Current Cost Accounting Methodologies for the Electronic Communications Sector

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Consultative Paper on Proposed Decision

July 2005

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Table of Contents

Executive Summary

In July 2002 the Malta Communications Authority published a report on consultation and decision regarding cost based accounting systems for the electronic communications sector[1]. In this Decision it was established that operators having a Dominant Market Position should implement cost-based accounting systems using a Fully Allocated Cost accounting methodology using a historic cost base.

At that time the MCA had taken the view that this methodology was the most practical approach in the short term. However, mindful of the deficiencies inherent in a historic cost-based system, particularly the issue that legacy costs and inefficiencies should not be shifted to other competing operators through incorporation in a Reference Interconnection Offer, in the same Decision the MCA stated that it would review the need to move to a current cost regime during 2005.

Current cost methodologies attempt to solve the problems posed by general price inflation and technological progress. These issues are not addressed by historic cost accounting since a historic cost base may no longer reflect the true current cost. Such methodologies are already widely used by National Regulatory Authorities in the Electronic Communications sector in the European Union. This consultation paper examines the various issues that are relevant to a transition from a historic cost base to a current cost base.

This document is without prejudice to the legal position or the rights and duties of the MCA to regulate the market generally. This is not a legal document; the MCA is not bound by this document and may amend it from time to time.

[1] "Implementation of Cost Based Accounting Systems for the Telecommunications Sector- Report on Consultation and Decision", MCA, July 2002.

1 Introduction

1.1 Background

Cost accounting systems provide National Regulatory Authorities (NRAs) with detailed information regarding notified operators' service costs. The purpose of mandating cost accounting obligations is to ensure that fair, objective and transparent methodologies are followed by operators in allocating their costs to services in a scenario where remedies such as price controls or cost-orientation of prices have been mandated. Information from cost accounting systems may be used by NRAs to complement the application of other regulatory measures (e.g. transparency, non discrimination) on notified operators.

Any mandated cost accounting methodology used, in particular as a basis for price control decisions, should be specified in a way that encourages efficient investment, identifies potential anti-competitive behaviour, notably margin squeezes, and should be in accordance with the NRA's policies and objectives.

In July 2002 the Malta Communications Authority (MCA) decided that operators having a Dominant Market Position (DMP) should implement cost-based accounting systems using a Fully Allocated Cost accounting methodology using a historic cost base (FAC (Historic)). At that time, the MCA had taken the approach that an FAC (Historic) methodology was the most practical in the short term, although it was mindful of the deficiencies inherent in this methodology - particularly where it relates to the issue of legacy costs and inefficiencies that should not be shifted to other operators through incorporation in a Reference Interconnection Offer. In the same Decision the MCA stated that it would review the need to move to a current cost regime during 2005.

1.2 Characteristics of Current Cost Methodologies

Historical cost information is generally accepted as being adequate for financial stewardship purposes but may provide unsatisfactory indicators for regulatory decision-making. The main drawback with a historic cost base is that the true current value of a company's assets may bear little relationship to their historic purchase prices. Accordingly the major problems with FAC (Historic) methodologies are that:

- as a result of general price inflation, historic gross book values (and hence net book values) of long-lived assets bear little relationship to the true values of the assets concerned;
- this problem is further exacerbated by technological progress, which means that the prices of different assets have evolved very differently over time both relative to each other and to prices in general. For example, switch costs, where there has been a lot of technical progress, have fallen sharply

relative to prices in general while site costs, where there has been little technical progress, have generally risen relative to the general rate of inflation.

The problems posed by general price inflation and by technological progress can be reduced or eliminated altogether by revaluing capital equipment to current replacement cost. The main regulatory impact of applying a current cost methodology is that it requires undertakings to record the value of assets to reflect their 'value to the business'.

The cost of fixed assets, as reflected in the required rate of return on capital and annual depreciation charges, is usually a significant percentage of the total costs of an electronic communications network. As a result, the choice between historic or current cost has a significant impact on wholesale interconnection rates where these are regulated using costing accounting systems.

The process of shifting from a Historical Cost Accounting (HCA) to a Current Cost Accounting (CCA) system mainly involves:

(i) Revaluation of Assets: it is necessary to make detailed estimates of the current value of all fixed assets on a Replacement Cost or Modern Equivalent Asset (MEA) basis. The difficulty of this task is directly related to the age and complexity of the network. The older and more complex the network the harder the task. Generally the newer the network the better and more up to date are the records of that equipment;

To arrive at current cost asset valuations it is necessary to revalue capital equipment so that the gross book value of equipment is replaced by the gross replacement cost, i.e. what it would cost to purchase and install the equipment today. This involves identifying the MEA and then attaching a price to it. The written down value of the equipment (net replacement cost) can then be derived using normal depreciation rules. Thus, for example, if a particular piece of equipment is five years old and has a useful life of 10 years, then, under straight-line depreciation, its net replacement cost will be half its gross replacement cost.

(ii) Depreciation Adjustments: it is also necessary to take asset price changes into account for depreciation purposes when moving to CCA. The applicable asset lives are applied to the current cost asset values. The accounting entries that are generated are adjustments in depreciation (supplementary depreciation and backlog depreciation) as well as any holding gains and losses generated by asset price changes that occur during the accounting period.

There are two different approaches to these adjustments that differ in their definition of 'capital maintenance', i.e. the way in which the capital of the company is viewed when determining profit. These approaches are Operating Capital Maintenance (OCM) and Financial Capital Maintenance (FCM). OCM considers the operating capability of the company while FCM considers that the financial capital of the company is maintained in current price terms.

1.3 Adoption of Current Cost Methodologies in Europe

Current cost methodologies are already widely used by several NRAs in the electronic communications sector throughout Europe. Commission Recommendation 98/195/EC[2] recommended that NRAs set deadlines for their notified operators for the implementation of new cost accounting systems based on current costs, where such systems are not already in place.

Figure 1 below reports the percentage of countries adopting respectively CCA, HCA or other accounting methodologies to set cost based fixed interconnection charges. It shows that the most widely used cost base is CCA (70%), followed by HCA (15%) and other mixed methodologies (15%).

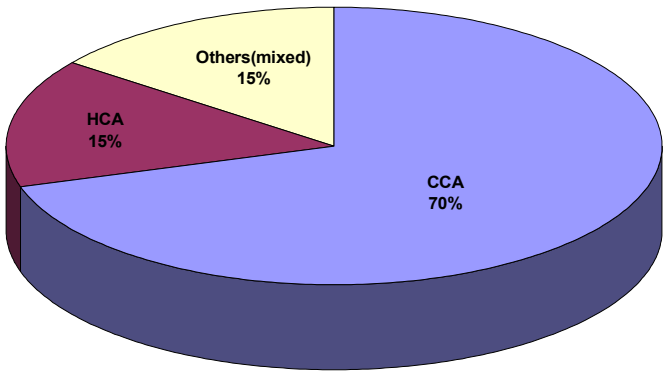

Figure 1: Cost base for fixed interconnection charges in Europe ***(source: IRG, March 2005)***

[2] Commission Recommendation on Interconnection in a Liberalised Telecommunications Market - (Part 1 – Interconnection Pricing), European Commission, 8 January 1998.

In the case of mobile Interconnection Charges (Figure 2), the most widely used cost base is HCA (59%), followed by CCA (29%) and other mixed methodologies (12%).

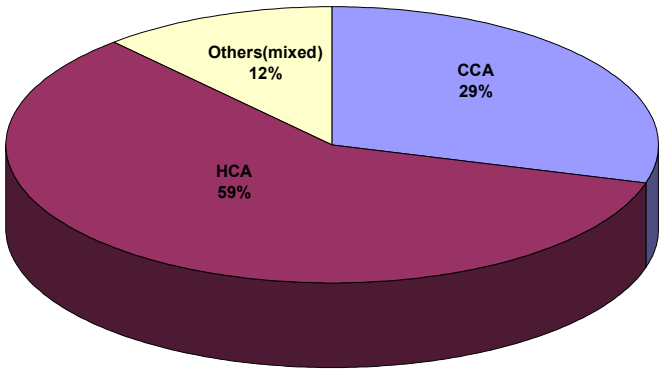

Figure 2: Cost base for mobile interconnection charges in Europe ***(source: IRG, March 2005)***

In the case of Local Loop Unbundling Charges (Figure 3), the most widely used cost base is CCA (54%), followed by HCA (31%) and other mixed methodologies (15%).

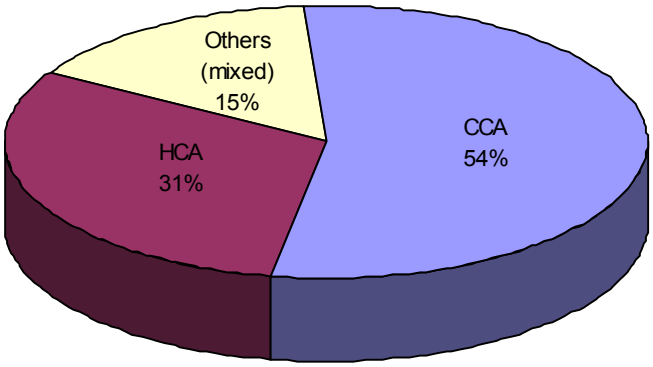

Figure 3: Cost base for Unbundled Local Loop charges in Europe ***(source: IRG, March 2005)***

1.4 Legislative Basis

In September 2004 the Telecommunications (Regulation) Act (Cap 399) was significantly amended to transpose the New EU Framework for Electronic Communications. The Telecommunications (Regulation) Act was renamed as the Electronic Communications (Regulation) Act. Since the revised legislation established new rules for the regulation of electronic communications, it also set

out a transitional period whereby the obligations that existed as at 1 May 2004 would still apply until the market analysis is carried out in line with Regulation 17 of LN 412/2004.

The obligations of cost-orientation and accounting separation were already applicable to DMP operators immediately before the coming into force of the amendments. According to the transitional provisions these obligations existing immediately before the coming into force of this Act shall remain applicable until such time as the market analysis is carried out. This consultation is in line with these obligations, particularly those of cost-orientation and accounting separation, currently applicable to operators with a DMP.

Furthermore operators designated as having Significant Market Power (SMP) in a relevant market as a result of the market analysis carried out under the new EU framework in accordance with Article 16 of Directive 2002/21/EC, may be subject *inter alia* to obligations concerning the implementation of a cost accounting system and/or preparation of separated accounts.

In publishing this consultation paper, the MCA has taken the utmost account of the general principles, policy objectives and remedies enshrined in the new regulatory framework and its compatibility therewith, and will keep any decisions taken following this consultation under review in light of the outcome of the market analysis procedure. This consultation is without prejudice to the Authority's power at law to maintain, amend or withdraw obligations, particularly relating to cost orientation and accounting separation on a case-by-case basis depending on the result of the market analysis.

2 Implementation of current cost methodologies

2.1 Scope of Current Cost Methodologies

Cost-based accounting systems using current costs take into account the costs that would be incurred to replicate a network built in the past using current technology. CCA is therefore more likely to reflect the costs that would underpin a price in a hypothetical competitive market. For this reason, current cost methodologies are generally considered to provide better investment signals to a Build-Buy decision faced by new entrants.

Cost accounting systems based on current cost methodologies have been widely implemented in the fixed core network particularly where price controls and cost orientation are applied[3]. The economic basis frequently invoked in such cases is that a switching network is generally considered to be highly replicable, and also because the level of interconnection charges is a major factor that determines competition.

The adoption of current cost methodologies for the fixed access network is less widespread. Such networks are generally considered to be less replicable in the medium-term by other operators, who are therefore less frequently confronted by a build-or-buy decision. If current cost methodologies are applied to such networks a number of parameters (such as cost of capital, depreciation profiles, mark-ups, time varying components) may need to be adjusted in order to reflect the degree of replication of the assets involved. Additionally, progressive introduction of current cost methodologies commencing with fixed core network services generally would allow more reasonable implementation timeframes.

Current cost methodologies are also less adopted in mobile networks. The problems posed by general inflation and technological progress are, as yet, not as great in mobile electronic communications networks mainly constructed within the past 10 years as with fixed electronic communications networks. This means that historic cost accounting may not provide such divergent results in the case of mobile electronic communications as fixed electronic communications.

Q 1: The MCA welcomes views and comments regarding the adoption of current cost accounting systems for any of the following:

1. Fixed core electronic communications services;
2. Fixed access electronic communications services;
3. Mobile electronic communications services.

[3] Vide Section 1.3

2.2 Separated Accounts

The purpose of separated accounts is to provide an analysis of information derived from financial records to reflect as closely as possible the performance of parts of a business as if they were operating as separate businesses. Accounting separation provides financial information that demonstrates compliance with non-discrimination obligations and the absence of anti-competitive cross-subsidies.

Comprehensive separated accounts prepared on HCA will still be required in the event that cost accounting systems using current cost are implemented in fixed core electronic communications services.

In order to increase transparency, supplementary information based on CCA information will however need to be prepared in addition to the HCA separated accounts. In this scenario the supplementary information could be limited to:

- A core network profit and loss account including CCA adjustments;
- A core network statement of mean capital employed including CCA adjustments;
- A statement of core network costs including CCA adjustments;
- A statement of fully allocated current costs to network services;
- Additional supporting information and reconciliations.

The supplementary information would ideally be prepared in a separate document from the main HCA separated accounts in order to distinguish the purpose and improve auditability of the separate sets of information.

Q 2: The MCA welcomes views and comments regarding:
- The continued preparation of HCA separated accounts;
- Limiting the preparation of CCA separated accounts and supplementary current costing information only to the businesses where CCA methodologies are mandated.

2.3 Revaluation of Assets

A key element of the current cost methodology is the valuation of assets. It is necessary to make detailed estimates of the current value of all fixed assets on a replacement cost or modern equivalent asset (MEA) basis. The difficulty of this task is directly related to the age and complexity of the network. The older and more complex the network, the harder the task. Generally the newer the network the better and more up to date are the records of that equipment.

Appendix A sets out the main valuation methodologies used under CCA.

The cost allocation methods used under HCA are also appropriate for CCA. However, when assets are re-valued on the basis of MEA, the attribution of these assets may need to be adjusted to reflect the cost drivers of the MEA technology where these differ from the existing drivers used.

Q 3: The MCA welcomes views and comments on the methodologies used for revaluation of assets to current cost methodology as set out in Appendix A.

2.4 Capital Maintenance

There are two alternative approaches to CCA that differ in their concept of "capital maintenance", i.e. the manner in which the capital of the company is viewed when determining profit. Capital can either be viewed in operational terms (i.e. the company's capacity to produce goods and services) or in financial terms (i.e. the value of shareholder's equity interest). These are known as Operating Capital Maintenance and Financial Capital Maintenance concepts respectively:

- **Operating Capital Maintenance** (OCM) considers the operating capability of the company. Proponents of OCM assert that capital maintenance under this approach requires the company to have as much operating capability - or productive capacity - at the end of the period as at the beginning,
- **Financial Capital Maintenance** (FCM) considers the financial capital of the company is maintained in current price terms. Capital is assumed to be maintained if shareholders' funds at the end of the period are maintained in real terms at the same level as at the beginning of the period.

Appendix B sets out the main adjustments required to historical cost accounts in order to derive current cost information using either OCM or FCM.

If OCM were used to determine charges, the revenue requirement would be derived as the sum of operating costs, historical cost depreciation, supplementary depreciation and a return on net assets. Under FCM, the revenue requirement would be the sum of operating costs, historical cost depreciation, supplementary depreciation and a return on net assets less holding gains/losses plus an adjustment to shareholders' funds.

The use of the OCM concept may systematically incorporate insufficient or excess returns into the level of allowed revenue (depending, respectively, on whether asset specific inflation was expected to be lower than or higher than general inflation). This is not a desirable feature of any regulatory regime, as it would not provide appropriate investment incentives. Therefore FCM is generally the preferred capital maintenance concept.

Q 4: The MCA welcomes views and comments on the adoption of the FCM capital maintenance concept.

2.5 Depreciation Methods

Depreciation is an estimate of the decrease in the value of an asset over its expected useful life. There are several methods for calculating depreciation, the simplest of which involves calculating the annual charge for depreciation by equal annual instalments over the asset's estimated useful life with a few variations. Other methods of calculating depreciation on the basis of economic values also exist, however such methods may be more subjective and difficult to implement.

Appendix C sets out the main depreciation methods normally used when adopting current cost methodologies – the Ratio Method and the Net Present Value Methodology.

The Ratio Method adjusts HCA depreciation by the ratio of gross replacement cost to gross book value. The Net Present Value Methodology is a method of economic depreciation.

Q 5: The MCA welcomes views and comments on the preferred depreciation methods to be used.

2.6 Other cost adjustments

New technologies are usually superior in many aspects to older technologies in terms of functionality and efficiency. Since MEA values are required to reflect assets of equivalent capacity and functionality, it may be necessary to make adjustments to the current purchase price and also the related operating costs - for example, the new asset may have surplus capacity and require less maintenance, less energy and less space. Examples of such adjustments are set out in Appendix 1 and are referred to as "abatements".

NRAs may also require further adjustments to financial information in respect of efficiency factors since the use of cost accounting systems (even applying CCA) may not fully reflect efficiently incurred or relevant costs. These efficiency adjustments may result from optimisation of network topology, of operational practices, and of technology used in the network.

Commission Recommendation 98/195/EC recommends that interconnection charges should be set on the basis of the level of costs that would be incurred by an efficient operator. If a top-down methodology implicitly assumes existing costs and current levels of efficiency, and fails to make sufficient allowance for efficiency improvements in operational practices necessary to match the costs of an efficient new entrant, interconnection costs as estimated may be unnecessarily augmented.

Accordingly further cost adjustments that may need to be carried out to a top-down modelling approach may be estimated from:

- simple indicators, benchmarks and comparative analyses of network costs with those of other competitive operators in EU Member States, already supposed

to be cost-based and reflecting the relative efficiency of network operators in a broad spectrum of countries;

- detailed engineering studies that involve analyses of network activities and processes in detail in order to assess the scope for improvements;
- reconciliation exercises that analyse the main reasons why top-down and bottom-up approaches are likely to produce different results.

Implementation of a bottom-up economic/engineering model assists in providing information on efficient operator costs. A bottom-up cost modelling approach implicitly assumes a level of best-practice operations and capital cost efficiency whereas a top-down modelling approach requires explicit estimates to be made of the scope for efficiency improvements. Bottom-up models are data intensive and can result in underestimation of costs unless careful attention is given to assumptions on capital costs, utilisation levels and other inputs. Underestimation itself is not an inherent weakness of the methodology and can be eliminated in particular with the active collaboration of an operator.

To address these issues, reconciliation exercises may be carried out to analyse the main reasons why the top-down and bottom-up approaches are likely to produce different results.

Q 6: The MCA welcomes views and comments regarding:
- the need to apply cost adjustments to top-down models;
- the most appropriate manner to evaluate such adjustments.

2.7 First year implementation

Due to the nature of the adjustments needed to prepare profit and loss statements on a current cost methodology it is necessary to have auditable current cost valuations both at the opening and closing of the relevant financial period. The first time that current cost statements are prepared will therefore require a revaluation of both the opening and closing capital employed.

A further consideration is also relevant in the particular case of Maltacom. The revaluation of Maltacom's existing assets on circuit-switched technology would involve a laborious process. Maltacom has recently announced that it will be upgrading the current circuit-switched network to an IP-based soft-switch technology. This change has considerable implications on the revaluation of assets under the MEA methodology. An outright valuation of IP-based technology for MEA purposes may thus be less costly and time-consuming for Maltacom in the preparation of CCA financial information. This would also be in line with Maltacom's short-term implementation planning horizon.

Q 7: The MCA welcomes views and comments on matters relating to the first year implementation of CCA methodologies.

2.8 Timeframes for implementation

As mentioned in Section 1.3 above the European Commission recommended that NRAs set a deadline for the implementation of cost accounting systems based on current costs and activity based costing. Although the implementation of a new costing system can be a time consuming process a CCA system may be adapted from an existing HCA system. Progressive implementation of CCA methodologies would lessen the burden of the initial transition.

The MCA is of the view that current cost information could be prepared for financial years starting on 1 January 2006 and thereafter. This information would be submitted to the MCA within 7 months of the financial year-end.

Q 8: The MCA welcomes views and comments on the proposals that:
- the first CCA information should be prepared for financial years commencing 1 January 2006 and later;
- the information would be submitted to the MCA within 7 months of the financial year-end.

3 Consultation framework

The MCA would like to invite comments from interested parties in relation to the various issues raised in this document. The consultation period will run until 12.00pm on Wednesday 31 August 2005. Comments should be sent to:

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Respondents are also kindly requested to refer their comments to the specific sections of this document. Written representations will be made publicly available at the MCA on request, unless these are of a confidential nature. Respondents are therefore asked to separate out any confidential material into a clearly marked annex[4].

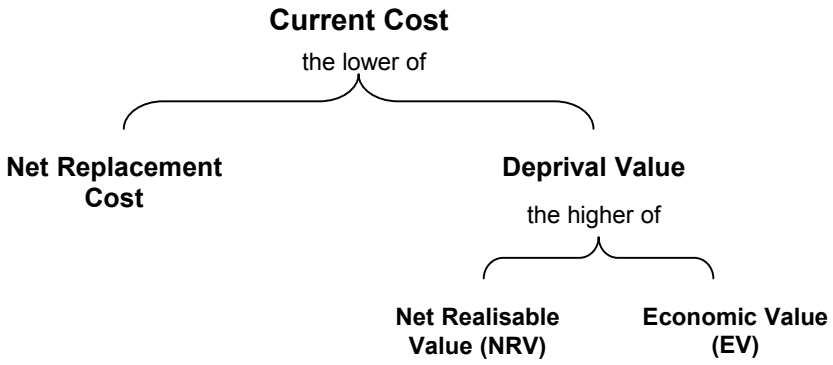
[4] Comments received from respondents are potentially public unless the Authority, in line with the relevant provisions at law, considers the information to be of a confidential nature. The onus to clearly state why information, documentation or submissions however so described should be treated by the Authority as confidential, in line with the relevant provisions at law, rests with the respondent. In deciding whether to accept a request for confidentiality, the Authority will give heed to the commercial sensitivity of the information provided.

Appendix A - Revaluation of Assets under CCA

This section looks at different valuation methodologies that can be used when assets are revalued for the purposes of current cost accounting. Any chosen set of valuation methods will need to be reviewed from time to time as a result of changes in technology.

A.1 Current Cost Valuation

Current cost values are often established on the basis of the "Value to the Owner" convention as follows:



Deprival Value

Deprival Value represents the recoverable value of the asset to the organisation; that is, the higher of the economic value the asset is likely to generate and the net realisable value (NRV) of the asset if it were sold.

Economic Value (EV) is a measure of the value of an asset based on the net present value of future cash flows.

The valuation rules can be summarised as follows:

- If EV > NRV, the company will keep the asset in its current use;
- If NRV > EV, the company will sell the asset now as the proceeds from the sale would exceed the economic value that it would be expected to generate from its continued use.

Therefore the deprival value or recoverable amount of the asset is the higher of EV and NRV.

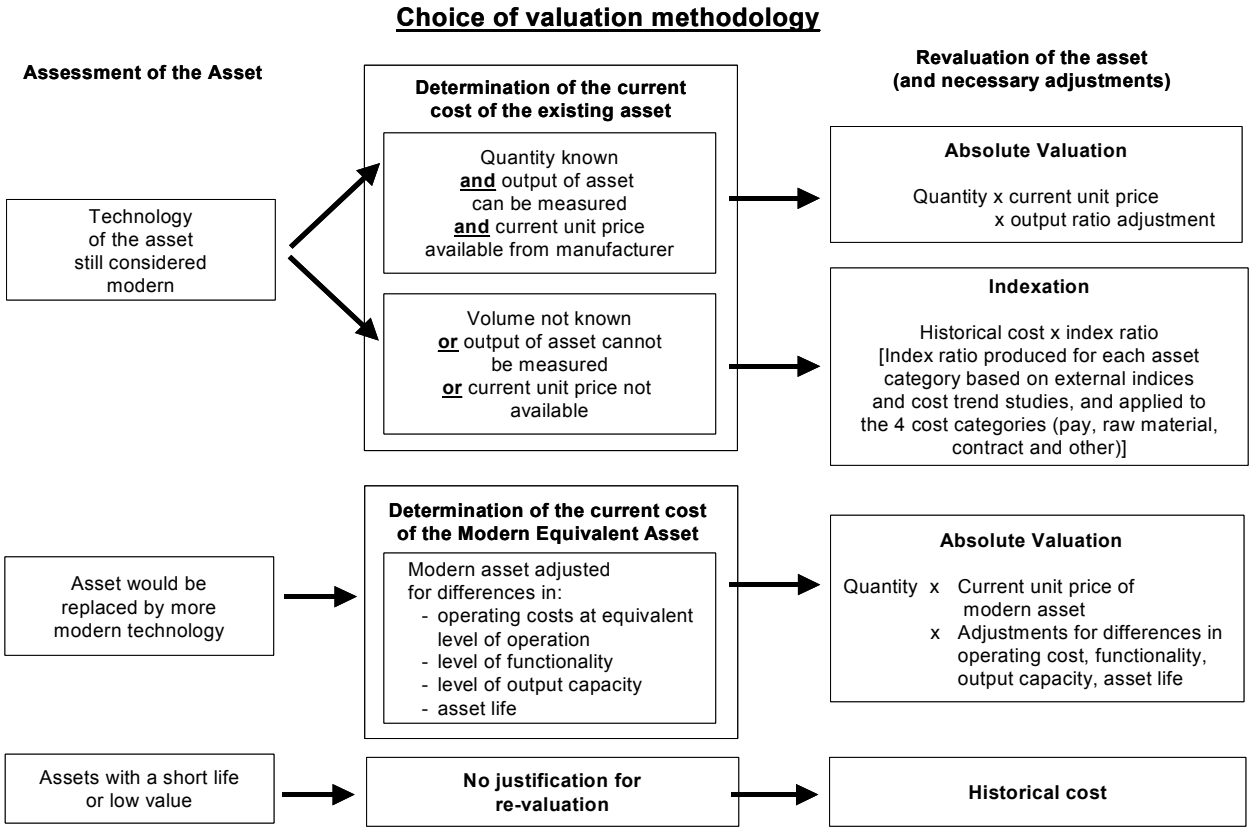
Net Replacement Cost

The Net Replacement Cost is the cost of replacing the asset with another asset of similar characteristics and age.

The current cost of assets therefore is the lower of its deprival value and the net replacement cost. That is, the lower of the amount the company could recover from the asset and the cost to the company to replace the asset with an identical one.

In practice the current cost is generally measured on the basis of Net Replacement Cost since it is difficult to calculate Economic Values and Net Realisable Values are appropriate where the asset is to be sold.

Where replacement cost methodology is used it is important to distinguish between those assets that would be replaced with the same technology and those where an alternative technology would be used. The chart below summarises the main principles underpinning the choice of a valuation methodology (in order to calculate the net replacement cost) as well as the adjustments that should be considered.



In some instances it may not be clear when an asset is no longer considered as "modern" and becomes replaceable by more recent technology. Very often the established technology co-exists with more recent cutting-edge technology. A

period of time may elapse before modern technology completely replaces the older technology. In these circumstances the revaluation of such assets on the existing technology basis or the Modern Equivalent Asset basis may be equally justifiable. The justification for the method to be adopted will need to be carefully evaluated on a case-by-case basis.

A.1.1 Existing Technology

If the asset in question has not been subject to substantial technological change, for example copper cable, two approaches are possible:

- **Absolute Valuation:** this involves taking non-financial measures such as physical volumes of equipment and multiplying these by current prices. This may be necessary where, for example, satisfactory index data does not exist. In some cases it may be difficult to calculate unit prices and decide on the baseline to be used. While in principle straightforward, issues arise in practice because the price may be sensitive to the quantity purchased.

- **Indexation:** where there has been very little technological change and the service potential of new assets is similar to that of existing ones, it is possible to apply appropriate price indices to historic cost acquisition values in order to derive current cost valuations;

It is not always obvious which method will give more reliable and accurate results and this will need to be assessed carefully for each category of assets. Absolute valuations may be preferred to indexation since, for example:

- The asset may comprise a number of separate elements requiring different indices particularly as the importance of these elements may vary over time;
- Absolute valuation makes use of an inventory of equipment needed whereas indexation does not;
- Assets in the books may not be used or alternatively may still be in use despite having been completely written off.

A.1.2 Modern Equivalent Asset Valuation

In some cases new technologies may have been developed since the existing asset was installed, and the existing asset may no longer be replaceable (e.g. it is no longer manufactured). As a result of changes in technology an asset may have altered substantially in any or all of the following respects:

- the initial capital cost;
- the level of operating costs, e.g. lower maintenance costs;
- the service provided (capacity and/or functionality).

The rate of technological change in the telecommunications industry has implications in both identifying suitable replacement costs for old technology assets and ensuring the assets exhibit the same levels of functionality and capability. The new technologies are usually far superior to the old technologies in terms of functionality and efficiency.

Where existing assets cannot be replaced in the same form, the replacement cost is based on "the modern equivalent asset" (MEA), that is the value of an asset with the same level of capacity and functionality as the existing asset. The issues relating to the calculation of MEA values for telecommunications operators are considered further below.

Since MEA values are required to reflect assets of equivalent capacity and functionality, it is necessary to make adjustments to the current purchase price and also the related operating costs - for example, the new asset may require less maintenance. These adjustments are known as “abatements”.

A.1.2.1 Illustration of abatement exercises

Consider the valuation of two digital switches:

- Assume that one of the switches is an older basic type while the other is a newer type that has additional feature facilities such as voice mail. The supplier may only have the current replacement cost of the newer switch. In this case, the costs of the additional functionality (or estimated cost of upgrade) should be deducted from the cost to derive an appropriate cost for the basic type;
- Where the new equipment has greater capacity than the existing equipment the value attributed to that equipment should be written down to reflect its lower functionality. Thus, if the existing equipment has 75% of the functionality of the new equipment it should be attributed 75% of the new equipment’s value (in gross terms);
- Where there is surplus capacity, i.e. capacity that is not currently required and is not expected to be required within the network-planning horizon, valuations should be adjusted downwards. For example, this may occur with specialised

accommodation such as exchange buildings reflecting the fact that the space requirement of modern equipment is much lower. A way to deal with this is to use modern building and site costs but assume a space requirement consistent with what is necessary for modern equipment.

- Where the operating costs of the new equipment are lower than that of the existing equipment, the difference should be estimated for each year of the asset's life, discounted by the relevant cost of capital and summed. The resultant total should be subtracted from the capital cost of the new asset [5].

A.1.3 Equipment with Low Value or Short Life

Historical costs are sometimes used for low value items or equipment with a very short service life and in this case no revaluation method is applied.

[5] The cost of the modern equivalent asset would effectively be reduced by the present value of the extra operating costs associated with the existing equipment over the remainder of its life.

Appendix B - Capital Maintenance Concepts

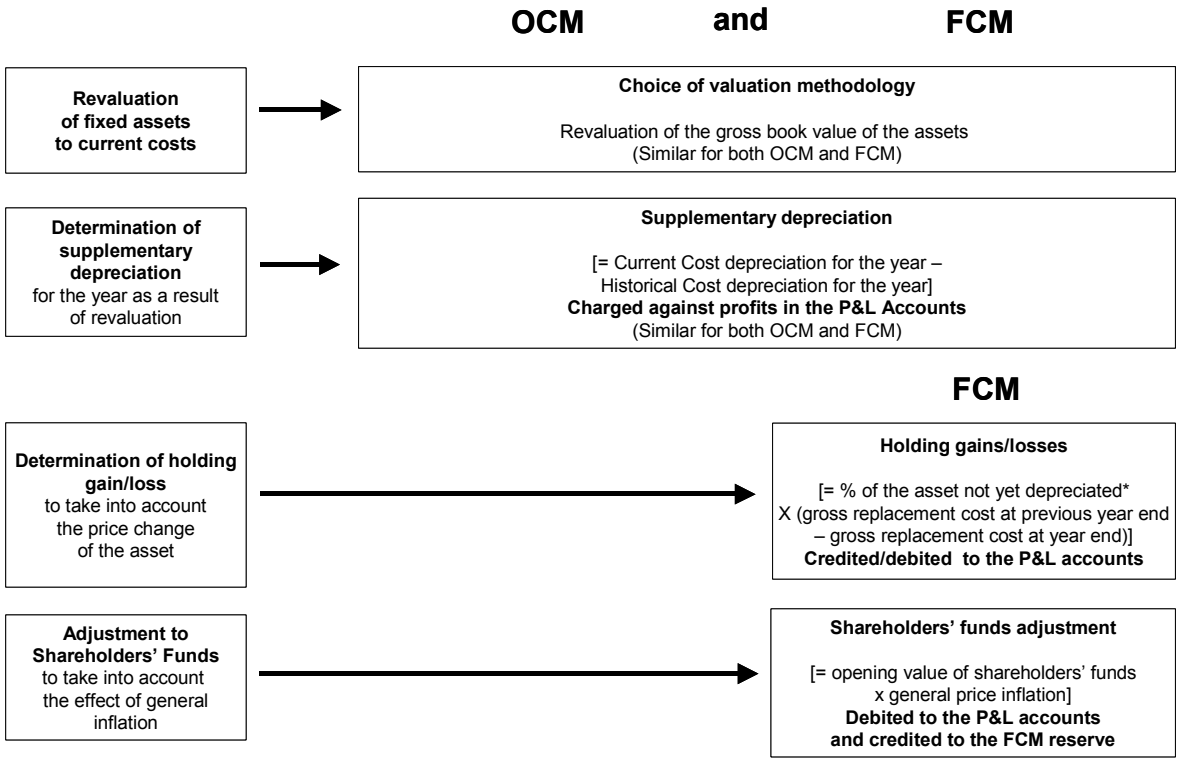
While the Operating Capital Maintenance (OCM) approach focuses on the ability of a company to maintain its operating capability (assets are revalued to current costs), it does not take account of the impact of price changes on financial capital (i.e. the value of shareholders' equity).

In contrast, the Financial Capital Maintenance (FCM) approach measures profits only after the value of financial capital has been maintained. Financial capital is assumed to have been maintained if shareholders' funds at the end of the accounting period are the same in real terms as they were at the beginning of the accounting period.

While both approaches require a revaluation of assets to current costs, costs under FCM differ in two respects from those under OCM, reflecting the need to maintain financial capital:

- allowance is made for the holding gains and losses that are caused by changes in the prices of assets; and
- the impact of general price inflation on the value of shareholders' equity is taken into account.

The chart below summarizes the main differences between the OCM approach and the FCM approach.



* = Historical cost Net Book Value of the asset at previous year-end / Acquisition cost

Generally, when preparing accounts in current cost terms, the use of FCM is recommended. This is in line with the European Commission's recommendation on interconnection in a liberalised telecommunications market, and the approach taken by various NRAs.

B.1 The main adjustments under OCM

This concept is concerned with the maintenance of the productive capacity of the operator. Due to the revaluation of fixed assets to current cost, additional adjustments are then required to restate depreciation amounts. These are identified below.

B.1.1 Revaluation of fixed assets

Under OCM the gross book value of assets is revalued to take account of specific price changes in the price of assets and changes in technology. The main valuation methodologies used are as set out in Appendix A.

B.1.2 Supplementary depreciation

The depreciation charge for the year is calculated on the basis of the new asset valuations. This ensures that the current cost of fixed assets consumed during the year is charged against revenue. For each asset, or group of assets, the OCM depreciation charge (assuming straight-line depreciation) can be derived by dividing the gross replacement cost by asset life[6].

Supplementary depreciation is the difference between historical cost depreciation and current cost depreciation charge. It may be positive or negative depending on whether the value of assets is rising or falling. It is a charge/credit against profits in the profit and loss account.

B.1.3 "Backlog" depreciation

The total current cost depreciation (i.e. the sum of historical and supplementary depreciation) charges over the life of an asset will not equal the replacement cost of the asset at the end of its life. The difference is "backlog" depreciation. Under OCM, backlog depreciation is not debited to the P&L account.

B.1.4 Illustration of these concepts

The tables below illustrate the above concepts for an asset purchased for Euro 10,000. The assumed life of the asset is four years. For simplicity, it is assumed that the asset is depreciated on a straight-line basis. In Table 1 it is assumed that the cost of replacing the asset falls by 10 % per annum. Table 2, on the other hand, assumes that the cost of replacement increases by 5 % per annum.

[6] Depreciation methods used in practice to restate HCA depreciation to CCA depreciation are set out in Appendix 3.

Q 9: Table 1: Replacement cost falling by 10% per annum

Year	Current Cost	Depreciation					
		Current cost	Historical	Supple-mentary	Cumulative	"Required"	Backlog
0	10,000						
1	9,000	2,250.00	2,500.00	(250.00)	2,250.00	2,250.00	Nil
2	8,100	2,025.00	2,500.00	(475.00)	4,275.00	4,050.00	(225.00)
3	7,290	1,822.50	2,500.00	(677.50)	5,872.50	5,467.50	(405.00)
4	6,561	1,640.25	2,500.00	(859.75)	7,107.75	6,561.00	(546.75)

Q 10: Table 2: Replacement cost rising by 5% per annum

Year	Current Cost	Depreciation					
		Current cost	Historical	Supple-mentary	Cumulative	"Required"	Backlog
0	10,000.00						
1	10,500.00	2,625.00	2,500.00	125.00	2,625.00	2,625.00	Nil
2	11,025.00	2,756.25	2,500.00	256.25	5,381.25	5,512.50	131.25
3	11,576.25	2,894.06	2,500.00	394.06	8,406.56	8,682.19	275.63
4	12,155.06	3,038.77	2,500.00	538.77	11,720.96	12,155.06	434.10

Derivation/explanation of table headings above:

- Current cost is the gross replacement cost of the asset;
- Current cost depreciation is derived as the gross replacement cost divided by the asset life;
- Historical cost depreciation is the original acquisition cost divided by the asset life;
- Supplementary depreciation is the additional depreciation charged as a result of revaluing the asset (it can also be derived as current cost depreciation less historical cost depreciation);
- Cumulative depreciation is the sum of cumulative current cost depreciation and backlog depreciation;
- "Required" depreciation is the cumulative depreciation that would have been charged given the current cost of the asset – put another way, it is the difference between the gross and net replacement cost of the asset; and
- Backlog depreciation is the difference between required depreciation and cumulative depreciation and arises where the prior period current cost depreciation shows a shortfall or surplus due to asset price changes.

B.2 The main adjustments under FCM

Under FCM there are similar adjustments to be made as in the OCM concept concerning the revaluation of fixed assets and supplementary depreciation. However, under FCM the profit and loss account is further adjusted for holding gains or losses that arise due to the effect of asset-specific inflation on the current cost value of assets and the effect of general inflation on shareholders' funds.

B.2.1 Revaluation of fixed assets

As for OCM.

B.2.2 Supplementary depreciation

As for OCM.

B.2.3 Backlog depreciation

As for OCM.

B.2.4 Holding gains and shareholders' funds

Under FCM, profit is recognised only after taking account of holding gains or losses that arise due to the effect of asset-specific inflation on the current cost value of assets and the effect of general inflation on shareholders' funds.

$$\textit{Gross holding gain} = GRC_{closing} - GRC_{opening} - \textit{additions} + \textit{disposals (at current cost)}$$[7]

$$\textit{Net holding gain} = \textit{Gross holding gain} - \textit{backlog depreciation}$$

Holding gains (or losses) comprise two components:

1. The gain in the current cost value of assets as a result of changes in the cost of assets; that is, as a result of asset revaluations; and

2. The element of the revaluation that is written off as depreciation during the year in question.

The effect of general inflation on shareholders' funds is taken into account through an adjustment to shareholders' funds, determined by multiplying the opening value of shareholders' funds by the change in the index of general price inflation for the period.

[7] The GBV of disposals may be multiplied by the ratio $GRC_{opening} / GBV_{opening}$ for the asset concerned.

Appendix C - Depreciation Methods

There are a number of methodologies that could be used for the purpose of adjusting historical cost accounting depreciation to current cost accounting depreciation, including:

- The Ratio method;
- The NPV methodology;

C.1 Ratio Method

The ratio method is a straightforward approach to multiply the HCA book entries by the GRC/GBV ratio. More specifically:

$$CCAAccDep_{opening} = HCAAccDep_{opening} \times GRC_{opening} / GBV_{opening}$$

$$CCAAccDep_{closing} = HCAAccDep_{closing} \times GRC_{closing} / GBV_{closing}$$

$$Backlog\ depreciation = (1 - NBV_{opening} / GBV_{opening}) \times Gross\ holding\ gain$$

$$CCA\ depreciation = CCAAccDep_{closing} - CCAAccDep_{opening} - Backlog\ depreciation - RetirementsAccDep \times GRC_{opening} / GBV_{opening}$$

C.2 The Net Present Value Methodology

The Net Present Value (NPV) methodology implies the use of economic depreciation. Essentially it involves estimating the NPV of the asset at the end of each year based on cumulated expected discounted cash flows. Economic Depreciation is the difference between these cash flows at the end of one year and at the end of the next year. While from an economic perspective there is much to be said for this approach, it is generally difficult to obtain the necessary data to put it into practice and in any case it is subject to a significant element of subjectivity.

C.3 Choice of Depreciation Method

In summary, while economic depreciation is appealing from a theoretical viewpoint it is difficult to implement, subjective and may result in similar results to other methodologies where multiple vintages of equipment are being considered.