

International Comparison Program

Machinery and Equipment Approach and Data Requirements

Draft Version



Operational Guide

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Machinery and Equipment ¹

1. Introduction

This chapter of the ICP Operational Guide is concerned with the price survey on Machinery and Equipment goods. The chapter is designed to provide guidelines, specific instructions, and practical tools to implementing the price survey across different countries with diverging economic structures.

2. Categories of Machines and Equipment Items

In the ICP classification, the category “machinery and equipment” is broken down into two groups, “metal products and equipment” and “transport equipment,” and these are further disaggregated into eight basic headings. Countries are required to collect the prices of several specified items within most of these basic headings.

2.1 Basic Headings

The 5 Basic Headings related to metal products and equipment are: (1) Fabricated metal products, except machinery and equipment; (2) General purpose machinery; (3) Special purpose machinery; (4) Electrical and optical equipment; and (5) Other manufactured goods n.e.c. The remaining 3 Basic Headings for transport equipment include: (1) Motor vehicles, trailers and semi-trailers; (2) Other road transport; and (3) Other transport equipment.

Additionally, it is important to elaborate on the different products belonging to each of the Basic Headings. For instance, the “Fabricated metal products, except machinery and equipment” Basic Heading includes prefabricated buildings of metal; bridges, bridge sections, towers, and lattice masts of iron or steel; reservoirs, tanks, vats, and similar containers of iron, steel, or aluminum for all materials; etc.

“General-purpose machinery” on the other hand includes engines and turbines except aircraft, vehicle, and cycle engines; pumps and compressors; ovens other than bakery ovens; furnaces, furnace burners, and incinerators; etc.

Items included in the “Special-purpose machinery” are intended for specific industries such as agricultural and forestry metallurgy, mining, quarrying, and construction; etc.

¹ This chapter is prepared by Biokou Mathieu Djayeola and Miglena Abels, based on material drafted by Richard Dibley.

“Electrical and optical equipment” Basic Heading includes word processing machines, printing machinery, computers and related equipment, electric motors, lighting equipment, radio and television equipment, etc.

“Other manufactured goods n.e.c. (not elsewhere classified)” includes office, shop, and hotel furniture, etc. Computer software that a producer expects to use in production for more than one year is also included here.

“Motor vehicles, trailers, and semitrailers” range from passenger cars, taxi cabs, vans, buses, coaches, to specialized parts, and engines. “Other transport equipment” includes cruise ships, excursion boats, ferry boats, ships, tankers, fishing vessels, oil rigs, all railway and tramway locomotives, airplanes, helicopters, including their specialized parts and engines.

Structured product descriptions (SPDs) are developed for each equipment item. The technical characteristics that determine the performance of a machine or piece of equipment are very important in the product specifications.

3. Summary of Pilot Study

The initial stage of the program was a pilot study. It was the first step of a number of phases which culminated with the start of the main survey. Pilot study work was based on an initial list of investment products which was drawn from results of similar exercises in different parts of the world. The list comprised products and items and it was also divided into two main parts, generic and specified items.

Prior to the pilot work, all items on the list were checked and were all current based on various sources. However, availability of products may vary across countries, e.g. new models may be introduced at different times in different countries.

The pilot was a research exercise, the objective of which was to determine the availability of the products and items on the list. It was carried out in nine select countries.

Following the pilot work, the objective was to analyze the results and then prepare a “global” list that would reflect – as much possible - markets in all the participating countries.

4. The Product List

The principal document of the price survey on Machinery and Equipment is the products list. A summary of the list is illustrated by the figure below.

BH No	BH Code	Title of the Basic Heading	2011 Survey			
			Products	Items		
			Total	Generic	Specific	Total
1	1501111	Fabricated metal products, except machinery and equipment	5	6	3	9
2	1501121	General purpose machinery	9	6	14	20
3	1501131	Special purpose machinery	24	17	33	50
4	1501141	Electrical and optical equipment	25	15	41	56
5	1501151	Other manufactured goods n.e.c.	4	3	5	8
6	1501211	Motor vehicles, trailers and semi-trailers	5	4	13	17
7	1501212	Other road transport	1	1	2	3
8	1503111	Other products	4	0	14	14
Total			77	52	125	177

Source: 2011 ICP

As indicated above, the list comprises eight different product groups called Basic Headings (1 through 8). Each Basic Heading is divided into:

Products and items:

- A product defines a group of specific pieces of machinery or equipment.
- An item is a sub-division and a variation of a product (e.g. a particular model and/or make of a product).

Generic and specified products/items:

- A generic product or item is one for which the specification gives a set of parameters that will define it but without a make or model.
- A specific product or item is one where the specification includes the make and model.

The list includes a total of 77 products and 177 items. Each item comprises one sheet (in Excel) that gives the details including the technical parameters. These are contained in the ICP Kit.

5. Objective

The main objective of the survey is to find and price as many of the products and items on the list as possible. In addition, the number of identical and important items priced within the list is expected to be maximized. When products are not identical but are similar to the given specifications, they are to be priced and classified as equivalent.

6. Working Methods

The results of priced items should be recorded on the technical sheets in the ICP Kit. For generic items, products matching as closely as possible the given technical specifications should be selected and priced. On the other hand, the exact product and model should be researched and priced for specific items. Also for specific items, an alternative method requests that an equivalent be chosen (e.g. an item of the same make but a different model) if the exact make and model is not found. A different make and model may also be selected given it matches the particular specification.

6.1. Generic Items

The objective is to identify items that nearly match the given specification. Makes and models of products are to be provided and the technical parameters are expected to be completed. The parameters are approximately ranked according to their importance.

For most generic items the technical specifications are based on a specific make and model. If a particular item exactly matches the given technical parameters – it is to be classified as identical. If differences exist, then the item is classified as equivalent.

When a priced product matches both the make and model of a specific item – it can then be recorded as either generic or specific.

Since it is generally better to price well-known makes of products, the makes and models most commonly used for the specific type of products are to be priced in the respective countries.

6.2. Specific Items

Items that match the exact make and model are to be classified as identical. In some instances, although the make and model are the same, differences may exist in terms of technical parameters (e.g. due to national rules and regulations). Therefore such items are to be classified as equivalent. If the same make is identified, however there is a difference in the model, the item is to be submitted as equivalent.

7. Standard Method for Pricing Equipment Goods

The standard method for pricing equipment goods is similar to that followed for consumer goods and services; countries collect prices for identical or very similar products—sometimes referred to as “specification pricing.”

7.1. Pricing Rules

To be consistent with the national accounts, countries are required to provide prices for equipment goods that are consistent with the valuation of those goods as fixed capital assets in the national accounts. Thus the prices must include import duties and other product taxes actually paid by the purchaser, costs of transporting the asset to the place where it will be used, and any charges for installing the asset so that it is ready for use in production. Deducted from the price are any of the discounts generally available to most producers.

The following rules should be observed in reporting prices for equipment goods:

- *Transport costs.* When the prices of equipment goods do not include transport costs, these costs should be estimated by countries. They would determine the average distance over which the items are transported from the factory where they are made or, for imports, the port of entry.
- *Installation costs.* Costs are usually associated with the installation of fixed equipment, and these costs are included in the gross fixed capital formation (GFCF) in the national accounts. Installation charges include not only those paid by the purchaser for physical installation of an item at a factory or other site but also any charges for testing or calibrating the equipment. In the case of transport equipment, there are usually no installation costs.
- *Product taxes.* The price should only include nondeductible product taxes. Countries that levy a value added tax (VAT) normally allow purchasers to deduct the full amount of the tax on capital goods. Sales and other product taxes, and sometimes import duties, may also be fully or partly deductible on capital goods.
- *Discounts.* The price should refer to the purchase of a single item so that it is not affected by discounts that may be available for large orders. The price of the single item should be reported after deducting any discount that is customarily available to most purchasers and that is available for most of the year.

The national average prices are required. Country experts should follow two guidelines in deciding how these prices are to be collected. First, in some small countries it may be sufficient to collect prices in only a single location such as the capital city or the largest industrial or commercial town. Second, in larger countries that have several centers of significant industrial and commercial activity, prices will have to be collected in several of these centers in order to calculate a national average price.

In many countries, a single dealer has the rights to sell the specified type of equipment. In this case, a single price observation will be sufficient. In other countries, however, there may be several distributors

of the specified type of equipment, and in this case several price observations will be required to establish the average national price. The decision as to whether one or more price observations are necessary is left to the national experts.

The prices reported should be the average prices for the reference year—that is, they should be the average of the prices collected at regular intervals throughout the year. However, experience shows that if all countries price equipment goods during the same period, there is no need to collect prices throughout the year. Price collection at midyear is recommended for the 2011 ICP.

7.2. Second Hand Items

A significant proportion of the Gross Fixed Capital Formation (GFCF) in equipment goods in some countries consists of imports of second-hand goods, some of which may have been reconditioned. Second-hand goods that are comparable for pricing purposes are difficult to find. Substantial quality adjustments may be necessary to make the prices comparable, and such quality adjustments are presently not feasible. Thus in the 2005 ICP price collection was confined to new equipment goods. The prices of second-hand equipment goods were not used even when those goods were actually more representative than new goods. Second-hand goods will also be omitted from pricing in the 2011 ICP.

7.3. Sources of Price Information

The prices of equipment goods can be obtained directly from producers, importers, or distributors or from their catalogues. Prices will be collected by the method or combination of methods that countries deem the most convenient such as personal visit, telephone, letter, or Internet. However, the prices had to be adjusted to conform to the valuation principles in terms of taking into account transport charges, installation costs, product taxes, and discounts.

The sources most often used for collecting the price information are the following:

(1) Within a national statistical office: Those who compile a producer price or an import price index are likely to have the most familiarity with the types of goods being compared for these basic headings. For some items such as automobiles and computers, the comparisons used for household consumption are also relevant to equipment, although the prices collected for the household consumption expenditure had to be adjusted by subtracting the value added taxes and other product taxes that are payable by households but usually can be deducted by enterprises.

(2) From dealers within the country: Equipment distributors and dealers know which models are available, their detailed characteristics, and prices. When prices were obtained from dealers, countries had to ensure that all product taxes and installation charges were included.

Government departments purchase transport and other equipment on a regular basis. Such purchases are often centralized under a “public works” or “central supply” department. They may buy directly from manufacturers, but often they will also use local dealers and distributors.

(3) Internet: Specialized Web sites of equipment goods manufacturers are also very useful. They often also provide the names and contact information for dealers and distributors. However, the price information obtained from Web sites had to be adjusted to conform to the valuation principles just outlined for taking into account transport charges, installation costs, product taxes, and discounts.

8. Pricing Guidelines

Reported prices by countries are required to be:

- Purchasers’ prices (however, without any VAT),
- National average prices, and
- Prices of the survey data collection period

Purchaser prices should include trade margins, transport and delivery cost, and assembly and installation cost and general discounts. VAT should not be included. However, other non-deductible taxes are to be included into the purchasers’ price. They may be special national taxes on certain equipment (e.g. for environmental reasons or to protect national producers of equipment goods).

National average prices should reflect the national average and not only certain locations or suppliers. Reported prices should be the ones observed during the survey period. No adjustments to annual average prices are required.

In addition to the list prices of items, other relevant components of the cost are also to be considered, such as additional delivery and/or installation costs, etc. These components will be added to the list price of items. Similarly, there may be applicable discounts which should be taken off the list price. These aspects will be taken into account by the ICP Kit.

Additional aspects to be considered include:

(1) Used Equipment: All the products specified for this survey are for new items. In a number of countries, however, a significant proportion of investment equipment consists of imports of second-hand goods, some of which may have been reconditioned. Experimental pricing of second-hand equipment goods shows that there is considerable variation in the quality of the goods priced by different countries. It is very difficult to find second-hand goods that are comparable for pricing purposes. Substantial quality adjustments may be necessary to make the prices comparable and such quality adjustments are not feasible in practice at the present time. Therefore, this survey is confined to new equipment goods. Prices of second-hand goods are not acceptable, even when second-hand equipment goods are more important than new goods.

(2) Number of price observations: In many countries there will be a single dealer with the rights to sell the specified type of equipment and in this case a single price observation will be sufficient. In other countries, however, there may be several distributors of the specified type of equipment; therefore several price observations are required to establish the average national price. The decision as to whether one or more price observations are necessary is left to the national experts.

8.1. Collection and recording of data

Annexes A and B – “Registration Form” and “Machinery and Equipment Data Collection Form” – illustrate the two main forms that countries are required to employ during the collection and recording of data. The various points addressed in the following section are directly related to the parameters in the specification sheets in the ICP Kit.

(1) Country: The country box will be completed by the ICP Kit automatically, when you have completed the introductory questions in the setup box.

(2) Make and model: When countries have found and priced an item, these details should be inserted. For some generic items there will be no model; in this instance, countries are advised to insert “unspecified.”

(3) Technical parameters: The technical parameters for an item should be completed according to the list given in the specification sheet. They can be completed either in metric or imperial units. Countries can choose either one in the setup box in the ICP Kit. Additionally, it is requested that countries complete the technical parameters for all items, even when they are identical to the given ones.

(4) Order quantity: Normally the order quantity for an item is one. However, for some items it will be realistic to take more than one. For example, it is not standard for fire extinguishers to be ordered as one. In commercial situations, an order of ten is considered a normal occurrence. Naturally, this aspect can affect the unit price.

(5) Currency: The currency box will be completed by the ICP Kit automatically when countries complete the introductory questions in the setup box.

(6) Unit price: The unit price should be submitted, regardless of the order quantity.

(7) Installation costs: For some items it may be relevant to include installation costs. Installation charges include not only any charges that the purchaser pays in order to have the item physically installed at the factory or other site, but also any costs for testing, running-in or calibrating the equipment. In the case of transport equipment there are usually no installation costs. This aspect is further covered in the ICP Kit.

(8) Transport and delivery costs: As a component of the total price the delivery cost should be included. For some items this will be included in the price. For others, an allowance should be taken into account. When items do not include transport and delivery costs, these should be estimated by countries

selecting their own average distance over which the items are transported and delivered. This aspect is also covered in the ICP Kit.

(9) Discounts: The price should refer to the purchase of a single item so that it is not affected by discounts that may be available for large orders. However, the price of the single item should be reported after deducting any discount that is customarily available to most purchasers and that is available for most of the year.

(10) Non-deductible taxes: Finally, the price should only include non-deductible product taxes. Countries that levy value added taxes normally allow purchasers to deduct the full amount of tax on capital goods. Sales and other product taxes and sometimes import duties may also be fully or partly deductible on capital goods.

(11) Importance: Countries are asked to classify each priced items as either important or less important. This process can be challenging as a certain degree of subjectivity is involved in assigning importance.

Importance is a concept that relates to individual products within a basic heading. It needed to be introduced because no expenditure weights are provided below the basic heading level with which to determine the relative importance of the various products priced within a basic heading. To ensure that there is sufficient number of prices collected for comparison between countries, participating countries are required to price both important and less important products within each basic heading.

Important products normally have a lower price level than less important products and, if this is not taken into account when calculating the PPPs for a basic heading, the PPPs will be biased. To avoid this, participating countries are required to identify which of the products they have priced within a basic heading are important when reporting their prices.

Countries are encouraged to identify important products for the survey. Such an item should be typical within the market for that product in a given country. To further elaborate, consider a fire extinguisher. This is a common item as it is widely used globally. As a result, it is an important product within its Basic Heading. Additionally, a particular make and model of a fire extinguisher may be purchased more than other brands, and is therefore classified as typical in the particular market. Such an item can be considered as important.

(12) Comparability: Countries are asked to price products that are either identical or equivalent to the one requested. If countries identify the exact item given in the specification, then the item will most likely be classified as identical. When a similar - but not an exact item- is priced, then it will most likely be classified as equivalent.

However, countries may find that even when the make and model are identical to the given ones, there may be differences in the technical parameters. If these differences are minor and are not believed to be price determinants, the items can be still be classified as identical. It is important for countries to be flexible with issues concerning these aspects as often times decisions on how to classify products will be based on judgment.

Annex A: Registration Form²

Registration Form

Designated Staff or Consultant	Name*:	
	Email Address*:	
	Phone Number:	
Company	Name*:	
	Address1:	
	Address2:	
	City/Town:	
	State/Province:	
	Country*:	
Country and Local Currency Unit (LCU) for data entry*:		

Source: 2011 ICP Operational Material

² The Machinery and Equipment Data Collection Form (Including the Registration form as a component) are available also in French, Spanish, and Arabic.

Data Collection Form

Product Code	Product Name	Make (and nationality) Model	Proposed	Observed

Prices	Total unit price (LCU)
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Unit base price⁵	*	Installation cost⁵	*
Order quantity⁵⁵	*	Other costs (please specify)⁵	*
Delivery cost⁰	*	Discount⁵	*

Specifications			
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	Specification	Metric	Imperial	Observed
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				

Notice: Fill in all required cells, Options and Notes, then proceed to "Add record to / Update database" below.

Options/Additional Specifications

Notes

³ The Data Collection Form is also available in French, Spanish, and Arabic. More information on Machinery and Equipment is available on the ICP Website.
<http://go.worldbank.org/4KH0YPSDLO>

