

**International Comparison Program
2011 Round**



**Machinery & Equipment:
Using Exchange Rates as PPPs for M&E**

Regional Coordinators Meeting

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Background: 2005 Experience

- Pricing the goods underlying investment expenditures on M&E [as well as expenditure breakdown by BH] was a problematic area in both the regional and the ring comparisons.
- The approach was similar to the one for consumption goods and services, for which SPDs were used as the starting point.
- However, for consumption products, each region developed its own specifications. For M&E, the global office staff prepared the SPDs on a worldwide basis and developed the product specifications.

Structured Product Descriptions

- **The standard procedure for calculating PPPs for M&E is to collect prices for a number of items defined by the Global Office in consultation w/Regional Advisors.**
- **For ICP 2005, this worked well for some regions and countries but others found it difficult and expensive to find prices for the SPDs [e.g., South America]**

Using Exchange Rates as PPPs for M&E

- **The standard procedure used in ICP 2005 for estimating PPPs for M&E involved collecting prices for about 100 core products that had been selected by the Global Office and had been specified in SPDs.**
- **The standard procedure proved difficult for many countries because the SPDs referred to items that were not commonly used in their countries.**
- **It is expensive to collect prices for M&E as national statistical offices do not usually have the necessary expertise in-house. Some had to hire equipment experts to identify the types of equipment specified in the SPD or close substitutes if what was specified in the SPD was not available in their countries. In some cases, outside experts also had to be consulted to determine the price.**

Using Exchange Rates as PPPs for M&E

- In most countries in Asia, Africa and Latin America almost all M& E is imported. How exchange rates can be adjusted to approximate purchasing power parities for M&E? The adjustment is based on the various costs that are added to the ex-factory price of the machine or piece of equipment in the exporting country to arrive at the cost of that item when it is installed and ready to use in the importing country.
- Some information is available on the Internet but it is difficult to use that information; collect directly from participating countries.
- A draft questionnaire to collect information required to adjust exchange rates so that they approximate PPPs.
- It should be completed by all participating countries, including those countries that will estimate PPPs for M&E using the standard procedure.

The relationship between the PPP for an imported item of M&E and the exchange rate:

The bilateral PPP is equal to the exchange rate between the two countries *times* an adjustment:

$$PPP_{A/B} = XR_{A/B} \left(\frac{1 + \sum_{i=1}^n a_i}{1 + \sum_{i=1}^n b_i} \right)$$

$PPP_{A/B}$: bilateral PPP using B as the base country

$XR_{A/B}$: exchange rate between countries A and B

a_i and b_i : n costs that intervene between the ex-factory price of the good in the countries of production & the final cost of the good when it is installed and ready for use in the importing countries A and B.

Table 1. Components of the price of a machine or piece of equipment, installed and ready for use in an importing country

	“Standard” ex-factory price in exporting country
<i>plus</i>	<i>Surcharge less discount for country or region</i>
<i>plus</i>	<i>Product taxes less subsidies in exporting country</i>
<i>plus</i>	<i>Trade margin in exporting country</i>
<i>plus</i>	<i>Drayage (transport from the factory to the wharf) in exporting country</i>
<i>plus</i>	<i>Wharfage (fee for using the wharf) in exporting country</i>
<i>plus</i>	<i>Fee for customs documentation in exporting country</i>
<i>equals</i>	F.o.b. price in exporting country
<i>plus</i>	<i>International freight</i>
<i>plus</i>	<i>Insurance costs</i>
<i>equals</i>	C.i.f. price in importing country
<i>plus</i>	<i>Fee for customs documentation in importing country</i>
<i>plus</i>	<i>Customs duty in importing country</i>
<i>plus</i>	<i>Wharfage (fee for using the wharf) in importing country</i>
<i>plus</i>	<i>Product taxes less subsidies in importing country</i>
<i>plus</i>	<i>Trade margins in importing country</i>
<i>plus</i>	<i>Drayage (transport from the wharf to the place of use) in importing country</i>
<i>plus</i>	<i>Installation costs at the producer’s establishment</i>
<i>equals</i>	Installed, ready-to-use price in importing country

Table 1. Components of the price of a machine or piece of equipment, installed and ready for use in an importing country

Several of the costs listed in Table 1 may be zero or small relative to the initial ex-factory price. These could be ignored. Specifically,

- **product taxes are rarely levied on goods for export;**
- **trade margins in the exporting country are not relevant if producers export the machines or pieces of equipment directly to their agents in the importing country or directly to the importing enterprise.**
- **fees for customs documentation are small relative to the value of the goods being traded;**
- **wharfage in the US is US\$ 2-3 per metric ton and can be assumed to be equally small in other countries;**
- **drayage depends on the distance between the factory and the port in the exporting country and the port and the producer's establishment in the importing country.**

Table 2. Main components of the price of a machine or piece of equipment installed and ready for use in an importing country

	Standard ex-factory price in exporting country
<i>Equals (approximately)</i>	F.o.b. price in exporting country
<i>plus</i>	<i>Surcharge less discount for country or region</i>
<i>plus</i>	<i>International freight</i>
<i>plus</i>	<i>Insurance costs</i>
<i>Equals (approximately)</i>	C.i.f. price in importing country
<i>plus</i>	<i>Customs duty in importing country</i>
<i>plus</i>	<i>Product taxes in importing countries (e.g. VAT)</i>
<i>plus</i>	<i>Trade margins in importing country</i>
<i>plus</i>	<i>Installation costs at the producer's establishment</i>
<i>Equals (approximately)</i>	Installed, ready-to-use price in importing country

The *main costs* that intervene between the standard ex-factory and installed prices of M&E. The problem is to measure the 7 italicised items in Table2.

Table 3. Summary of 2005 Questionnaire on Machinery and Equipment: Africa and Asia

	Percent imported						Three most important source countries			Margins (as % of cif value of imports)				
	0 to 24	25 to 49	50 to 69	70 to 79	80 to 89	90 to 100				Customs	VAT etc	Trade	Transport & installation	Total
AFRICA														
Cameroun			x				France	USA	Japan	18	9	58	..	85
Comoros	x						France	UAE	Réunion	13	1	..	..	14
Kenya					x		UK	Japan	Germany	100	16	20	10	146
Mali			x				France	USA	Germany	5	18	20	25	68
Mauritania		x					France	USA	Germany	4	11	..	15	..
Senegal		x					France	EU	USA	11	18	..	29	..
S. Leone					x		UK	USA	Belgium	..	..	..	0	..
Tanzania		x					Japan	S. Africa	UK	13	..	..	13	..
Uganda						x	Japan	Germany	UK	19	..	..	19	..
ASIA														
Bangladesh			x				USA	UK	China	9	7	29		45
Bhutan			x				India	Japan	UK	5		27	18	50
China PR		x					EU	Japan	USA	10	17	6	3	36
Fiji							Australia	N.Zealand	Japan	..	..	..	..	..
Hong Kong						x	China	Japan	Taiwan	0	0	23		23
India		x					USA	Germany	Japan	25	0	10	3	38
Iran		x					Germany	Austria	Spain	22	24			48
Macao						x	China	Japan	Korea	0	0	10	..	..
Malaysia		x					USA	Japan	China	5		17	5	27
Maldives						x	Singapore	Sri Lanka	India	20				20
Mongolia						x	Russia	Japan	China	5	15	10		30
Nepal	x						India	China	..	..	..	..	..
Pakistan	x						China	USA	Italy	..	..	..	..	..
Philippines		x					Japan	USA	Singapore	7	0	9	9	25
Singapore			x				Malaysia	USA	Japan	..	..	..	..	..
Taiwan			x				Japan	USA	Germany	..	..	..	..	..
Thailand		x					Japan	..	..	3	7	10	..	..

ICP 2005 Questionnaire

- Sent to all participating countries about international freight, insurance and other margins on imported M&E.
- No systematic follow-up to the survey.
- Easy to identify some questionable responses.
 - Reunion and United Arab Emirates are almost certainly not source
 - Countries for M&E imported by Comoros Islands.
 - Nepal reports that less than 25% of GFCF in M&E comes from imports.
 - 100% customs duties reported by Kenya should have been questioned.
- ICP 2005 survey does nevertheless suggest that most countries do have the information required and that w/systematic follow-up useable information could have been obtained for most if not all countries.

Product Specifications: 2005 Survey

Basic Heading: General Purpose Machinery
Product Name: AIR COMPRESSOR (Towed Unit)

Basic Heading Code: 1501121
Product Code: 150112102_3



DESCRIPTION:

This is a self-contained trailed unit that can be towed to the work. The air compressor and the propulsion unit for the compressor are integrally mounted to the trailer chassis.

SPECIFICATIONS:

The compressor is generally of a screw-type architecture driven by a diesel engine. Typically, the 15 kW units are popular for driving a compressor delivering 2 m³/min @ 7 bars.

SELECTION	MANUFACTURER	MODEL
<input type="checkbox"/> Preferred		
<input type="checkbox"/> Alternate 1		
<input type="checkbox"/> Alternate 2	Ingersol Rand	
<input type="checkbox"/> Unspecified Alternate		

CHARACTERISTICS (For Unspecified Alternate)
 Engine (kW): _____ Pressure (bars): _____
 Tank Volume (Liters): _____

	Terms & Conditions:	Cost Estimate (2011)	Cost Estimate (2012)
A	Equipment Costs (in national currency)		
B	Installation if not included		
C	Transportation if not included		
D	Non-deductible tax if not included		
E	Deductible tax if included		
F	Sub Total (B + C + D - E)		
	Total Cost [A + F]		

PRICING INFORMATION (Source of Price)

<input type="checkbox"/> Distributor	<input type="checkbox"/> Catalogue
<input type="checkbox"/> Dealer	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Expert/Consultant	

Comments:

Draft questionnaire on imported M&E

		Year _____	
Item No.	Description	Metal products and equipment	Transport equipment
1	Surcharge or discount applied to the standard ex-factory price	_____ %	_____ %
2	C.i.f. value of imports in national currency		
3	International freight costs in national currency		
4	International insurance in national currency		
5	Customs duties in national currency		
6	Non-deductible VAT or other product taxes in national currency		
7	Trade margins (wholesale and retail combined): <i>either</i> amounts in national currency <i>or</i> estimated margin (% of c.i.f. value)	_____ _____ %	_____ _____ %
8	Installation costs: <i>either</i> amounts in national currency <i>or</i> estimated margin (% of c.i.f. value)	_____ _____ %	_____ _____ %
9	What percentage of imported machinery and equipment is second-hand?	_____ %	_____ %

Draft questionnaire on imported M&E

Unlike the 2005 survey:

- the questionnaire will be pilot tested in 10 countries from different regions.
- visits to some countries to solve problems in answering particular questions.
- after pilot testing the survey will be undertaken on a regional basis, w/the regional co-ordinators responsible for editing and validating replies.
- the survey will be carried out in 2010, 2011 & 2012 collecting data for 2009, 2010 and 2011. Only the 2011 data will be used for ICP 2011 but data for other years will be used to test the survey methodology & the proposed adjustment procedure.
- all participating countries in all regions will be asked to complete the questionnaire.

Questions

- **Is it agreed that we should collect this information from all participating countries? - including countries in regions where the standard procedure will be used.**
- **Should the survey be carried out by the regional offices under the supervision of the regional coordinators?**
- **The questionnaire is very basic. Should it collect additional information?**
- **Are the instructions clear?**
- **Is it agreed to carry out the survey for three years – 2010, 2011, and 2012?**

Equipment Core List

Basic Heading Code	Basic Heading Title	Product Code	Product Name		
1501121	General purpose machinery	150112101	AIR COMPRESSOR (Small)		
		150112102	AIR COMPRESSOR (Towed Unit)		
		150112107	MARINE DIESEL ENGINE – PLEASURE		
		150112109	WATER PUMP (Centrifugal)		
		150112110	WATER PUMP (Jet)		
		150112113	ROUGH TERRAIN Forklift (Hydraulic Extendable Boom)		
		1501131	Special purpose machinery	150113116	DUMPER (Rigid Frame)
150113118	DUMPER (up to 30 tonnes)				
150113119	HYDRAULIC EXCAVATOR (Large)				
150113120	HYDRAULIC EXCAVATOR (Compact)				
150113121	HYDRAULIC EXCAVATOR (Mini)				
150113122	MOTOR GRADER				
150113127	WHEEL LOADER (Large)				
150113128	WHEEL LOADER (Mid-Size)				
150113129	WHEEL LOADER (Compact)				
150113132	MINCING MACHINE (1 KW POWER)				
150113133	SPIRAL DOUGH MIXER (For 50 kg)				
1501133	Special purpose machinery_2			150113302	UTILITY TRACTOR
				150113304	POWER CIRCULAR SAW
		150113307	ROUTER		
1501141	Electrical and optical equipment	150114103	DIGITAL PROJECTOR		
		150114105	PAPER SHREDDER		
		150114110	LASER PRINTER		
		150114112	PDA (PERSONAL DIGITAL ASSISTANT)		
		150114118	DVD PLAYER		
		150114121	CHEMISTRY ANALYZER		
		150114126	MRI (MAGNETIC RESONANCE IMAGE)		
		150114127	PATIENT MONITOR		
		150114129	X-RAY UNIT		
1501211	Transport equipment	150121104	DIESEL MINIBUS (21 Passengers)		
		150121108	CAB CHASSIS (10 Tones)		
		150121110	PICKUP TRUCK		
		150121111	VAN TRUCK		

