

# [03.03]

#### A Preliminary Assessment of the Effect of the Change in Construction Methodology Between the 2005 and 2011 Rounds



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#### Outline

- Comparing the 2005 and 2011 ICP rounds
- **2005** Results Using the BOCC Method
- **2005** Results Using the Input Method
- **Comparison of Results and Conclusions**

#### **Comparing the 2005 and 2011 ICP rounds**

# Changes between 2005 and 2011 ICP rounds



#### Construction: 2005 vs. 2011

	2005 Approach – BOCC Method	2011 Approach – Input Method
Basket	A combination of simple and complex components. Simple components are inputs. Complex components are composed of a <u>certain mix of inputs</u> (Materials, Labor, and Equipment).	A basket of simple components: Materials (38 inputs) Equipment (5 inputs) Labor (7 inputs).
Structure	3 BHs: Residential, Non-Residential, and Civil Engineering. Components are grouped under systems that play the role of sub-headings.	3 BHs: Residential, Non-Residential, and Civil Engineering. Each BH has three Sub-Headings: Materials, Equipment and Labor.
PPP computation	Unweighted CPD is used to calculate PPPs for these Systems (Sub-Headings).	Unweighted CPD is used to calculate PPPs for these Sub-Headings.
PPP aggregation	Aggregation of the Systems PPPs to the BH level PPPs requires System Weights (W2 weights).	Aggregation of the Sub-Heading PPPs to the BH level PPPs requires Sub-Heading Resource Mixes to be used as weights.
lssues	Difficulties with the establishment of W2 weights and confusion over the mixture of simple and complex components.	Need Markups and professional fees? Need Productivity Adjustment? Resource mixes need to be reliable.

#### 2005 Results Using the BOCC Method

#### BH Structure under the BOCC Method

Basic Heading	Systems (Sub-headings)
	Site-work (10 components)
	Substructure (11 components)
	Superstructure (9 components)
Residential buildings	Exterior Shell/Building Envelope (5 components)
Residential buildings	Interior Partitions (6 components)
	Interior and Exterior Finishes (10 components)
	Mechanical and Plumbing (2 components)
	Electrical (3 components)
	Site-work (10 components)
	Substructure (11 components)
	Superstructure (9 components)
Non-residential buildings	Exterior Shell/Building Envelope (5 components)
Non-residential buildings	Interior Partitions (6 components)
	Interior and Exterior Finishes (10 components)
	Mechanical and Plumbing (2 components)
	Electrical (3 components)
	Site-work (10 components)
	Substructure (11 components)
Civil onginooring works	Superstructure (9 components)
Civil engineering works	Mechanical Equipment (5 components)
	Electrical Equipment (3 components)
	Underground Utility (9 components)

# Estimating W2 weights

Systems	Reside Buildi	ntial ngs	Non-Resi Buildi	dential ngs	Civil Engineering		
	Non-Gulf	Gulf	Non-Gulf	Gulf	Non-Gulf	Gulf	
Site-work	5%	3%	6%	3%	12%	37%	
Substructure	22%	14%	18%	13%	21%	22%	
Superstructure	23%	22%	23%	25%	<mark>40</mark> %	27%	
Exterior Shell/ Building Envelope	12%	6%	10%	6%			
Interior Partitions	9%	7%	10%	7%			
Interior and Exterior Finishes	11%	19%	17%	16%			
Mechanical and Plumbing	10%	1 <mark>7%</mark>	9%	14%			
Electrical	8%	13%	8%	17%			
Mechanical Equipment					10%	3%	
Electrical Equipment	1 3/				8%	4%	
Underground Utility					9%	7%	

## 2005 Results using the BOCC Method

		PLIs (Base=Region)										
Code	Aggregate	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	Syria	Yemen
1502	Construction	1.14	0.65	1.13	1.09	1.19	1.02	1.19	1.35	1.20	0.79	0.60
15021	Residential Buildings	1.15	0.57	1.08	1.20	1.21	1.22	1.16	1.23	1.37	0.70	0.59
15022	Non-Residential Buildings	1.17	0.63	1.06	1.08	1.08	1.04	1.22	1.23	1.26	0.83	0.68
15023	Civil Engineering Works	1.14	0.74	1.24	1.01	1.25	0.86	1.21	1.77	0.88	0.87	0.54

#### Results Using the Input Method

## Scenarios Under the Input Method

**Prices** 

<u>Scenario A:</u> computed the PPPs for Materials, Labor, and Equipment using the unit costs of overlapping inputs between the BOCC and Input methods.

<u>Scenario B</u>: considered the unit costs of all inputs -Materials, Labor, and Equipment- identified from the BOCC data sets submitted by countries.

National Accounts Resource mix shares were identified to help estimate the national accounts expenditure at the sub-heading level.

#### BH Structure under the Input Method

Basic Heading	Sub-headings
	Materials: 34 material inputs
Residential buildings	Equipment: 5 types of equipment (hire rates)
	Labor: 7 categories of construction labor
	Materials: 36 material inputs
Non-residential buildings	Equipment: 5 types of equipment (hire rates)
	Labor: 7 categories of construction labor
	Materials: 19 material inputs
Civil engineering works	Equipment: 5 types of equipment (hire rates)
	Labor: 7 categories of construction labor

#### **Estimating Resource Mixes**

	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	Syria	Yemen
Income Classification	н	М	М	М	н	М	н	н	н	М	М
Relative Cost of labor	М	L	М	Μ	н	н	Μ	Μ	Н	L	L
CONSTRUCTION		1				- 17	1.7				
Residential buildings											
Labor	25%	20%	25%	2 <mark>5%</mark>	30%	25%	25%	25%	30%	20%	20%
Equipment	5%	5%	5%	5%	8%	5%	5%	5%	8%	5%	5%
Materials	70%	75%	70%	70%	63%	70%	70%	70%	63%	75%	75%
Non-residential buildings											
Labor	25%	20%	25%	25%	30%	25%	25%	25%	30%	20%	20%
Equipment	8%	8%	8%	8%	10%	8%	8%	8%	10%	8%	8%
Materials	68%	73%	68%	68%	60%	68%	68%	<mark>68%</mark>	60%	73%	73%
Civil engineering works											
Labor	23%	20%	23%	23%	20 <mark>%</mark>	23%	23%	23%	20%	20%	20%
Equipment	28%	30%	28%	28%	30%	28%	28%	28%	30%	30%	30%
Materials	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%

H = High; M = Medium; and L = Low.

# Scenario A: Overlap with BOCC

Materials (9 inputs)	Labor (7 inputs)	Equipment (5 inputs)
Aggregate for concrete	General (unskilled) laborers	Wheeled loader and excavator
Sand for concrete and mortar	Bricklayer	Tracked tractor
Exterior plywood	Plumber	Skid steer loader
Emulsion paint	Carpenter	Tandem vibrating roller
Ordinary Portland cement	Structural steel worker	Compact track loader
Ready mix concrete	Electrician	
High yield steel reinforcement	Machine (equipment) operator	
Mild steel reinforcement		
Structural steel sections		

# Scenario A: 2005 Results

		PLIs (Base=Region)										
Code	Aggregate	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	Syria	Yemen
1502	Construction	1.13	0.62	1.15	0.92	1.78	0.93	0.85	1.15	1.18	0.73	0.97
15021	Residential Buildings	1.15	0.63	1.24	0.88	1.59	1.00	0.85	1.10	1.20	0.71	1.02
15022	Non-Residential Buildings	1.14	0.63	1.22	0.89	1.64	0.98	0.86	1.11	1.19	0.71	0.99
15023	Civil Engineering Works	1.09	0.63	1.04	1.01	2.08	0.86	0.86	1.28	1.14	0.76	0.81

## Scenario B: Larger basket of inputs

#### Residential Buildings

Non-Residential Buildings Materials (31 inputs)

Labor (7 inputs)

Equipment (5 inputs)

Materials (31 inputs)

Labor (7 inputs)

Equipment (5 inputs)

**Civil Engineering** 

Materials (34 inputs)

Labor (7 inputs)

Equipment (5 inputs)

International Comparison Program

#### Scenario B: 2005 Results

		PLIs (Base=Region)										
Code	Aggregate	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	Syria	Yemen
1502	Construction	1.04	0.64	1.08	1.04	1.50	0.86	1.03	1.17	1.32	0.74	0.88
15021	Residential Buildings	1.05	0.61	1.07	1.04	1.52	0.89	1.04	1.19	1.28	0.72	0.91
15022	Non-Residential Buildings	1.05	0.61	1.07	1.04	1.54	0.85	1.04	1.18	1.32	0.73	0.90
15023	Civil Engineering Works	1.00	0.70	1.11	1.06	1.49	0.86	1.00	1.13	1.39	0.79	0.76

#### **Comparison of Results and Conclusions**

# **Comparison of Results**

fe	S	PLIs (Base=Region)											
Aggrega	Method	Bahrain	Egypt	Iraq	Jordan	Kuwait	Lebanon	Oman	Qatar	S. Arabia	Syria	Yemen	Average absolut % chang
Construction	BOCC Method	1.14	0.65	1.13	1.09	1.19	1.02	1.19	1.35	1.20	0.79	0.60	
	Input Method - Scenario A	1.13	0.62	1.15	0.92	1.78	0.93	0.85	1.15	1.18	0.73	0.97	
	% change	-1%	-4%	2%	-16%	50%	-9%	-28%	-15%	-1%	-9%	61%	18%
	Input Method - Scenario B	1.04	0.64	1.08	1.04	1.50	0.86	1.03	1.17	1.32	0.74	0.88	
	% change	-9%	-1%	-4%	-5%	26%	-15%	-14%	-13%	10%	-7%	47%	14%

#### **Conclusions and Questions**

No markups or professional fees included in the analysis, as this information was not collected in 2005. Are markups and professional fees needed?

No productivity adjustment on the cost of labor under the Input Method. Does the data imply the need to adjust for labor productivity?

BOCC method has multiple layers of weights (mix of inputs under each component, frequency of inputs under components, and system weights). Input method has one set of weights (Resource mixes). Thus, it is crucial to have reliable resource mixes.

We can obtain resource mixes from the BOCC data in some regions. The cost of materials, labor, and equipment as percentages from the total cost of each complex component can be used to deduce average resource mixes for each country. Would that be useful?

To further study the impact of the change in Construction methodology between the 2005 and 2011 Rounds on the resulting PPPs for Construction, the 2005 Construction PPPs need to be compared to the 2011 preliminary Construction PPPs, once these are available.

# Thank you

