EGYPT ICT DEFLATORS UPDATE
(OUR REF 7288, WB SELECTION NO. 1015295)

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Preface/Acknowledgements

I would like to express my appreciation for the time and cooperation of all the staff of MCIT Information Centre, in particular Heba Ahmad Youssef and Ehab El Araby of the Economic Analysis Department.
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Abbreviations

FDI       Foreign Direct Investment
GDP       Gross Domestic Product
ICT       Information and Communications Technology
ISIC      International Standard Industrial Classification
OPM       Oxford Policy Management
MCIT      Ministry of Communication and Information Technology
MCIT-IC   MCIT Information Center
MED       Ministry of Economic Development
1 Introduction

1.1 Background and Objectives

The World Bank has been engaged with the Ministry of Communication and Information Technology (MCIT) on a long term technical assistance program in this respect they have worked in the last 4 years in close contact with the MCIT Information Centre (MCIT-IC) team, and completed a number of statistical capacity building activities for MCIT-IC in several areas including studies relative to ICT prices.

The objective of this activity was to provide MCIT-IC with an update of previous work on the GDP deflator. The aims were to:

- review the current methodology used in the index calculation, in order to take into account the new updates and developments that have taken place
- propose methodology changes in order to better reflect those changes and allow an improved accuracy in the deflator calculation; and
- provide a calculation of an improved deflator

By considering the following elements:

- an update on the goods and services that should be included
- an estimate of the potential scale of adjustments to macroeconomic indicators
- the data requirement for new methods
- a gap analysis based on existing data and statistical materials,
- a draft design and costing of methods to fill data and statistical gaps;
- a broader discussion of the appropriateness, practicality, costs and benefits of adoption of the new deflator.

And hold a workshop to present the updates to the stakeholders and provide some knowledge transfer at the end of the assignment.

1.2 Activities

The consultant visited the MCIT between 30th October and 5th November and consulted with staff of all areas of the information section. External consultations were limited to discussions with the Pricing manager of Vodaphone and the General Manager of Telecom Egypt. A brief training session on index number concepts was held with staff of the Economics Section and an initial revised calculation workbook was prepared with them. We also worked through a list of specific queries compiled by MCIT prior to the visit. Results were presented to a small meeting of MCIT information section staff led by Dr. El Shenawy on Thursday 4th November. A preliminary note summarising these results and outlining the next steps was provided on 9th November and MCIT have subsequently written the Telecoms companies to seek extra data.

1.3 Structure of this report

The next section of this report contains a review of the current methodology. It is followed by recommendations for future actions and an estimate of the effects of the proposed changes.
Annexes A and B contain the terms of reference and schedule of activities and annex C the responses to the specific queries raised by MCIT. An excel workbook with the calculations of an improved deflator including the changes implemented to date is included as attachment 1.
2 Review of current Methodology

The existing methodology was developed with extensive assistance from the World Bank as described in World Bank/MCIT 2008.

A quarterly price index is compiled in an excel workbook using monthly prices that are largely collected from company websites. Prices are collected for fixed telecommunications (i.e. landlines), postal services, mobile telecommunications, and internet access services. Averages of the monthly prices for each quarter are then calculated and compared with the average of the monthly prices for the 2006/07 fiscal year to produce indices which are weighted together using weights from the 2006/07 fiscal year.

The major use of the index is the deflation of the quarterly series for current price communications value added produced by the Ministry of Economic Development. The following sections review the suitability of the present index for this purpose.

2.1 Goods and Services covered

2.1.1 Coverage of Current Price Value Added

In one sense the appropriate goods and services for the MCIT’s GDP deflator are fully determined by those supplied by the companies included in the Ministry of Economic Development’s current price estimates and so the only question that must be answered is how well the products of those industries are covered.

By far the largest hole in product coverage is the large gap between the Telecom Egypt services for which prices are collected and the total output of the company. Most of these revenues appear to be made up of payments made to Telecom Egypt by the mobile companies. At the moment all Telecom Egypt services are deflated using the “Fixed” price index calculated using only prices for services to consumers.

There is also a gap in coverage of ADSL internet services. Traditionally prices have been recorded for unlimited 256 Kps only. There is also no attempt to track prices of new products such as iphone apps. However the weight of the entire internet sector is only 2% and even this appears to be an overestimate so the area cannot be considered a priority.

2.1.2 Coverage of ICT ISIC Categories

If we consider a wider definition of Information and Communications Technology Services drawn from the International Standard Industrial Classification (ISIC) there are several areas that are often included but that are not covered by the existing index including Computer programming, computer consultancy, and other information services including data

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1 The new index workbook addresses the issue by excluding the value of inter company sales from the weight for Telecom Egypt. The resulting index is ideal for deflating total communications value added as payments by the Mobile phone companies to Telecom Egypt net out at this level. However the public sector index is not appropriate for separate use. Guidance to MED should therefore advise them to resume deflating value added for the whole sector by the composite index. If they are unwilling to do this they should be advised to deflate the three components, Private, Fixed, and Posts separately.
processing and webhosting. Even if we accept that the MCIT index is designed for deflating communications (including postal) services rather than ICT as normally defined there are serious gaps because all private courier activities are excluded.

The MCIT team will also have to address the issue of the move to ISIC revision 4 in the near future. As explained above any attempt to adopt the new classification will require a substantial increase in coverage in both information technology and posts. The new section J “Information and Communication” also includes publishing; film, television, and record production, and broadcasting. Meanwhile Postal Services have been included with section H “Transportation and Storage”. The extent to which the MCIT can or should react to these challenges depends on the policy of the MED.

2.2 Index formula used

The current index is a base weighted (Laspeyres) index. The theoretically correct index to use for deflation is a current weighted (Paache) index (see UNSD 2008). National accountants normally attempt to justify the use of Laspeyres deflators by saying that the structure of the markets in question are stable and that deflation is taking place at a very disaggregated level. Neither of these arguments holds for the Egyptian telecoms market. As an alternative it is suggested that MCIT move to an annually chained index using the weights of the current year. The attached workbook contains such an index. Because of time constraints however chaining has only been undertaken at the level of the companies and for the different post products. Chained indices for the different products within Telecom Egypt and Internet Services have not yet been prepared.

The index presented in the attached spreadsheet is suitable for the deflation of quarterly value added estimates. However distortions may arise if a simple average of the quarterly index is used for deflation of annual estimates as some quarters will see many more transactions than others. In particular quarters where there is a special offer of some sort on signing or joining fees for a payment package may see substantial extra activity. Failure to allow for this effect will lead to underestimation of real growth. Similar logic applies when aggregating the monthly prices to produce quarterly estimates. Lack of monthly current price data makes it difficult to adopt the same solution. However Telecom Egypt is able to provide Actual effective rates and these should be used wherever they are available.

2.3 Price Measurement Methodology for Mobile Phones

As mobile phone markets mature companies attempt to segment the market by providing many different pricing plans and updating them frequently. In these circumstances the strategy of selecting a single plan and tracking its price no longer produces a meaningful index. The solution adopted in other countries is to maintain a set of consumer profiles and calculate the minimum cost of following each profile in each period given the plans offered by an operator (see Lacroix and Magnien, Gallo and Magnien and ILO 2004). Talks with Vodaphone suggest that this approach is feasible in Egypt and I recommend that it is adopted.

2 However the base weights have been corrected to allow for arithmetical mistakes discovered in the weights calculation for the base year. Note that the new deflator workbook contains spreadsheets for all the weights calculations.
There is also a small problem with the concept used for price measurement. In a few cases legally mandated prices have been used even when the actual prices charged by the Mobile phone companies differ. It is recommended that actual prices charged are used instead.

2.4 Operational Issues

The collection and production of regular price indices is a new task for the MCIT and there are several areas where operational procedures could be improved. In particular

- All deflator information should be kept in one folder on one PC with separate subfolders for each quarter. This folder should be backed up every quarter.
- Where information is obtained from websites, screenshots of all the websites used in each time period should be stored in named and timed files.
- Weights calculations and the data underlying them should be tracked as carefully as price calculations.
- Attempts should be made to persuade companies to supply details of tariff plans and their prices rather than obtaining them from websites. It appears that Vodaphone at least maintains a spreadsheet with details of all its tariff plans if so this will provide better coverage and require far fewer resources than searching the websites.
- There is no public document on the MCIT website containing details of compilation procedures for the index (including a schedule of future publication dates). Nor are the public warned of methodological changes in advance of publication.
3 Proposed Changes to fill statistical gaps

The two main proposed methodology changes are the adoption and extension of the attached workbook and the development of a profiles based approach to the measurement of mobile phone prices. It is also recommended that the operational issues identified in the previous section are addressed. Progress to date is as follows.

Workbook Extension

- The MCIT Information Centre Economic Analysis Department have replaced legislated prices for Mobile to Fixed charges with actual prices. In some cases actual prices for past periods are no longer obtainable so they have been interpolated.
- The MCIT Information Centre Economic Analysis Department have also sent a formal letter to Telecom Egypt to ask for the effective rates for connection and quarterly spreadsheets containing revenues disaggregated into the 4 major components (local calls, calls to mobiles, long distance calls and international calls). They have also requested the internet and data revenues of Telecom Egypt to be disaggregated between dial-up and ADSL.
- The MCIT Information Centre Economic Analysis Department is working on a series of disaggregated weights for detailed price categories from Fixed and Mobile operators based on annual reports and Quarterly disaggregated revenue figures from Telecom Egypt. When these are completed they plan to Prepare Chained versions of Fixed and Mobile Indices Sheets:

Operational issues

- all Price Index documents have been collected into one organized filing system that is regularly backed up and screenshots of price websites used are collected.
- A draft Methodological note has been prepared to publish with Q4 estimates

Profiles based approach for Mobile Phones

- The MCIT Information Centre Economic Analysis Department have sent a formal letter to mobile phone operators to ask them to supply their customer profiles and to begin supplying a quarterly spreadsheet containing blended rates, price plans and promotions and the most prevalent system and traffic in minutes (total and disaggregated to on-net, off-net and to fixed).

Given the present experience of the Economic Analysis Department it seems likely that they will be able to sustain progress on the extension of the new workbook and improved operating procedures without further support. Even if pressure of time makes it difficult to extend the workbook the measures already adopted will make a real improvement to the index. If the MCIT is successful in obtaining some information on profiles of Mobile Phone users however they will require some assistance to develop spreadsheets to use it. I would estimate at least one week of technical assistance overseas to develop the spreadsheets and a week in country for training staff in the new approach. There are no other direct costs to this program however it will require time from the MCIT staff. The actual cost will depend on the other activities that will be displaced.
4 Adjustments to Macroeconomic Indicators

Figure 4.1 shows a comparison of the old and new indices. The major difference between them is that the new index fell much faster in the years up until the current base period. This effect is almost entirely due to reduced weight allocated to Telecom Egypt in a period when Mobile prices are falling rapidly. Note however that fixed 2006/7 weights were used for all periods up to and including 2006/7. If chaining was carried backwards as well as forwards the gap would be much smaller. The data to do this would almost certainly be obtainable.

Figure 4.1 Comparison of Old and New Indices
References/Bibliography


Lacroix and Magnien Methodology for constructing a price index for mobile-telephony services Paper presented at the Sixth Meeting of the International Working Group on Price Indices 2001


MCIT/World Bank 2008 Developing a New Deflator for the Communications and Information Technology (CIT) Component of GDP in Egypt


UNSD 2008 Chapter 15 (Prices and Volumes) in the System of National Accounts

UNSD 2008 International Standard Classification of all economic activities Revision 4
Annex A  Terms of reference

A.1  Background

The World Bank has been engaged with the Ministry of Communication and Information Technology (MCIT) and its affiliate agencies, on a long term technical assistance program that covers a number of areas. These include the assessment of different policy options in the area of broadband development. In this respect, the World Bank has worked in the last 4 years in close contact with the MCIT Information Center (MCIT-IC) team, and has completed a number of studies relative to the ICT part in the consumer price index, and the ICT part in foreign direct investments (FDI). The World Bank has also provided a number of statistical capacity building activities for MCIT-IC.

A.2  Objectives

The objective of this activity is to provide MCIT-IC with an update of the GDP deflator and of the contribution of ICT in FDI, as well as develop a methodology and calculation of the contribution of the ICT sector in Exports.

A.3  Scope of work

a) Updating the calculation of the GDP deflator:

The study will consist in (i) the review of the current methodology used in the index calculation, in order to take into account the new updates and developments that have taken place in the area of the deflator; (ii) the proposition of methodology changes in order to better reflect those changes and allow an improved accuracy in the deflator calculation; and (iii) the actual calculation of the deflator.

In particular, the work will involve: the update on goods and services to be included in the deflator, an estimate of the potential scale of adjustments to macroeconomic indicators that might result from adoption, the data requirement for adoption, a gap analysis based on existing data and statistical materials, and draft design and costing of methods to fill data and statistical gaps; and a broader discussion of the appropriateness, practicality, costs and benefits of adoption of the new deflator.

A workshop to present the updates to the stakeholders and provide some knowledge transfer will be organized at the end of the assignment.
Annex B   Activities

B.1 Discussions Held

- Dr. Nagwa Ibrahim El Shenawy (MCIT Information Centre Director)
- Heba Abd El Moneim (Executive manager - MCIT Information Centre)

- MCIT Information Centre Economic Analysis Department:
  - Heba Ahmad Youssef (Unit manager)
  - Eman El Shewy (Senior Economic analyst)
  - Ehab El Araby (Economic analyst)

- MCIT Information Centre International Organizations Department:
  - Safa Mostafa Abd El Hamid (Senior Economic researcher)

- MCIT Information Centre Information Department:
  - Ahmed Saad (Unit manager)
  - Ahmed El Sarawy (Senior Information analyst)

- Outside MCIT
  - Moataz Abd El Gelil (Pricing Senior Manager – Vodafone Egypt)
  - Mohamed Kamal (General manager, investor relations and internal reporting department - Telecom Egypt)
### Table B.1 Schedule of Activities

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday 31st October</td>
<td>10:00-12:00</td>
<td>Meeting at MCIT, B5 with Dr. Nagwa El Shenawy and the team &quot;Discussing the general scope of work&quot;</td>
</tr>
<tr>
<td></td>
<td>1:00 - 4:00 p.m.</td>
<td>Meeting with team at MCIT B5: &quot;Revising the previously done work, methodology and the available data sets&quot;</td>
</tr>
<tr>
<td>Monday 1st November</td>
<td>10:00-12:00</td>
<td>Meeting with Vodaphone</td>
</tr>
<tr>
<td></td>
<td>2:00 - 4:00 p.m.</td>
<td>Work with team at MCIT B5</td>
</tr>
<tr>
<td>Tuesday 2nd November</td>
<td>10:00-12:00</td>
<td>Work with team at MCIT Re information supplied for National Accounts and ICTU</td>
</tr>
<tr>
<td></td>
<td>1:00 - 4:00 p.m.</td>
<td>Work with team at MCIT Re weights and index theory for deflation</td>
</tr>
<tr>
<td>Wednesday 3rd November</td>
<td>10:00 -12.00 p.m.</td>
<td>Working with the team in MCIT- on specific problems raised in ToR</td>
</tr>
<tr>
<td></td>
<td>1.00-4.00</td>
<td>Working with the team at MCIT B5 - writing the report and presentation</td>
</tr>
<tr>
<td>Thursday 4th November</td>
<td>10:00 -12.00</td>
<td>Working with the team in MCIT - finalize report and presentation</td>
</tr>
<tr>
<td></td>
<td>1.00-3.00</td>
<td>Wrap up meeting with Dr. Nagwa to finalize the work and discuss the future agenda</td>
</tr>
</tbody>
</table>
Annex C  Responses to Specific Problems raised by MCIT team:

1. During the year 2009, the mobile operators have differentiated their price into on-net and off-net calls and also peak and off-peak calls for mobile services. For example: for Vodafone operator, the calls to other mobile is differentiated between on-net calls that cost 0.2 EGP and the off-net calls that cost 0.4 EGP in the period of October- December 2009. And the revenues of on-net and off-net calls and also peak and off-peak calls needed for calculating weights are not easily reachable from the operators.

In the long term this should be solved through the Profiles method. In the short term on net and off net tariffs have been weighted using market shares under the assumption that a call is equally likely to be made to any subscriber. This method could be improved by replacing revenue shares with subscriber number shares.

2. Having differences between the actual tariff rates set and used by the mobile operators and the one declared by the official authorities, for example : since July 2008, the National Telecom Regulator Authority had announced the tariff rate for calling fixed lines from mobiles is to be 0.3 EGP, although the mobile operators are applying different rates as 0.5 EGP for Mobinil and 0.6 EGP for Vodafone.

Actual tariffs should be used in all cases. It has been necessary to interpolate actual prices for some of the period between the introduction of the legal maximum and the resumption of actual price collections.

3. The weights used in developing the deflator are based on the revenues generated along the base year 2006/07. Since the third operator Etisalat didn’t start operating during this period so we backward estimated its market share to be 5%, but now, Etisalat share had reached 11.8% of the total market share, which indicates an underestimation to its market effect.

The chaining has dealt with this problem.

4. The mobile subscription system followed to get the mobile tariff rates was the most prevailing systems in the market according to the highest number of subscribers, but these systems changed recently either vanished or changing its tariff rates.

The profiles approach will cope with this problem. In the meantime we have examined the new plans and decided that they offer at least as much service as the old and therefore represent genuine price reductions.

5. Discounts and promotion offered by the fixed operator (Telecom Egypt) for the installation fees, as it sometimes offer free installation for certain month and some other
times offer free minutes when contracting on a new land line, all these promotions are not well taken into calculations.

**Actual effective rates are available from Telecom Egypt and should be used. The series provided so far are for years and half years but quarterly data will soon become available. When it does it should be spliced in to the composite index for Installation and Contraction Charges for Residential lines**

6. The complexity of some mobile tariff systems that makes it uneasy to calculate average price for the service, for example in July 2010, Vodafone released a new prepaid subscription system (called Hakawy) that has on net - off peak rate for the first three minutes to be 0.2 EGP and the rest of the hour for free, while on net - peak rate for the first three minutes is also 0.2 EGP but the rest of the hour minutes for 0.05 EGP, while off net minute rate is 0.3 EGP.

The profiles approach will cope with this problem. In the meantime Hakawy should not be used. A similar issue applies to the Etisalat unlimited prepaid tariff which is already being used. For this we have adopted the interim solution of calculating per minute rates based on maximum use of the plans benefits while recognizing that this approach is not satisfactory.

7. The internet index basket include the most ADSL speed used which was 256 Kb/sec, but this speed vanished and the minimum speed replacing it is 512 Kb/sec.

We are still attempting to produce a chained weighted index based on survey results for the proportion of people using different internet speeds. However we have discovered from discussions with Telecom Egypt that the actual market for Internet Service Providers is even smaller than supposed so this index Is not a key issue.