory Value Weight at VSIC 4-digit} \times \text{Inventory Value of Commodity} \div \frac{\text{Sum of Inventory Value of Commodities under the VSIC 4-digit}}{\text{VSIC 4-digit}}$$

Example (Calculation of Value Added Index):

	Value Added Weight
Expanded value added of VSIC 1512	1000000
Expanded value added of VSIC 1514	500000
Expanded value added of VSIC 1810	3500000

	Base Period
Production Value of Commodity A (VSIC1512)	1000
Production Value of Commodity B (VSIC1512)	500
Production Value of Commodity C (VSIC1514)	2000
Production Value of Commodity D (VSIC1810)	5500



Weight of Commodity A (VSIC1512)	666666
Weight of Commodity B (VSIC1512)	333333
Weight of Commodity C (VSIC1514)	500000
Weight of Commodity D (VSIC1810)	3500000

Step 5: Index Calculation at Commodity Level (every month)

This step is conducted every month. Using the quantity data from the database, calculate the index of individual commodities by taking the quantity in current month divided by the quantity in the base time period:

$$I_t = \frac{Q_t}{Q_0} \times 100$$

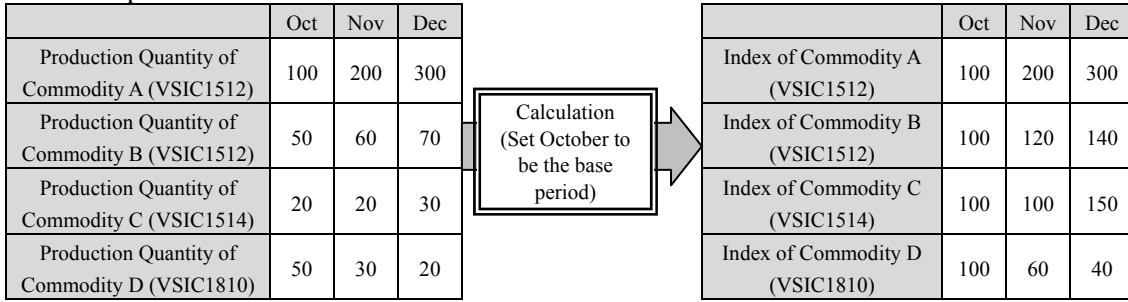
where

I_t : Index of commodity at time t

Q_t : Quantity of commodity at time t

Q_0 : Quantity of commodity at base time

Example:



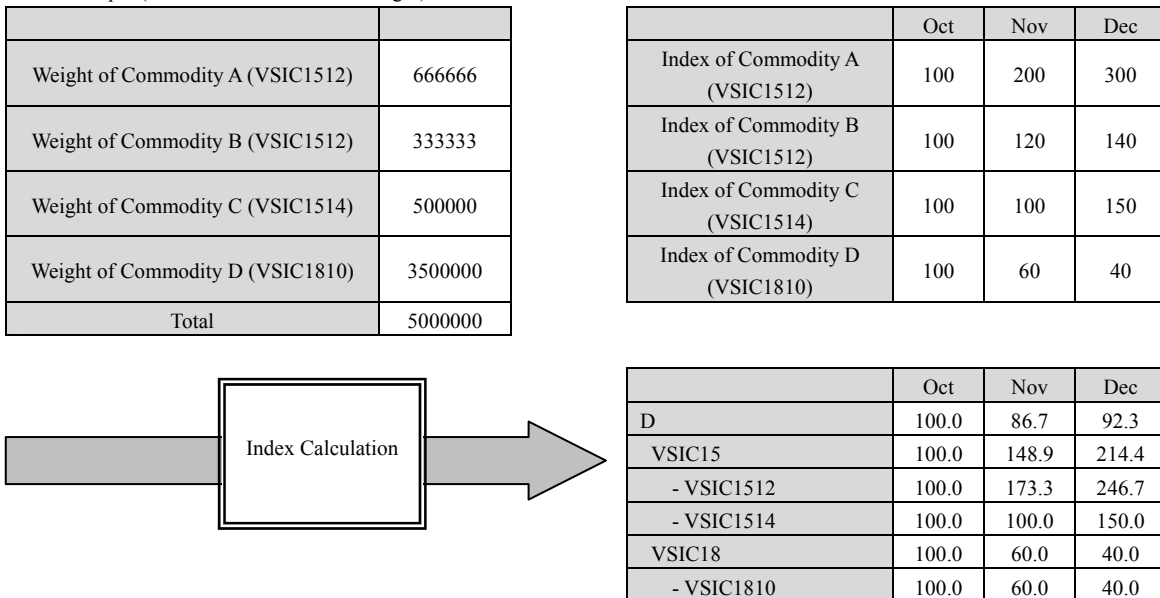
Step 6: Index Calculation at VSIC 1-digit, 2-digit and 4-digit Level (every month)

Finally, calculate the index at VSIC 1-digit, 2-digit and 4-digit levels by using the weight and index at commodity level by the following equation.

$$I_{VSIC,t} = \sum \frac{w}{\sum w} I_t$$

- $I_{VSIC,t}$ Index at industry level at time t
- I_t Index at commodity level at time t
- w Weight at commodity level

Example (Index with Value Added Weight)



Example:

- Calculation of VSIC 1-digit index (November)

$$\begin{aligned} I_{D,11} &= \sum \frac{w}{\sum w} I_t \\ &= \frac{666666}{5000000} 200 + \frac{333333}{5000000} 120 + \frac{500000}{5000000} 100 + \frac{3500000}{5000000} 60 \\ &= 86.7 \end{aligned}$$

- Calculation of VSIC 2-digit index (November)

$$\begin{aligned} I_{15,11} &= \sum \frac{w}{\sum w} I_t \\ &= \frac{666666}{1500000} 200 + \frac{333333}{1500000} 120 + \frac{500000}{1500000} 100 \\ &= 148.9 \end{aligned}$$

- Calculation of VSIC 4-digit index (November)

$$\begin{aligned} I_{1512,11} &= \sum \frac{w}{\sum w} I_t \\ &= \frac{666666}{1000000} 200 + \frac{333333}{1000000} 120 \\ &= 173.3 \end{aligned}$$

6.2.6 Revision for the Base Period and Commodity Selection

(1) Base Period Revision

The Laspeyres quantity index applies: 1) weight that represents the industrial structure, 2) major commodities of industries and 3) price evaluated at the base period. Thus, it is imperative to revise the base period when there is a change in commodity, e.g. emergence of new commodities and new industries, change in commodity prices and etc.

As stated earlier, one of the advantages applying this index is efficiency because it requires only the quantity data once the weights are prepared. On the other hand, however, it should be noted that the Laspeyres index would be “biased” if the weight of the base period differs significantly from the one of the current period. Especially, the Laspeyres index in the phase of economic growth is known to be higher than the one using the weight at the current period. The most typical case is the index with commodities made by mass production. In this case, the price is relatively high in the beginning, but it becomes gradually lower due to the volume effect. As a result, the Laspeyres index would have upper bias because the commodity growth

is evaluated at a relatively high price. Thus, the revision of weight is essential in the calculation of Laspeyres index.

At the time of revision, it is also quite frequent to reconsider the commodity classification so as to cover the new commodities in the calculation. Although the bias would be decreased if the revision is made frequently, too frequent revision would not be very efficient considering revision involves a lot of work in the statistics office. In this sense, the revision of the base period should be conducted with regard to the change in the industrial structure.

(2) Commodity Selection and Representation Ratio

Since monthly statistics requires reliability and timeliness, the index calculation should be made in efficient and accurate manner. Although it is feasible to cover all commodities in calculation, it would be burdensome to include all commodities as it requires analyzing and compiling numerous commodities under limited number of staff and computer capacity. Thus, covering all commodities in the calculation is not deemed to be very valuable as it does not necessarily increase the accuracy. Instead, covering major commodities would be more valuable as it increases the efficiency with sufficient accuracy.

The commodities would be selected by the order of production value in each industry. More specifically, at the first step, the "representation ratio" shown below is calculated. The representation ratio indicates the ratio of production value of selected commodities to all commodities in the corresponding industry.

$$\text{Representation Ratio} = \frac{\sum_{i=1}^m p_i q_i}{\sum_{i=1}^N p_i q_i}$$

where

- p_i Price of commodity i
- q_i Production quantity of commodity i
- m Number of selected commodities
- N Number of all commodities

One may wish to choose a representation ratio in consideration of manpower availability or computer capacity. The ratio, however, should be chosen by comparing to the index with using all commodities. That is, it is valuable to calculate the index with the 100% representation ratio and compare to the index with 95%, 90%, and/or 85% representation ratios. Although one may apply statistical tests such as t test or Wilcoxon test, it is important to plot the data and check them visually.

One should note it is essential to update the commodity selection so that the selection always matches the industrial structure and covers new commodities in an appropriate manner. As in the case of base period revision, however, too frequent revision of selection would be inefficient due to the limits of statistical office and the availability of data in analyzing the representation ratio. Thus, the revision of selection may be conducted at the time of base period revision. Nonetheless, it should take into account that the index calculation should always consider the relevance of commodity selection in order to calculate accurate index.

It should be also noted that the Trial Surveys conducted in this Study covered all commodities in the calculation. This is due to the fact that the quantity data with a sufficient duration, which is indispensable in analyzing the data, was not available at that time. It is, however, strongly recommended to select the commodity from the new survey in order to attain the efficiency in the index calculation.

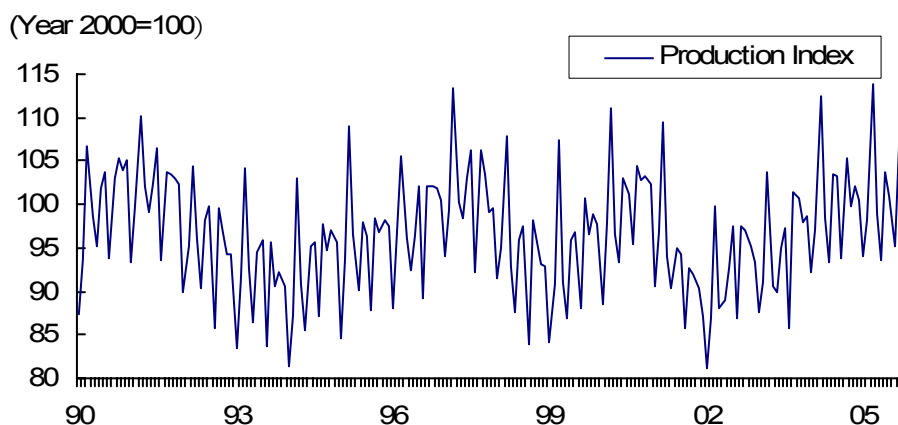
6.2.7 Analysis by Using the Indexes (Case of Indexes in Japan)

One of the advantages in applying the new index is that it serves as a powerful tool to analyze the industries. Although there are numerous methods for the use of a new index as it reflects industrial trends accurately and comprehensively without having price fluctuation, the most frequent method is the one using time series data as explained below.

(1) Analysis Using Single Series of Data

The most frequent method is to use a single series of data and to analyze industrial trends such that: (1) what time period had the largest production, (2) how the industrial trend in the recent month looks like, and (3) how the industrial cycle looks like, and etc.. For instance, the figure below shows the production index in Japan from January 1990 to October 2005 (not seasonally adjusted).

Figure 6-5 Production Index in Japan (Not Seasonally Adjusted)



As shown in the figure, the production index increases and decreases repeatedly with very volatile fluctuations. Although it is hard to see from the figure, the production index in Japan tends to increase in March as it is the end of fiscal year and to decrease in August because of the summer vacation. It is therefore important to apply seasonal adjustments in order to avoid these seasonal fluctuations. The other method more simply applicable is to take year-on-year growth rate so as to eliminate seasonality:

$$R_{i,t} = \frac{(I_{i,t} - I_{i,t-12})}{I_{i,t-12}} \times 100$$

where

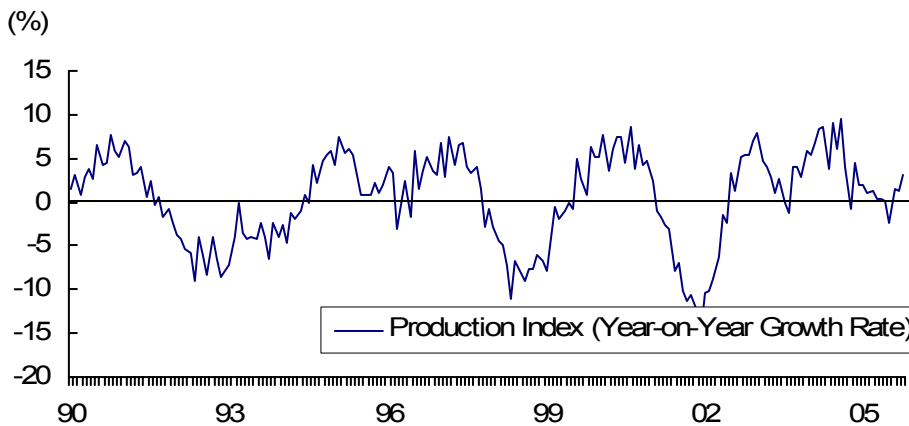
$R_{i,t}$ Year-on-year growth rate of industry i at time t

$I_{i,t}$ Index for industry i at time t

$I_{i,t-12}$ Index for industry i at time $t-12$ (same month in the previous year)

The figure below shows the same production index that is converted into the year-on-year growth rate. Although an original figure is ambiguous, the year-on-year growth rate illustrates the overall trends, which are valuable in analyzing the latest trend in industrial activity.

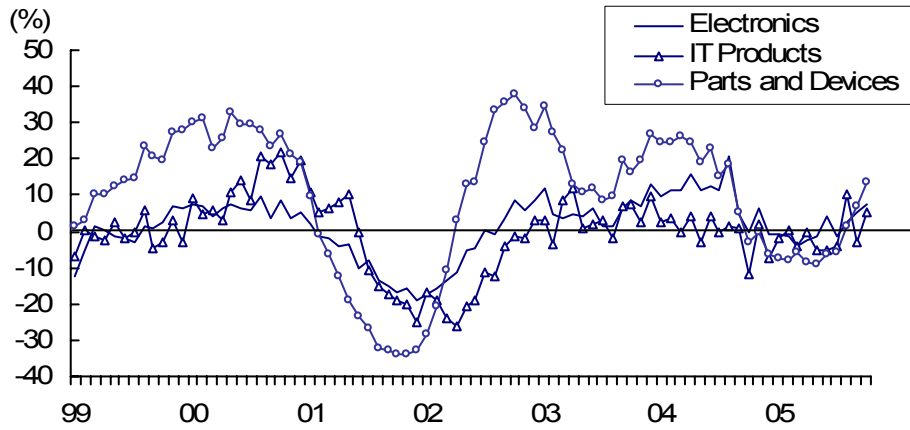
Figure 6-6 Production Index in Japan (Year-on-Year Growth Rate)



(2) Analysis Using More Than Two Series of Data

Analysis using more than two series is also frequently performed. The simplest way is to take the year-on-year growth rate and compare by industry in order to understand what industry has the highest growth in the latest month. The figure below represents the year-on-year growth rate of industries of electronics, IT products and electronic parts and devices. As shown here, the electronic parts and devices has the highest growth compared with the others in the latest month.

Figure 6-7 Production Index in Electronics, IT Products and Electronic Parts and Devices (Year-on-Year Growth Rate)



In addition, it is also frequent to examine what industry has the largest impact on the entire growth by calculating the contribution rate below:

$$CR_{i,t} = \frac{(I_{i,t} - I_{i,t-12})w_i}{(I_{ALL,t} - I_{ALL,t-12})w_{ALL}} \frac{(I_{ALL,t} - I_{ALL,t-12})}{I_{ALL,t-12}} \times 100$$

where

$CR_{i,t}$ Contribution rate of industry i at time t

$I_{i,t}$ Index for industry i at time t

$I_{i,t-12}$ Index for industry i at time $t-12$ (same month in the previous year)

$I_{ALL,t}$ Index for all industries at time t

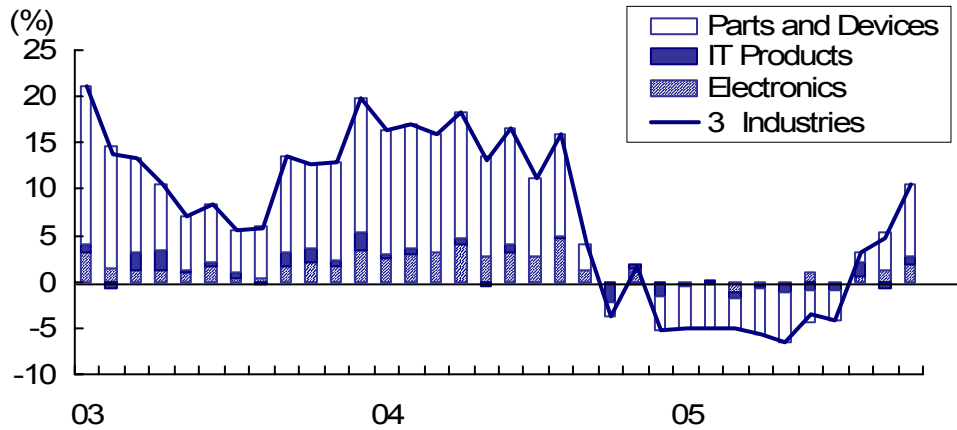
$I_{ALL,t-12}$ Index for all industries at time $t-12$ (same month in the previous year)

w_i Weight of industry i at time t

w_{ALL} Weight of all industries at time t

The figure below illustrates the contribution rate of electronics, IT products and electronic parts and devices under the three industries. As shown, the recent growth in the entire industry is contributed most largely by the industry of electronic parts and devices.

Figure 6-8 Production Index in Electronics, IT Products and Electronic Parts and Devices (Contribution Rate)

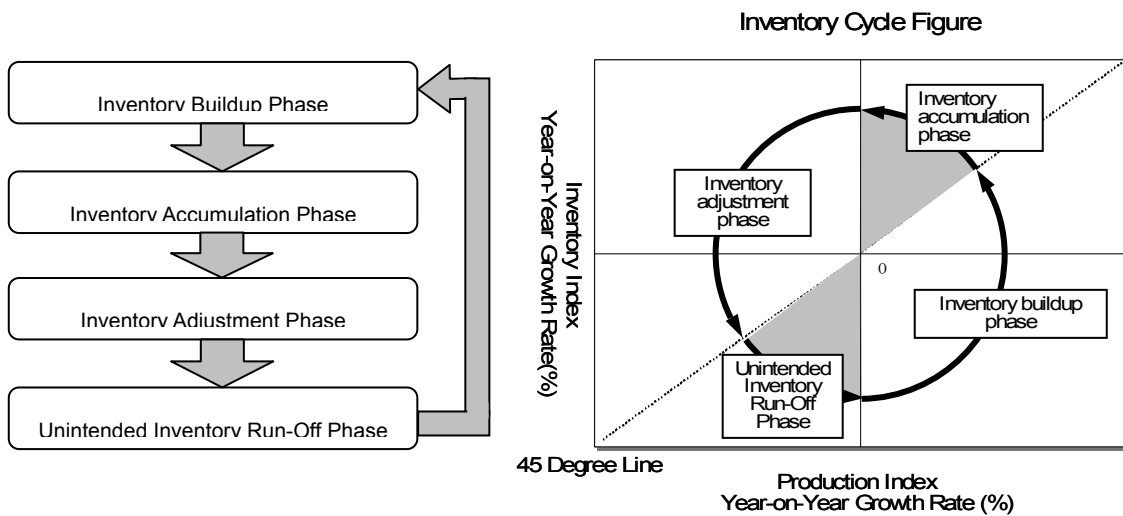


(3) Inventory Cycle Analysis

Inventory cycle analysis is a powerful analytical tool used for understanding the industrial activity by focusing on production and inventory trends. This cycle is also known as “Kitchin cycle” named after an American economist Joseph A. Kitchin who proposed this theory in his article published in 1923. The Kitchin cycle explains the link between inventory and production that occurs repeatedly in a short duration of approximately 40 months.

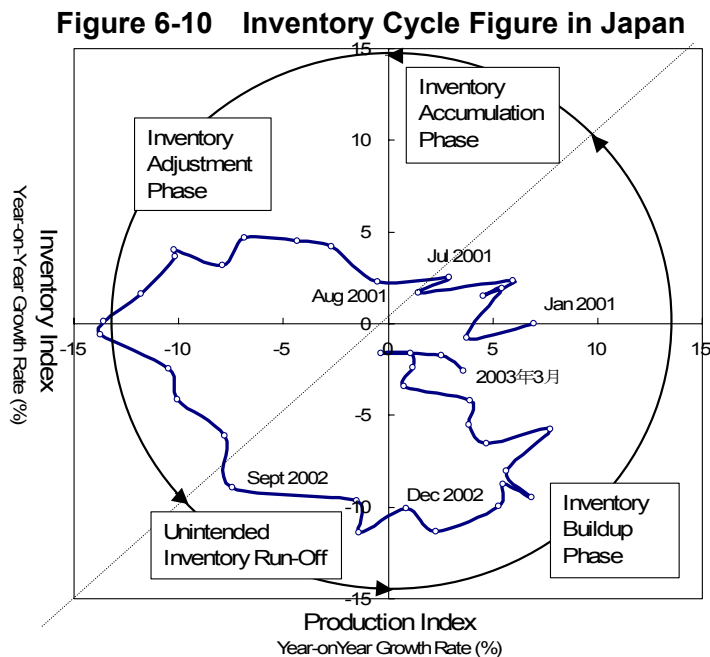
Inventory cycle analysis is made by drawing “inventory cycle figure” having the year-on-year growth rate of production index on the horizontal axis and the year-on-year growth rate of inventory index on the vertical axis. The inventory cycle tends to be counter-clockwise as shown in the figure below.

Figure 6-9 Inventory Cycle Figure



The “inventory buildup phase” denotes a phase when the industry procures raw materials at an accelerated pace to make more commodities and increases its inventory in anticipation of greater future demand. The “inventory accumulation phase” denotes a phase when actual demand falls below production, and inventory starts to build up. The “inventory adjustment phase” denotes a phase when the industry further decreases production to reduce the accumulated inventory. Finally, the “unintended inventory run-off phase” denotes a phase when both production and shipment increase, and the industry begins to build up the inventory at the time of economic pick-up.

The figure below represents a real inventory cycle in Japan using the data from January 2001 to March 2003 as an example. As shown, the inventory accumulation phase started in July 2001, the inventory adjustment phase in August 2001, the unintended inventory run-off phase in September 2002, and finally the inventory buildup phase in December 2002. The inventory cycle in this case took two years and two months to complete one cycle. This allows users to grasp the phase of industrial activity by applying the inventory cycle analysis.



6.2.8 Notes on Application of New Index

As explained earlier, the new index has several capabilities such as: (1) the new index solves problems relating to constant price that occurs in the current index, (2) the new index conforms to an international standard that ensures international comparability, and (3) the new index provides a powerful analytical tool to understand industrial activities. On the other hand, there are several conditions required for compiling the new index.

(1) Reliability of Source Data for the Weight

The Laspeyres index is calculated by taking the commodity ratio between the current and base periods multiplied by the weight. In other words, each commodity trend is represented by the index with respect to the size of weight, i.e. the weight represents the impact of each commodity in the entire industry. Thus, it should be noted that reliability of source data for determining the weight is indispensable in calculating the index.

The source data for the weight is obtained from the Enterprise Census. However, this census has some issues to concern. First, identification of an industry to which each establishment or enterprise belongs may not be accurate especially in case of new industries. Second, the weight by area or by province requires to be “estimated” as the Enterprise Census is composed of enterprise-oriented data (which provide only the consolidated data by enterprise that is not separable by area or by province). Third, the source data for the weight may lack accuracy in some provinces or industries.

Although these issues are not unique in Vietnam, they need to be resolved by enhancing the quality of compilation procedure. It should be noted that the new index requires reliable source data in order to attain the accuracy.

(2) Application of Annual Average in Quantity

The Trial Surveys conducted in this Study used a single month as a base period, i.e. October 2004 for the First Trial Survey and October 2005 for the Second Trial Survey. A major reason for applying these single months is a relatively short period of a few months, thus not presenting a serious problem when the index is developed on an experimental basis. It should be noted, however, that the application of single month may contain problems especially when the quantity data has seasonal disturbances. As mentioned earlier, the purpose of index calculation is to provide information on the industry trend in accurate and timely manner. Thus, the index should be calculated by using a stable base period, not based on a single month but on an annual average. The Pre-Survey, currently implementing, covers 60 sectors for 12 months. If the reliability of the data will be confirmed, it is recommended to adopt the average of 2006 as a base period.

(3) Application of Seasonal Adjustment

Any time series data contains seasonalities caused by the changes in natural factors such as a climate and social factors such as holidays. Vietnam also has seasonality typically in the climate of wet and dry seasons and the social customs of Tet holidays and etc.. The seasonal adjustment is a statistical methodology that removes seasonality from the time series data. In industrial statistics, there are many commodities contain seasonalities especially in food and electronics products. Thus, the application of seasonal adjustment is very valuable in order to grasp the industrial activity. This seasonal adjustment shall be reflected to the Official Survey based on the specific direction from the results of the Pre-Survey (yearly).

6.3 Basic Thoughts of System Development

6.3.1 Database Engine

(1) Processing System Used for Trial Surveys 1 and 2

During the implementation periods of Trial Surveys 1 and 2, a database was established using Visual FoxPro as database engine. Also software for data input (input screen) was developed using Visual FoxPro and functions available in the Windows system environment. The data in the questionnaires which were distributed and collected by each PSO and DSO were encoded using this input screen and data files were transmitted to GSO. The transmitted files were stored in the database server installed in the GSO's Systems Department *¹. (Processing portion 1 and 2 in Figure 6-11)

(2) Pre-survey and Institutionalized Full Scale Survey

IT Center in Hanoi will be responsible for system development for the pre-survey, which will be conducted in the beginning of the year 2006. The input screen is developed using MS-Access and as a database engine MS-SQL Server is adopted as a database engine for managing data storage. An interface module between two software, input screen and database engine, Visual Basic has been used as a development language. (Processing portion 5 in Figure 6-11)

The input screen will be delivered to each of the selected PSOs by the GSO via file transmission. Due to the participation of IT Center into the implementation of survey, the Industrial and Constructional Statistics Department will change its role from the system developer to the system user. (Processing portion 3 and 4 in Figure 6-11)

(3) Visual FoxPro and SQL Server 2000

Major comparison and characteristics between Visual FoxPro, which was used during Trial Surveys 1 and 2, and SQL Server which need to be used in the pre-survey are listed hereunder. (Refer to Table 6-2)

*¹ The file format is .dbf format of FoxPro.

Table 6-2 Overall Comparison and Characteristics of Database Engine

	Visual FoxPro	SQL Server 2000
Manufacturer	Microsoft	Microsoft
Versatility (Application)	Software package for accounting	General purpose relational database software
Configuration	Stand alone and client server type	Client server type, personal edition are also available
Use of SQL	Possible	Possible
Price	Mid range	Mid range
Expandability	Medium	High
Compatibility	Medium	High
Reputation	Medium	High

6.3.2 Basic Concept of System Development

(1) Number of Transactions

Figure 6-12 shows contents and schedules for system development. First, all data from Trial Surveys 1 and 2 data will be processed using FoxPro as a database engine. For data processing, it is assumed that the system has an interface function between data input and database establishment/analytic software. Stored data will be handed to any external application software using an export function of FoxPro and used as data for analytical purposes or making an index.

The number of transaction occurred during the Trial Surveys 1 and 2 are shown in Table 6-3.

Table 6-3 Number of Transaction Occurred During the Trial Surveys

Trial surveys/ Transactions	Trial survey 1	Trial survey 2
Number of survey provinces	3	9
Number of surveyed sectors	40	48
Number of surveyed commodities	213	524
Number of samples	500	1900+

FoxPro has a full function to process all the transactions shown in the above table.

Microsoft Access will be used for data input and SQL Server for database storage during the pre-survey that will be initiated in February 2006. These stored data will be handed to an external application package such as Microsoft Excel using an export function of SQL Server and used for index creation.

An expected number of transactions that will occur during the pre-survey and the full-scale official survey are shown in the following table.

Table 6-4 Number of Expected Transactions

Survey/Number of transactions	Pre-survey	Institutionalized survey (Tentative)
Number of survey provinces	25	64
Number of surveyed sectors	60	65
Number of surveyed commodities	590	530
Number of samples	8,500	$4,500 + \alpha < 20,000$

Not only FoxPro but SQL Server 2000 have enough capacity to handle the above indicated number of transactions.

(2) Basic Concepts of System Development

Basic concepts of system development for processing of monthly statistics can be listed as the followings *²;

1) To adopt currently used software at the GSO as core system for data processing

As previously described, relational database software has been used as the database engine to process the data in the core system. It is therefore suggested that the same software should be used in the future. Since functions of software which acts as the database engine do not vary among product names, it is not really necessary to specify a specific product name. It is because users should not pay so much attention to which software are they really using. However, when the user switches to a new relational database software program, more attention should be paid to data transfer and creation of interface program with the new application software.

2) To use a widely accepted software program and confirm its operability at the PSO/DSO levels which use old versions

The GSO has installed relatively new hardware and software. Particularly personal computers have been frequently upgraded to the latest model. Then old models are transferred to both PSOs and DSOs. Therefore, it becomes necessary to get acquainted with old and new models. Also software should be of off-shelf and popular products. Thus personnel who are responsible for system development need to understand the conditions of the environment for PC installation.

*² As described in Chapter 2.4, extension of new hardware for software development of monthly statistics processing is not necessary because the GSO's hardware system is well equipped. Therefore, in this section, the basic concept of software development is described but not hardware development. It, however, is necessary to improve number of computers and its function at DSO level in regional areas.

- 3) Systems should be transferred from the pre-survey that will start in February 2006 to the full-scale survey that will start in January 2007.

The data that are stored during Trial Survey 2 and the pre-survey will be used as targeted data even after the launching of the full-scale official survey. In this case, transfer of data should be smoothly implemented. On the contrary, when these data have not been used, they should be deleted from the database and the establishment of new data should be considered.

- 4) The system should have enough capacity to process all transactions that occurs during the pre-survey and official surveys.

The number of transactions to be processed is not discussed here as it was already discussed in the previous section.

- 5) Ease of maintenance and support, and full security function.

Since the data obtained throughout the survey include highly confidential information, unintended disclosure from the GSO or the PSO/DSO should be prevented. It is imperative to set up the security system to prevent an accidental or intentional leakage of data not only from the GSO's server system but from a personal computer installed at each PSO for data input purposes. Also it is necessary to establish the secure system for periodical maintenance of not only input software and database engine for data storage, but also the interface program software.

Upon creation of the database, most important is maintenance and support of the database itself. Maintenance includes periodical update, the establishment of the network system, and the management of the security system. To implement these maintenance and support systems, the deployment of permanent staff is required.

- 6) Continuous use of the same software

Continuous use of the same software during the certain period of time is highly desirable. Particularly, there is less needs of changing software used as database engine unless the number of transactions changes dramatically. Therefore, it is required to consider continuous use of the same software for the time being. At the moment, the SQL Server used for the Pre-Survey are pointed out problems in the first 3 months since its operation. These problems have been solved gradually, and it is now recommended to utilize it continuously with timely improvements.

The above policy also applies to software for data input. Basically the input software should not be changed regardless the changes of number and volume of transactions, and it is sufficient to add minor functions such as the improvement of data input operation and procedure, error checking functions, and the adjustment of color arrangement, etc.

7) To consider Web based software development

The most important thing to be considered relating to future system expansion is to promote the development in the web based system environment. This is important to aim at the automation of statistical processing including online distribution and collection of the questionnaire and file transfer of data to the database engine.

6.3.3 Basic Structure of Data Processing

In consideration of the basic concept of system development described in the previous section, structure of data processing to be taken thereafter is described as follows.

(1) Data processing design

A data processing flow ranging from collection, inspection, aggregation, revision and to publication should be clearly defined and delineated by indicating the roles and responsibilities of each organization such as GSO, PSOs/DSOs, and IT Center. Following major responsibilities are identified during the pre-survey processing.

1) GSO

- Survey management at the national level
- Preparation and revision of questionnaires
- Addition/deletion of surveyed commodities
- Addition/deletion of surveyed establishments
- Addition of survey areas

2) PSO

- Survey management at the provincial level
- Inspection and data encoding of questionnaires
- File transfer of input data to GSO

3) DSO

- Implementation of the survey
- Inspection of questionnaires

4) IT Center

- System development (Input screen, analytical tool, etc.)
- Updating of database (establishment, commodity data, survey areas)

In addition, after a specific processing period has lapsed, it will be necessary to review the entire process flow in terms of efficiency. Also the processing schedule should be clearly established and needs to be enforced strictly to ensure smooth implementation..

(2) Publication of data

Confidentiality of data at each level of the GSO and PSOs should be established as well as publication level of its contents. At present, the confidentiality rule should be established for the pre-survey only, and the rule for the official survey should be established by the next year.

(3) Handling of individual data

Statistical data provided by surveyed establishments are collected through the DSOs and aggregated at each PSO, and then they are transmitted to the GSO systems. Note that the PSO should transfer the data to the GSO without aggregating or processing individual data.

(4) Provision of data from GSO to PSO

The GSO will provide each PSO with processed and compiled data (by region and industry) on a specified date of each month. Upon compilation and tabulation of data, each regional unit is authorized to use these data. The date of provision should be decided by the counterpart.

(5) Data backup and storage

The database system containing data on surveyed establishments and commodities should be backed up periodically, and each organization is to establish the rule for the duration of data storage.

(6) Updating of individual data

1) Period for updating data until the period of publication by GSO concerning the data of publication month

The PSO is responsible for correction or updating of establishment data and send it to the GSO. The GSO is not engaged in correction or updating but reprocesses and revises data upon reception of the establishment data.

2) Other data than above

Upon the revision or updating of data, each PSO is to send an individual data to the GSO. IT Center temporally stores the data and update the data collectively upon the lapse of a specific period of time. This period should be decided by the counterpart organization. In addition, the system should be able to update the data retrospectively up to the initiation period of the survey. (the GSO is to consider the timing of updating or revision by taking consideration into the publication period, Tet holidays, etc. either one in a year or at the end of each year.)

(7) Restriction on data encoding

To prevent an encoding error, a format of encoding cell should be regulated in terms of characters and integer numbers.

- (8) Training of PSO staff
 IT Center is responsible for preparation of related manuals and train PSO staff.

Figure 6-11 Conceptual Design of Monthly Statistics System

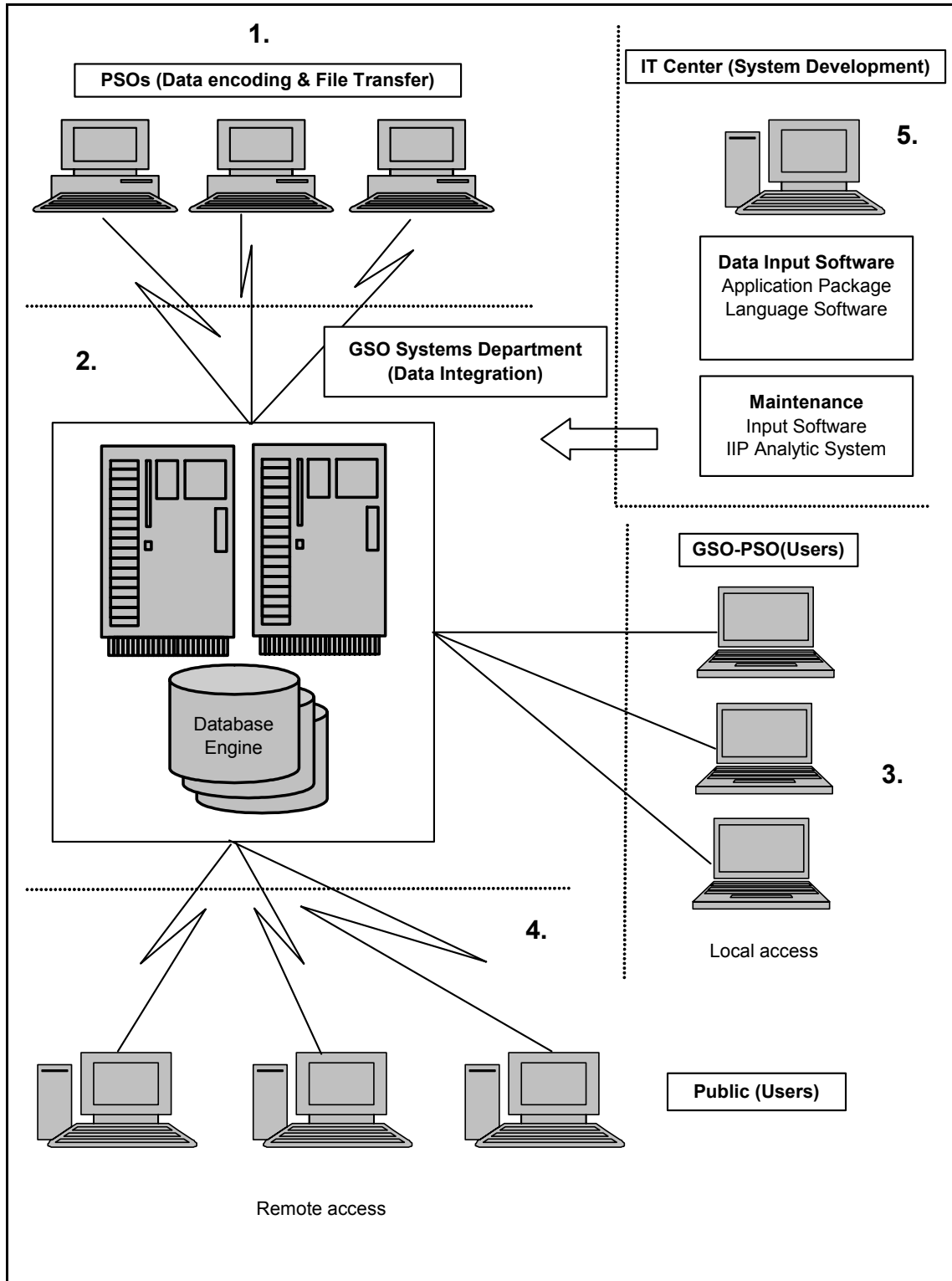
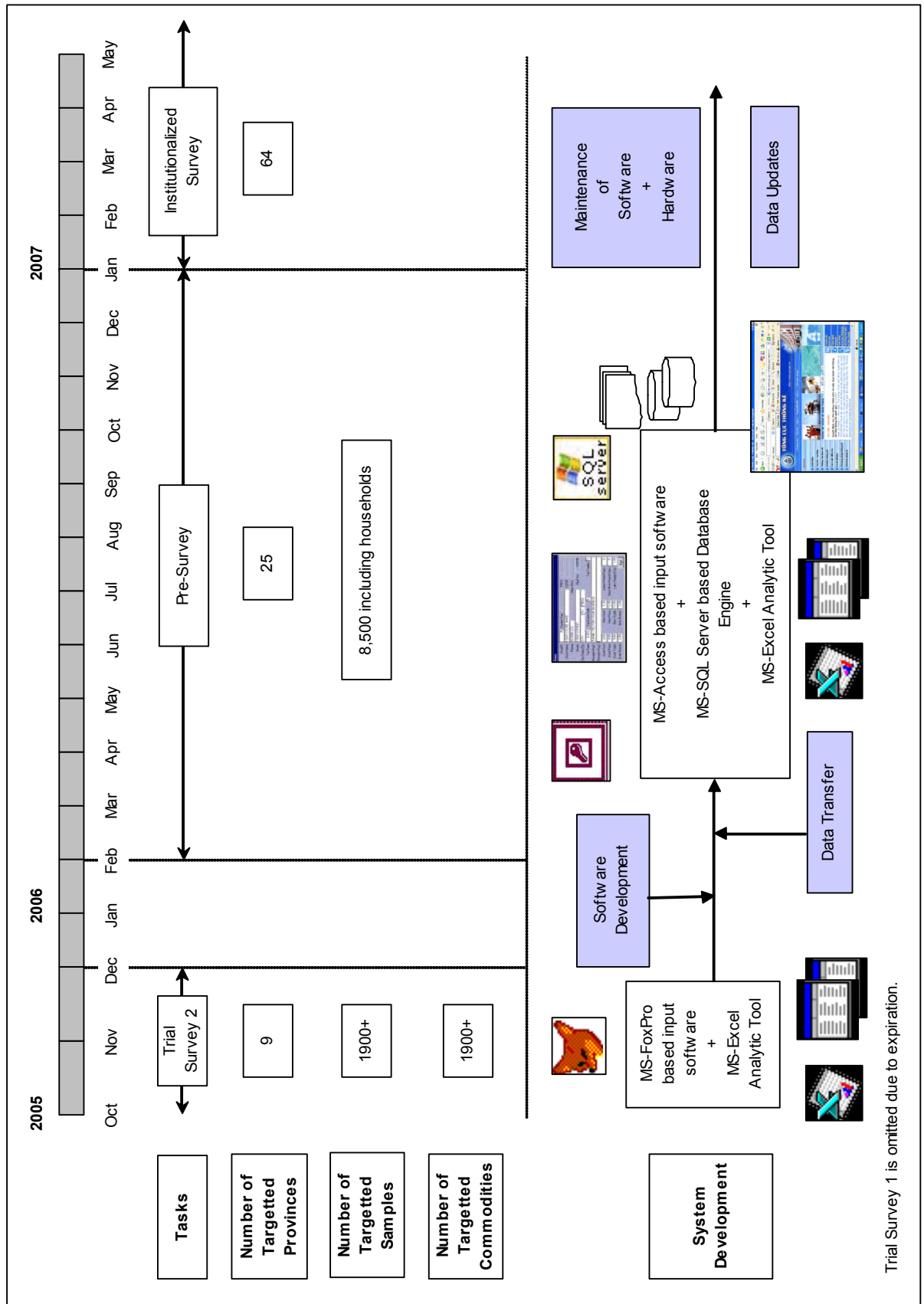


Figure 6-12 Contents and Schedule of System Development



Chapter 7 Action Plans for Institutionalization of the Current Production Statistics Survey

Chapter 7 Action Plans for Institutionalization of the Current Production Statistics Survey

7.1 Positioning of Action Plans

This chapter presents supplementary proposals relating to the GSO's policies and actions (including infrastructure development) that should be taken to pursue primary objectives of the Study - the "Basic Development Plan for Current Production Statistics" and "Development of Production Indices in Vietnam" as proposed in the report. In other words, action plans are proposed for institutionalization of the MSMIP, which is to be officially implemented in 2007. Note that the action plans are expected to be started promptly after the completion of the Study and to be implemented in the next two years, thus not necessarily addressing various issues that are revealed through the Study and need to be dealt with by the GSO from long-term perspectives.

After the end of this study, JICA plans to support the effort of the GSO by changing their support formation to the Technical Cooperation Project. Even though, the implementation body of the action is the GSO's Industrial and Constructional Statistics Department, which will be responsible for implementation of the MSMIP. Thus, the action plans are expected to require actions with the division itself, focusing on institutionalization, implementation, and sustainable management of the MSMIP.

7.2 Action Plans

7.2.1 Appointment and Team Organization Plan for the Institutionalization of MSMIP

Rationale for proposal:

To start the MSMIP as official statistics in February 2007, a variety of preparatory activities need to be conducted in 2006, under the leadership of the GSO's Industrial and Constructional Statistics Department. The division has been actively involved in the trial surveys, but it has to carry out the preparatory work, together with the ongoing Monthly Industrial Sample Survey and other survey activities, until the MSMIP is institutionalized. Furthermore, the pre-survey for the MSMIP will start this year, creating much more workloads than the two trial surveys. Under these circumstances, the division needs to clearly define the role of staff who is engaged in the preparatory work, while securing sufficient time and budget to facilitate activities.

Proposal outline:

Within the GSO's Industrial and Constructional Statistics Department, a team in charge of startup of the MSMIP will be formally appointed and the preparatory work for the MSMIP will

be incorporated into the GSO's ordinary business. The Preparation Team for MSMIP Institutionalization, as tentatively named, will be organized by five members, namely a team leader and four members in charge of "procedure and budgeting," "survey planning and design," "data configuration and system development," and "local promotion and training." Then, specific time and budget will be formally allocated to the team for implementation of the preparatory work. Upon institutionalization of the MSMIP (since 2007), the team will be transformed to the secretariat of the MSMIP Supervisory Board. Unwilling influence may be caused if the Industry and Construction Department supplies personnel in order to set up the full-time MSMIP team. Therefore, essentially, the number of staff of the department shall be increased.

7.2.2 Statistical Reliance Improvement Support Plan

Rationale for proposal:

One of problems that have been identified in the course of the Study is a low level of confidence in present statistics among local users; doubts about statistical data published by the GSO are raised by not only private companies but also government offices and organizations that are main users. Also, it is pointed out that statistics in Vietnam lack international compatibility with other countries due to the differences in classification, standard, and methodology. There are many reasons for the lack of confidence. It is partly due to the misunderstanding or the lack of understanding on the user side. Or it may come from the lack of information disclosure by the GSO concerning the statistical method or deficiency in the publication system itself, not to mention the lack of data reliability. As the current production statistics survey is designed to grasp monthly trends in production activities by industries, especially mining and manufacturing, it must achieve higher levels of accuracy, promptness, and international compatibility than previous statistics. Meeting these requirements will lead to the improvement of public confidence in statistics as a whole.

Proposal outline:

To ensure reliability of the new survey for current production statistics, the "Statistical Reliance Improvement Support Plan" will be formulated by the Preparation Team for MSMIP Institutionalization, followed by prompt implementation by the GSO. The plan essentially sets forth an implementation guideline for the basic plan proposed in this report and contains the following support programs to supplement the basic plan: ① a program to develop survey plans and designs; ② a program to review and revise survey designs; and ③ an educational and promotional program. The plan will set forth basic policy and specific activities for these programs, including specific instructions to the GSO's Industrial and Constructional Statistics Department and PSO/DSO enumerators. Basic design principles for the three programs are summarized as follows.

(1) Program to develop survey plans and designs

This program gives an opportunity for the GSO to review the basic development plan proposed in this report and to revise it in such manner to reflect the actual working environment surrounding the survey. For instance, questionnaire design should take into account convenience of survey subjects (establishments), i.e., survey items should be minimized as far as the survey objective is achieved, and the questionnaire should give due consideration to the ease of understanding about questions and explanations, as well as layout and other considerations to allow the respondent to fill out easily and quickly. To ensure accuracy and promptness, system rules supporting efficient implementation of key activities up to data tabulation should be established and enforced. The GSO should prepare its own survey plan after carefully reviewing the proposal in this report and by taking into account the above requirements. The program output is the “Preliminary Plan for MSMIP Implementation” that will be prepared as the basis of securing the premiere’s decree. If possible, the program will be implemented under technical support of outside experts.

(2) Program to review and revise survey designs

Vietnam’s industry recently undergoes substantial changes due to privatization of local companies and the impacts of foreign investment. In particular, increased foreign investment seems to accelerate production of new products within the country. Meanwhile, international industrial classifications have been revised to reflect the changes in the worldwide industry trend. To keep up with these dynamic changes, the MSMIP design should be accompanied by general rules for systematic and periodical reviewing and replacement of industries and commodities after the official launching of the system (after 2008), together with revision of industry and commodity classifications. Thus the program should contain clear rules for reviewing the current production statistics survey - e.g., who does what and when - with reference to similar cases in other countries.

(3) Educational and promotional program

This program will target surveyed establishments. It is critical to promote a general understanding of surveyed establishments concerning the objective of the MSMP survey and questionnaire design, partly because the MSMIP is newly introduced in the country and partly because high levels of accuracy and promptness must be assured as the official statistics published by the government. The educational and promotional program will be therefore planned to promote a good understanding of surveyed establishments about current production statistics and will be implemented on a regional (block) basis. As useful information has been obtained from implementation of the two trial surveys, the program will be designed to contain more specific details by taking into account lessons learned from the previous experience.

For the development and implementation of these programs, it is required to make positive use of the long-term expert by the Technical Cooperation Project from July 2006 and other supports from other donors.

7.2.3 Action Plan to Develop the “Master Sample” and the MSMIP Establishment List

Rationale for proposal:

The current production statistics survey treats manufacturing establishments as basic unit of survey. This will be inherited to the MSMIP. However, the MSMIP will be primarily based on the sample survey to select survey subjects from a population group list, while state enterprises and foreign companies will be subject to the 100% survey. The GSO’s Industrial and Constructional Statistics Department has not made the list of establishments, and the list of companies is maintained as population used for taking annual enterprise census. Between the MSMIP and the enterprise census, while at least state enterprises and foreign companies are more or less the same, but the two lists are never identical because some companies have two or more establishments. For this reason, it is desirable to maintain the Industrial and Constructional Statistics Department’s population group list as master samples. The master samples contain basic information and allows results of the two different statistical surveys (the enterprise census and the MSMIP) to improve accuracy and minimize bias due to non-responses. It is therefore desirable to develop a list of surveyed establishments for the MSMIP on the basis of the master samples.

Proposal outline:

Types of establishments contained in the latest list of companies will be rechecked on the basis of the enterprise census survey conducted in March 2005 and will be established as the master samples. The MSMIP establishment list will be made on the basis of the master samples. In this case, data on household enterprises will be treated separately, but they will be added to the MSMIP establishment list by using information in the population group list for the establishment census (to be compiled in the near future) as reference. If it is difficult to develop the master samples and the establishment list by data processing personnel of the Industrial and Constructional Statistics Department, use of IT Center will be considered. In this case, as confirmation with individual companies and establishments will be partly required in the process of development the master samples or the establishment list, appropriate rules and procedures need to be made in advance.

7.2.4 Organization Plan for the Household Enterprise Data Analysis Team

Rationale for proposal:

In the MSMIP pre-survey that is conducted since this February, households (household industries) have been added as a new survey subject. As discussed earlier, however, inclusion of small business operators (household industries) those are not suitable for the sampling survey.

Their share in the total GDP is so small, so that the most of small business operators are excluded from the survey objects of the current production statistics survey. Rather, the statistical survey of household industries is useful for learning the trends in rural economy where they dominate. At the same time, the number of households to be covered by the official survey is expected to exceed 10,000 and thus to surpass a combined total of state enterprises and foreign enterprises, creating significant workloads on data processing. To deal with the situation, the policy for handling household data should be decided prior to the start of the official survey by analyzing responses by households (including the unit of measurement) and their patterns during the pre-survey. Note that no such verification has been made during the trial surveys.

Proposal outline:

Within the GSO Industrial and Constructional Statistics Department, a team will be organized to thoroughly analyze household data obtained during the pre-survey. In consideration of the department's manpower and resources, however, it is not realistic to organize an ad-hoc team for implementation of this plan. Instead, the team will be led by members of the Preparation Team for MSMIP Institutionalization, with assistance of the Trade, Services, Prices Statistics Department as required. The team will analyze the survey results and decide on standards and rules for treating household industries (e.g., the form of questionnaire compared to other enterprise types, presence of problems relating to data processing and tabulation), which will then be reflected in the official survey (in 2007 and afterwards). According to circumstances, the team may have to consider the possibility of conducting a survey of small enterprises and micro-enterprises, including households, as separated from the MSMIP. (Also, this may be postponed for additional year to analyze data in 2007 and reflect the results in the survey in 2008 and later).

7.2.5 Plan for Education and Training Planning for Enumerators and Statistical Analysts

Rationale for proposal:

To launch a new statistical survey, it is imperative to provide proper education and training for enumerators. For the current production statistics survey, necessary education and training has been carried out in the form of technology transfer from the study team to the GSO's Industrial and Constructional Statistics Department and key PSOs in Hanoi and Ho Chi Minh, with expectation that statistical knowledge and techniques will then be disseminated to rural regions. However, it has become apparent in the course of the Study that statistical staffs at the GSO and related organizations need to learn more than statistical techniques, i.e., they need to understand the meaning of the current production statistics survey in the context of market principle, in light of the fact that the Vietnamese economy is in the middle of a major transition period. This entails a major change in mindset of statistical staff. For enumerators who form the front line of statistical survey, it is imperative to understand the difference between the new

and old surveys (especially the ongoing Monthly Industrial Sample Survey). Without it, it is impossible to give an accurate explanation on the new survey or examine collected questionnaires. Likewise, data analysts and other statistical technicians who are responsible for development of indices and statistical analysis will face similar problems. Thus, it is difficult to support the MSMIP under old ideas and methods.

Proposal outline:

This proposal consists of the formulation of an education and training plan for enumerators in areas that will be covered by the pre-survey and the official survey. The plan will be implemented under the leadership of the GSO's Industrial and Constructional Statistics Department. In the planning process, the development of the curriculum and selection of instructors will be made by utilizing expertise and experience of staff of the Industrial and Constructional Statistics Department and preceding PSOs as Hanoi and Ho Chi Minh PSOs. Prompt response and action on the enumerator training is needed to the areas where the pre-survey of the MSMIP has not been implemented up to now. It is appropriate to hold routine workshops by areas in the second half of 2006. The Industrial and Constructional Department will be the main implementation body and carries out adjustments on schedule and budget in the GSO. Also, the training of statistical analysts will be carried out by using overseas training programs as far as possible.

Appendix

1. FIELD OPERATION MANUAL

GENERAL STATISTICS OFFICE

FIELD OPERATION MANUAL

FOR

MONTHLY SURVEY OF

MAJOR INDUSTRIAL PRODUCTS (MSMIP)

HANOI, 2006

For further inquiries or in case of emergency, please contact to the following address

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CONTENTS

I. OVERVIEW	A1 - 1
II. SURVEY SCHEDULE	A1 - 8
III. HOW TO FILL IN THE QUESTIONNAIRE	A1 - 12
IV. QUESTIONNAIRE CONFIRMATION MANUAL	A1 - 16
V. FREQUENCY ASKED QUESTIONS (FAQ)	A1 - 19
VI. CONFIDENTIAL ISSUE	A1 - 22
VII. COMMODITY CLASSIFICATION for 48 Industries	A1 - 23

I. OVERVIEW

1. Objectives of the Survey

- (1) Provision of monthly trends of production activities of Vietnamese industry¹ in timely and reliable manner.
- (2) Compilation of Industrial Statistics with sufficient international comparability
- (3) Implementation of commodity based statistics in order to identify the production activity on real time manner.
- (4) Disseminating the report of survey result for nationwide industrial activity and on the basis of provincial level.
- (5) Construction of Indexes of Industrial Production (IIP) using methods in line with international standards
- (6) Construction of the system to attain cost effectiveness to alleviate financial burden in the statistics office at central and province level, and reduce the load of the survey objects.

2. Statistical Survey System

(1) Name of the survey

The full scale industrial statistics in Vietnam, which will be surveyed on the basis of the Basic Plan for Development of Industrial Statistics, is called the Monthly Survey of Major Industrial Products (MSMIP).

(2) Organization

The full scale industrial statistics in Vietnam will be conducted under the supervision of the “MSMIP Supervisory Board,” which is the top management organization, by making most use of regional network of the GSO (the GSO, PSO and DSO). The Industrial and Construction Statistics Department of the GSO will serve as the supervisory department.

(3) MSMIP Supervisory Board

The GSO will set up an “MSMIP Supervisory Board,” chaired by the director general of the

¹ In Vietnam, “industry” is defined according to three categories of the 2-level classification system of Vietnam’s Standard Industrial Classification (VSIC) (which corresponds to the sub class of the International Standards Industrial Classification (ISIC)): “Mining and Quarrying”, “Manufacturing” and “Electricity, Gas and Water supply”. “Industry” in the plan presented here conforms to this definition.

GSO, to make recommendations on a regular basis, concerning the management and control of the MSMIP and measures to improve the MSMIP. The secretariat of the committee will be set up at the Industrial and Construction Statistics Department of the GSO.

1) Composition of the membership of the MSMIP Supervisory Board

The following six representatives of institutions sit on the MSMIP Supervisory Board.

Chairman:	Director General of the General Statistics Office
Deputy Chairman:	Director of the Industrial and Construction Statistics Department, GSO
Committee member:	Director of the Department of Industrial Economy, MPI
Committee member:	Director of the Research Department, PMO
Committee member:	Director of the Planning Department, MOI
Committee member and secretary-general of the secretariat:	Deputy Director of Industrial and Construction Statistics Department

2) Role of The MSMIP Supervisory Board

The MSMIP Supervisory Board plays the following roles.

- i. To approve the planning of the survey, the revision of questionnaires and the revision of regulations
- ii. To approve a review of target industrial sectors, products and establishments
- iii. To make instructions and recommendations concerning the management and control of the survey

(4) Role of the Industrial and Construction Statistics Department

The roles of the Industrial and Construction Statistics Department are as follows.

- i. Planning and designing of the “MSMIP” survey
- ii. Preparing of questionnaires and various manuals and distributing them to the PSO
- iii. Providing of guidance to the enumerators of the PSO and DSO
- iv. Implementing and controlling of the survey
- v. Final tabulation and analysis of the statistical data
- vi. Disseminating of the results of the survey
- vii. Managing of he Survey budget

(5) Roles of PSO

- i. Providing of guidance and explanations to establishments to be surveyed at the province
- ii. Distributing and collecting questionnaires
- iii. Examining of the collected questionnaires
- iv. Entry the data of questionnaires into a computer and summarization
- v. Editing a report of the survey results at the province level
- vi. Analyzing and preparing of the data for dissemination in the province level
- vii. Managing the work of the enumerators

(6) Roles of the DSO

The DSO distributes questionnaires to target establishment (those mainly responsible for non-state enterprises and household) at the province level, collects and examines them, and supervises the enumerators. It must submit the collected questionnaires to the PSO by the designated date.

3. Coverage

(1) Survey Area

The survey covers all over the country.

(2) Target Industry

Target industry is based on the VSIC 4-digit level classification. The selection process will start in the 2006 pre-survey stage, based on the selection criteria given below, and the final composition of the industry for the survey will possibly be completed by January 2008.

Selection criteria of industry at VSIC 4-digit level.

The Industries which satisfied 2 criteria shown as follows are selected as target industry,

- i. Output value of a industry at VSIC 4-digit level is 20 trillion VND more
- ii. Ratio of each industry at VSIC 4-digit level in terms of output value will be calculated in order to make descending list of industry at VSIC 4-digit by output value ratio. A cut-off line at 90% of cumulative ratio of output value will be set to select target industries.

(3) Survey Targets

Targets (survey subjects) of the survey are essentially the establishments or enterprises that

produce the products listed on the questionnaire.

An “establishment” employed in the survey is a unit that engages in production activities in a specific place. This term refers to a business establishment where a specified person (or owner) is stationed, which has been operating for three months or more in the fixed location in Vietnam. The form of ownership is not questioned when you select companies (establishments or enterprises.)

4. Number of Sample

The sample is selected by the output value size by the GSO.

All enterprises in one target industry at VSIC 4-digit will be listed by descending order in terms of output value. A cut-off line at 80% of cumulative output value will be set to select the target enterprises.

Enterprises ranked in the top 80% of representative rate will be selected as target enterprises.

State enterprises (both central and local government-owned enterprises) and Foreign Direct Investment enterprises will be surveyed in their totality (not sampled). This will be done to maintain the continuity of the statistics, since complete count surveys of these are already conducted in the current monthly industrial sample survey. That is, all state and Foreign Direct Investment enterprises are very likely to be included among the target enterprises, since the represent is set at the upper 80% of representative rate, which is the position they all occupy now. Non-state and household should be ranked in the top 80% of representative rate in order to allow them to have a chance of being selected as target enterprises.

5. Target Commodities (Products)

Although the commodity (product) classification will be based on the industrial commodity (product) classification of the Industrial and Construction Statistics Department of the GSO, the latest version of the Vietnamese Central Product Classification (VCPC) five-digit level classification will also be referred to in a bid to make international comparisons possible.

Target commodities (products) include finished goods in terms of final consumer goods and intermediate goods in circulation in the market.

Basically all commodities (products) of a target industry at VSIC 4-digit level will be listed by descending order in terms of output value (or net turnover). A cut-off line at 80%of cumulative output value will be set to select the target commodities (products).

6. Reference Period

The reference period of the survey for each month is determined from the first day to the last day of the month.

7. Outline of Questionnaires

The survey will apply many types of questionnaire, each type of questionnaire for each target industry at VSIC 4-digit level. Products which are pre-printed in each questionnaire are different from each industry.

The products are selected from Vietnam Central Product Classification (VCPC) with modification to meet with the current industrial statistics. The list of selected industries and products for Pre Survey are available at Appendix 1.

The explanation of each survey item in Questionnaire is described in III, "How TO FILL IN THE QUESTIONNAIRE".

8. Control Sheet and Establishments List

Control sheet is prepared for the smooth and efficient of enumerators' Activity. During the distribution and collection of the questionnaire, enumerators are required to keep records in "Control Sheet" for each establishment by hand writing. The sheet contains information where all enumerators are required to fill in the respective information. The required items include;

i. Status

Enumerators write down the status of each establishment every month if they are: Active, Temporarily Shutdown, Shutdown, Moved location, Non-exist. Enumerators may use abbreviation for the notation, e.g. "AC for active", "TS for temporarily shutdown", "SD for shutdown", "ML for moved location", and "NE for non-exist".

ii. Distribution Date

Enumerators write down the date of the questionnaire distribution for each establishment.

iii. Collection Date

Enumerators write down the date of collection.

iv. Name of Responsible Person and Director in Establishment

Enumerators write down the person who is responsible for answering the questionnaire in each establishment, as well as the name of the director.

Example of Establishment List and Control Sheet

Example of Establishment List

Province Code	District Code	Commune Code	Tax Code (10-digit)	Establishment Code (3-digit)	Name of Establishment	Address	Telephone Number	Fax Number	V SIC (4-digit)
101	114	17677	020934594 1	373	Hanoi Factory	07 Hoang Thu Street Hanoi	(4)7575898	(4)8765348	2102

Major Product (1)	Major Product (2)	Major Product (3)	Shipment Value of Establishment	Name of Enterprise	Type of Enterprise	Name of Manager	Name of Chief Accountant
Corrugated paper	Carton box	non	Total Shipment Value	Hanoi Company, LTD	2	Mr. Nguyen Manh Ha	Mr. Tokyo Taro

Control Sheet

Example

Status AC=active; TS=temporarily shutdown; SD= shutdown; ML=moved location; NE=non exit

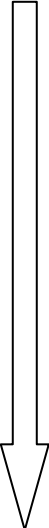
Establishment Name	Status		Distribution		Collection Date		Name of Contact Person	Name of Director
	Oct.	Nov.	Dec.	Date	Oct.	Nov.			Dec.
Hanoi Factory	AC	AC	AC	Sep. 12	Nov. 12	Dec. 11	Mr. Nguyen Van Tuan	Mr. Nguyen Manh Ha

Name of Enumerator _____

II. SURVEY SCHEDULE

Enumerators are, in principle, expected to follow the survey flow described below.

Attendance of Enumerator Guidance




Enumerator guidance shall be held in the PSOs of the survey area. All enumerators are requested to clearly understand the purpose of Survey, the contents of questionnaire, and related points through the attendance of guidance.

At the time of guidance, the material for distribution includes:

- i. Field Operations Manual (this manual)
- ii. Questionnaire
- iii. Control Sheet and Establishment List
- iv. Other related Documents

The selected survey establishment are listed in the Establishment List. Please kindly confirm your survey establishment in the Establishment List

Distribution of Questionnaire



As a rule, the questionnaires will be distributed semiannually (December and July) by the enumerators of the PSO and DSO. The questionnaires will be used in order during the next six months starting from the following month of the survey.

- i. Enumerators directly visit target establishment in the establishment list and check the type of industry. After checking type of industry, distribute the most suitable questionnaire to the establishment.
- ii. On the visit, clearly inform the dead line for the questionnaire. Deadline is the 12th of next month.
- iii. After the distribution, write down "Status", "Distribution Date", "Name of responsible person in Establishment" and "Name of Director" in the Control Sheet. If the name, address, telephone number and/or the type of enterprise is different from the List of Establishment, please write down "deferent" the free space of the questionnaire (please refer to **8. control sheet V**). "VSIC (if changed)". Please refer to Appendix 1 of this manual to find out the most suitable VSIC Code.

Distribution of Questionnaire (continued)

Example

Establishment Name	Status			Distribution Date
	Oct.	Nov.	Dec.	
Hanoi Factory	AC			Sep. 22

Collection Date			Name of Contact Person	Name of Director
Oct.	Nov.	Dec.		
			Mr. Nguyen Van Tuan	Mr. Nguyen Manh Ha

return the unused/remaining questionnaire to the PSO or DSO, if any.

Collection of Questionnaire

Collection Method

The dead line of questionnaire collection is fixed in 12th of every month.

Enterprise/establishment visit the PSO to submit questionnaires, will be followed the reporting system under the GSO monthly industrial sample survey. The reporting system is applied to State enterprise and FDI.

Meanwhile, enumerator visit generally non-state enterprises and households to collect questionnaires

While survey targets are allowed to submit questionnaires by fax or via the internet, they are not permitted to mail in the questionnaires, because of the current condition of the Postal Service.

- i. When received, enumerators confirm the contents of the questionnaire and check if all questions are properly answered. Points to check include:
 - 1) Blank answer
 - 2) Unclear writing
 - 3) Wrong responses (wrong unit, wrong value, and etc)
- ii. After collecting the questionnaire, please write down "Collection Date" in the Control Sheet.

Collection of Questionnaire (continued)

- iii. After collecting questionnaires, enumerators write down: (1) your name, (2) Province Code (2 digits), (3) District Code (3 digits), (4) Commune Code (4 digits) and (5) Establishment Code (3 digits) at the up-right corner of the questionnaire. All codes for each establishment/enterprise are available from the Establishment List.

Example:

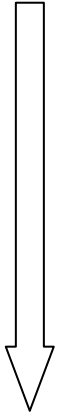
PSO sử dụng nội bộ (Tên Điều tra viên)												
Nguyen Trong Nghia												
Tỉnh		Huyện			Xã				Cơ sở kinh tế			
0	5	0	0	3	0	1	4	3	2	0	1	0

- iv. enumerators make confirmation of collected questionnaires following the procedures described in IV Procedure for Questionnaire Confirmation in the PSO and DSO office.
- v. To keep in mind that answered questionnaires are strictly confidential. Enumerators keep the questionnaire with extra care from other persons.

Note

1. The reference period of the survey is from the first day to the last day of the month (the calendar month). Establishment may assign different date as the last day of the survey (e.g. 20th, or 25th of the month). If establishments apply different survey period, it should be noted in the control sheet.
2. If the establishment temporarily shutdown, please keep asking the establishment to submit the questionnaire as long as there remains ending inventory in the establishment.
3. If the establishment run out of business or changed the kind of business, it is not necessary to collect the questionnaire. Please report in the control sheet for the change.

Submission of Collected Questionnaire

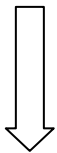


i. Deadline for submission of questionnaire

DSO enumerators submit all the confirmed questionnaires to the PSO by 11th every month. While that State enterprises and FDI submit the questionnaire to PSO by 12th day of each month. If the appointed day falls on a Saturday or Sunday, the deadline will be changed to the Monday of the following week.

- ii. If there are questionnaires collected after the deadline, submit them to the PSO or DSO right after the collection.

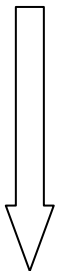
Data entry



Input Data of Questionnaire

- i. Enumerators or data entry operators input data of the confirmed questionnaires to the computer in the PSO office from 13th day to 17th day of each month.

Transmission of Input Data and Management of the Collected Questionnaires

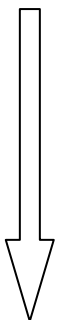


- i. PSOs transmit the Input data to GSO via GSO network.

ii. PSOs keep the collected questionnaire that finally confirmed by Chief of Industrial construction Division in PSO to GSO by 18th day of each month.

- iii. If there are questionnaires collected after the deadline, keep them to GSO.

Preparing of Dissemination



Editing of the preliminary report of the survey result in GSO

GSO will set the date of dissemination of preliminary report beforehand.

GSO make editing of the report in time for the date of dissemination

- i. Analyzing of data transmitted from PSOs

ii. Tabulation and Calculation of Indices

iii. Editing of the preliminary monthly report of survey result

iv. GSO will disseminate preliminary monthly report at the date which GSO set.

III. HOW TO FILL IN THE QUESTIONNAIRE

All enumerators shall keep in mind how to fill in questions stated below.

1. Establishment name:

Please write down the name of establishment as in business license.

2. Address:

Please write down address of the establishment (number, street, commune/district, province/city)

3. Telephone, fax, and email:

Please write the respondent' telephone number, fax number, and email address.

4. Enterprise name:

Please write down the name of enterprise as in business license. In case the name of the establishment is the same as the enterprise name, leave this space blank.

5. Type of enterprise:

Please fill the number corresponding to your type of enterprise.

6. Information on product:

- Production Quantity of reference month:

Please report the production quantity in the reference month for each listed products (excluding work-in-process). The item includes products directly produced by enterprise with material of the enterprise and products that enterprise done for others with other enterprises' material.

- Shipment Quantity of reference month:

Please report the shipment quantity for the reference month for each listed products. The item only includes quantity of products directly shipped by establishment that are produced in the establishment and does not include the quantity of products directly shipped by establishment that are produced by other establishments with survey establishment's material. Please note the shipment quantity does NOT include the internal consumption.

- Ending inventory quantity of reference month:

Please report the quantity of ending inventory at the ending of reference month for each listed products (excluding work-in-process and products which are produced by other establishments by survey establishment's material). The item only includes finished products that exists in warehouses or other stockyards owned or rented by the establishment.

- Internal Consumption:

Please report the quantity of internal consumption in the reference month for each listed products. The item is quantity of finished products that are consumed in the establishment as the material or the intermediate goods to make new production (This item does not include quantity of products produced by other establishment with the surveyed establishment's material which are internally consumed as well as the products for samples, gifts, exhibits, and laboratory uses.).

- Shipment value of reference month:

Please report shipment value of each listed finished products. The shipment value is the shipment quantity multiplied by the shipment price where the definition of shipment quantity. The shipment value is calculated on the basis of sale invoice (excluding VAT).

- Projected Production Quantity of this month:

Please report the quantity of projected production of this month for each listed product. Please refer the explanation for the above Item "Production Quantity".

7. Remarks:

Please describe the specific causes which reflect the main factors of abnormal values comparing with the previous month.

8. Respondent

Please provide a signature of respondent with his full name

9. Signature by the Director (Head of Establishment)

Please provide a signature of the head of establishment and his full name

10. Date signed by the Head of Establishment

Please provide the date signed by Director (Head of Establishment).

For any inquiries, please contact at:

General Statistics Office

02 Hoang Van Thu Street, Hanoi

Phone: (04) 8463483

Sample of questionnaire for MSMIP is showed in next page.

IV. QUESTIONNAIRE CONFIRMATION MANUAL

This confirmation for questionnaire is an essential process in order to conduct the survey the survey efficiently and sufficiently.

The confirmation for the questionnaires is made by the enumerators in the District Statistics Office (DSO) and the Provincial Statistic Office (PSO). The enumerators are required to follow the processes below.

Question 1 to 7: Confirmation for the General Information

(1) Check if there is any blank in the answers in:

- 1-1. Enterprise Name
- 1-2. Name of Establishment
2. Tax code
3. Address
4. Type of Enterprise
5. Respondent
6. Phone Number
7. Reference Month

If there are any blank,

Ask the establishment/enterprise by phone or direct visit to get the response. Please write down the response in the blank column.

(2) There is any different compared with those in the Establishment List in:

- Name of Establishment
- Address
- Phone Number
- Type of Enterprise

If there are any different,

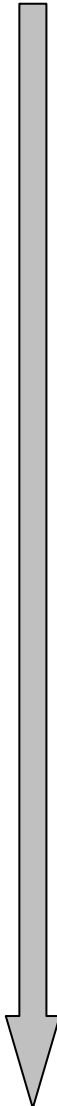
Write down "different" in the free space of the questionnaire as follows

Example

Address of establishment

deferent

Question 8 to 13: Confirmation for the Information on Products



(1) Check if there is any blank in the answers in:

- 8. Production Quantity
- 9. Shipment Quantity
- 10. Internal Consumption
- 11. Ending Inventory Quantity
- 12. Shipment Value (Million Dong)
- 13. Projected Production

If there are any blank,



Ask the establishment/enterprise by phone or direct visit to get the response. Please write down the response in the blank column.

(2) Check if the establishment or enterprise appropriately applied the correct unit for each product

If different units are applied,



Ask the establishment/enterprise to the reason for applying different unit and correct if necessary. If the application of a different unit is necessary, make a note in the questionnaire in order to inform the other staff.

Confirmation for the Top Right Part of the Questionnaire

(1) After finishing all confirmation described above, confirm if the enumerator's name, province code, district code, commune code and establishment code are properly filled into the top right part of the questionnaire shown below.

Note: These codes are significantly important for the data processing. The questionnaire without these codes would be regarded as "incomplete".

If there are any blank or unclear writing,

Consult with the enumerators to have proper codes. If necessary, refer to the control sheet

Submission of the Questionnaire to the Respective Organization

(1) Submit the questionnaires to the respective organization by the deadline as suggested in the Field Operation Manual.

To enhance the efficiency of compilation, it is recommended to make the questionnaire confirmation at each time of questionnaire collection.

V. FREQUENCY ASKED QUESTIONS (FAQ)

Question:

When the industry in each establishment is different to those in the Control Sheet, how do we find the actual industry?

Answer:

Please have a look at the appendix in this manual. The target products and industries are listed with the detailed description.

Question:

What would we do with the control sheet? Do we need to report the Sheet each month?

Answer:

Please retain the control sheet for a year.

Question:

The product classification in the questionnaire is not familiar in the usual industrial statistics. Why do you employ this classification?

Answer:

One of the purposes for applying the product classification that compiles the statistics under the international standard is to establish international comparable industrial statistics in Vietnam.

Question:

What would we do if there were additional products not listed in the questionnaire? In this case, how do we set the “unit” for the products?

Answer:

Please ask the establishment to fill the extra products into the additional space below. The unit should be under the description of establishment i.e. that should be widely used among the industry.

Question:

Does the Shipment Quantity include unfinished products or by-products?

Answer:

Products in this survey only intend for finished products. It does not include unfinished products or by-products.

Question:

In order to submit the questionnaire by the deadline, the establishment may send the questionnaire by Fax. In this case, what would we do?

Answer:

Please also request the establishment to submit a questionnaire (an original or copy). When the original questionnaire was filled out, please ask the establishment to send it to the statistical office, and compare the questionnaire with the FAXED questionnaire for checking discrepancies.

Question:

If the responsible person of establishment refuses to cooperate with the survey, what would we do?

Answer:

Please confirm and record the reason of not cooperate with the survey. Please also consult with the chief of the industry and construction section of the PSO.

Question:

What would do if the establishment used the unit of products that is different to the one specified in the questionnaire.

Answer:

Please ask the establishment why they used the different unit and make a note in questionnaire.

Question:

The questionnaire response may contain the numbers after the decimal point. In this case, what would we do?

Answer:

Please ask the establishments to fill in the number rounded before the decimal point.

Question:

If there are another question we may face during the distribution and collection of questionnaire, what would we do?

Answer:

For further inquiries or in case of emergency, please contact:

General Statistics Office

Industrial and Construction Department

02 Hoang Van Street, Hanoi

VI. CONFIDENTIAL ISSUE

Data collected from this Survey shall be taken by the GSO to further national attention and shall be disseminated in consolidated form. Nevertheless, data collected from each establishment **MUST BE KEPT CONFIDENTIAL.**

VII. COMMODITY CLASSIFICATION POR PRE SUVEY

Pre Survey Commodity

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1010	Mining and collecting fossil coal	1	Fossil coal (clean coal)	1-1	Agglomerated coal	1000 Tons	
				1-2	Coal-dust of all kinds	1000 Tons	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1110	Extraction of crude petroleum and natural gas	1	Crude petroleum			1000 Tons	
		2	Commercial natural gas			Million m3	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1320	Quarrying of non-ferrous metal ores	1	Copper ores, 20% Cu			Ton	
		2	Nickel ores			Ton	
		3	Aluminium ores, 42% Al2O3			Ton	
		4	Tin ores, 25-30% Zn			Ton	
		5	Tin ores, 70% Sn			Ton	
		6	Wolfram ores, 65% WO3			Ton	
		7	Chromium ores, 46% Cr2O3			Ton	
		8	Cobalt ores			Ton	
		9	Lead ores			Ton	
		10	Titanium, 52% TiO2			Ton	
		11	Antimoan ores.			Ton	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1410	Mining of sands, pebbles, gravel, stone, clay and kaolin	1	Stone of all kinds	1-1	Schist	1000 m3	
				1-2	Other kinds of construction stone which do not contain calcium (Granite, Pénpát, ...)	1000 m3	
				1-3	Agglomerated schist which contain calcium	1000 m3	
				1-4	Macadam of all kinds (crushed stone)	1000 m3	
		2	Broken stone			1000 m3	
		3	Black sand			1000 m3	
		4	Yellow sand			1000 m3	
		5	White sand			1000 m3	
		6	Pebbles			1000 m3	
		7	Gypsum of all kinds (including powder)			1000 m3	
	8	Clay			m3		
	9	Kaolin			Ton		
	10	Refractory soil			Ton		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1511	Meat and meat products preserving and manufacturing	1	Meat of cattle and poultry, chilled and frozen	1-1	Meat of cattle, chilled	Ton	
				1-2	Meat of poultry, chilled	Ton	
		2	Meat of cattle and poultry, frozen	2-1	Meat of cattle, frozen	Ton	
				2-2	Meat of poultry, frozen	Ton	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1511	Meat and meat products preserving and manufacturing	4	Other kinds of processing meats	4-1	Meat; salted, dried and smoked	Ton	
				4-2	Pork pies of all kinds	Ton	
				4-3	Ham	Ton	
				4-4	Sausage	Ton	
				4-5	Chinese sausage	Ton	
				4-6	Other kinds of processing meat	Ton	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1512	Processing & preserving of fish & fish products	1	Chilled Seafood and Aquatic Products			Ton	Processed seafood preserved by ice or in the refrigerator at 0°C.
		2	Frozen Seafood and Aquatic Products			Ton	Processed seafood preserved at - 45°C.
		3	Salted or Dried/Smoked Aquatic Products (e.g. Torn Dried Squid)			Ton	Salted, dried or smoked aquatic products whether or not cooked before or during the salting, drying or smoking process. It includes smoked roes, anchovies, and shark fin.
		4	Canned Aquatic Products	4-1	Canned tuna	Ton	
		4	Canned Aquatic Products	4-2	Other canned fish and seafood	Ton	
		5	Minced or Pasted Aquatic Products			Ton	Seafood of all kinds preserved after grinding, mincing such as fish paste, shrimp paste, etc.
		6	Fish Sauce	6-1	Dried fish sauce	kg	
6	Fish Sauce	6-2	Fish sauce of all kinds (except dried fish sauce)	1000 litres			
7	Other Seafood and Aquatic Products n.e.c				Ton	Other processed seafood and aquatic products such as: well cooked products used as instant foods, sausage, ham, processed seafood for making animal feeds and other processed n.e.c.	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1513	Processing and preserving vegetable and fruit	1	Canned vegetable and fruit	1-1	Canned vegetable (including canned mushroom)	Ton	
		2	Vegetable; chilled	1-2	Canned fruit and nut	Ton	
		3	Fruit-juice, vegetable-juice (pure)			Litre	
		4	Other kinds of processing fruits and nut (roasted, salted, dried, dipped in vinegar)			Ton	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1514	Vegetable and animal oils and fats	1	Crude Vegetable Oil			Ton	Vegetables oil, pressed, distilled or dehydrated apart, but in the form of crude oil, not refined again yet.
		2	Refined Vegetable Oil	2-1	Soybean oil	Ton	
				2-2	Palm oil	Ton	
				2-3	Coconut oil	Ton	
	2-4	Other vegetable oil	Ton	Other refined vegetable oil such as peanut oil, sesame oil, olive oil, etc.			
3	Animal Fats			Ton	Animal fats whether or not fried, frozen, salted, dried, smoked. Pressed fats of fish and fish's liver.		
4	Margarine			Ton	Margarine and liquid margarine.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1520	Dairy products	1	Condensed Milk Can			1000 cans	Condensed or sweetened milk or cream in can.
		2	Sterilized Fresh Milk of all kinds			1000 litres	Sterilized fresh milk of all kinds.
		3	Powder Milk of all kinds			Ton	Milk or cream in powder, granules or other solid forms whether or not sweetened.
		4	Butter of all kinds			Ton	Butter and other fats and oils derived from milk.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1520	Dairy products	5	Cheese			Ton	Fresh (unripened or uncured) cheese, including whey cheese and curd, grated or powdered cheese of all kinds, processed cheese, blue-veined cheese, cheddar cheese, colby, and other others including mixtures.
		6	Yoghurt of all kinds			Ton	Yogurt whether or not sweetened, flavoured and mixed with other foods such as fruits.
		7	Ice Cream and Other Similar Products			Ton	Ice cream whether or not flavoured and mixed with other food.
		8	Other Dairy Products n.e.c			Ton	Other dairy products such as whey, kephir, and other related products.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1531	Grain mill products	1	Ground and Polished Rice			Ton	This item includes 2 kinds: ground and polished rice.
		2	Cereals Flour	2-1	Wheat flour	Ton	Crude Cereals Flour made from ground or husked cereals.
				2-2	Rice flour	Ton	
				2-3	Corn flour	Ton	
				2-4	Flour from all kinds of bean	Ton	
3	Potato, Cassava Flour			Ton	Crude flour of manioc, sweet potato, taro, etc. The item EXCLUDES those of potato.		
4	Other kinds of Flour			Ton	Other kinds of flour made from body, root of kudzu, arrowroot, etc.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1533	Prepared animal feeds	1	Preparation Animal Feeds			Ton	Animal feeds prepared from vegetable, animal and waste products of other factory, in the form of liquid, solid, powder, tablet, etc. The item EXCLUDES gain weight medicine.
		2	Preparation Animal Feeds for Aquaculture			Ton	Animal feeds for aquaculture prepared from vegetable, animal and waste products of other factory, in the form of liquid, solid, powder, tablet, etc. The item EXCLUDES gain weight medicine.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1542	Manufacture of sugar	1	Raw Sugar and Molasses (Raw sugar in the form of bricks, etc)			Ton	Sugar pressed from raw material and condensed such as molasses or casted such as Palmyra sugar, etc.
		2	Sugar	2-1	Refined sugar (granulate, powder; made from sugar beets, cane, etc.) - RE	Ton	Refined sugar in the form of granulate or powder made from sugar beets, cane, etc.
				2-2	Unrefined sugar (brown sugar, etc) - RS	Ton	Brown sugar or molasses not refined.
3	Other Kind of Sugar				Ton	Other kinds of sugar or syrup products that are not applicable to above classification.	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1544	Manufacture of other products of flour	1	Noodles of Fresh Wheat Flour	1-1	Round, flat noodles, macaroni	Ton	Noodle flattened from fresh flour, whether or not mixed with other ingredients such as egg, spices, crocus and then dried. Finished products in the shape of round, flat, spiral, knot, etc.
				1-2	Rolled noodle	Ton	Rolled noodle of all kind whether or not round and flat shape of noodle. The item is mainly used for hotpot and used with other ingredients.
		2	Instant Noodles			Ton	
				3-1	Fresh vermicelli, fresh rice noodle	Ton	Fresh vermicelli, fresh rice noodle
		3	Other Flour Products	3-2	Vermicelli made of cassava and pancake	Ton	Vermicelli made of cassava and pancake
				3-3	Instant vermicelli, noodle gruel	Ton	Instant vermicelli, noodle gruel

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1549	Manufacture of other food products n.e.c.	1	Coffee	1-1	Ground coffee of all kinds (including flavoured coffee)	Ton	Powder coffee ground from roasted coffee whether or not flavoured
				1-2	Mixed coffee (including milk, sugar, etc.)	Ton	Instant coffee mixed or coffee substitutes containing other ingredients such as milk, sugar, caffeinated or decaffeinated.
				1-3	Instant black coffee	Ton	Essence Coffee, caffeined or decaffeinated, whether or not flavoured.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1549	Manufacture of other food products n.e.c.	2	Tea	2-1	Pure green tea of all kinds	Ton	Dehydrated Green tea, whether or not flavoured.
				2-2	Other tea except green tea (including flavoured tea)	Ton	Processed Tea whether or not fermented and flavoured. This item includes straining tea bag.
		3	Seasoning of all kinds		Ton	Seasoning made from chemically modified substances such as MSG (monosodium glutamate).	
		4	Nutritious Powder		Ton	Powder made of any ingredients such as flour, eggs, and other ingredients.	
		5	Salted Egg		1000 eggs	Salted Egg	
		6	Sauce of all kinds		1000 liters	These products made from vegetables, mainly from Soyabean, fermented and processed such as magi, soybean sauce, etc.	
		7	Vinegar		1000 liters	Vinegar of all kind	
		8	Gravy (tomato gravy, etc) of all kinds		Ton	Gravy sauce, whether or not mixed with other ingredients such as tomato, wine, and cream.	
		9	Iodine Salt		Ton	Salt and Pure Sodium Chloride containing iodine.	
		10	Spices and Soup of all kinds		Ton	Spices and soup of all kinds	
		11	Tofu (soya cake)		Ton	Tofu	
		12	Ice		Ton	Ice used for drinking beverages, beers and liquors. This item EXCLUDES edible ice cream, dry ice and similar products.	
		13	Nuts (Roasted or processed nuts, kernels and seeds of all kinds)		Ton	Roasted or processed nuts, kernels and seeds of all kinds such as cashew nut.	
		14	Other Food Products		Ton	Other food products such as nut food, artificial honey, caramel and others consumed as food.	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1551	Distilling, rectifying and preparing spirits, liqueurs and ethyl alcohol from alcoholic fermentation	1	White alcohol of an alcoholic strength by volume of 25°C or higher			1000 litres	
		2	Colour alcohol of an alcoholic strength by volume of 25°C or higher			1000 litres	
		3	Champagne of all kinds			1000 litres	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1553	Malt liquors and malt	1	Draught Beer			1000 litres	Draft beer made from malt, wheat, corn, rice, and oats of those not pasteurized and stored in keg.
		2	Bottled Beer			1000 litres	Beer made from malt, wheat, corn, rice, and oats of those stored in bottle.
		3	Canned Beer			1000 litres	Beer made from malt, wheat, corn, rice, and oats of those stored in can.
		4	Other Beer n.e.c (e.g. fresh beer)			1000 litres	Other beers not classified above such as fresh beer and flavoured beer.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1554	Soft drinks; bottling of mineral waters	1	Carbonated Drink (excluding mineral water)			1000 litres	Carbonated Drink of all kind such as soda or sweet drink whether or not flavoured such as pepsi, cocacola, 7up, etc.
		2	Non-carbonated Drink (excluding pure water)	2-1	Juices of all kind	1000 litres	Juice contains vegetable or fruit such as orange Juice, grapefruit juice, juice of any citrus fruit, pineapple juice, tomato juice, grape juice, apple juice, berry juice and these mixtures.
				2-2	Other non-carbonated drink n.e.c	1000 litres	Non-carbonated drink that not contain vegetable and fruit such as sport drink, vitamin drink, and nutrition supplement drink.
		3	Pure Water			1000 litres	Pure water not extracted from the water source not containing added sugar or flavor.
4	Mineral Water			1000 litres	Mineral waters not containing added sugar or flavor.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1600	Tobacco products	1	Cigarette	1-1	Filter-tipped cigarettes	1000 packs	Cigarettes or cigarillo Containing Tobacco and other substitutes tipped with filter.
				1-2	Untipped cigarettes	1000 packs	Cigarettes or cigarillo Containing Tobacco and other substitutes not tipped with filter.
		2	Cigar			1000 cigars	Cigars or Cheroots Containing Tobacco and other substitutes.
		3	Processed Leaf			Ton	Tobacco leaf, dehydrated, whether or not flavoured and packaged.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1711	Prep. of textile fibres; weaving of textiles			1-1	Spun silk yarn	Ton	Spun silk yarn containing more than 50% of silk whether or not dyed and put up for retail (other than sawing thread).
		1	Textile Yarn	1-2	Woolen yarn	Ton	Yarn of wool containing more than 50% of wool whether or not dyed and put up for retail sale (other than sawing thread).
				1-3	Cotton yarn	Ton	Yarn of cotton containing more than 50% of cotton whether or not dyed and put up for retail sale (other than sawing thread).
				1-4	Yarn from other natural fibers	Ton	Yarn of natural fiber other than those listed above containing more than 50% of the material whether or not dyed and put up for retail sale (other than sawing thread).
				2-1	Nylon yarn	Ton	Yarn of nylon containing more than 50% of nylon whether or not dyed and put up for retail sale (other than sawing thread).
				2-2	Acrylic yarn	Ton	Yarn of acrylic containing more than 50% of acrylic whether or not dyed and put up for retail sale (other than sawing thread).
		2	Textile Yarn of Man-Made Filaments or Staple Fibres	2-3	Polyester yarn	Ton	Yarn of polyester containing more than 50% of polyester whether or not dyed and put up for retail sale (other than sawing thread).
				2-4	Yarns from other synthetic fibers	Ton	Yarn of man-made fiber other than those listed above containing more than 50% of the material whether or not dyed and put up for retail sale (other than sawing thread).

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1711	Prep. of textile fibres; weaving of textiles	3	Sewing Thread of all kinds			Ton	Sewing thread of all kind including those made from natural fiber, man-made fiber and the mixture of those whether or not dyed.
		4	Woven Fabrics of all kinds	4-1	Woven fabrics of cotton fibres	1000 m2	Woven fabrics of cotton containing more than 50% of cotton whether or not dyed. The item EXCLUDES canvas.
				4-2	Woven fabrics of silk fibres	1000 m2	Woven fabrics of silk containing more than 50% of silk whether or not dyed.
				4-3	Woven fabrics of synthetic or man-made fibres	1000 m2	Woven fabrics of synthetic or man-made fibres containing more than 50% of synthetic or man-made fibres whether or not dyed.
				4-4	Woven fabrics of wool fibres	1000 m2	Woven fabrics of wool containing more than 50% of wool whether or not dyed.
		5	Canvas	1000 m2	Canvas made of cotton and other kind of fibre whether or not dyed, bleached, and printed.		
		6	Table-mat (inner lining of tyre such as motorcycles or autocar's tyre)	1000 m2	Inner lining of tyre such as motorbike or autocar's tyre made of any material such as canvas, synthetic fiber and others.		
7	Towel, Bath Towel			Ton	Towel and bath towel of all kinds whether or not containing natural and man-made fibre.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1810	Manufacture of wearing apparel (except fur apparel)	1	Woolen Apparel of all kinds			1000 pieces	Woolen apparel of all kind whether or nor knitted or crocheted. The item is those containing more than 50% of wool. The example includes dress, trousers, skirts, sweater, blouses, shirt, pullovers and other woolen apparel products for adults and children. The item EXCLUDES coats, jacket, suit, groves and mitten, hats, and work clothing.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1810	Manufacture of wearing apparel (except fur apparel)	2	Knitted Wearing Apparel of all kinds			1000 pieces	Knitted or crocheted apparel of all kinds "other than woolen products". The item includes sweater, cardigans, skirt, blouse, shirt, shirt, trousers, underwear and other non-woolen products of those knitted or crocheted. The item EXCLUDES coats, jackets, suits, groves, mitten, hats, work clothing and sportswear.
		3	Coats and Jacket	3-1	For adult	1000 pieces	Coats and Jackets for adults whether or not knitted or crocheted and made of any material including wool. The item excludes suits (jacket and trouser as a set), work clothing and those made of leather.
				3-2	For children	1000 pieces	Coats and Jackets for children whether or not knitted or crocheted and made of any material including wool. The item excludes suits (jacket and trouser as a set), work clothing and those made of leather.
		4	Apparel for Casual Wear (trousers, shirt, dress, skirt, etc.)	4-1	For adult	1000 pieces	Apparel products for casual wear for adults. The example include those of "non-knitted" and "non-woolen" products such as shirt, jeans, trousers, skirts, vests and blouse. The item EXCLUDES woolen products, coats or jacket, knitted products, sportswear and underwear.
				4-2	For children	1000 pieces	Apparel products for casual wear for children. The example include those of "non-knitted" and "non-woolen" products such as shirt, jeans, trousers, skirts, vests and blouse. The item EXCLUDES woolen products, coats or jacket, knitted products, sportswear and underwear.
		5	Sport Apparel for adult			1000 pieces	Sportswear of all kind for adults whether or not knitted or crocheted. The item includes tack suits, ski suites, and swim wear. The item EXCLUDES woolen products.
6	Work Clothing			1000 pieces	Work clothing for men and women for professional use including overalls whether or not woolen, and knitted or crocheted.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1810	Manufacture of wearing apparel (except fur apparel)	7	Underwear of all kinds (excluding knitted apparel)			1000 pieces	Under wear of all kind for adult and children. The item includes pants, panties, brassieres, socks, stocking and similar products.
		8	Suits			Set	Suite for adults and children whether or not woolen, and knitted or crocheted. The item includes the suits consists of jacket and trouser or skirt as a set such as business suits, ao dai, and other traditional suits.
		9	Apparel of Tanned Leather			1000 pieces	Apparel for adults and children made of tanned natural leather such as leather jacket, coat, and similar products. The item EXCLUDES gloves, mitten, hats, and caps.
		10	Apparel of Synthetic Leather			1000 pieces	Apparel for adults and children made of synthetic leather such as leather jacket, coat, and similar products. The item EXCLUDES gloves, mitten, hats, and caps.
		11	Gloves (excluding sport gloves, gloves made by rubber and knitted gloves)			1000 pairs	Gloves for adults and children whether or not woolen, and knitted or crocheted made of any material. The item EXCLUDES sport gloves.
		12	Hats and Caps of all kinds			1000 pieces	Hats and caps for adults and children whether or not woolen, knitted or crocheted, and made of any material for any use.
		13	Other Wearing Apparel Products			1000 pieces	Other wearing apparel products not listed in the classification above such as neck-tie, corset, veils, and shawls.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1920	Manufacture of footwear	1	Footwear of Rubber Materials			1000 pairs	Footwear of all kind consisted of more than 50% of rubber including waterproof footwear or sandals.
		2	Footwear of Plastic Materials	2-1	For adult	1000 pairs	Footwear of all kind including sandals for adults consisted of more than 50% of plastic. The item EXCLUDES sport footwear.
				2-2	For children	1000 pairs	Footwear of all kind including sandals for children consisted of more than 50% of plastic. The item EXCLUDES sport footwear.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
1920	Manufacture of footwear	3	Footwear of Tanned Leather	3-1	For adult	1000 pairs	Footwear of all kind including sandals for adults consisted of more than 50% of tanned natural tanned leather. The item EXCLUDES sport footwear.
				3-2	For children	1000 pairs	Footwear of all kind including sandals for children consisted of more than 50% of tanned natural tanned leather. The item EXCLUDES sport footwear.
		4	Footwear of Synthetic Leather	4-1	For adult	1000 pairs	Footwear of all kind including sandals for adults consisted of more than 50% of synthetic leather. The item EXCLUDES sport footwear.
				4-2	For children	1000 pairs	Footwear of all kind including sandals for children consisted of more than 50% of synthetic leather. The item EXCLUDES sport footwear.
		5	Footwear of Canvas			1000 pairs	Footwear of all kind consisted of more than 50% of canvas including sports footwear.
		6	Sport Footwear of all kinds			1000 pairs	Sport footwear of all kind made of any material for adults and children.
		7	Soles of all kinds			1000 pairs	Soles of all kinds whether or not for retail sales.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2010	Manufacture of sawn, chipped and peeled wood	1	Sawn wood of all kinds			m3	
		2	Impregnated wood	2-1	Impregnated timber	m3	
				2-2	Railway sleepers of wood, impregnated	m3	
		3	Strips for parquet flooring			m3	
4	Friezes for parquet flooring			m3			

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2029	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	1	Wood Products	1-1	Clothes hangers	1000 pieces	A hanger that is shaped like a person's shoulders and used to hang garments on. It is made mainly of wooden materials. Hangers mainly made of other materials such as plastics are excluded.
				1-2	Wood boxes for jewelry and cosmetics	1000 boxes	A small sized wood box that is used to store jewelry, cosmetics, etc. It is made mainly of wooden materials.
				1-3	Wood flower vases	1000 vases	A flower vase made mainly of wooden materials.
				1-4	Wood statues	1000 pieces	A statue such as the Buddha and animals made mainly of wooden materials.
				1-5	Wood interior decoration	1000 m2	An interior decoration for wall, ceiling, wooden artists' canvases and other decoration in different shape (i.e., round, triangle or checked).
				1-6	Wood kitchen appliances	1000 pieces	Kitchen appliances such as a rice scoop made with wood excepting wood chopsticks.
				1-7	Wood chopsticks	1000 pairs	A pair of chopsticks made mainly by wooden materials, whether or not disposable. Bamboo chopsticks are excluded.
				1-8	Other wood products	1000 pieces	Other wood products that are not applicable to above classification.
		2	Rattan and Bamboo Products	2-1	Bamboo, ivory bamboo blinds of all kinds	1000 m2	Shades, blinds, or awnings to shut out the light or sight from outside made from bamboo or ivory bamboo.
				2-2	Woven bamboo and rattan of all kinds	1000 pieces	Woven bamboo or rattan products such as bags or basket-weaves excepting mats.
				2-3	Bamboo mats (standard: 1.5 x 2m)	1000 sheets	A bamboo mat made of many small pieces of bamboo, ivory bamboo used instead of sedge mats. Convert to standard size of 1.5 x 2m for calculation.
				2-4	Sedge mats (standard: 1.5 x 2m)	1000 sheets	A kind of mat made of sedge fiber placed on the bed or floor. Convert to standard size of 1.5 x 3m for calculation.
				2-5	Bamboo chopsticks	1000 pairs	A pair of chopsticks made mainly by bamboo materials, whether or not disposable. Wood chopsticks are excluded.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2029	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	2	Rattan and Bamboo Products	2-6	Bamboo toothpicks	Ton	A pair of toothpicks made mainly by bamboo materials, whether or not disposable. Toothpicks made from wood are excluded.
				2-7	Other bamboo products	1000 pieces	Other bamboo products that are not applicable to above classification.
		3	Other Products Made of Entangled and Twisted Materials			1000 pieces	Other products made of entangles and twisted materials such as straw, ivy or vine excepting wood, bamboo, and rattan.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2101	Manufacture of pulp, paper and paper board	1	Pulp of all kinds			Ton	Chemical wood pulp, dissolving grades; chemical wood pulp, other than dissolving grades; mechanical wood pulp; semi-chemical wood pulp, pulps of fibrous cellulosic material other than wood.
				2-1	Newspaper printing paper	Ton	Newsprint, in rolls or sheets.
		2	Printing Paper	2-2	Other printing paper	Ton	Other printing paper, excepting newsprint, in rolls or sheets.
						Ton	Uncoated paper, of a kind used for writing.
		3	Writing Paper			Ton	Paper to produce bags specially packing cement, in rolls or sheets.
						Ton	Kraft paper in rolls for use as wrapper; sulphite wrapping paper; vegetable parchment, greaseproof papers, tracing papers and glassine and other glaze transparent or translucent papers, in rolls or sheets.
		4	Cement Paper			Ton	Paper for religious services whether or not coated.
						Ton	Copy or printing paper of all kind (standard size: A4)
		5	Wrapping Paper			Ton	A usually soft absorbent paper, especially in a roll, used for cleaning the body after defecating or urinating, whether or not bleached.
						Ton	Other paper products that are not applicable to above classification.
6	Worship Paper	7-1	Ream of paper	Ton			
		7-2	Toilet paper	Ton			
		7-3	Other Paper	Ton			

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2101	Manufacture of pulp, paper and paper board	8	Paperboard of all kinds			Ton	Composite paper and paperboard (made by sticking flat layers of paper or paperboard together with an adhesive) not surface-coated or impregnated, whether or not internally reinforced, in rolls or sheets; paperboard, corrugated with or without glued flat surface sheets, creped, crinkled, embossed or perforated, in rolls or sheets; paper and paperboard, coated on one or both sides with kaolin (China clay) or other inorganic substances, with or without a binder, and with no other coating, whether or not surfaced-coloured, surface-decorated or printed, in rolls or rectangular (including square), sheets, of any size.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2102	Manufacture of corrugated paper and paperboard	1	Corrugated Paper			Ton	Corrugated paper and paperboard, whether or not perforated.
		2	Paper Bags (i.e. carrier paper bag)			Bag	Paper bags (except plastics only), made by laminating or coating combinations of paper and plastics for holding customer's purchases.
		3	Multi Layer Paper Bags	3-1	For cement	1000 pieces	Multi layer paper bags made by paper and plastics for containing cement.
				3-2	For other purpose (fertilizer, grain, etc.)	1000 pieces	Other multi layer paper bags made by paper and plastics for containing fertilizer or grain excepting the purpose of cement.
4	Carton Boxes and Papers			1000 pieces	Cartons, boxes, cases, record sleeves and other packing containers of paper excepting the shape of bag.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2109	Other articles of paper and paperboard	1	File Made by Paper, Paperboard			1000 pieces	A thin cardboard folder of a size to be stored in the drawer of a file cabinet and for containing correspondence and other files, made by paper or paperboard.
		2	Envelopes, Postcards and the Similar Paper Products			1000 pieces	Envelopes, letter cards, plain postcards and correspondence cards; boxes, pouches, wallets and writing compendiums, of paper or paper board, containing paper stationery.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2109	Other articles of paper and paperboard	3	Moulded Disposal Paper Products			1000 pieces	Moulded disposable paper products used for egg cartons, food containers, food trays, cups, florists' pots, etc.
		4	Sanitary Paper	4-1	High-grade facial tissues	Ton	A soft, disposable paper tissue especially for cleansing the face or for use as a handkerchief.
				4-2	Napkins for babies	Ton	A piece of soft absorbent material that is worn by a baby as underwear to absorb bodily waste.
				4-3	Sanitary napkins for female	Ton	A disposable absorbent pad used postpartum or during menstruation to absorb the uterine flow.
		5	Decal Label			1000 pieces	Gummed paper products such as labels, sheets, or tapes made from paper.
		6	Unbound Ruled Paper			1000 pieces	Unbound ruled paper of all kinds.
		7	Notebook (standard 100 pages)			1000 pieces	Notebooks (including mechanically bound by wire or plastic), converting to standard size of 100 pages.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2221	Printing	1	Typo Print Pages (size 13 x 19)			Mill. pages	Typo printing paper, converting to standard size of 13x19cm for calculation.
		2	Offset Print Pages (size 13 x 19)			Mill. pages	Offset printing paper, converting to standard size of 13x19cm for calculation.
		3	Special Printing (except printing on paper)			Mill. pages	Other special printing excepting typoprint and offset printing such as stamp and money

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2412	Fertilizers and nitrogen compounds	1	Ammonia (NH ₃ conv. to 99%)			Ton	Ammonia, anhydrous or in aqueous solution. Converting amount of volume to 99% for calculation.
		2	Nitric Acid (conv. to 72%)			Ton	A corrosive colorless or yellowish liquid that is a highly reactive oxidizing agent for fertilizer. Converting amount of volume to 72% for calculation.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions	
2412	Fertilizers and nitrogen compounds	3	Urea Fertilizer (Nitrogenous fertilizer with 46% Nitrogen)			Ton	Urea containing 46% of nitrogen, whether or not in aqueous solution; ammonium sulphate, double salts and mixtures of ammonium sulphate and ammonium nitrate; ammonium sulphate, ammonium nitrate, whether or not in aqueous solution; mixtures of ammonium nitrate with calcium carbonate or other inorganic non-fertilizing substances.	
		4	Super Phosphate Fertilizer (P ₂ O ₅)			Ton	A commercially produced soluble mixture of fertilizer prepared by treating insoluble mineral phosphates with acid, either sulfuric acid, phosphoric acid, or a mixture of the two. Triple superphosphates are also included.	
		5	Phosphate Fertilizer			Ton	Fertilizer compound or mixture containing soluble phosphate such as calcinated phosphatic fertilizers made from phosphate rock (phosphorite), basic slag, and etc.	
		6	Potassium, Phosphate			Ton	Any of the three orthophosphates of potassium (potassium monophosphate (K ₂ HPO ₄), potassium diphosphate (KH ₂ PO ₄), and tripotassium phosphate (K ₃ PO ₄)) used as fertilizer.	
		7	Compound Fertilizer (N, P, K)			Ton	Mineral or chemical fertilizers containing the three fertilizing elements of nitrogen, phosphorus and potassium.	
		8	Microorganic Fertilizer			Ton	Fertilizer containing microorganisms to regenerate soil fertility by fermentation and decomposition.	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions	
2422	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	1	Architectural Paint			Ton	Paint used to cover the exterior woodwork of house or building.	
		2	Anti-fouling Paint			Ton	A poisonous paint used to prevent barnacles and other organisms (verdigris) from growing on the bottom of a boat or ship.	
		3	Industrial Coatings	3-1	Coatings for wood		Ton	Industrial coatings for wood materials in the form of aerosols, liquids, powders, etc.
				3-2	Other industrial coatings		Ton	Industrial coatings for metal or plastic materials excepting wood materials in the form of aerosols, liquids, powders, etc.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions	
2422	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	4	Paint for Traffic			Ton	Traffic paint is a reflected light, non-flammable, lead free, fast drying paint that is available in many colours applying onto concrete and asphalt for marking highways, parking lots, crosswalks, stop bars, etc.	
		5	Varnishes			Ton	Liquid paint that dries to a hard, glossy surface because of its varnish, polyurethane, alkyd resin or acrylic base.	
		6	Enamels			Ton	A hard, glossy, clear or colored liquid coating made up of resins or cellulose derivatives and a plasticizer in a volatile solvent.	
		7	Lacquers			Ton	A liquid preparation that when spread and allowed to dry on a surface forms a hard lustrous typically transparent coating.	
					Gravure ink	8-1	Ton	Water-based ink and contains a high proportion of solvents used for an intaglio process of photomechanical printing, such as photogravure or rotogravure.
		8	Printing Ink		Flexographic ink	8-2	Ton	Printing inks that are made with cellulose-acetate-propionate ester resin, which is soluble in alcohol and other resins.
					Offset ink	8-3	Ton	An ink used for offset lithography, and it is very finely ground, free from water soluble particles, and contains only lithographic varnish or certain lacquers as the binding medium.
		9	Mastics				Ton	The aromatic resin of the mastic tree, used especially in varnishes, lacquers, adhesives, and condiments and as an astringent.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2423	Pharmaceuticals, medicinal chemicals, etc.	1	Liquid Medicine (except medicinal wine)	1-1	Antibiotic liquid medicine	Litre	A injectable liquid medicine used to treat infections caused by bacteria and other microorganisms. Excluding antibiotic orally taken liquid medicine.
				1-2	Other liquid injectable medicine (except antibiotic)	Litre	Other injectable liquid medicine excepting antibiotic liquid medicine.
				1-3	Orally taken liquid medicine	Litre	A medicine in the form of liquid to be swallowed as in an oral solution.
				1-4	Liquid medicine for spraying, rubbing, etc.	Litre	A medicine in the form of liquid used to spray or rub skin.
		2	Tablet/Capsule	2-1	Antibiotic tablet/capsule	Mill. tablets	A small solid pill in the shape of a disc/cylinder, or powder/granule in a capsule containing measured and compressed antibiotic medicine.
				2-2	Other tablet/capsule (except antibiotic)	Mill. tablets	A small solid pill in the shape of a disc/cylinder, or powder/granule in a capsule containing measured and compressed medicine excepting antibiotic medicine.
		3	Granulated/Powdered Medicine	3-1	Antibiotic granulated/powdered medicine	Kg	A medicine in the shape of granulated or powdered containing antibiotic medicine.
				3-2	Other granulated/powdered medicine (except antibiotic)	Kg	A medicine in the shape of granulated or powdered NOT containing antibiotics.
		4	Medicinal Wine			Litre	Wines made of liquor or yellow wine mixed with herbs and is used to treat or prevent diseases.
		5	Transfusion Solution			Litre	Transfusion solution of all kinds.
		6	Ointment of all kinds	6-1	Antibiotic ointment	Kg	A semisolid preparation for external application to the body, and containing an antibiotic medicinal substance, such as bacitracin, mupirocin, etc.
				6-2	Other ointment (except antibiotic)	Kg	A semisolid preparation for external application to the body, and containing a medicinal substance excepting antibiotic.
		7	Prepared Herbal Medicine of all kinds			Kg	A drug or preparation made from a plant or plants and used for to prevent and treat diseases and ailments or to promote health and healing, such as ginkgo biloba, echinacea, etc.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions	
2423	Pharmaceuticals, medicinal chemicals, etc.	8	Dermatologist Preparation	8-1	Liquid ointment for rubbing	Litre	A liquid preparation for external application to the body whether or not containing an antibiotic medicinal substance.	
				8-2	Dried ointment for rubbing	Kg	A dried preparation such as powder for external application to the body whether or not containing an antibiotic medicinal substance.	
				8-3	Plaster	m2	An adhesive skin patch with a curative preparation used for placing over a sore body part.	
		9	Preventive Vaccine for Human of all kinds			1000 remedies	A substance used to prevent initial infection for human (excluding for animals) prepared from the causative agent of a disease or a synthetic substitute.	
		10	Medicine for Animal and Poultry	10-1	Preventive vaccine for animal and poultry of all kinds	Remedies	A substance used to prevent initial infection for animal and poultry (excluding for human) prepared from the causative agent of a disease or a synthetic substitute.	
				10-2	Other injection drug and ampoule for animal	Litre	Other injectable liquid medicine excepting preventive vaccine for animal.	
				10-3	Powder medicine for animal	Kg	A medicine in the shape of granuled or powdered for animal.	
		11	Other Medical Products	11-1	Medical thread	Kg		Medical thread of all kinds such as dissolvable stitches, plastic suture, nonabsorbable surgical suture, etc.
								A liquid substance that inhibits the growth and development of microorganisms without necessarily killing them.
				11-2	Antiseptic available (including bactericide)	Litre		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2424	Soap, cleaning preps, perfumes, cosmetics, etc.	1	Skin Care Products	1-1	Face cleansing	1000 litres	Skin care products such as serum or skin moisturizer in the form of liquid of all kinds. (All kinds of liquid milk used for cleansing face or remove make-up)
				1-2	Skin cream	Ton	Skin care products in the form of foam and cream such as lip balm, moisture cream or cleansing cream.(whitening cream)

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions	
2424	Soap, cleaning preps, perfumes, cosmetics, etc.	1	Skin Care Products	1-3	Lotion	Kg	Skin care products in the form of foam and cream such as lip balm. (apply to your skin after bathing to keep the skin smooth and moisturizing).	
				1-4	Other kinds of skin care products	Ton	Other skin care products excepting face cleansing, skin cream, and lotion.	
				2-1	Shampoo	1000 litres	A liquid preparation for washing the hair of all kinds.	
		2	Hair Care Products	2-2	Hair rinse, tonic, treatment	1000 litres	A preparation for conditioning or tinting the hair of all kinds.	
				2-3	Other hair care products	1000 litres	Other hair care products excepting shampoo, hair rinse, tonic, and treatment.	
				3-1	Solid bath soap (body use)	Ton	Soap in the form of bars, cakes, moulded pieces, shapes, powder, liquids, pastes or in other forms; made from any kinds of material. Soap including body soap, etc. Soap for facial wash is classified as skin care products.	
		3	Solid, liquid and powder soap	3-2	Shower milk	Ton	Liquid soap with milky colour for the purpose of bathing (body washing).	
				3-3	Washing soap for clothing	Ton	Soap made from all kinds of material used for washing cloth excepting synthetic detergent..	
						1000 litres	Synthetic detergent in the form of powder, solid bars, liquids or in other forms; for the purpose of cloth washing, dish washing or in other purposes.	
		4	Synthetic Detergent				1000 tubes	A dentifrice in paste form; usually contains binder, humectant, an abrasive, a detergent, flavouring agent and often carries preventives, anti-infective agents or other medicaments. It shall be converted to 175 gm type for calculation.
		5	Toothpaste (conv. to 175gm type)					A substance that emits a pleasant odor; a fluid preparation of natural essences (as from plants or animals) or synthetics and a fixative used for scenting.
		6	Perfume, Eau de Colonge, and Toilet Preparations	6-1	Perfume		Litre	A scented liquid with a lighter scent than perfume.
				6-2	Eau de colonge		Litre	A liquid or solid substance that masks or neutralizes odors including incense.
6-3	Aromatic substance for perfuming or deodorizing rooms				Ton			

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2424	Soap, cleaning preps, perfumes, cosmetics, etc.	7	Makeup Products	7-1	Foundation and face powder	Kg	Foundation is a cosmetic in liquid, cream, or cake form, usually colored, that is applied as a base for makeup. Face powder is a flesh-colored cosmetic powder applied to the face to make it look smoother or less shiny.
					Lipstick	1000 pieces	A coloured cosmetic substance applied to the lips from a small solid stick of all kinds.
2429	Other chemical products n.e.c.	1	Attar and Essential Oil			Kg	A fragrant essential oil or perfume obtained from flowers in the form of liquid.
		2	Adhesive Agents (glue, paste, etc.)			Kg	A substance used for sticking objects together, such as glue, cement, or paste.
		3	Lubricating Preparations of all kinds			Ton	Any substances being used for lubricating application.
		4	Fire-resistant Chemical			Ton	A chemical in the form of liquid or others used as a coating for or a component of a combustible material to reduce or eliminate a tendency to burn.
		5	Explosive, Detonator and Primer			Ton	Prepared explosives; safety fuses; detonating fuses; percussion or detonating caps; igniters; electric detonators.
		6	Delayed-burning Wire			1000 meters	A kind of wire for connection of explosives and detonators.
		7	Blank Electronic Media (Disk, video tape, cassette tape, etc.)			1000 pieces	Blank electric media such as floppy disk, magnetic recording tapes (i.e., audio, data, video), compact discs (recordable or re-writable), computer software tapes and disks, etc.
		8	Photographic paper			Ton	Light-sensitive paper on which photograph can be printed of all sizes and qualities.
		9	Calcium Carbonates (CaCO3)			Ton	A white insoluble compound occurring naturally as chalk, limestone, marble, and calcite, and forming mollusc shells used for antacids, paint, cement, or toothpaste, excepting fertilizer.
		10	Other Chemical Products n.e.c			Ton	Other chemical products that are not applicable to above classification.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2511	Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres	1	Tyres for Motor Vehicle	1-1	Tyres for sedan type car with 4 seats	1000 tyres	Pneumatic tyres, excluding inner tubes, for 2- or 4-door passenger vehicles seating 4 or more persons and usually having a permanent top.
				1-2	Tyres for truck and bus	1000 tyres	Pneumatic tyres, excluding inner tubes, for truck and bus.
				1-3	Tyres for motorcycles	1000 tyres	Pneumatic tyres, excluding inner tubes, for motorcycles.
						1000 tyres	Pneumatic tyres, excluding inner tubes, for bicycle.
		2	Tyres for Bicycle	3-1	Inner tubes for motor vehicles of all kinds	1000 tubes	A flexible, airtight hollow ring made of rubber, that is inserted into the casing of a pneumatic tyre for motor vehicle of all kinds excluding for motorcycles and bicycles.
				3-2	Inner tubes for motorcycles	1000 tubes	A flexible, airtight hollow ring made of rubber, that is inserted into the casing of a pneumatic tyre for motorcycles of all kinds excluding for motor vehicles and bicycles.
		3	Inner Tubes	3-3	Inner tubes for bicycle	1000 tubes	A flexible, airtight hollow ring made of rubber, that is inserted into the casing of a pneumatic tyre for bicycles of all kinds excluding for motor vehicles and motorcycles.
						1000 tyres	A tyre that has been given a new tread; a remould of all kinds.
		4	Tyre Rebuilding				

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2519	Other rubber products	1	Normal Rubber Tubes	1-1	Tubes Φ less than 400 mm	1000 m	Tubes, pipes and hoses, of vulcanized rubber other than pressure-resistant rubber with a diameter of less than 400 mm.
				1-2	Tubes Φ over 400 mm	1000 m	Tubes, pipes and hoses, of vulcanized rubber other than pressure-resistant rubber with a diameter of over 400 mm.
		2	Pressure-resistant Rubber Tubes	2-1	Tubes Φ less than 400 mm	1000 m	Tubes, pipes and hoses, of vulcanized pressure-resistant rubber other than normal rubber with a diameter of less than 400 mm.
				2-2	Tubes Φ over 400 mm	1000 m	Tubes, pipes and hoses, of vulcanized pressure-resistant rubber other than normal rubber with a diameter of over 400 mm.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2519	Other rubber products	3	Conveyor of Rubber			1000m	Conveyor of vulcanized rubber; reinforced only with metal; reinforced only with textile materials.
		4	Flat Driving Belt of all kind			1000 m	A device that consists typically of a continuous wide flat rubber loop such as conveyor belt of all kinds.
		5	Trapezoid Driving Belt			1000 m	A cogged belt, usually of reinforced rubber, such as a timing belt used for the camshaft in an internal combustion engine.
		6	Rubber-coated Cloth			1000 m ²	Rubberized textile fabrics, excepting tyre cord fabric.
		7	Rubber Washer			Ton	A flat disc with a hole in the center made of rubber. It is often placed under a nut to even out pressure and prevent damage to the part on which it rests.
		8	Rubber Clothes			1000 pieces	Including rubber raincoat.
		9	Rubber Gloves			1000 pairs	Gloves for adults and children mainly made of rubber material.
		10	Condom			1000 pieces	Sheath contraceptives of all kinds.
		11	Rubber Band			Ton	A short length of rubber and latex formed in the shape of a loop for various purposes.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions		
2520	Plastic products	1	Plastic Pipe of all kind	1-1	Soft plastic pipe	Ton	Soft plastic tubes, pipes and hoses made of plastics of all kinds.		
				1-2	Hard plastic pipe Ø less than 50 mm	Ton	Hard plastic tubes, pipes and hoses, with a diameter of less than 50 mm.		
				1-3	Hard plastic pipe Ø over 50 mm	Ton	Hard plastic tubes, pipes and hoses, with a diameter of over 50 mm.		
		2	Plastic Joints and Accessories of all kind			Ton	Plastic joints, fittings, and accessories such as joints, elbows, flanges, etc.		
		3	Plastic Bags, Containers	3-1	Plastic containers blow-moulding			Ton	Blow moulded plastic containers of all kinds.
				3-2	Plastic bags			Ton	A bag made of thin plastic material of all kinds.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2520	Plastic products	4	Plastic for Package	4-1	Soft plastic film	1000 m2	A thin and soft film of plastic material used to wrap or cover things.
				4-2	Hard plastic film	1000 m2	A hard film of plastic material used to wrap or cover things.
		5	Plastic Materials for Building (except tubes, joints and accessories)	5-1	Floor, ceiling, wall and roof materials of plastic	m2	Floor, ceiling, wall and roof materials of plastics in rolls or in the form of tiles.
				5-2	Other plastic materials for building	Ton	Other plastic materials for building excepting tubes, joints, accessories and materials for floor, ceiling, wall in rolls or in the form of tiles.
		6	Plastic Formed Products			Ton	Plastic formed products including in the form of plates, mould, sheets, plat plates, and wave plates.
		7	Housewares and Office Equipments of Plastic			Ton	Plastic housewares such as household utensils for kitchen, bathroom, living room, etc.
		8	Sanitary Equipment of Plastic	8-1	Basin	1000 sets	Plastic container with sloping sides, typically used for holding water or washing of all kinds.
				8-2	Bathtub	1000 pieces	Plastic bathtub of all kinds.
				8-3	Toilet	1000 sets	Plastic lavatory basin of all kinds.
		9	Plastic Raincoat			1000 sets	Ponchos and similar waterproof raincoats made of plastic of all kinds.
10	Other Plastics Products n.e.c			Ton	Other plastic products that are not applicable to above classification.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2610	Glass and glass products	1	Sheet Glass	1-1	Normal glass (convert to 2mm)	1000 m2	Normal sheet glass excepting float glass. Convert to 2mm thick for calculation.
				1-2	Other float glass (convert to 2mm)	1000 m2	Extremely smooth, nearly distortion-free plate glass manufactured by pouring molten glass onto a surface of molten tin. Convert to 2mm thick for calculation.
		2	Glass Bottle over 250ml			1000 pieces	Over 250ml glass bottle of all shapes, whether or not coloured.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions	
2610	Glass and glass products	3	Other Housewares of Normal Glass			Ton	Bottles, jars, phials and other containers of glass (less than 25ml), of a kind used for the conveyance or packing of goods, except ampoules; glassware of a kind used for table, kitchen, toilet, office, indoor decoration or similar purposes (except bottles, jars and the like, of glass, and ornaments of lamp-worked glass); clock or watch glasses and similar glasses, glasses for spectacles, not optically worked, hollow glass spheres and their segments for the manufacture of such glasses.	
		4	Crystal Products			Ton	Crystal glass products, whether or not coloured, used for tableware, optical instruments, prisms, window panes, mirrors, lenses, and various articles of ornament.	
		5	Finished Thermos			1000 pieces	Final products of vacuum thermos flasks or other vacuum vessels, excepting inner glass for thermos as a final products.	
		6	Commercial Glass for Thermos			1000 pieces	Inner glass products for thermos flask, excepting "Finished Thermos".	
		7	Medical, Laboratory Glass Products			Ton	Carboys, demijohns and bottles or injectables of a capacity exceeding 1 litre; bottles and vials for antibiotics, and other injectables of a capacity not exceeding 1 litre; other bottles for intravenous fluids; ampoules; and others.	
		8	Insulated Glass			1000 pieces	A laminated glass products for insulating electric wire and similar products.	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2691	Manufacture of non-structural non-refractory ceramic ware	1	Sanitary Earthenwares	1-1	Ceramic bathtub	1000 tubs	Non-refractory ceramic bathtub of all kinds, excepting those made of other materials.
				1-2	Ceramic basin	1000 sets	Non-refractory ceramic basin of all kinds, excepting those made of other materials.
				1-3	Ceramic toilet	1000 sets	Non-refractory ceramic lavatory basin of all kinds, excepting those made of other materials.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2691	Manufacture of non-structural non-refractory ceramic ware	2	Ceramic Housewares	2-1	Ceramic kitchen/table wares	1000 sets	Non-refractory ceramic kitchen or table wares of all kinds, excepting those made of other materials.
				2-2	Ceramic/pottery vases	1000 vases	Non-refractory ceramic or pottery vases of all kinds, excepting those made of other materials.
		2-3	Other ceramic houseware	1000 pieces	Other non-refractory ceramic housewares of all kinds, excepting kitchen or table wares and vases.		
		3-1	Under 6KV insulated ceramics	1000 balls	Ceramic insulation products to insulate thermocouple wire which is under 6KV.		
		3-2	6-35 KV insulated ceramics	1000 balls	Ceramic insulation products to insulate thermocouple wire which is over 6KV but not exceed 35KV.		
		3-3	Over 35 KV insulated ceramics	1000 balls	Ceramic insulation products to insulate thermocouple wire which is over 35KV.		
		4	Laboratory/Industry Ceramics of all kinds			1000 pieces	A laboratory or industry ceramics of all kinds, such as crucibles, pots, or combustion boats for chemical analyses.
		5	Other Ceramic Articles			1000 pieces	Other ceramic articles that are not applicable to above classification.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2693	Structural non-refractory clay & ceramic products	1	Terra-cotta Brick of all kinds (Standard size: 220x105x60 mm)			1000 pieces	Terra-cotta brick of all kinds. Convert to standard size of 220x105x60 mm for calculation.
		2	Tiles of all kinds (22 pieces/m2)			1000 pieces	Terra-cotta tiles of all kinds. Convert to standard size of 22 pieces/m2 for calculation.
		3	Ceramic Paving Bricks			1000 m2	Ceramic paving bricks of all kinds, whether or not rectangular.
		4	Artificial Granite Paving Bricks			1000 m2	Artificial granite paving bricks of all kinds, whether or not rectangular.
		5	Wall Tile			1000 m2	Tiles, cubes and similar articles, whether or not rectangular. Tile used as wall decoration, most commonly in the kitchen or bathroom.
		6	Other Refined and Non-refined Bricks			1000 pieces	Other refined and non-refined bricks excluding terra-cotta bricks, ceramic paving bricks, and artificial granite paving bricks.
		7	Earthenware Pipe of all kind			1000 pieces	Earthenware pipe of all kinds, whether or not

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions	
2694	Cement, lime and plaster	1	Plaster of all kinds			Ton	Plaster in the form of powder or other forms of all kinds.	
		2	Lime of all kinds			Ton	Lime of all kinds such as quicklime, slaked lime and hydraulic lime.	
		3	Cements	3-1	Black portland cement		Ton	Black portland cement of all kinds.
				3-2	PCHs (Salinity tolerance)		Ton	Salt tolerant portland cement of all kinds.
				3-3	White portland cement		Ton	A true Portland cement that differs from gray cement mainly in color (white).
3-4	Portland clinker		Ton	Portland clinker of all kinds such as normal Portland and sulphate resistant clinker.				
3-5	Other cements		Ton	Other cement products that are not applicable to above classification.				

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2695	Articles of concrete, cement and plaster	1	Ready Mixed Concrete (fresh concrete)			m3	A cement mixture in proper proportions of two or more ingredients of all kinds.
				2-1	Pipes of all kind	m3	Ferro-concrete pipes of all kinds.
		2	Ferro-Concrete Products	2-2	Poles of all kind	m3	Ferro-concrete poles of all kinds.
				2-3	Piles of all kind	m3	Ferro-concrete piles of all kinds.
				3-1	Concrete sheets	m2	Including reinforced concrete sheets, prestressed concrete sheets, etc.
		3	Normal Concrete Blocks	3-2	Concrete blocks for bank protection	m3	Concrete blocks, such as hollow concrete blocks and tetrapods, specifically used for the protection of banks of a river, or slopes of embankments along it, from erosion by the current of flow, from floods, etc. Excepting concrete sheets.
				3-3	Concrete products for road	m3	Concrete products specifically used for the construction of road excepting concrete sheets.
				4-1	Beam and crossbeam	m3	Concrete reinforced beam and crossbeam with steel cables, wires, or the like, which have been embedded in it under tension and thus actively resist loads.
		4	Prestressed Concrete Blocks	4-2	Other prestress concrete products	m3	Other prestress concrete products excepting beam and crossbeam.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2695	Articles of concrete, cement and plaster	5	Other Concrete Products	5-1	Asbestos cement corrugate sheets	1000 m2	Fire-resistant cement corrugate sheet made of a combination of asbestos fibers and portland cement.
				5-2	Other concrete products n.e.c	m3	Other concrete products that are not applicable to above classification.
2710	Basic iron and steel	1	Pig Iron of all kind	1-1	Pig Iron for steel making	Ton	Pig iron for steel making of blocks or other primary forms, excepting foundry pig iron.
				1-2	Foundry pig iron	Ton	Foundry pig iron of blocks or other primary forms, excepting pig iron for steel making.
				2-1	Ordinary steel ingot	Ton	Ordinary steel ingot of blocks or other forms, excepting alloy steel ingot.
				2-2	Alloy steel ingot	Ton	Alloy steel ingot of blocks or other forms, excepting ordinary steel ingot.
				2-3	Ordinary cast steel	Ton	Ordinary cast steel of blocks or other forms, excepting alloy cast steel.
				2-4	Alloy cast steels	Ton	Alloy cast steel of blocks or other forms, excepting ordinary cast steel.
				3-1	Rails	Ton	Railway or tramway track construction material of iron or steel.
				3-2	Sheet piling	Ton	Sheet piling, of iron or steel; welded angles, shapes and sections, of iron or steel.
		3	Shaped Iron and Steel of all kind	3-3	Steel pipes	Ton	Steel pipes of all kinds.
				3-4	Steel sheets of all kind	Ton	Coated steel sheets and plates of all kinds.
				3-5	Uncoated steel plates	Ton	Uncoated steel sheets and plates of all kinds.
				3-6	Steel bars	Ton	Steel/iron bars of round or square, whether or not rolled, excepting rounded iron with diameter of less than 8mm.
				3-7	Rounded iron Ø less than 8mm	Ton	Rounded steel/iron bar with diameter of less than 8mm.
4	Alloy Steel of all kind (stainless steel, silic steel, etc.)	3-8	Other iron (iron bar, etc.)	Ton	Other shaped iron and steel products that are not applicable to above classification.		
				Ton	Alloy steel such as stainless steel and silicon-electrical steel of all kinds, excepting alloy steel ingot and alloy cast steel.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2811	Structural metal products	1	Steel Structure	1-1	Heavy Structural-steel frames	Ton	Heavy structural-steel frames of all kinds.
				1-2	Middle structural-frames	Ton	Middle structural-steel frames of all kinds.
				1-3	Light structural-frames	Ton	Light structural-steel frames of all kinds.
		1-4	Steel girder bridges, transmission lines	Ton	Steel girder bridges and transmission lines of all kinds.		
		1-5	Water gate	Ton	Water gate of all kinds.		
		1-6	Container, ducts and other equipments for plants	Ton	Container, ducts and other equipments for plants made of steel of all kinds.		
2	Doors, Frames of Steel or Aluminum	2-1	Aluminium frames for windows, doors and shutters	m2	Aluminium frames for windows, doors and shutters of all kinds.		
		2-2	Exteriors, doors and windows of iron	m2	Exteriors made of iron, such as doors and windows of all kinds.		
		2-3	Roof sheet of metal	1000 m2	Roof sheet made of metal of all kinds.		
3	Other Prefabricated Structures and Parts of Iron, Steel or Aluminum			Ton	Other structural metal products that are not applicable to above classification.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2899	Other fabricated metal products n.e.c.	1	Domestic Metal Products	1-1	Pot, pan, salvers and saucepan of all types	1000 pieces	Utensils such as pot, pan, salvers and saucepan of all types, made of iron, steel, copper or aluminum.
				1-2	Spoons, folks of all types	1000 pieces	Silverwares such as spoons, folks, knives, chopsticks of all kinds made of any metal materials.
				1-3	Other metal houseware	1000 pieces	Other domestic metal products made of any metal materials excepting utensils and silverwares.
2	Metal Containers			Piece	Metal containers such as tanks, casks, drums, cans, boxes, and similar containers (other than for compressed or liquefied gas) of iron, steel or aluminum, not fitted with mechanical or thermal equipment.		
3	Soldering Stick			Ton	Soldering stick of all kinds.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2899	Other fabricated metal products n.e.c.	4	Metal Wire Products	4-1	Barbed wire	Ton	Barbed wire of all kinds made of any metal materials, whether or not folded or rolled.
				4-2	Steel net of all kind	1000 m2	Steel net of all kinds, whether or not folded or rolled.
				4-3	Cable not used for conducting electricity	Ton	Metal wire or cable of iron or steel excepting using for electricity.
		5	Bolt, Rivet and Screw of all kind		Ton	Expanded metal of iron, steel or copper; nails, tacks, staples (except staples in strips), screws, bolts, nuts, screw hooks, rivets, cotters, cotter-pins, washers and similar articles, of iron, steel, copper or aluminum.	
		6	Metal Basin, Bath tub used in the Toilet and Kitchen		Piece	Metal basin or bathtub used in the bathtub, toilet, and kitchen of all kinds, excepting those made of other materials.	
		7	Safe and Strongbox of Metal		Piece	Safe and strongbox made of metal of all kinds.	
		8	Needles (for hand sewing and knitting)		1000 Pieces	A long, slender, object with a pointed tip made by metal for hand sewing and knitting of all kinds.	
		9	Other Metal Products nec.		Ton	Other fabricated metal products that are not applicable to above classification.	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2930	Manufacture of domestics appliances n.e.c	1	Domestic Electric Appliances	1-1	Electric blankets, pillow and mattress	Piece	Electric bedding such as blankets, pillow and mattress.
				1-2	Refrigerators and freezers	Piece	Refrigerators and freezers of all kinds.
				1-3	Washing machines	Piece	Washing machines of all kinds. Cloth dryer is classified as "Other domestic electric appliances".
				1-4	Vacuum cleaners	Piece	Vacuum cleaners of all kinds.
				1-5	Liquidizers, other grinders and mixers	Piece	Electric liquidizer products such as grinders and mixers of all kinds.
				1-6	Other domestic electric appliances (e.g. electric shaver and toothbrush)	Piece	Other domestic electric appliances that are not applicable to above classification, such as electric shaver, electric toothbrush, cloth dryer, etc.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
2930	Manufacture of domestics appliances n.e.c	2	Domestic Thermo-electric Appliances	2-1	Hair dryers	Piece	Hair dryers of all kinds regardless of its spec.
				2-2	Hair curlers	Piece	Hair curlers of all kinds regardless of its spec.
				2-3	Smoothing irons	Piece	Smoothing irons of all kinds regardless of its spec.
				2-4	Electric fans of all kind	Piece	Electric fans of all kinds regardless of its spec.
		2-5	Electric kitchen appliances (e.g. grillers and roasters, cookers)	Piece	Electric kitchen appliances such as grillers, roasters, rice cookers, cooking plates, etc.		
		2-6	Microwave ovens	Piece	Microwave ovens of all kinds regardless of its spec.		
		2-7	Water boilers	Piece	Electric hot-water pot of all kinds regardless of its spec.		
3	Gas Cookers	Piece	Gas cooker with gas ring ranges of all kinds regardless of its spec.				

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3000	Office, accounting and computing machinery	1	Personal Computers	1-1	Desktop types	Piece	Personal computer of desktop type regardless of specs. The item includes PC servers of desktop type ad lack type.
				1-2	Notebook types	Piece	Personal computer of notebook type regardless of specs.
		2	Peripheral Equipments	2-1	Ink-jet printers	Piece	Printers of ink-jet type regardless of specs. The item includes the printer with ribbon cartridge (thermal transfer ribbon and others).
				2-2	Laser printers	Piece	Laser printer of all kinds regardless of specs. The item EXCLUDES those combined with other peripherals such as copy machine and scanner.
				2-3	PC monitor	Piece	PC monitor of all kinds including cathode ray tube display, liquid crystal display and other similar products regardless of the specs.
				2-4	Hard Disk Drive (HDD)	Piece	Hard disk drive of all kinds regardless of specs whether or not for retail sales.
		3	Cash Register	Piece	Cash register whether or not of digital or analog system.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3000	Office, accounting and computing machinery	4	Copying Machines	4-1	Analog copying machines	Piece	Electrostatic photocopying apparatus operating by analog photo copying system. The item EXCLUDES Colour copying machine.
				4-2	Digital copying machines	Piece	Electrostatics photocopying apparatus operating by digital photo copying system. The item EXCLUDES Colour copying machine.
				4-3	Full colour copying machines	Piece	Full colour electrostatic photocopying apparatus whether or not by digital or analog photo copying system. The item EXCLUDES monochrome copying machine.
		5	Other Office Machines	Piece	Other office machines such as electronic calculator, sorting machine, card-punch machine, bookbinding machine etc....		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3110	Electric motors, generators and transformers	1	Generator/Motor	1-1	DC (Direct Current) generator	Set	DC (direct current) Generators regardless of Output including multiphase.
				1-2	DC (Direct Current) motor/engine	Piece	DC (direct current) motors or engine regardless of Output including multi phase.
				1-3	AC (Alternating Current) generator	Set	AC (alternating current) generators regardless of Output including multi phase.
				1-4	AC (Alternating Current) motor/engine	Piece	AC (alternating current) motors and engine regardless of Output including multi phase.
		2	Rotary and Static Converter	Piece	Rotary converter, static converter and its parts.		
		3	Electrical Transformers	3-1	Transformer of under 35/0.4 KV	Piece	Electrical transformer under 35/0.4 KV regardless of specs.
				3-2	Transformer of 35/0.4 KV or greater	Piece	Electrical transformer of 35/0.4 KV and over regardless of specs.
		4	Ballasts	Piece	Ballast and its parts regardless of specs used for any kind of electronic components.		
		5	Inductors	Piece	Inductors and its parts regardless of specs used for any kind of electronic components.		
		6	Voltage Stabilizer	Piece	Voltage stabilizer and its parts regardless of specs.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3130	Insulated wire and cable	1	Wire	1-1	Insulated Wire	Ton	This product used in motor, the main part of engine
				1-2	Non-insulated Wire	Ton	Wire that is not covered with insulation material of all kinds.
		2	Co-axial Cable	2-1	Wrapped coaxial cable	Ton	Used for loading high voltage, central axis mainly by aluminium, covered by copper wire, insulated.
				2-2	Unwrapped coaxial cable	Ton	Used for loading high voltage, central axis mainly by aluminium, covered by copper wire, uninsulated.
		3	Electric Conductors of all kind	3-1	Wrapped wire used for tension not exceeding 1 KV	Ton	Wrapped wire, used in interior house.
		4	Photo-Electric Cable	3-2	Wrapped wire used for tension exceeding 1 KV	Ton	Used for loading low voltage from transformer stations, insulated.
		5	Electric Wire Set for Car			1000 Sets	A set of various electric wires manufactured as car parts.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3190	Other electrical equipment n.e.c.	1	Electrical Ignition or Starting Equipments			Piece	Electronic ignition or starter for combustion engine regardless of material and specs.
		2	Electrical Lighting and Signalling Equipments specially used in Motor Vehicles and Motorbikes	2-1	Electrical lighting specially used in motorbikes and motor vehicles of all kinds	Piece	Electrical devices used for the head light and tail light of motor vehicle such as inlet, inner covers and outer covers. The item EXCLUDES light bulb.
		3	Sound Signalling Devices	2-2	Direction indicator light of all kind	Piece	Direction indicator light such as blinker and similar products. The item EXCLUDES light bulb.
		4	Wipers/Electrical Deforesters/Demisters			Piece	Sound signaling apparatus such as distributor, mixer and other similar products.
		5	Electro-magnets of all types			Piece	Windscreen wipers, electrical deforesters, demisters of all kinds regardless of material and purpose.
		6	Electrical Insulators that are not made of Porcelain, Glass, Rubber and Plastic			Piece	Electro-magnets whether or not for retail sales regardless of specs. Electrical insulators not made of porcelain, glass, rubber and plastic. The example includes those made of silicon, acrylic, and other material.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3190	Other electrical equipment n.e.c.	7	Carbon Electrodes, Carbon Brushes, Lamp Carbons and Battery Carbons			Piece	Carbon electrodes, carbon brushes, lamp carbons and battery carbons and other apparatus made of carbon regardless of specs.
3210	Electronic valves, tubes; other electronic component	1	Printed Circuit Board	1-1	Rigid	m2	Rigid printed circuit such as multilayer printed wiring board , printed-wiring board, double-sided printed wiring board , and ceramic printed wiring board.
				1-2	Flexible	m2	Flexible printed circuit board of al kind regardless of material and specs.
		2	Electric Tubes	2-1	Cathode ray tubes for TV	Piece	Cathode-ray Tubes for Colour Television and Monochrome Television. The item EXCLUDES those for computer related equipment.
				2-2	Cathode ray tubes for computer & related equipment	Piece	Cathode-ray Tubes for PC monitor and other related equipment.
		3	Capacitors of all kind			1000 pieces	Capacitors of all kind whether or not fixed or variable regardless of purpose.
		4	Resistors of all kind			1000 pieces	Resistors of all kind regardless of specs and material.
				5-1	Liquid crystal diodes	1000 pieces	Liquid crystal diodes of all kind regardless of size and purpose.
		5	Semiconductor Devices	5-2	Light-emitting diodes	1000 pieces	Light Emitting Diodes of all kinds regardless of material and purpose.
				5-3	Other semiconductor devices	1000 pieces	Other semiconductor devices including photosensitive semiconductor devices regardless of material and purpose.
		6	Integrated Circuits (IC)	6-1	Monolithic IC	1000 pieces	Monolithic Integrated Circuits and its parts regardless of specs and purpose.
				6-2	Hybrid IC	1000 pieces	Hybrid Integrated Circuits and its parts regardless of specs and purpose.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3220		1	Broadcasting Equipments	1-1	Radio broadcasting equipment	Piece	Transmission apparatus for radio broadcasting, whether or not incorporating reception apparatus or sound recording or reproducing apparatus.
				1-2	TV broadcasting equipment	Piece	Transmission apparatus for TV broadcasting, whether or not incorporating reception apparatus or sound recording or reproducing apparatus.
				1-3	Radiotelegraphy	Piece	Transmission apparatus for radiotelegraphy, whether or not incorporating reception apparatus or sound recording or reproducing apparatus.
				1-4	Citizen's transceiver	Piece	Citizen's transceiver of all kind regardless of specs and purpose.
	2	Television Camera			Piece	Television camera of all kind regardless of specs and purpose. The item EXCLUDES video camera used for households.	
			3-1	Corded telephone	Piece	Telephone and telephone sets of all kind whether or not attached with other apparatus such as answering system. The item includes wireless telephone and public telephone.	
	3	Telephones	3-2	Mobile telephone	Piece	Mobile phone of all kinds regardless of specs. The item EXCLUDES wireless telephone.	
			3-3	Switchbox	Piece	Telephonic or Telegraphic Switching Apparatus regardless of specs.	
			3-4	Other communication equipments	Piece	Other communication equipments and its parts such as video phone and TV phone.	
			4-1	G4 facsimile	Piece	Facsimile on the G4 (Group 4) standards and those for digital line.	
	4	Facsimile Machines	4-2	G3 facsimile	Piece	Facsimile on the G3 (Group 3) standards and those for analog line.	
			4-3	Other facsimile	Piece	Other facsimile machines not listed above regardless of specs.	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions		
3230	TV and radio receivers and associated goods products	1	Radio Receivers			Piece	Radio Receivers with Sound Recording or Reproducing Apparatus. The item EXCLUDES those attached with cassette tape player and CD player and similar products. The item also EXCLUDES those used for car audio and audio minicomponent.		
				2	Cassette Tape Player			Piece	Cassette tape player of all kinds. The item includes those attached with radio receiver. The item EXCLUDES those attached with CD, DVD, MD, and MP3 players. The item also EXCLUDES those used for car audio and audio minicomponent
		3	Digital Audio Disc (CD) Player			Piece	Digital Audio Disc (CD) Player of all kinds. The item includes those attached with radio, cassette player, MD and similar products. The item also EXCLUDES those used for car audio, audio minicomponent, and Karaoke.		
		4	Car Audio			Piece	Radio receivers, cassette tape player, CD, MD, MP3, and DVD player used as car audio.		
		5	Audio Minicomponent			Piece	Audio component of all kind whether or not attached with radio receivers, cassette tape recorders, CD, MD, DVD and other similar products.		
		6	Video Recording or Reproducing Apparatus	6-1	Video camera			Piece	Video camera used for household regardless of specs. The item EXCLUDES those used for broadcasting.
				6-2	Video cassette tape player (VCP)/recorder (VCR)			Piece	Video cassette tape player (VCP) and recorder (VCR) of all kinds regardless of specs. The item EXCLUDES those used for audio minicomponent.
				6-3	Video compact disc (VCD) player/recorder			Piece	Video compact disc (VCD) player and recorder of all kinds regardless of specs. The item EXCLUDES those used for audio minicomponent and Karaoke.
				6-4	Digital versatile disc (DVD) player/recorder			Piece	Digital versatile disc (DVD) player and recorder. The item EXCLUDES those used for audio minicomponent and Karaoke.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3230	TV and radio receivers and associated goods products	7	Audio Equipments	7-1	Microphone	Piece	Microphone and its parts regardless of specs.
				7-2	Headphone / earphone	Set	Headphone and earphone, and its parts regardless of specs.
				7-3	Speaker	Piece	speaker and its parts regardless of specs.
				7-4	Amplifier	Piece	Amplifier and its parts regardless of specs.
		8	Color Television and Spare Parts	8-1	Regular TV (CRT - Cathode-ray tube)	Piece	Cathode-ray Tubes for Colour and Monochrome Television regardless of specs. The item EXCLUDES those used for PC Monitor.
				8-2	LCD (Liquid crystal display) TV	Piece	LCD (Liquid crystal display) TV regardless of specs. The item EXCLUDES those used for PC Monitor.
		9	Reception Apparatus for Radio-telephony or Radio-telegraphy	8-3	Plasma TV	Piece	Plasma TV regardless of specs. The item EXCLUDES those used for PC Monitor.
				8-4	Parts of TV	Piece	Parts of TV whether or not cathode-ray TV, LCD TV, plasma TV and other kinds.
		10	Karaoke	Piece	Karaoke of all kinds whether or not attached with DVD, VCD and CD regardless of specs.		

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3311	Medical and surgical equipment and orthopaedic appliances	1	Instruments and appliances used in dental sciences (teeth driller...)			Piece	
		2	Medical sterilizers			Piece	
		3	Electro-diagnostic (X-rays, ultra-violet or infra-red ray apparatus....)			Piece	
		4	Massage apparatus			Piece	
		5	Mechano-therapy appliances			Piece	
		6	Ophthalmic instruments and appliances			Piece	
		7	Orthopaedic appliances (crutch, waist-band, splint, ...)			1000 pieces	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3311	Medical and surgical equipment and orthopaedic appliances	8	Artificial teeth			1000 pieces	
		9	Artificial leg and hand			1000 pieces	
		10	Syringe, injection needle			1000 pieces	
		11	Other instruments and appliances used in medical sciences (Examination table, table for baby delivery, dental chair, bed for patients)			1000 pieces	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3410	Motor vehicles	1	Road Tractors			Piece	Road tractors of all kinds used in agriculture regardless of specs. The item EXCLUDES those used for road construction.
		2	Passenger Car			Piece	Autovehicle principally designed for the transport of persons such as sedan, sport car and other similar products regardless of specs. The item EXCLUDES utility vehicle such as pick-up truck and light-wagon, and jeep.
		3	Utility Vehicle			Piece	Utility vehicle such as pick-up truck and light-wagon, light-van, and jeep mainly used in households regardless of specs. The item EXCLUDES those used mainly in the commercial sector such as buses, trucks and other professional vehicle.
		4	Truck	4-1	Truck less than 5 ton	Piece	Trucks and other motor vehicles for the transport of goods with load less than 5 tons.
				4-2	Truck from 5 ton to 10 ton	Piece	Trucks and other motor vehicles for the transport of goods with load over 5 tons but less than 10 tons.
				4-3	Truck more than 10 ton	Piece	Trucks and other motor vehicles for the transport of goods with load over 10 tons.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3410	Motor vehicles	5	Bus	5-1	Small sized bus (with 5 - 14 seats)	Piece	Small sized buses with 5 - 14 seats including the driver. The item includes those used mainly in the commercial sector.
				5-2	Medium sized bus (with 15 - 30 seats)	Piece	Medium sized buses with 15 - 30 seats including the driver. The item includes those used mainly in the commercial sector.
				5-3	Large bus (more than 31 seats)	Piece	Large sized buses with more than 31 seats including the driver. The item includes those used mainly in the commercial sector.
		6	Special Purpose Vehicle			Piece	Special purpose vehicle including fire-fighting vehicles, ambulance cars, garbage trucks, vehicle for construction, cranes and etc.
		7	Major Repairing			Piece	Major repairing conducted NOT on regular basis such as body repair, bumper repair and etc..

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3430	Parts and accessories for motor vehicles & their engines	1	Brakes			1000 sets	Brakes of all kind regardless of air brakes, oil brakes and other similar products.
		2	Gear Boxes			1000 pieces	Gear boxes and Other Speed Changers regardless of material and specs.
		3	Radiators			1000 pieces	Radiators for motor vehicle and its parts regardless of specs and material.
		4	Wheel Rims			1000 pieces	Wheel rims and spokes for motor vehicle regardless of material.
		5	Axles			1000 pieces	Axles and parts for motor vehicle whether or not provided with other transmission components.
		6	Spring			1000 pieces	Suspension with spring used for motor vehicle. The item only includes those with spring and EXCLUDES those use air, oil and other substances.
		7	Exhaust Pipe			1000 pieces	Mufflers and exhaust pipes for motor vehicle regardless of material and specs.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3511	Building and repairing of ships	1	Steel Vessel for Transportation	1-1	Small sized vessel (less than 5000 ton)	Gross Ton	Steel vessel of small size less than 5,000 ton for the transport of goods such as fish boat, cargo ship, and transport ship.
				1-2	Medium sized vessel (from 5000 ton to 10,000 ton)	Gross Ton	Steel vessel of medium size from 5,000 ton to 10,000 ton for the transport of goods such as fish boat, cargo ship, and transport ship..
				1-3	Large vessel (more than 10,000 ton)	Gross Ton	Steel vessel of large size more than 10,000 ton for the transport of goods such as fish boat, cargo ship, and transport ship.
		2	Wooden Vessel and Boat	2-1	Small sized vessel (less than 10 ton)	Gross Ton	Wooden vessel and boat of small size less than 10 ton for the transport of goods such as fish boat, cargo ship, and transport ship..
				2-2	Medium sized vessel (from 10 ton to 100 ton)	Gross Ton	Wooden vessel and boat of medium size from 10 ton to 100 ton for the transport of goods such as fish boat, cargo ship, and transport ship..
				2-3	Large vessel (more than 100 ton)	Gross Ton	Wooden vessel and boat of large size more than 100 ton for the transport of goods such as fish boat, cargo ship, and transport ship..
		3	Vessel of Other Materials			Gross Ton	Vessel made of material other than steel and wood for the transport of goods such as fish boat, cargo ship, and transport ship..
		4	Towing, Tugging and Pushing Boat, Pilot Boat, Flash-light Boat			Gross Ton	Towing, Tugging and Pushing Boat, Pilot Boat, Flash-light Boat of all kinds regardless of specs.
		5	Barge of all kinds			Gross Ton	Barge of all kinds regardless of specs.
		6	Ferry-boat of all kinds	6-1	Self-propelled ferry-boat	Gross Ton	Ferry boats, Cruise ships, excursion boats and similar vessels of those self-propelled. The item is those principally designed for the transport of persons.
				6-2	Other kinds of ferry-boat	Gross Ton	Ferry boats, Cruise ships, excursion boats and similar vessels of those NOT self-propelled. The item is those principally designed for the transport of persons.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3511	Building and repairing of ships	7	Floating Structures			Gross Ton	Floating structures such as rafts, tanks, buoys and etc.
		8	Overhaul and Maintenance of Vessel, Motor Boat and Ferry of all kinds	8-1	Overhaul and maintenance of vessel, motor boat of all kinds	Mil. Dong	Overhaul and maintenance of vessel and motor boat used for the transport of person.
				8-2	Overhaul and maintenance of barge and ferry-boat	Mil. Dong	Overhaul and maintenance of barge and ferry-boat used for the transport of goods.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3591	Motorcycles	1	Motorcycle	1-1	Motorcycle (less than 50cc)	Piece	Motorcycle including mopeds and motor scooters of those less than 50cc of cylinder capacity.
				1-2	Motorcycle (50-125cc)	Piece	Motorcycle including mopeds and motor scooters of those 50-125cc of cylinder capacity.
				1-3	Motorcycle (over 125cc)	Piece	Motorcycle including mopeds and motor scooters of those more 125cc of cylinder capacity.
		2	Motorcycle Parts	2-1	Engine of all kinds	Piece	Engine of all kinds used for motor cycle regardless of specs.
				2-2	Carburetors	Piece	Carburetors of all kinds used for motor cycle regardless of specs.
				2-3	Gear	Piece	Gear of all kinds used for motor cycle regardless of specs.
				2-4	Brake	Piece	Brake of all kinds used for motor cycle regardless of specs.
				2-5	Frame	Piece	Frame of all kinds used for motor cycle regardless of specs.
				2-6	Saddle	Piece	Saddle of all kinds used for motor cycle regardless of specs.
				2-7	Handlebar	Piece	Handlebar of all kinds used for motor cycle regardless of specs.
				2-8	Shock absorber/Suspension	Piece	Shock absorber/Suspension of all kinds used for motor cycle regardless of specs.
2-9	Meters	Piece	Meters of all kinds used for motor cycle regardless of specs.				
2-10	Mufflers	Piece	Mufflers of all kinds used for motor cycle regardless of specs.				
2-11	Other motorcycle parts	Piece	Other motorcycle parts of those not listed above.				

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3610	Furniture	1	Chair of all kind	1-1	Wooden chair	Piece	Wooden chair of all kind used more than 50% of material by wood regardless of size and purpose. The item EXCLUDES those used in furniture set for guest room.
				1-2	Metal chair	Piece	Metal chair of all kind used more than 50% of material by metal regardless of size and purpose such as those made of iron pipes. The item EXCLUDES those used in furniture set for guest room.
				1-3	Bamboo/rattan chair	Piece	Bamboo and rattan chair of all kind used more than 50% of material by bamboo or rattan regardless of size and purpose. The item EXCLUDES those used in furniture set for guest room.
				1-4	Other kind of chair	Piece	Other chairs of those not listed above such as those made of plastic. The item EXCLUDES those used in furniture set for guest room.
		2	Coated Salon		Set	Set of chair and table mainly for guest room. The item includes only those combined with cushioned chair.	
		3	Uncoated Salon	3-1	Inlaid wooden salon	Set	Set of chair and table mainly for guest room of those combined with uncushioned chair. The item only includes those inlaid with shell or pearl.
				3-2	Uninlaid wooden salon	Set	Set of chair and table mainly for guest room of those combined with uncushioned chair. The item does not include those inlaid with shell or pearl.
				3-3	Bamboo/rattan salon	Set	Set of chair and table mainly for guest room of those combined with uncushioned chair. The item includes only those made by bamboo or rattan.
		4	Kitchen Cabinet		Piece	Kitchen Cabinet of all kind regardless of material and size.	
		5	Table/Desk for Working (except dining table)		Piece	Table/Desk for Working regardless of material and size. The item includes those used in household and professional sector. The item EXCLUDES those used in school.	
6	Dining Table		Piece	Dining table of all kind regardless of material and size.			
7	Desk for Pupil		Piece	Desk for students of those mainly used in school regardless of material and size.			

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
3610	Furniture	8	Wooden bed and Bed from similar material.			Piece	Wooden Bed and Bed made of the similar material regardless of size.
		9	Special and traditional Bed with multi-purposes (used for sitting or sleeping).			Piece	
		10	Special and traditional Bed that has Curved Leg with multi-purposes (used for sitting or sleeping).			Piece	
		11	Wardrobe, Bookcase			Piece	Wardrobe and bookcase of all kind regardless of size and material. The item EXCLUDES bookshelf of those not attached with front cover.
		12	Inlaid Tea Chest			Piece	Tea chest inlaid with shell or pearl. The item EXCLUDES those combined with furniture set for guest room.
		13	Bookshelf			Piece	Bookshelf of all kind regardless of seize and material. The item EXCLUDES those attached with front cover.
		14	Dressing Table			Piece	Dressing table of all kind regardless of size and material whether or not attached with mirror.
		15	Cabinet for TV, Audio			Piece	Cabinet for TV and Audio regardless of size and material.
		16	Mattress of all kinds			Piece	Mattress of those installed with rubber or plastic material for the inner.
		17	Seat for Car of all kinds			Set	A driver's or passenger's seat in a car of all kinds.
		18	Other Furniture			Piece	Other furniture not listed above regardless of size and material.

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
4010	Electricity manufacturing and supply	1	Commercial electricity			Million Kwh	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
4020	Manufacturing of gas, gas fuel supply by pipe	1	Bupro (LPG) - Liquefied gas			1000 Ton	

VSIC	VSIC Name	Code1	Name	Code2	Name	Unit	Definitions
4100	Water quarrying, purifying and supply	1	Commercial tap-water			1000 m3	

2. INDEX CALCULATION & TABULATION MANUAL

GENERAL STATISTICS OFFICE

INDEX CALCULATION MANUAL

For

**MONTHLY SURVEY OF
MAJOR INDUSTRIAL PRODUCTS (MSMIP)**

HANOI, 2006

For further inquiries or in case of emergency, please contact:

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CONTENTS

Chapter 1. Overview of Index Calculation

1.1. Objective of Index Calculation	A2 - 1
1.2. Fundamental Concepts of Industrial Activities	A2 - 2
1.3. Index Calculation Methodologies	A2 - 5
1.4. Choice of Index Items and Formula.....	A2 - 11
1.5. Weight Calculation.....	A2 - 12

Chapter 2. Calculation Practice in the index calculation

2.1. Calculation Flow	A2 - 15
2.2. Calculation Schedule.....	A2 - 16
2.3. Calculation and EXCEL Practice	A2 - 16
2.4. Details of EXCEL Program.....	A2 - 20

Chapter 3. Revision of Base Period

3.1. Biases in Laspeyres and Paasche Index	A2 - 29
3.2. Paasche Check.....	A2 - 29
3.3. Importance of Base Period Revision.....	A2 - 30

Chapter 1. Overview of Index Calculation

This chapter explains the overall concept of index of industrial production. It explains the objective of the calculation, calculation methodologies, and choice of weight measurement that would be beneficial in case of Vietnam.

1.1. Objective of Index Calculation

The Index of Industrial Production (IIP) is a measurement of industrial activity made in the domestic sector at given period of time. This measurement needs to reflect the industrial activity in reliable and timely manner in order to provide sufficient information for the statistical users in their policymaking, economic analyses and other relevant uses. The IIP explained in this Manual have 4 objectives as listed below:

- (1) Reliability
- (2) Accessibility
- (3) Timeliness
- (4) International Standard

The first objective implies that the IIP requires to represent the industrial activities in reliable manner. This includes not only the reliability of source data, but also the selection of calculation methods. The calculation method for the IIP should avoid any factors that could negate understanding pure performance of industrial activity such as price fluctuation and etc..

The second objective implies that the IIP requires to provide the information that statistical users comprehensively understand the industrial situation without any difficulties. This involves publication method of statistics, dissemination style and any other relevant matters in enhancing the use of statistics.

The third objective implies the efficiency of compilation practice in order to attain the timeliness. Although there were a number of methodologies in attaining the reliable data including the sophisticated source data acquisition, it would negate the use of statistics if the data lacks the timeliness. In this sense, the IIP compilation requires to employ the efficient process in order to attain the timeliness in accordance with the reliability of data.

The last objective implies the IIP calculation requires to base on the international standard. As the industry faces global markets, the needs for using the statistics in international comparison

would inevitably be enhanced in inside and outside the country. Especially when the country goes into the free trade system, the needs for preparing statistics that applies international standards would be further esteemed. The application of international standards includes not only calculation methods, but also classification system such as commodity and/or industry classification.

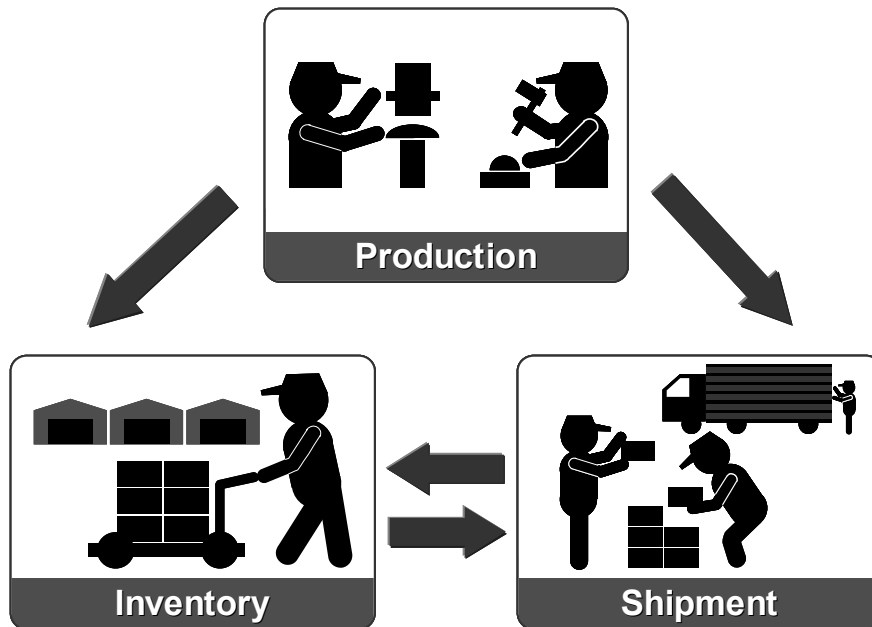
This manual introduces the methodology for the index calculation that meets the objectives listed above. The methodology given this manual is also made so that the compilation process best meets the economic and social condition in Vietnam.

1.2. Fundamental Concepts of Industrial Activities

Everyday, we are surrounded by a number of information on the economy. Since the economic fluctuation always affects the performance of enterprise, understanding the economic dynamics is extremely important to manage business circumstances. In doing so, everybody is always considering a fundamental question --- how does the economy work? Nobody has successfully answered this question yet. However, there are several keys to get the solution.

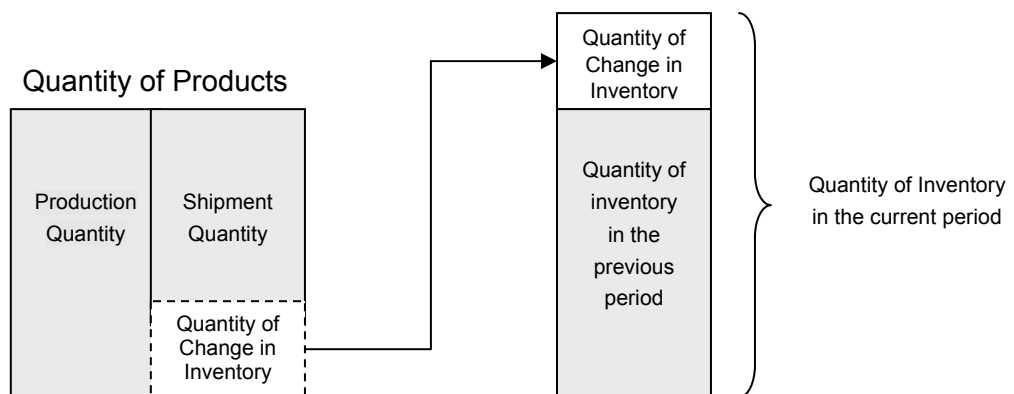
Let's look at the case of manufacturing industry. In this industry, all enterprises continuously carry out a series of 3 activities, namely production, shipment and inventory. In the beginning of the series, enterprises make the products by machines or hands with using the materials. Next, they ship the finished products to the customers where they normally obtain turnover as a reward of production. In this stage, some of enterprises may store the products in the stockyard in order to prepare for the shipment in the future. More simply, these series are described as in the figure below.

Three Basic Activities in Manufacturing Industry

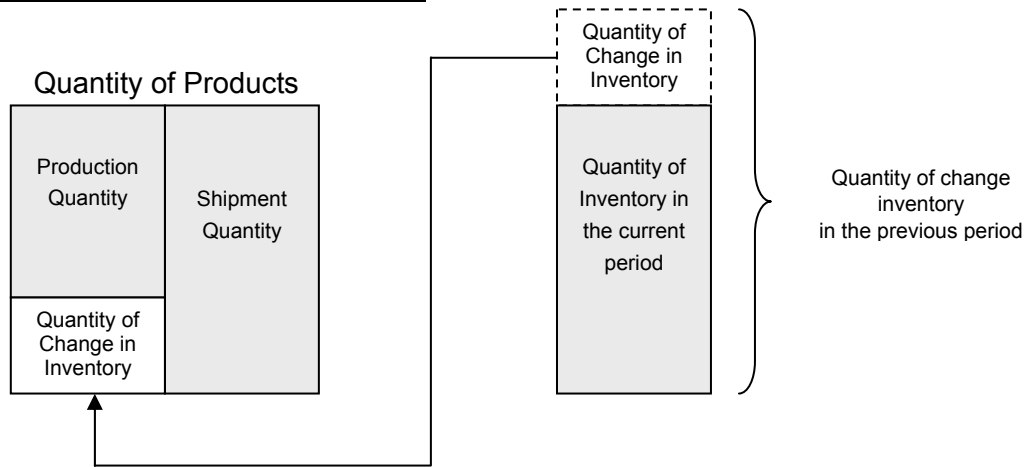


Let's look at the details of these activities. The finished products are always shipped to customers or stored in the inventory. This implies the quantity of finished products is always the same as the quantity of shipment plus the change in inventory, i. e. they are always balanced. There are 2 cases in this balance. The first case is when the quantity of production exceeds the quantity of shipment. In this case, unshipped or unsold products will be store in the inventory, which will be shipped sometime in the future. The second case is when the quantity of shipment exceeds the quantity of production. In this case, the deficiency will be covered up by the inventory. These two cases are illustrated in the figure below.

When production exceeds shipment

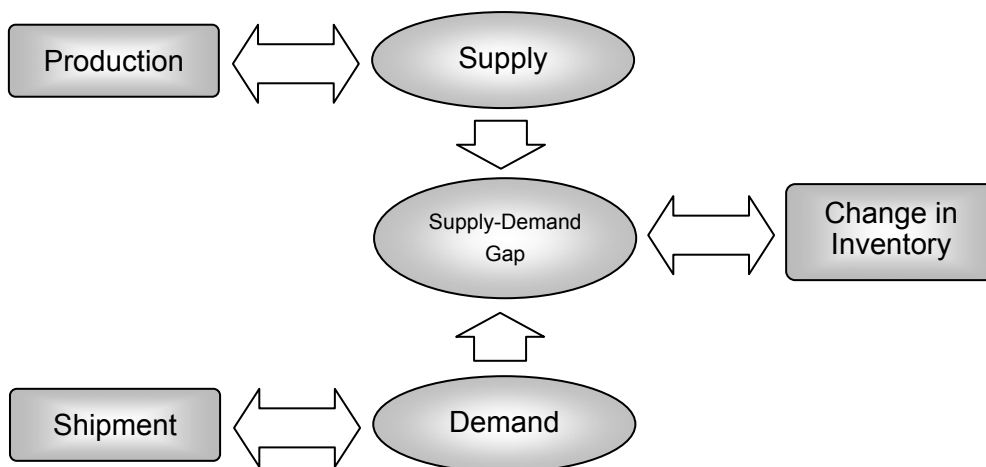


When shipment exceeds production



These activities are fundamental elements of the economy. Production is the quantity of goods or services provided to the economy. In the economic term, this quantity is regarded as the “supply” of product. Shipment is the quantity of goods or services that people are ready to purchase at a given price. In the economic term, this is regarded as the “demand” of product. AT last, the change in inventory is the quantity of difference between supply and demand. In the economic term, this is regarded as the “supply-demand gap”. Taking these factors into account, the indicators describing the quantity of production, shipment and inventory would be essential in understanding the economic situation.

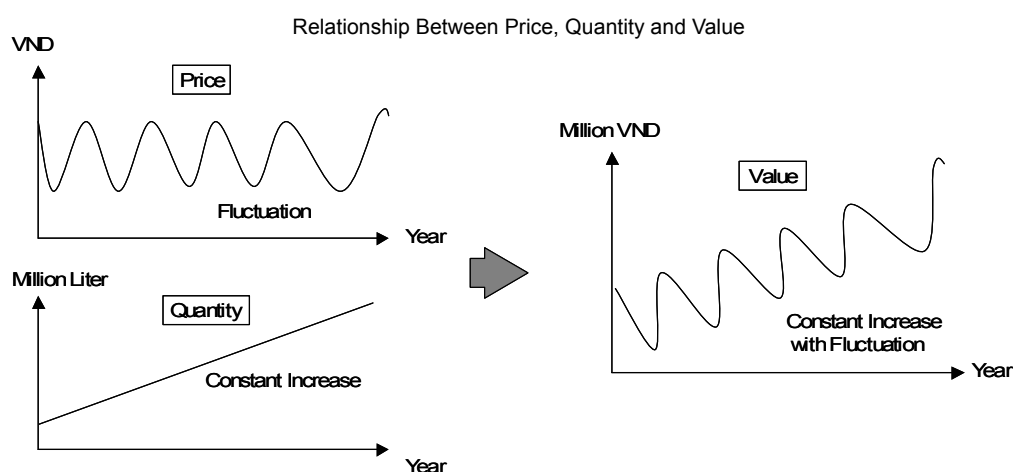
Relationship between 3 Activities and the Economic Terms



1.3. Index Calculation Methodologies

(1) Value Index and Quantity Index

There are 2 major methods in measuring industrial activities, namely quantity index and value index. In order to understand the industrial activity, the application of quantity is more reliable than taking value. This is because the value reflects the price fluctuation, which negates understanding pure performance of economy. When the economy experiences price fluctuation, the value would also fluctuate even if the quantity constantly increases as shown in the figure below. In this sense, the application of quantity would be more reliable in order to observe the industrial activity.



(2) Laspeyres Formula and Other Types of Indexes

Aside from the price fluctuation, there are a number of products in the economy. The purpose of calculating the index as stated earlier is to provide the information that statistical users comprehensively understand the industrial situation without any difficulties. To do so, the methodology frequently used in many countries is the calculation of a “quantity index” by applying the weighted average. In this method, the index provides an indicator on the movement of industrial activity without the effect of price fluctuation.

There are several ways to calculate indexes. In general, methodologies to calculate the quantity index include the Laspeyres index, the Paache index, and the Fisher index as shown below.

Laspeyres Index:
$$\frac{\sum_{i=1}^I P_0^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i} \times 100$$

$$\text{Paasche Index: } \frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_t^i Q_0^i} \times 100$$

$$\text{Fischer Index: } \sqrt{\frac{\sum_{i=1}^I P_0^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i} \times \frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_t^i Q_0^i}} \times 100$$

where

P_0^i = Price of Commodity i at base period (monthly average)

P_t^i = Price of Commodity i at time t

Q_0^i = Quantity of Commodity i at base period (monthly average)

Q_t^i = Quantity of Commodity i at time t

As noticed, all indexes are constructed from the ratio of quantity at the current and the base period. The difference among these methods is only the choice of time for the weight, i.e. (1) the Laspeyres index applies the price at the base time period, (2) the Paache index applies the price at the current time t, and (3) the Fischer index is a geometric average of these two indexes in order to share their advantages. In another expression, these indexes can be rewritten as follow:

$$\text{Laspeyres Index } \frac{\sum_{i=1}^I w_0^i \frac{Q_t^i}{Q_0^i}}{\sum_{i=1}^I w_0^i} \times 100$$

$$\text{Paasche Index: } \frac{\sum_{i=1}^I w_t^i \frac{Q_t^i}{Q_0^i}}{\sum_{i=1}^I w_t^i} \times 100$$

$$\text{Fischer Index: } \sqrt{\frac{\sum_{i=1}^I w_0^i \frac{Q_t^i}{Q_0^i}}{\sum_{i=1}^I w_0^i} \times \frac{\sum_{i=1}^I w_t^i \frac{Q_t^i}{Q_0^i}}{\sum_{i=1}^I w_t^i}} \times 100$$

where

w_0^i =Weight of Commodity i at base period where $w_0^i = P_0^i Q_0^i$ (annual total)

w_t^i =Weight of Commodity i at current period where $w_t^i = P_t^i Q_t^i$ (annual total)

As noticed from the equations, the index at the base period is always equal to 100. This implies if 100 is deducted from the index in any period, it would be equal to the growth rate of the month compared with the base period.

A well known fact in the index theory is that when the production is increasing, the Laspeyres index tends to exceed the Paasche index. The reason is that, the production quantity would be evaluated at relatively high price in the base period because the production increase tends to accompany with lower price. On the other hand, when the production is decreasing, the Paasche index tends to exceed the Laspeyres. Thus, the Laspeyres and Paasche would not properly represent the industrial activity when the price is significantly different between the current period and the base period.

The Fisher index takes the geometric average of Laspeyres and Paasche index. As the Fisher index do not contain the bias occurred in these indexes, the Fisher index is occasionally called the ideal index. However, the time series of the Fischer index requires data on weight and quantity in each successive period. Thus, it is costly and time consuming to calculate the Fischer indexes. On the other hand, the Laspeyres index could be compiled easily once the information on the base period are available. Hence, the Laspeyres index has an advantage over the Fisher index in terms of efficiency.

EXAMPLE

Let's look at an example on these three indexes. Suppose there are 3 selected commodities: refrigerator, motorbike, and PC with production quantity (Q), price (P) and production value (W) as in the table below.

Example: Production Quantity of Selected Commodities

	Name of Commodities	Unit	00:1	00:2	00:3	....	....	....	04:10	04:11	04:12
Quantity	Refrigerator (Q ¹)	Piece	276489	361843	394832	....	....	....	227622	227288	181577
	Motorbike (Q ²)	Piece	17235	17552	17010	....	....	....	22398	25067	21368
	PC (Q ³)	Piece	693666	1096998	1318393	....	....	....	667915	755442	791442
Price	Refrigerator (P ¹)	Mil VND	4.21	4.24	4.22	....	....	....	4.76	4.75	4.84
	Motorbike (P ²)	Mil VND	11.54	10.98	11.01	....	....	....	14.34	12.04	13.67
	PC (P ³)	Mil VND	9.11	8.71	8.68	....	....	....	6.02	5.92	5.70
Weight	Refrigerator (W ¹ = P ¹ Q ¹)	Mil VND	1163843	1533380	1666389	....	....	....	1083519	1080694	879444
	Motorbike (W ² = P ² Q ²)	Mil VND	198889	192731	187269	....	....	....	321111	301713	292037
	PC (W ³ = P ³ Q ³)	Mil VND	6320278	9553519	11446343	....	....	....	4022731	4470463	4507546
	TOTAL ΣW	Mil VND	7683009	11279630	13300000	....	....	....	5427361	5852870	5679028

From the figures above, annual average of production quantity and price would be calculated as

below.

Example: Annual Average of Production Quantity and Price

	Name of Commodities	Unit	00	01	02	03	04
Monthly Average	Refrigerator (Q ¹)	Piece	352020	314848	267972	241834	245508
	Motorbike (Q ²)	Piece	24786	21377	19658	21107	21946
	PC (Q ³)	Piece	1003348	947874	753250	737667	758720
	Refrigerator (P ¹)	Mil VND	4.77	4.87	4.44	4.72	4.74
	Motorbike (P ²)	Mil VND	12.47	13.07	14.64	14.43	13.56
	PC (P ³)	Mil VND	8.24	6.79	6.27	6.22	6.03

Additionally, annual total of weight would be calculated as below.

Example: Annual Total of Weight

	Name of Commodities	Unit	00	01	02	03	04
Annual Total	Refrigerator W ¹	Mil VND	20142176	18470417	14518796	13668843	14062731
	Motorbike W ²	Mil VND	3753565	3355787	3444583	3665509	3593472
	PC W ³	Mil VND	98552176	77520000	56729074	54958194	54711713
	TOTAL ΣW	Mil VND	122447917	99346204	74692454	72292546	72367917

Laspeyres Index

Now, let's calculate the Laspeyres index. The Laspeyres index is calculated by summarizing the growth of each quantity compared with the base period, multiplied by the weight in the base period. Let suppose the base period to be the year 2000. Then, the index is calculated as follows:

$$\text{Laspeyres Index} = \frac{\sum_{i=1}^I w_0^i \frac{Q_t^i}{Q_0^i}}{\sum_{i=1}^I w_0^i} \times 100 = \left(\frac{w_0^1 \frac{Q_t^1}{Q_0^1}}{\sum_{i=1}^I w_0^i \frac{Q_0^i}{Q_0^i}} + \frac{w_0^2 \frac{Q_t^2}{Q_0^2}}{\sum_{i=1}^I w_0^i \frac{Q_0^i}{Q_0^i}} + \frac{w_0^3 \frac{Q_t^3}{Q_0^3}}{\sum_{i=1}^I w_0^i \frac{Q_0^i}{Q_0^i}} \right) \times 100$$

Using this equation, the index of December 2004, for instance, would be calculated as:

$$\begin{aligned} \text{Index in December 2004} &= \left(\frac{20142176}{122447917} \frac{181577}{352020} + \frac{3753565}{122447917} \frac{21368}{24786} + \frac{98552176}{122447917} \frac{791442}{1003348} \right) \times 100 \\ &= (0.084 + 0.026 + 0.634) \times 100 \\ &= 74.61 \end{aligned}$$

Applying the calculation to each month, indexes would be solved as following:

	00:1	00:2	00:3	....	....	....	04:10	04:11	04:12
Index	70.70	107.08	126.31	....	....	....	66.98	74.32	74.61

As noticed, the average of index in the base period is always equal to 100. This implies if 100 is deducted from the index in any period, it would be equal to the growth rate of the month compared with the average of base period.

Paasche Index

The Paasche index is calculated by summarizing the growth of each quantity compared with the base period, multiplied by the weight in the current period. Let suppose again the base period to be the year 2000. Then, the index is calculated as follows:

$$\text{Paasche Index} = \frac{\sum_{i=1}^I \frac{w_t^i Q_t^i}{\sum_{i=1}^I w_t^i Q_0^i}}{\sum_{i=1}^I \frac{w_t^i Q_t^i}{\sum_{i=1}^I w_t^i Q_0^i}} \times 100 = \left(\frac{w_t^1 Q_t^1}{\sum_{i=1}^I w_t^i Q_0^i} + \frac{w_t^2 Q_t^2}{\sum_{i=1}^I w_t^i Q_0^i} + \frac{w_t^3 Q_t^3}{\sum_{i=1}^I w_t^i Q_0^i} \right) \times 100$$

Using this equation, the index of December 2004, for instance, would be calculated as:

$$\begin{aligned} \text{Index in December 2004} &= \left(\frac{14062731}{72367917} \frac{181577}{352020} + \frac{3593472}{72367917} \frac{21368}{24786} + \frac{54711713}{72367917} \frac{791442}{1003348} \right) \times 100 \\ &= (0.100 + 0.042 + 0.596) \times 100 \\ &= 73.94 \end{aligned}$$

Applying the calculation to each month, indexes would be solved as following:

	00:1	00:2	00:3	....	....	....	04:10	04:11	04:12
Index	70.70	107.08	126.31	....	....	....	67.38	74.49	73.94

As in the case of Laspeyres index, the average of index in the base period is always equal to 100.

Fischer Index

As described earlier, the Laspeyres and Paasche indexes would not properly represent the industrial activity when the weight is significantly different between the current period and the base period. To mitigate this situation, Fisher index takes the geometric average of Laspeyres and Paasche index as shown below:

Fischer Index:
$$\sqrt{\frac{\sum_{i=1}^I P_0^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i} \times \frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_t^i Q_0^i}} \times 100$$

	00:1	00:2	00:3	....	....	....	04:10	04:11	04:12
Index	70.70	107.08	126.31	....	....	....	67.18	74.41	74.28

(3) Quantity Index and Price Index

Lets think about the relationship between quantity index and price index. The price index of Laspeyres, Paasche and Fischer types are defined in a similar way to the quantity index, simply by interchanging the P and Q in formulas as follows.

Laspeyres Price Index:
$$\frac{\sum_{i=1}^I Q_0^i P_t^i}{\sum_{i=1}^I Q_0^i P_0^i} \times 100$$

Paasche Price Index:
$$\frac{\sum_{i=1}^I Q_t^i P_t^i}{\sum_{i=1}^I Q_t^i P_0^i} \times 100$$

Fischer Price Index:
$$\sqrt{\frac{\sum_{i=1}^I Q_t^i P_t^i}{\sum_{i=1}^I Q_0^i P_t^i} \times \frac{\sum_{i=1}^I Q_0^i P_t^i}{\sum_{i=1}^I Q_t^i P_0^i}} \times 100$$

A Laspeyres price index evaluate the price at the fixed quantity in the base period, while Paasche price index use the quantity of current period. Now, by applying the combination of quantity and price indexes of Laspeyres, Paasche and Fischer, it provides the ratio of the values in the base and current periods as shown below.

$$\text{Laspeyres Price Index} \times \text{Paasche Quantity Index} = \left(\frac{\sum_{i=1}^I Q_0^i P_t^i}{\sum_{i=1}^I Q_0^i P_0^i} \times 100 \right) \times \left(\frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_t^i Q_0^i} \times 100 \right) = \frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i} \times 10000$$

$$\text{Paache Price Index} \times \text{Laspeyres Quantity Index} = \left(\frac{\sum_{i=1}^I Q_t^i P_t^i}{\sum_{i=1}^I Q_t^i P_0^i} \times 100 \right) \times \left(\frac{\sum_{i=1}^I P_0^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i} \times 100 \right) = \frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i} \times 10000$$

$$\begin{aligned} \text{Fischer Quantity Index} \times \text{Fischer Price Index} &= \left(\sqrt{\frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_t^i Q_0^i} \times \frac{\sum_{i=1}^I P_0^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i}} \times 100 \right) \times \left(\sqrt{\frac{\sum_{i=1}^I Q_t^i P_t^i}{\sum_{i=1}^I Q_t^i P_0^i} \times \frac{\sum_{i=1}^I Q_0^i P_0^i}{\sum_{i=1}^I Q_0^i P_t^i}} \times 100 \right) \\ &= \frac{\sum_{i=1}^I P_t^i Q_t^i}{\sum_{i=1}^I P_0^i Q_0^i} \times 10000 \end{aligned}$$

1.4. Choice of Index Items and Formula

(1) Index Items

As explained earlier, each enterprise carries out a series of economic activities on a regular basis. This includes: (1) production by using necessary materials; (2) shipment or sales of the products to customers; and (3) storage of unsold products in inventory. It is also explained earlier that these activities can be regarded as fundamental elements of economic activity: (1) supply of products; (2) demand for products; and (3) a supply-demand gap for products. These activities are essential in obtaining a good understanding of economy.

Taking these factors into account, it is desirable to compile, at least, “production index”, “shipment index” and “inventory index” for the items to observe the economy. It would be also valuable if “projected production index” that provides the forecasts of production index in the next month. Among indexes them, it is important to point out that the combination of these indexes provide a strong analytic tool in the “inventory-cycle analysis”, which provides a good indicator of the economic cycle as explained in Chapter 5.

(2) Index Formula

As stated above, there are a variety of methods in index calculation. One should note, however, that the Paasche and/or Fischer indexes involve prices at the current time period. This requires a

number of tasks in index compilation and a complexity in getting synthesized data on quantity and price. In addition, considering the statistics condition of Vietnam, the Enterprise Census, source data for index calculation, has been disseminated two years later than the reference year. Thus, these methods are not the most appropriate in order to undertake monthly compilation in Vietnam. On the other hand, the Laspeyres index simply requires prices and quantities of the base time and quantities of the current time. It should also be noted that most of other countries apply the Laspeyres index, which would provide international comparability for statistics users. Thus, it is desirable to apply the Laspeyres index to the calculation of the Vietnamese index.

(3) Choice of Weight

Compilation of the indexes entails selection of weights. Among the four indexes, the production index generally uses value-added or production value for the weight. Value added is used to compile an index to reflect a single sequence of production activity. The production value, on the other hand, is used to compile an index to make comparison with shipment and/or inventory indexes. The shipment index and the inventory index generally use the turnover and inventory values respectively so that they can precisely reflect the share of industry. The table below explains respective indexes with its purpose and selection of weight.

Items to Calculate Indexes

Index Items	Purpose	Weight
Production Index (Value-added Weight)	Representation of production or supply trend	Value Added
Production Index (Production Value Weight)	Representation of production trends with comparison to shipment and inventory index	Production Value
Shipment Index	Representation of demand for products	Shipment Value
Inventory Index	Representation of inventory level	Inventory Value
Projected Production Index	Representation of production index projected in the next month.	Value Added

1.5. Weight Calculation

(1) Weight for each Commodity

The source data for weight can be obtained from the Annual Industrial Statistics such as the Enterprise Census that provides data on value-added, production value, turnover, and inventory value of each province at the VSIC 4-digit level. To calculate the weight for each commodity, it is imperative to use the share of values of each commodity such as the shipment value, and to

apply the share into each VSIC four-digit level. The process involves: (1) estimation of price by dividing the shipment value by shipment quantity, (2) estimation of production and inventory value by multiplying the price to the production quantity and the inventory quantity, and (3) application of the commodity share of these values into the respective data from the Enterprise Census. The summary of the weight calculation at commodity level is shown below.

Value-Added Weight for Each Commodity in Production Index

$$\begin{array}{ccccccc} \text{Value-Added} & & \text{Value-added at VSIC 4} & & \text{Production Value} & & \text{Sum of Production Value for} \\ \text{for Each} & = & \text{Level} & \times & \text{for Each} & \div & \text{each Commodity in VSIC 4} \\ \text{Commodity} & & \text{(Enterprise Census)} & & \text{Commodity} & & \text{Level} \\ & & & & \text{(New Survey)} & & \text{(New Survey)} \end{array}$$

where

$$\begin{array}{ccccccc} \text{Production Value} & & \text{Shipment Value for Each} & & \text{Shipment} & & \text{Production Quantity for Each} \\ \text{for Each} & = & \text{Commodity (New} & \div & \text{Quantity for Each} & \times & \text{Commodity} \\ \text{Commodity} & & \text{Survey)} & & \text{Commodity} & & \text{(New Survey)} \\ \text{(New Survey)} & & & & \text{(New Survey)} & & \end{array}$$

Production Value Weight for Each Commodity in Production Index

$$\begin{array}{ccccccc} \text{Production Value} & & \text{Production Value at} & & \text{Production Value} & & \text{Sum of Production Value for} \\ \text{for Each} & = & \text{VSIC 4 Level} & \times & \text{for Each} & \div & \text{each Commodity in VSIC 4} \\ \text{Commodity} & & \text{(Enterprise Census)} & & \text{Commodity} & & \text{Level} \\ & & & & \text{(New Survey)} & & \text{(New Survey)} \end{array}$$

where

$$\begin{array}{ccccccc} \text{Production Value} & & \text{Shipment Value for Each} & & \text{Shipment} & & \text{Production Quantity for Each} \\ \text{for Each} & = & \text{Commodity (New} & \div & \text{Quantity for Each} & \times & \text{Commodity} \\ \text{Commodity} & & \text{Survey)} & & \text{Commodity (New} & & \text{(New Survey)} \\ \text{(New Survey)} & & & & \text{Survey)} & & \end{array}$$

Weight for Each Commodity in Shipment Index

$$\begin{array}{ccccccc} \text{Net Turnover} & & \text{Net Turnover at VSIC 4} & & \text{Shipment Value} & & \text{Sum of Shipment Value for} \\ \text{for Each} & = & \text{Level} & \times & \text{for Each} & \div & \text{Each Commodity} \\ \text{Commodity} & & \text{(Enterprise Census)} & & \text{Commodity} & & \text{(New Survey)} \\ & & & & \text{(New Survey)} & & \end{array}$$

Weight for Each Commodity in Inventory Index

$$\begin{array}{ccccccc} \text{Inventory Value} & & \text{Inventory Value at VSIC} & & \text{Inventory Value} & & \text{Sum of Inventory Value for} \\ \text{for Each} & = & \text{4 Level} & \times & \text{for Each} & \div & \text{each Commodity in VSIC 4} \\ \text{Commodity} & & \text{(Enterprise Census)} & & \text{Commodity} & & \text{Level} \\ & & & & \text{(New Survey)} & & \text{(New Survey)} \end{array}$$

where

$$\begin{array}{ccccccc} \text{Inventory Value} & & \text{Shipment Value for Each} & & \text{Shipment} & & \text{Inventory Quantity for Each} \\ \text{for Each} & = & \text{Commodity (New} & \div & \text{Quantity for} & \times & \text{Commodity} \\ \text{Commodity} & & \text{Survey)} & & \text{Each Commodity} & & \text{(New Survey)} \\ & & & & \text{(New Survey)} & & \end{array}$$

(2) Expansion

Since the new survey covers all commodities in VSIC 4-digit codes, the sum of weight for each

commodity is identical to the weight for the respective VSIC 4-digit code. When there is an industry not covered in the new survey, the sum of VSIC 4-digit codes would not be identical to the VSIC 2-digit code industry and, hence, VSIC 1-digit code industry (the ratio of selected industry to the entire industry is called the “representation ratio”). In order to calculate the weight for VSIC 2-digit or VSIC 1-digit level industries, there are two methods in general to calculate the weight. First, “single weight” can be applied. “Single weight” is simply the share of a selected industry to the entire industry. Second, “expansion” is another way of calculating the weight. “Expansion” calculates the share of the selected industry where the share is made so that it represents the share of unselected industries. From statistical viewpoint, they are equivalent because both of them use the ratio of selected industries so as to reflect the entire industry. In “expansion”, however, the sum of weight for VSIC 4-digit level industry becomes identical to the weight for the VSIC 2-digit level industry. Thus, one may find more useful to obtain the effect of each industry to the entire industry. The expansion from VSIC 4-digit level to VSIC 2-digit level or VSIC 1-digit level is acquired by the calculation below.

$$\begin{array}{l} \text{Expanded Weight} \\ \text{of Selected Industry} \\ \text{(VSIC 4)} \end{array} = \frac{\text{Weight for the Industry (VSIC 2)}}{\text{Sum of Weight for the Selected Industry (VSIC 4)}} \times \begin{array}{l} \text{Weight for the} \\ \text{Selected Industry} \\ \text{(VSIC 4)} \end{array}$$

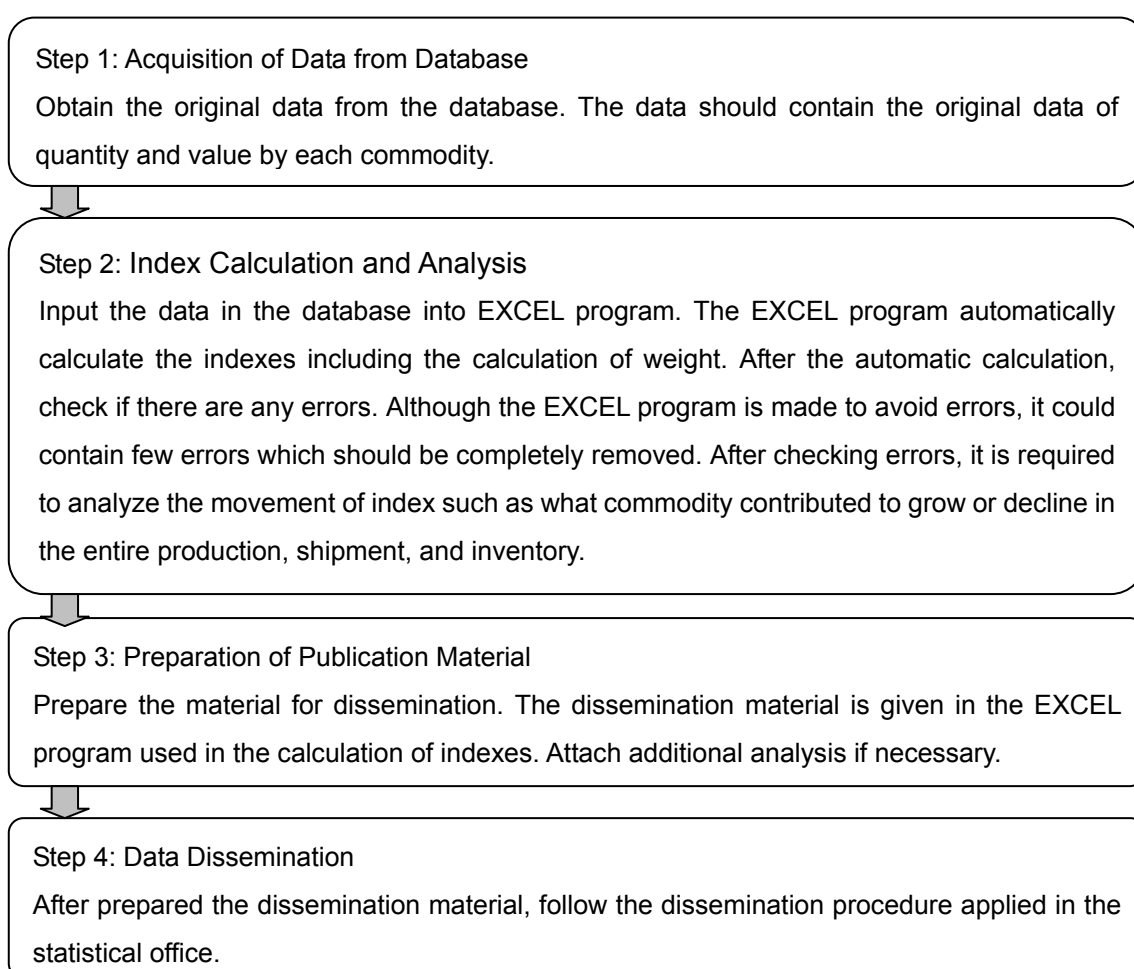
Chapter 2. Calculation Practice in the index calculation ¹

This chapter explains the practice of index calculation. This chapter explains the calculation flow, calculation schedule and the use of EXCEL program that is originally prepared under the Trial Surveys conducted under this Study. The methodologies applied in this chapter are drawn from the discussion given in Chapter 1.

2.1. Calculation Flow

Index calculation takes the following four steps: (1) Acquisition of data from database, (2) index calculation and analysis, (3) preparation of publication material, and (4) dissemination. The chart below explains the compilation flow of index calculation.

Compilation Flow of Index Calculation



¹ At the time of formal implementation of the MSMIP, other software may be applied. This chapter uses the EXCEL program for the explanatory purpose as the logic for the index calculation is equivalent regardless of the software.

2.2. Calculation Schedule

The calculation steps suggested above are expected to be conducted as follows.

Every Month Calculation

18th Day of Every Month: Acquisition of data from the database entered by the PSOs.



19th Day of Every Month: Index calculation



20th Day of Every Month: Analysis on the index and error corrections



20th Day of Every Month: Preparation of Dissemination Material

Note: This calculation schedule follows the suggested dates given in “the Manual for the Pre-survey” that is planned to be applied from January to December of 2006. The dates used in the formal implementation of the MSMIP are subject to change.

2.3. Calculation and EXCEL Practice

For the calculation in practice, follow the steps described below. The explanation below uses EXCEL program tentatively, but the statistician may apply other software depending on the preference.

Step 1: Source Data Acquisition from Database

Obtain the source data from the database that contains original commodity data such as quantity of production, shipment, ending inventory, and projected production in the next month, and shipment value. The output file in the database may look as in the following table.

Example: Database Output

VSIC	Code	Production			Shipment			Ending Inventory			Projected Production in the Next Month			Shipment Value (Million Dong)		
		T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12
1512	1-1	5461.15	2307.69		5405.03	4922.61		9778.15	3312.11		2769.48	1214.84		4973.49	6803.05	
1512	2-1	6282.88	6271.66		3242.67	8361.90		8137.36	9087.77		360.69	4473.15		6956.33	206.58	
1512	3-1	271.73	747.42		1849.70	7998.90		334.95	1620.60		2549.05	6318.24		7314.30	5858.51	

As shown, the items are listed from left to right by order of VSIC, code, production, shipment,

ending inventory, projected production and shipment value for each month respectively.

Step 2: Index Calculation and Analysis

Open the EXCEL program. The EXCEL program contains 10 tabs with the functions explained below.

Name of Tab	Function
INPUT	Original data by commodity input from the database output.
DATA	Coding for each commodity data and calculation of each values.
INDEX(COM)	Calculation of quantity index, weight, contribution rate and other preparation for each commodity level.
INDEX(VSIC4)	Calculation of quantity index and other preparation at VSIC 4-digit level.
INDEX(VSIC2)	Calculation of quantity index and other preparation at VSIC 2-digit level.
INDEX(VSIC1)	Calculation of quantity index and other preparation at VSIC 1-digit level.
WEIGHT	Calculation of expanded weight for VSIC 4-digits.
CENSUS DATA	Original data by Enterprise Census that are used for the source data for the weights.
OUTPUT	Calculation results of the indexes accompanied with commodity contributions.
REFERENCE	Commodity classification applied in the Survey.

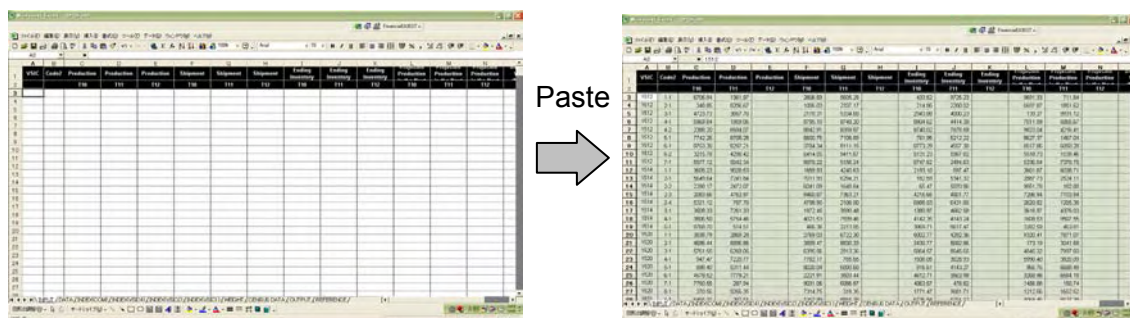
The details of calculation mechanism applied in the EXCEL program is explained in the next section. As can be seen, all cells are colored in either white, grey or black. The white cell implies that it contains original data and it is able to modify. The grey cell implies that it is automatically calculated using the original data. The black cells implies that it automatically fills the codes for commodities and industries that are used to be referred in the calculation throughout the EXCEL program. The user of the EXCEL program may change the contents of these cells only after thoroughly understand the mechanism of calculation. It should be noted that the unreasonable modification would lead errors or miscalculation of the indexes.

Step 2-1: Data Input into INPUT Tab

Now, it is ready to calculate the indexes. The EXCEL program is set to automatically calculate the indexes at VSIC4, 2, and 1 level and expresses in the dissemination format right after the data will be made in the INPUT tab.

Simply “paste” the original data from database into the INPUT tab. Then, it would be automatic to calculate the indexes.

Example: Input into INPUT Tab

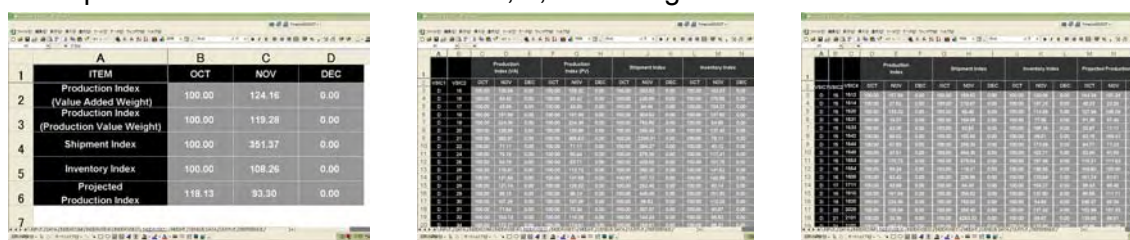


Step 2-2: Calculation Checking

Right after pasting the data into the INPUT tab, the indexes are automatically calculated at VSIC 4, 2, and 1 digit level. All users are required to check if the calculation was made successfully. To check the error, go to the INDEX(VSIC1) tab and check if there are any error such as #VALUE!, #DIV/0!, #NUM!, #N/A, #REF!, or #NULL!. If there are any errors, the most frequent case is “the double coding”. That is, the original data contains the commodities applying the same code with other commodities. When there is the case, simply modify them to the proper code. After checking at VSIC 1 digit level, check them at VSIC 2 and 4 digit level if there is no such errors.

Another important check is to see if there is non zero values at the base time period in production, shipment, and inventory indexes. When there is the case, it is mostly caused by the miscalculation of the weight, i.e. the expansion of the weight is not properly done with the sum equal to 100. When this case occurs, check the CENSUS DATA tab to see if the data are properly input. Note that the base period of index for “the projected production” is not equal to 100. The projected index does not use the quantity of “projected quantity” as the base quantity, but uses “production quantity” of the base period.

Example: Calculate Indexes at VSIC 4, 2, and 1 Digit level



Step 2-3: Output Reviewing

After checking the calculation, it is required to review the results. All results in VSIC 2 and 1 digits are represented in the OUTPUT tab. It also contains the list of commodities that contributed to the growth and decline of indexes and the list of weight applied in the index calculation. Note that the projected production index is automatically substituted into the production index attached with “p” notifying that the number is a projected figure. These results are made ready to print out for the preparation of dissemination material.

Example: Calculation Results and Related Figures

Index for Selected Industries				
Year	Index	Change	Weight	Value
15	100.0	0.0	100.0	100.0
16	100.0	0.0	100.0	100.0
17	100.0	0.0	100.0	100.0
18	100.0	0.0	100.0	100.0
19	100.0	0.0	100.0	100.0
20	100.0	0.0	100.0	100.0
21	100.0	0.0	100.0	100.0
22	100.0	0.0	100.0	100.0
23	100.0	0.0	100.0	100.0
24	100.0	0.0	100.0	100.0
25	100.0	0.0	100.0	100.0
26	100.0	0.0	100.0	100.0
27	100.0	0.0	100.0	100.0
28	100.0	0.0	100.0	100.0
29	100.0	0.0	100.0	100.0
30	100.0	0.0	100.0	100.0
31	100.0	0.0	100.0	100.0
32	100.0	0.0	100.0	100.0
33	100.0	0.0	100.0	100.0
34	100.0	0.0	100.0	100.0
35	100.0	0.0	100.0	100.0
36	100.0	0.0	100.0	100.0
37	100.0	0.0	100.0	100.0
38	100.0	0.0	100.0	100.0
39	100.0	0.0	100.0	100.0
40	100.0	0.0	100.0	100.0
41	100.0	0.0	100.0	100.0
42	100.0	0.0	100.0	100.0
43	100.0	0.0	100.0	100.0
44	100.0	0.0	100.0	100.0
45	100.0	0.0	100.0	100.0
46	100.0	0.0	100.0	100.0
47	100.0	0.0	100.0	100.0
48	100.0	0.0	100.0	100.0
49	100.0	0.0	100.0	100.0
50	100.0	0.0	100.0	100.0
51	100.0	0.0	100.0	100.0
52	100.0	0.0	100.0	100.0
53	100.0	0.0	100.0	100.0
54	100.0	0.0	100.0	100.0
55	100.0	0.0	100.0	100.0
56	100.0	0.0	100.0	100.0
57	100.0	0.0	100.0	100.0
58	100.0	0.0	100.0	100.0
59	100.0	0.0	100.0	100.0
60	100.0	0.0	100.0	100.0
61	100.0	0.0	100.0	100.0
62	100.0	0.0	100.0	100.0
63	100.0	0.0	100.0	100.0
64	100.0	0.0	100.0	100.0
65	100.0	0.0	100.0	100.0
66	100.0	0.0	100.0	100.0
67	100.0	0.0	100.0	100.0
68	100.0	0.0	100.0	100.0
69	100.0	0.0	100.0	100.0
70	100.0	0.0	100.0	100.0
71	100.0	0.0	100.0	100.0
72	100.0	0.0	100.0	100.0
73	100.0	0.0	100.0	100.0
74	100.0	0.0	100.0	100.0
75	100.0	0.0	100.0	100.0
76	100.0	0.0	100.0	100.0
77	100.0	0.0	100.0	100.0
78	100.0	0.0	100.0	100.0
79	100.0	0.0	100.0	100.0
80	100.0	0.0	100.0	100.0
81	100.0	0.0	100.0	100.0
82	100.0	0.0	100.0	100.0
83	100.0	0.0	100.0	100.0
84	100.0	0.0	100.0	100.0
85	100.0	0.0	100.0	100.0
86	100.0	0.0	100.0	100.0
87	100.0	0.0	100.0	100.0
88	100.0	0.0	100.0	100.0
89	100.0	0.0	100.0	100.0
90	100.0	0.0	100.0	100.0
91	100.0	0.0	100.0	100.0
92	100.0	0.0	100.0	100.0
93	100.0	0.0	100.0	100.0
94	100.0	0.0	100.0	100.0
95	100.0	0.0	100.0	100.0
96	100.0	0.0	100.0	100.0
97	100.0	0.0	100.0	100.0
98	100.0	0.0	100.0	100.0
99	100.0	0.0	100.0	100.0
100	100.0	0.0	100.0	100.0

Shipment Index for Selected Industries				
Year	Index	Change	Weight	Value
15	100.0	0.0	100.0	100.0
16	100.0	0.0	100.0	100.0
17	100.0	0.0	100.0	100.0
18	100.0	0.0	100.0	100.0
19	100.0	0.0	100.0	100.0
20	100.0	0.0	100.0	100.0
21	100.0	0.0	100.0	100.0
22	100.0	0.0	100.0	100.0
23	100.0	0.0	100.0	100.0
24	100.0	0.0	100.0	100.0
25	100.0	0.0	100.0	100.0
26	100.0	0.0	100.0	100.0
27	100.0	0.0	100.0	100.0
28	100.0	0.0	100.0	100.0
29	100.0	0.0	100.0	100.0
30	100.0	0.0	100.0	100.0
31	100.0	0.0	100.0	100.0
32	100.0	0.0	100.0	100.0
33	100.0	0.0	100.0	100.0
34	100.0	0.0	100.0	100.0
35	100.0	0.0	100.0	100.0
36	100.0	0.0	100.0	100.0
37	100.0	0.0	100.0	100.0
38	100.0	0.0	100.0	100.0
39	100.0	0.0	100.0	100.0
40	100.0	0.0	100.0	100.0
41	100.0	0.0	100.0	100.0
42	100.0	0.0	100.0	100.0
43	100.0	0.0	100.0	100.0
44	100.0	0.0	100.0	100.0
45	100.0	0.0	100.0	100.0
46	100.0	0.0	100.0	100.0
47	100.0	0.0	100.0	100.0
48	100.0	0.0	100.0	100.0
49	100.0	0.0	100.0	100.0
50	100.0	0.0	100.0	100.0
51	100.0	0.0	100.0	100.0
52	100.0	0.0	100.0	100.0
53	100.0	0.0	100.0	100.0
54	100.0	0.0	100.0	100.0
55	100.0	0.0	100.0	100.0
56	100.0	0.0	100.0	100.0
57	100.0	0.0	100.0	100.0
58	100.0	0.0	100.0	100.0
59	100.0	0.0	100.0	100.0
60	100.0	0.0	100.0	100.0
61	100.0	0.0	100.0	100.0
62	100.0	0.0	100.0	100.0
63	100.0	0.0	100.0	100.0
64	100.0	0.0	100.0	100.0
65	100.0	0.0	100.0	100.0
66	100.0	0.0	100.0	100.0
67	100.0	0.0	100.0	100.0
68	100.0	0.0	100.0	100.0
69	100.0	0.0	100.0	100.0
70	100.0	0.0	100.0	100.0
71	100.0	0.0	100.0	100.0
72	100.0	0.0	100.0	100.0
73	100.0	0.0	100.0	100.0
74	100.0	0.0	100.0	100.0
75	100.0	0.0	100.0	100.0
76	100.0	0.0	100.0	100.0
77	100.0	0.0	100.0	100.0
78	100.0	0.0	100.0	100.0
79	100.0	0.0	100.0	100.0
80	100.0	0.0	100.0	100.0
81	100.0	0.0	100.0	100.0
82	100.0	0.0	100.0	100.0
83	100.0	0.0	100.0	100.0
84	100.0	0.0	100.0	100.0
85	100.0	0.0	100.0	100.0
86	100.0	0.0	100.0	100.0
87	100.0	0.0	100.0	100.0
88	100.0	0.0	100.0	100.0
89	100.0	0.0	100.0	100.0
90	100.0	0.0	100.0	100.0
91	100.0	0.0	100.0	100.0
92	100.0	0.0	100.0	100.0
93	100.0	0.0	100.0	100.0
94	100.0	0.0	100.0	100.0
95	100.0	0.0	100.0	100.0
96	100.0	0.0	100.0	100.0
97	100.0	0.0	100.0	100.0
98	100.0	0.0	100.0	100.0
99	100.0	0.0	100.0	100.0
100	100.0	0.0	100.0	100.0

List of Commodities Contributed to Growth and Decline of Production Index in November					
Rank	Growth	Name of Commodity	Rank	Decline	Name of Commodity
1	0.1	For children	1	-1.4	Polyester yarn
2	4.9	Bottle Beer	2	-1.3	Other Cotton Oil (e.g. shorting)
3	3.1	For children	3	-1.0	Type Printing Ink (7.5 %)
4	3.4	Knitwear, Footwear and the Similar Paper Products	4	-0.3	Artificial grass/industrial machine
5	3.1	Other Beer (e.g. fresh beer)	5	0.9	For adult
6	2.4	Other Milk Products nec.	6	0.9	Beer
7	2.4	Truck less than 7 ton	7	0.8	Cosmetics, Soaps and other preparations for skin
8	1.4	Apparel of Tanned Leather	8	0.7	Soft plastic pipe
9	1.0	Mats and Caps of all kinds	9	0.7	Flower fabrics of wool fibres
10	1.3	Process Saffron and Aqueous Products	10	0.7	Sealing Thread of all kinds
11	1.1	Essence of Camomile	11	0.7	Use Clean and Other Sinter-Products
12	1.1	For adult	12	0.5	Light-weight fabrics
13	1.1	PCOs (Safety/terrorism)	13	0.5	Unwashed animal garden mix
14	0.8	Subs. Excluded from Animal Fat	14	0.5	Patented device
15	0.8	Range of all kinds	15	0.5	For children
16	0.8	White-painted metal	16	0.5	Electrical insulators that are not made of Porcelain, Glass, Rubber and Plastic
17	0.8	Apparel of Synthetic Leather	17	0.5	Crushed Beer
18	0.8	For children	18	0.4	Coin Slot
19	0.8	Photo-inks	19	-0.4	Shampoo
20	0.8	Animal Shaving Preparations of all kinds	20	-0.4	Non-walk (e.g. of shoes, slippers) nec. (20% (2004))

It is required to analyze the cause of change in the indexes by looking at these outputs. As the purpose of index calculation is to grasp the movement of industrial activity, it should be understood what commodity contributed the change. Especially, it should be carefully studied if there were significant change in either jump up and down of indexes. This is because it is normally the case where the mistakes in questionnaire or data input tend to create such significant change.

Step 3: Preparation of Publication Material

The publication material would be easily made simply by printing out the OUTPUT tab. Several statistical offices may add other analysis by modifying the representation style. In general, the dissemination style should be in the consolidated form in order to protect the information on the individual enterprises. The dissemination format should be decided under the discretion of each statistical office. After preparing the material, prepare the copy for the distribution.

Step 4: Data Dissemination

The data is required to disseminate at the end of the month next to the reference month. The dissemination objective should be based on the discretion of each provincial statistics office.

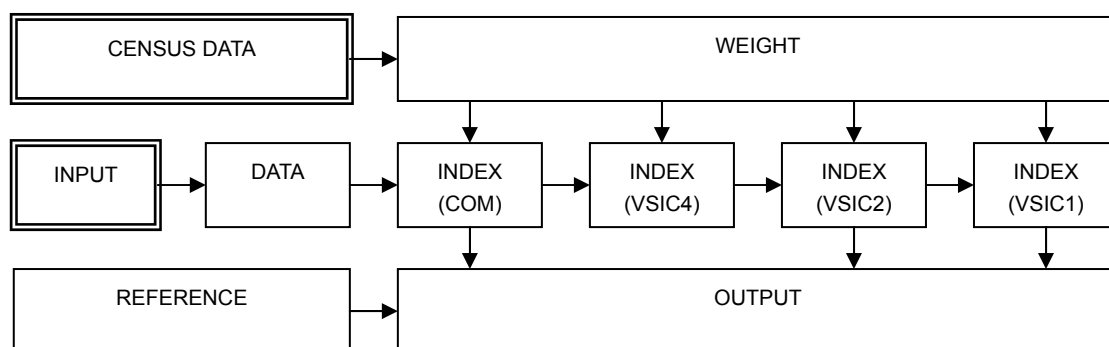
2.4. Details of EXCEL Program

The EXCEL program introduced above applies the index calculation methodologies explained in Chapter 1. This section explains more details on the methods applied in the EXCEL for the calculation of indexes.

- Entire Structure

The entire structure of the EXCEL program is made so that all data are interlinked as described below. Data in the CENSUS DATA are used in the WEIGHT tab where it calculates the expanded weight of VSIC 2 and 4 digits level. In the meantime, the original data in the INPUT tab are rearranged with commodity codes in the DATA tab where it also calculates the production and inventory value for each commodity. These arranged data in the DATA tab are used in calculating the index at commodity level and VSIC 4, VSIC 2, and VSIC1 digit level in INDEX(COM), INDEX(VSIC4), INDEX(VSIC2) and INDEX(VSIC1) tab, respectively. The result of these outputs are represented in the OUTPUT tab being ready to disseminate. The details of each tab is described in the later sections.

Figure: Structure of EXCEL program



- Functions and Coding

The EXCEL program uses only simple functions for the users to easily modify. The most frequent functions are SUMIF and VLOOKUP functions where the explanation of these functions are available in any EXCEL references. The EXCEL also applies IF and ISERROR commands in order to avoid errors.

The EXCEL program uses the unique commodity code. It uses the combination of VSIC and commodity code such as 1511-1-1 where the first 4 digits implies the VSIC code and the last part is the codes applied in the commodities in questionnaire. These codes are automatically made in the DATA tab by referring the codes in the INPUT tab.

- Description of Tabs

(a) CENSUS DATA

The CENSUS DATA is made for a storage of the original data from the Enterprise Census that will be used for calculating weights. It is ordered from left to right by the following arrangement for each industry.

Example: CENSUS DATA Tab

	VSIC2	VSIC4	Value Added (Million Dong)	Production Value (Million Dong)	Net Turnover (Million Dong)	Ending Inventory (Million Dong)
D
D

Among the columns, VSIC2 is automatically made by truncating the last 2 digits of VSIC4. It should be noted that these order in column should be strictly protected because these arrangement will be followed by the calculation in other tabs.

(b) WEIGHT

The WEIGHT automatically calculates the weight using the data in the CENSUS tab. It is ordered from left to right by the following arrangement for each industry.

Example: WEIGHT Tab

	VSIC2	VSIC4	1 if Included in Sample (VSIC2)	1 if Included in Sample (VSIC4)	Value Added of VSIC2 Included	Production Value of VSIC2 Included	Net Turnover of VSIC2 Included	Ending Inventory of VSIC2 Included	Value Added of VSIC4 Included	Production Value of VSIC4 Included	Net Turnover of VSIC4 Included	Ending Inventory of VSIC4 Included	Expanded Value Added	Expanded Production Value	Expanded Net Turnover	Expanded Ending Inventory	Expanded Value Added (%)	Expanded Production Value (%)	Expanded Net Turnover (%)	Expanded Ending Inventory (%)
D
D

VSIC2 and VSIC4 directly refers the figures in the CENSUS DATA tab. “1 if Included in Sample (VSIC2)” and “1 if Included in Sample (VSIC4)” refer to the DATA tab and set equal to 1 if the production value of the industry is nonzero. Value added, production value, net turnover,

and ending inventory of VSIC2 and VSIC4 directly refer the CENSUS DATA. These are set zero if the production value in October (base time period) data are zero. Finally, the expanded weigh of value added, production value, net turnover and ending inventory are calculated by the following equation:

$$\begin{aligned} \text{Expanded Weight of Selected Industry (VSIC 4)} &= \frac{\text{Weight for the Industry (VSIC 1)}}{\text{Sum of Weight for the Selected Industry (VSIC 2)}} \\ &\times \frac{\text{Weight for the Industry (VSIC 2)}}{\text{Sum of Weight for the Selected Industry (VSIC 4)}} \\ &\times \text{Weight for the Selected Industry (VSIC 4)} \end{aligned}$$

The weights are expanded twice from VSIC4 to VSIC2 and VSIC2 to VSIC1 digit level. The calculation also sets zero if there are any errors (this is most likely caused by division error). The last 4 columns are the percentage share of these expanded weights.

(c) INPUT

INPUT tab does not contain any functions. This is made for a storage of the original data. It is ordered from left to right by the following arrangement for each commodity.

Example: INPUT Tab

VSIC	Code2	Production	Production	Production	Shipment	Shipment	Shipment	Ending Inventory	Ending Inventory	Ending Inventory	Projected Production in the Next Month	Projected Production in the Next Month	Projected Production in the Next Month	Shipment Value (Million Dong)	Shipment Value (Million Dong)	Shipment Value (Million Dong)
		T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12
....
....

It should be noted that these order should be strictly protected as these arrangement will be followed by the calculation made in other tabs.

(d) DATA

The purpose of DATA tab is to make arrangement for the data in the INPUT tab. It is ordered from left to right by the arrangement for each commodity as shown below.

Example: DATA Tab

VSIC2	VSIC4	Code2	COM CODE	Production Quantity			Shipment Quantity			Ending Inventory Quantity			Projected Production Quantity			Production Value			Shipment Value			Ending Inventory Value		
				T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12
....	
....	

Of these, VSIC 4 and Code2 directly refer those in the INPUT tab. From these cells VSIC2 is made by truncating the first 2 digits of VSIC4. The COMCODE is made by combining VSIC4 and Code2 into XXXX-X-X format where the first 4 digit represents VSIC 4 digits and the others represents code2. Quantity data in production, shipment, ending inventory and projected production in each month also refer to the INPUT tab. While the value data in shipment directly refers to the INPUT tab, value for production and inventory are calculated as:

$$\text{Production Value} = \text{Production Quantity} \times \text{Shipment Value} / \text{Shipment Quantity}$$

$$\text{Ending Inventory Value} = \text{Ending Inventory Quantity} \times \text{Shipment Value} / \text{Shipment Quantity}$$

There are several adjustment made to avoid errors in the value items in production, shipment and ending inventory. Shipment value is set zero if there is no shipment quantity. Production and ending inventory value are set at zero if there are errors caused by division error.

(e) INDEX(COM)

The INDEX(COM) tab is made for calculating the indexes at commodity level.

Example: INDEX(COM) Tab (left part)

VSIC2	VSIC4	Code2	COMCODE	Production Weight	Shipment Weight	Ending Inventory Weight	Production Weight (VA)	Production Weight (PV)	Shipment Weight	Ending Inventory Weight	Production Index	Shipment Index			Ending Inventory Index			Projected Production Index				
												T10	T11	T12	T10	T11	T12	T10	T11	T12		
.	.	.	.	in VSIC4	in VSIC4	in VSIC4	in All	in All	in All	in All

Example: INDEX(COM) Tab (right part)

Production (w/Σw)(Qt/Q0)			Shipment (w/Σw)(Qt/Q0)			Inventory (w/Σw)(Qt/Q0)			Projected Production (w/Σw)(Qt/Q0)			Contribution Rate for Production Index (VA)			Contribution Rate for Production Index (PV)			Contribution Rate for Shipment Index			Contribution Rate for Inventory Index			Contribution Rate for Projected Production Index (compared with real production)			COM CODE					
T10	T11	T12	T10	T11	T12	T10	T11	T12	T10	T11	T12	T11	T12	T11	T12	T11	T12	T11	T12	T11	T12	T11	T12	T11	T12	T11	T12	T11	T12	T11	T12	.....
.....

VSIC4, Code 2, and COMCODE refer directly to those in the INPUT tab. VSIC2 is, as in the other cases, truncates the first 2 digits of VSIC4. Other variables are calculated as follows:

- Weights in VSIC4 Digits

Production weight, shipment weight and inventory weight in VSIC4 is calculated as follows:

$$\begin{aligned} \text{Production weight in VSIC4} &= \frac{\text{Production value of commodity}}{\text{Production value of all commodities in the VSIC 4-digit}} \\ \text{Shipment weight in VSIC4} &= \frac{\text{Shipment value of commodity}}{\text{Shipment value of all commodities in the VSIC 4-digit}} \\ \text{Inventory weight in VSIC4} &= \frac{\text{Inventory value of commodity}}{\text{Inventory value of all commodities in the VSIC 4-digit}} \end{aligned}$$

Adjustments are made for these 3 weights to apply the average of values if there are no production made.

- Weights in All

Production weight, shipment weight and inventory weight “in all” is the weight at commodity level calculated as follows:

$$\begin{aligned} \text{Production weight in all (Value added weight: VA)} &= \frac{\text{Production value of commodity}}{\text{Production value of all commodities in the VSIC 4-digit} \times \text{Expanded weight (\%)}} \\ \text{Production weight in all (Production value weight: PV)} &= \frac{\text{Production value of commodity}}{\text{Production value of all commodities in the VSIC 4-digit} \times \text{Expanded weight (\%)}} \\ \text{Shipment weight in all} &= \frac{\text{Shipment value of commodity}}{\text{Shipment value of all commodities in the VSIC 4-digit} \times \text{Expanded weight (\%)}} \end{aligned}$$

$$\text{Inventory weight in all} = \frac{\text{Inventory value of commodity}}{\text{Inventory value of all commodities in the VSIC 4-digit} \times \text{Expanded weight (\%)}}$$

Adjustments are made for these weights to apply the average of values if there are no production made.

- Indexes at Commodity Level

The index of production, shipment index, inventory and projected production at commodity level are made by the following equation:

$$\text{Index at commodity level} = \frac{\text{Quantity at the current period}}{\text{Quantity at the base period}} \times 100$$

Adjustments are made for the indexes to set 100 if there are no quantity at the base period. Note that projected production applies the quantity of production in the base period. It does not use the quantity of projected production in the base period. This implies the index of projected production at the base period is always different to 100.

- Calculation of $(w/\sum w)(Q_t/Q_0)$ at Commodity Level

The calculation of $(w/\sum w)(Q_t/Q_0)$ at Commodity Level is made in this tab in order to make preparation for the indexes at VSIC 4-digit level. The calculation is made by the equation:

$$(w/\sum w)(Q_t/Q_0) = \text{Index at commodity level} \times \text{Weight in VSIC4}$$

- Contribution Rate for Indexes

Contribution rate is the breakdown of the growth rate at the commodity level. The contribution rate is calculated as:

$$\text{Contribution rate} = \frac{(\text{index at current period} - \text{Index at previous period})}{\text{x Index at VSIC 4-digit} \times \text{weight in all industries}}$$

(f) INDEX(VSIC4)

The INDEX(VSIC4) tab is made for calculating the indexes at VSIC 4-digit level.

Example: INDEX(VSIC2) Tab

	VSIC1	VSIC2	Production Index			Shipment Index			Inventory Index			Projected Production Index			Production (Value Added) (w/1w)(Qt/Q0)			Shipment (w/1w)(Qt/Q0)			Inventory (w/1w)(Qt/Q0)			Projected Production (w/1w)(Qt/Q0)		
			OCT	NOV	DEC	OCT	NOV	DEC	OCT	NOV	DEC	OCT	NOV	DEC	OCT	NOV	DEC	OCT	NOV	DEC	OCT	NOV	DEC	OCT	NOV	DEC
	D	15																								

- Indexes

The index of production, shipment index, inventory and projected production at VSIC2 level are made by the following equation:

$$\text{Index at VSIC 2 level} = \text{Sum of } (w/\sum w)(Qt/Q0) \text{ in the INDEX(VSIC4)}$$

Adjustments are made for the indexes to set 100 if there are errors in the calculation.

- Calculation of $(w/\sum w)(Qt/Q0)$ at VSIC 2-digit Level

The calculation of $(w/\sum w)(Qt/Q0)$ at VSIC 2-digit is made in this tab in order to make preparation for the indexes at VSIC 1-digit level. The calculation is made by the equation:

$$(w/\sum w)(Qt/Q0) = \text{Index at VSIC 2-digit level} \times \text{Weight in VSIC1}$$

Adjustments are made for these to apply “100 divided by the number of VSIC4” in the VSIC1 if there are no production made.

(h) INDEX(VSIC1)

The INDEX(VSIC1) tab represents the calculation result at the VSIC1 digit level.

Example: INDEX(VSIC1) Tab

ITEM	OCT	NOV	DEC
Production Index (Value Added Weight)			
Production Index (Production Value Weight)			
Shipment Index			
Inventory Index			
Projected Production Index			

The index at VSIC 1 digit is calculated by:

$$\text{Index at VSIC 1 level} = \text{Sum of } (w/\sum w)(Q_t/Q_0) \text{ in the INDEX(VSIC2).}$$

Note the index of projected production bases on the quantity of production in October, which implies the index of projected production in October is not equal to 100. Also, it should be noted that the projected production in October, for example, implies the “production projected in October”, which is the expected production in November.

(i) OUTPUT

The OUTPUT tab is the representation of calculation results. It contains the calculation results of production index (value added and production value weight), shipment index, inventory index and projected production index at VSIC1 and VSIC2 digit level. It is adjusted to insert “-“ when there is no data available. For production index with value added weight, it is also adjusted to insert the projected production index attached with “p”. It also contains the list of commodity contributed the growth and decline of production, shipment and inventory indexes. It also contains the list of weight applied in the index calculation.

(j) REFERENCE

The REFERENCE tab contains the commodity list accompanied with the VSIC codes. This is used for the reference in calculation of “the list of commodity contributed to the growth and decline” in the OUTPUT tab.

Chapter 3. Revision of Base Period

This chapter explains the topic on the base period revision. For the calculation of indexes, it should be always concerned about the biases in applying the Laspeyres formula. This chapter raises the issue of the importance of base period revision, and explained the checking method such as Paasche check.

3.1. Biases in Laspeyres and Paasche Index

The Laspeyres index applies the weight fixed at the base period, and may dissociate from the actual industrial structure and fail to reflect the actual condition along with changes in the economic and industrial structures as the time passed away from the base period. From the long-term viewpoint, the relative price of items showing upward trends will decrease due to decrease in the production cost because of the change in the supply/demand balance that is caused by volume efficiency and increase in the supply amount as the production level rises. On the other hand, the items showing the downward trend tend to have the higher relative price because of price maintenance measures, and etc. Consequently, with this index, the growing items tend to be overestimated while declining ones tend to be underestimated. After all, the upward bias is included in the overall index. If the bias grows along with the time elapsed from the base period, the base period must be renewed to the appropriate timing. Such renewal to the new base period is called revision of the base period.

3.2. Paasche Check

There are several ways to check the existence of bias in Laspeyres index. The most frequently applied method is called “the Paasche Check” that is simply to compare both Laspeyres and Paasche index to find out the diversion. More specifically, the method employs the comparison ratio by the following formula such that:

$$\text{Comparison Ratio} = \frac{\text{Laspeyres Quantity Index} - \text{Paasche Quantity Index}}{\text{Paasche Quantity Index}} \times 100$$

Paasche check does not have specific criteria on the existence of dispersion where it customary applies the range of 3-5%. Thus, the judgment on the bias is under the statistician’s discretion. The check result is usually compared with other industries and other time period. These checks provides the judgment on the revision of base period especially when the dispersion is significantly large.

3.3. Importance of Base Period Revision

The Paasche check provides diagnostics on the biases in the Laspeyres index. Not only for these biases, there are many reasons for the revision of base year. As described in the Chapter 1, the indexes reflect the industrial activity in reliable, accessible, and timely manner based on the international standard. In this sense, the weight used in the index calculation should be the one that reflects the share of industrial activity in proper manner. Since the form of industries vary continuously, the weight, and thus the base year, should be changed in order to properly calculate the index. In most of the countries, the base year have been revised in every 5 years where the task includes the revision of commodity classification, industrial classification, selection of commodities in the index and weight revision. The statisticians in charge of index calculation are required to remember the importance of base year revision.