



## **Asset valuation in telecoms**

### **A discussion of issues and some of the methods used**

**July 2022**

File reference: Asset\_valuation\_10082022.docx

Details: This is a discussion paper on telecom asset valuation

Author: R Steele

No liability is accepted for the accuracy of information contained in this report or for any decisions made or actions taken by any party, as a result of this report.

This report need not reflect the views of any client of Telzed.

## Table of contents

<b>1</b>	<b>The need to define Asset Values .....</b>	<b>2</b>
1.1	Purpose .....	2
1.2	Background .....	2
<b>2</b>	<b>Background and examples of valuation related work .....</b>	<b>5</b>
2.1	Background – current assets .....	5
2.2	Accounting values.....	6
2.3	Accounting values are good but can be useless.....	10
2.4	Ignore all accounts and values in the books .....	11
2.5	It is a fire sale! Maybe the asset values do not matter .....	14
<b>3</b>	<b>Practical asset valuations .....</b>	<b>16</b>
3.1	Using historical cost accounting (HCA) of asset values – no revaluation .....	16
3.2	Using current cost accounting of asset values – a single revaluation .....	18
3.3	Example of CCA depreciation and asset values: multiple value changes over time.....	22
3.4	Summary of the key messages from the revaluation examples and CCA .....	24
3.5	Accounting values using CCA, in more detail .....	25
<b>4</b>	<b>Revaluation methods .....</b>	<b>28</b>
4.1	Historic or HCA values.....	28
4.2	CCA revaluation by assessment (expert appraisal) .....	33
4.3	Absolute valuation .....	34
4.4	Indexation.....	37
4.5	Revaluation problems.....	39
4.6	Copper valuations.....	41
<b>5</b>	<b>Conclusions .....</b>	<b>45</b>

Document history

Ver 10082022 Initial version

# 1 The need to define Asset Values

## 1.1 Purpose

This Telzed report provides a background to asset valuations in telecoms. It is aimed at helping consultants, economists and accountant to understand the key issues and some of the methods. It is an introduction only, aimed more at beginners, not experts. This report is not exhaustive and cannot cover all details. A primary aim of the report is to stimulate thought and provide examples that anyone can develop further in valuation work. This assists with understanding of the issues that need to be tackled, which is a vital foundation before any detailed calculation is attempted.

The report includes some advice and thoughts that should prove useful. These are based on the author's experience. These insights move beyond valuation. This makes the report unusual it also means this report is not just focussed on the formal valuation calculations, but provides wider insights based on actual experience. This should also benefit experienced consultants. A key aim of this report is therefore to encourage thought and debate.

The report includes thoughts and experiences, plus essential valuation principles. It covers issues that should prove useful in practical projects. The full benefits are therefore from understanding the report "in the round" as it covers wider issues and ideas. These are included within the report and not always in specific sections.

The report also shows that, in many situations, the work can be complicated and multiple skills are needed – accounting, economic, business and technical. So a revaluation may need a large project or team. But some projects might not need very complicated or exacting solutions – general values and broad understandings can be obtained without every asset being revalued to great accuracy. Trade off: time (of project); cost; and accuracy (complexity) of the work.

Contact Telzed or engage trusted firms for assistance, if needed.

## 1.2 Background

Many decisions and business evaluations need to understand the value of assets in a business. This can be the actual assets or future assets. In this report we focus on the existing fixed assets – physical items that may be quantified and seen, at least in principle. "Fixed" is often omitted. Good will and staff-skill assets or intellectual property or brand etc. are not a focus in this report, but they are also assets in other valuation work and relevant to some decisions. So the likes of brand name or intellectual property or strategic potentials etc., are assets but are less easy to define and measure.

Enterprise value or market share price values are often critical, and these are shown for example in stock market values. If privately owned, then specialists can still define an enterprise value. Aside: this is the domain of financial analysts and strategy consultants, so many consultants *et al* should avoid this area unless done with agreement and with some experience. NB in any case the investors (banks and private equity firm) will have their own methods and can make the final decision on enterprise values. Often these stock market or enterprise values are only loosely related to the fixed assets, but there are often some

connections and if these are not understood, then problems can arise. Hopefully the market/enterprise value is well more than the (fixed) asset value.

This report therefore does not define a *company valuation*. This report does not attempt to discuss in the shareholder (or stock market) valuations and how company valuations are carried out.

A key issue is the definition of value. This could be re-sale (second hand market values) or accounting values or the future long run discounted net cash flow that the asset can be used to generate. Other definitions exist. This report does not look at the revenues over time, only the asset value and its related costs. This is the replacement value assuming purchase price and the depreciation that reflects the asset “wearing out” over time. Notionally an older asset can be bought or sold at this price.

If prices are based on costs, then the asset value shows a minimum revenue needed to recover the investment costs. So asset values are highly relevant to pricing, especially where prices are directed to be cost based<sup>1</sup> (as is commonly done by a regulator) or with strong competition. Competitive markets tend to give prices close the efficient business cost, where the cost includes the assets’ costs. See regulatory papers or basic finance books. Clearly asset values are then critical.

A company’s assets represent the result of past and current investments (assets = debt + equity) so the asset base is measure of the business and its investments. Low values might mean wasted shareholder money (the investors see assets below what was lent by banks *et al* or paid in by the equity investors). Alternatively, it might mean high returns – the return on capital employed (ROCE) is high. This is normally a good measure (for the investors) especially if the ROCE is above the cost of capital employed (CoC<sup>2</sup>). Good profits from just a few/cheap assets is a good outcome. Most investments aim to achieve a return of, or better than, the CoC. See many financial papers and books<sup>3</sup> and the Telzed paper<sup>4</sup> on CoC and on calculating it using the Weighted Average Cost of Capital (WACC). In some telecoms discussion it is common to use WACC and CoC terms interchangeably, though strictly they are not the same.

Assets can be bought and sold. This may be part of a whole-business sale or part-sale of the business as an operating entity. Some assets can be sold as physical items (e.g. sale of an office building or mobile masts<sup>5</sup>). Clearly the value of the sale depends on the asset values. Potential revenues generated by the assets will be a factor as well, but start points are the values based on prices paid and market values if sold/bought or replaced (re-build costs).

---

<sup>1</sup> Cost oriented is a term often used by regulators

<sup>2</sup> This is the cost of investing money – the investment should give this return which considers the risk of the company (high risks of failure increase the CoC) and the alternative of investing in a bank which gives low return but very low risk. See standard text books or some telecom regulator’s papers

<sup>3</sup> Brealey and Myers. Principles of Corporate Finance. Other such books and papers exist

<sup>4</sup> [WACCy thoughts](#). A discussion of issues related to the cost of capital and WACC. See Telzed web site

<sup>5</sup> Sale of telecoms assets is a major aspect of telecom strategies in recent years. So masts may be sold by a mobile operator and leased back. Mast assets can be leased to other mobiles. Fibre can be built and rented by other operators or sold outright. Arguably the most significant part of telecoms industry is the infrastructure based services – which are the critical and largest assets. See [Telzed paper](#) “Understanding telecom technology and the real transformational changes” that shows how infrastructure assets are the key business focus of many telcos but are not discussed so often compared to (say) novel 5G services that might not actually generate any revenues

Physical asset values and enterprise values when sold (either the whole business or the asset may be sold), may or may not be related, but it is likely that enterprise values will still want to be compared to the asset values.

It is common for infrastructure to be a central strategic focus as infrastructure sale/rental/access is becoming a major part of the industry structure. So, rental of infrastructure (e.g. passive infrastructure access in UK – PIA) is important and likely to be related to asset values. Open Access is now a common discussion which is a reversal of past business and regulatory thinking which restricted access to (ay) cables or duct, in the hope alternative operators built their own cables (or restrict the new entrants in the minds of some sellers). Readers may think about the wider lessons from this history and what it shows about regulators in different countries. Why was this change delayed in many countries and why did others lead in this direction, long ago?

A regulator will often want to see or control the prices and profits of telecom services. This is to ensure prices are neither too high nor too low, especially from the operators with significant market power (dominance). The basis of the work looks at the operating costs, plus the asset costs. The asset costs include the CoC plus depreciation – where this is assumed to reflect future cash flow and replacement of assets in the future. Efficient costs may be used but those future asset costs are probably based on the existing assets. Existing asset costs relate the asset value.

Prices and other regulatory decisions are forward looking, but the basis is derived from current assets and other current business costs. So regulations normally need detailed understanding of the fixed asset base (plus operating costs and volumes). Business managers should also be led by the forward-looking business costs, so they must understand the costs (including assets) over time. The values of assets today are a foundation as they are the basis for future asset costs – replacements, enhancements for more traffic/customers, and the returns on the asset investment (ROCE). So business models and management decisions (pricing, network investments) need to understand the asset values.

This report is not a full tutorial, but includes analysis and descriptions of the key basic techniques in Current Cost Accounting (CCA) of the physical systems and equipment. This builds on the author's experience in many projects. In consulting, regulatory, accounting, financial and strategic work, at least *some* consideration of the assets is needed. The detailed accounting aspects of CCA may need additional inputs from accountants with CCA skills, but many others can do most or even all of the analysis. This report provides the basic understandings needed.

The report aims to stimulate thinking and to assist anyone working on the business modelling, strategy, regulation, sales and acquisitions, pricing etc. It is important to think about the wider issues as well as some of the practical/detailed techniques needed to define asset values. The report does not define “best” or “correct” methods – what is most appropriate depends on the needs. Sometimes exact values do not greatly matter.

This report includes some practical experiences of valuation related work, so that the reader can use these to help refine their thinking and the work in their valuation projects. Some experiences may be apocryphal or adapted or even invented – the point of the examples is to illustrate points and stimulate thought.

## 2 Background and examples of valuation related work

In this section a variety of valuation methods are discussed. Additional factors seen in valuations are also discussed. This this is *not* a comprehensive description of methods and of the background.

The section begins with examination of asset types, including current assets before concentrating on the physical assets.

### 2.1 Background – current assets

Some valuations of a company may have little or no relation to *assets* (we assume assets are physical for most discussions on this report). It is worth noting that the definition of assets frequently includes *current* assets such as cash or inventories or invoices sent. If considered, the current liabilities are then also relevant – bills payable. The net *current* assets (assets minus liabilities) are usually a relatively small number and much less than the physical asset and so they may be ignored in some work.

Current assets may not be physical entities, but are very real (as opposed to brand or staff skills) and can even be traded and translated into money. See below on the sale of debt.

Net current assets is arguably needed to be enough to pay all imminent payments – salaries, or bills to suppliers. So roughly one to two months of the average operation costs should cover most bills without risks of a need to speak to the bank for loans or an overdraft.

It is worth noting that net current assets can even be negative in some tightly run businesses or ones who risk not being able to pay suppliers on time.

Large current assets such as a lot of cash may need to be examined. This can be good or bad, depending on the view and decision needed. It might reflect the value of a loan or shareholder investment that is about to be used to buy equipment or another business. So the current asset (cash or loan debt) is soon to be turned in to physical fixed assets. Else it might represent a very profitable business with lots of retained profit (cash) that needs to borrow little (low debt). It *is* possible to have a business with cash enough to run the business for 3-12months<sup>6</sup> without any revenues. Is this good or bad?

The invoices sent out are not real money (cash), in some views. The customers might not pay and the money is not received for perhaps a month or more (longer in some regions of the world – business managers and consultants should be already aware of this). But the invoice forms debt owed, and this can be sold to a debt collection agency for a percentage of the invoice amount. The agency chases the customers to get paid. So invoices are considered a real current asset item, *almost* like cash.

---

<sup>6</sup> Author has seen this

Generally current assets (net of liabilities) are simple to analyse and understand. The value of these assets translates directly into a solid \$ value. This report focusses on the fixed assets. But if returns on all capital employed are relevant then the capital employed is both the fixed assets and the working capital. As fixed asset dominate, these may be all that is relevant.

## 2.2 Accounting values

A starting point for many project,s are the company accounts. The *statutory or annual reports* have aggregated asset data. These are often public.

*Management accounts* are used internally have more detailed assets by type (buildings, cables, switches) plus information on capital investments in each year. The accounts also define assets' depreciation<sup>7</sup>. Invested values (purchase value) minus depreciation give the *net book value* of assets. NBV is a key number for many analyses. It defines the asset value, which is the focus of this report. Note that it is an *accounting value*, not an economic value such as the asset's net future cash that it might generate from delivery of services. This asset information is in the Fixed Asset Register (FAR) of the business and is part of the management accounts.

Only a brief summary of assets is reported on in the statutory accounts. Maybe only 2-5 items, but the FAR may store 20,000 items covering all of the systems and buildings in the business. The purchase values, dates purchased, lifetime, ages, accumulated depreciation, annual depreciation and NBV are defined for every asset.

Many valuations can use the FAR and management accounts. Else the valuation work has to analyse the business to identify the *likely* physical systems. This can be done with models and experience to define likely physical assets and hence their values without the full data. Making such models and identifying the assumptions and factors, without full asset information from a FAR is the type of (difficult) project that consultants and analysts may have to do if only the statutory accounts are available. With company support the FAR data can be accessed (NB this is normally confidential).

An interesting aside is that access to accounting detail and FAR information may be given. But this can be close to useless if the data was poorly entered or was aggregated<sup>8</sup> to general numbers with no detail. Asset numbers might even be false: accidental or deliberately done. Valuations investigations might need asset verification – what is really in existence and are

---

<sup>7</sup> Readers, especially economists should think more upon depreciation. It is a useful accounting measure and also useful for some economic decisions and evaluations. Purchase Value (Gross Book Value) minus accumulated depreciation = Net Book Value. Annual depreciation shows a notional cost from loss of asset value. It is useful, yet also possibly useless. It is important to understand where it is relevant. Many economic measures and derived measures from accounts are defined without depreciation – such as EBITDA. This reflects some unease with a purely accountant's view and whether depreciation is a relevant cost. Depreciation is not a cash flow cost, yet it is a proxy to cash flow needed over time Accountants and consulting economists, if they have never met, might have difficult conversations in the first meeting on *depreciation*

<sup>8</sup> One company absorbed another and all of the 1000s of assets of the absorbed company did not fit with the IT of the buyer, so they were summed up to circa seven big numbers. This was good enough for the combined accounts, but close to useless to understand asset types. Voice and data switches were grouped as one item and office and network buildings become "buildings". Valuing the assets or processing them to services is not easy when different items are all within one number

the accounts reflecting this or grossly in error. Consultants and accountants should be aware and might need to do checks and changes if the numbers in a FAR or accounting system are not solid. They can be wrong. This is more likely if the company and asset investigation is started because there are known past problems with asset data (badly entered data) or other problems in the business (financial stress, desperation for more investment, not meeting targets etc). The fact that a project is needed, may indicate that problems do exist. Project directors or partners can direct the work but even a junior consultant should be cognisant of possible errors or even fraud. Asset data in accounts is not always correct.

An accounting value (NBV or annual depreciation), even if correctly based on accounting rules might still be close to useless. Here we see divergences of opinion, especially if looked at from an economist's view. They can be scathing of accounting views – hence so many company valuations use EBITDA<sup>9</sup>, or similar. The costs that are relevant to some, are the operating costs and sometimes the capital expenditure. These require cash. Depreciation is not an *economic cost*, for many considerations, even if loved by accountants. Taxation is also not relevant as there are so many accounting games to avoid paying tax. Look at the widely reported concerns of moving costs and revenues so that profits (and taxes) are reported overseas where company tax is low.

Aside. This report's author has run many costing/regulation/pricing courses. A standard discussion is: what is depreciation? All readers should be able to give a definition. A provocative definition is: "it is a number of a piece of paper." The real cash flows that matter is the purchase price and the future purchases (considered in today's terms based on time and CoC). This may be abhorrent to some accountants. Yet the depreciation number is also very useful as it provides a basis for net asset values (the subject of this paper). The annual depreciation is also useful. A view abhorrent to some economists. So the issue is to balance the needs with economic views of values and accounting views. Both can be right or wrong. Corrected depreciation is a relevant cost for many decisions if it is based on sensible asset values. This report therefore sees depreciation as relevant if combined with proper values – and values are the report's focus.

Related to this aside, is the view that the value is based on the net cash flow return on the investment. The asset is worth what you can get from it. This is a really critical point:

- If the returns are huge then the value of the asset is almost immaterial. If a company can build a network for 1million and make 10million profit per year from 100million revenue then the value of the asset is 10 million per year (plus future years' profits). Who then cares about the asset cost and notional value as the sale of the asset on its own will be worth less than 1million in accounting or if sold? The asset replacement cost is still only c1million. Valuations here are of the asset itself, not the cash it may generate. Modelling cash flows and profits may be a better way to value the assets in economic rather than accounting terms. That is not within this report's scope [ask if a model is needed of costs and revenues over time to get a profit and cash flow prediction to value a business and its assets in this way]
- The opposite also applies. A network may have cost a million to build last year. But if sold it is only worth what a buyer will pay. A buyer might offer only fifty thousand

---

<sup>9</sup> Earnings before interest, taxation and depreciation and amortisation



when the network investment was one million. Corporate sales do see this – if no one else wants to buy the network you have to take what paltry amount is on the table. The enterprise value and hence the asset value is unrelated to the actual monies recently spent. In the event of company stress, asset values are often only 5-10% of the price paid. The real market value is unrelated to the accounting value or the price paid.

The second point above is returned to later in this report.

A general assumption in this report is that the annual depreciation and the asset values are relevant. These may both need adjustments from accounting numbers but must be understood:

- Annual depreciation *is* a cost that must be recovered. If not done the income will not be sufficient to enable a replacement of the asset, when it is worn out or obsolete. Thus it is a *proxy* to the average cash flow needed. In annual reports, depreciation *is deemed* a cost, like salaries and rentals. An advantage of depreciation-based thinking is that it is an average of the asset replacement cost over time. Annual capital expenditure (capex) may be a cash flow measure but is subject to huge variances. No capex is possible for some years as assets are used and spare capacity is filled with additional traffic. In some years huge capex is needed for network upgrades. So cash flow measures based on capex are subject to big annual variations (needing analysts to adjust or average). In contrast sensible depreciation methods tend to average out years of large investments, and then they define realistic average cash flow costs
- The asset value *is* a measure of the investment in the company. Invested asset value falls as it is depreciated. Having been bought, there is no direct cash cost per year until it needs replaced. When the asset is fully depreciated, the sum of depreciation over time provides enough to compensate for the investment, when bought. If properly adjusted the depreciation can be a proxy value for costs needed to be recovered for the replacement asset. Therefore it is a *forward looking* cost (more relevant economically). NB the replacement is likely to cost different to when the original asset was bought. This is discussed later – the replacement value impacts the actual physical asset's value
- The asset value x CoC% defines the economic cost of the investment. There is a cost of buying a switch that goes beyond the purchase price. Investors need a return on the investment. This compensates for the risks of putting the money into a telco. If CoC is defined using the WACC method, then the cost percentage reflects the relative debt and equity costs and risks. See footnotes 3 and 4 or other financial books.

This means that the total asset annual economic cost per year = asset value x CoC% + depreciation. Of course there are also staff to repair the asset and power costs to operate it or heat or cool it. These are *operational* costs, and are not the primary focus of this report, which are the asset costs. Of course the full business costs are operational costs (opex) plus the capital costs. It should be noted that the capital costs can dominate in telcos: it is an asset based business, needing major investments (digging cables, building masts etc.). The retail business that sells the network business can be a separate business, and this needs many staff (large opex) but few assets. The key part of most telcos is the network. This is where most assets are.

The asset value = purchase value minus accumulated depreciation. This is NBV today. Accumulated depreciation =  $n \times \text{Purchase Value}/\text{lifetime}$ , and  $n$  is the age of the asset.  $\text{PV}/\text{lifetime}$  is the annual depreciation. These simple formulae define the asset's value over time. It might show a notional value if the company assets were sold off "at book cost" aka book value. This is the normal *accounting value*. It is what annual reports and management accounting systems show.

Revaluation of an asset is based on the as-new-value. What is the asset worth if bought new today. In this case,  $\text{Depreciation} = \text{As-new-value}/\text{lifetime}$ . As seen later this can be slightly different from  $\text{Purchase Value}/\text{lifetime}$ , which is what the accounts normally show.  $\text{PV}/\text{lifetime}$  is useful. PV is also termed Gross Book Value in accounting discussions.

Better economic measures can be defined than using accounting PV based numbers, and these are more useful for pricing and business decisions. The as-new-value is the current price of the asset if bought new, some years after purchase. As asset prices change, this is often different to what was paid originally. This is the current asset price (or value) – also termed the Gross Recoverable Value (GRV) in many accounting discussions. GRV is the price of the asset as new today.

Assets are not usually new and just purchased. The real value is the notional price that would be recovered if the asset were sold. It is no longer new. The value is then: as-new-value minus depreciation.  $\text{GRV} = \text{as-new-value}$  of a new version of the asset if bought today. This notional sale of an asset - the value that could be recovered – might never actually happen (companies are rarely sold at asset value and assets are not often sold), but the principle of valuations often starts with this assumption. The value is the price of a new asset bought today, devalued by the depreciation.

When asset prices change, the real asset value is not the NBV, but the GRV, depreciated by the asset lifetime. This is the current price of the asset after  $n$  years of depreciation. So this is,  $\text{GRV} - n \times \text{GRV}/\text{lifetime} = \text{NRV}$ , where NRV is the net recoverable value. This is the real asset value of the asset, allowing for price changes over time. This is better than the accounting values in many decisions.

Summary of terms:

- GBV – gross book value. The purchase value - PV- (price) of the asset.
- GRV – gross recoverable value. The purchase price of the asset if bought today. The as-new-value.
- NBV – Net Book Value. The normal accounting value =  $\text{GBV} - \text{accumulated depreciation}$ .
- Accumulated depreciation =  $n \times \text{GBV}/\text{lifetime}$ , where  $n$  is the age of the asset in years.
- Lifetime = how long the asset is in service. Usually set by accountant, ideally with engineering experts. Lifetimes vary by country but there is often some commonality in numbers.
- NRV is the net recoverable value of an asset that is revalued using the GRV value. It is equivalent to the NBV but more relevant as it is based on updated asset values, i.e. based on the GRV.

Note that the valuation calculation formulae (for NBV and NRV) assume depreciation in each year is linear. It is possible to depreciate asset faster or slower in other approaches. In this

report this is *not* done as the GRV is updated (new asset valuations are defined) and if the GRV is adjusted correctly then the depreciation value in each year also alters. In this case the depreciation is not linear. Therefore correct valuations *do* alter the depreciation and reflect the reality of non-linear changes over time.

This report does not consider accelerated depreciation in accounts to reduce profits and reduce tax payments. This has been seen.

## 2.3 Accounting values are good but can be useless

Long life assets are subject to inflation issues. This was a major issue when inflation was huge (seems to have returned in 2022). So major constructions might have been made but the book value is close to zero, in today's terms after a period of high inflation. So the accounts are useless to evaluate the future expenses needed for a replacement asset. This gets extreme with say a steel works with perhaps 20 operational years that is close to needing replacement. A replacement might be 10x more than was paid. This is caused by inflation. As a result, any numbers in the accounts (NBV and depreciation) give next to no indication of the real cost (revenues) that the business needs to make to build a new steel plant. The book values do not indicate its value, if sold or another one is bought (new or second hand).

Some similar aspects are seen with telco assets, especially with those whose values relate to salaries (say construction staff to build civil works such as manholes or ducts) as these costs rise with time. Rising prices are also seen with items such as land or buildings which can be in a bubble<sup>10</sup>. What was paid (and is in the accounts) has almost no relevance to what *will* need to be paid in future. Normally the asset book values are not related to the market value of assets if bought or sold.

So accounting values need not reflect the market sale value or the future average investment \$s needed to replace the asset. They are also not related to cash flows (revenues). Yet, if adjusted properly, the depreciation could be a measure of average expenditure needed over time. For this reason, EBITDA type thinking might seem a good measure (depreciation is close to useless) but it can also be dangerous. If incomes are not enough to cover the depreciation "costs," then possibly the company is being "run into the ground." Existing assets can be "soaked" and profit obtained for several years before updated and new assets are bought. Good business or is this masking the fact that the business is not long term viable and able to replace assets<sup>11</sup>?

Business assessment needs to understand the actual assets and the plans for relacing them. This is additional to managing the short-term cash flows. This can manifest itself in telcos with almost zero capex for many years. Then a huge upgrade and expansion is needed. Depreciation is not an exact measure of average asset expenses, but it *is* a start measure.

---

<sup>10</sup> Some building values can rise massively in some cities with a booming economy. Accounts do not reflect this

<sup>11</sup> This is not an academic idea. Some telcos might not buy new assets and can run old assets for may years. It is profitable using EBITDA type measures. Possible still profitable using EBIT based measures because the assets are old or heavily used. The depreciation is possibly not enough to buy a replacement asset if replacement is depreciation x lifetime. The replacement investment is left for future management to cope with and, in the short-term, operational costs can be paid for. If proper (larger) depreciation is used then that cost would e a cost to recover and then EBIT might not look so good

After all, it *is used* by accountants and regulators (who are usually competition economists and do see assets beyond just an “accounting number”). Lesson: economists and strategists should not dismiss accounting asset numbers and depreciation, especially when adjusted using good revaluation.

## 2.4 Ignore all accounts and values in the books

There are situations where little or no considerations is made to the assets. This could almost completely ignore the accounting values. The company is evaluated by the revenues or profits and synergies that the company may bring, if bought. The value is in the people or intellectual property. Fixed assets do not matter.

Most investment and buy outs look at a number of items: accounts, asset book values, business plan and sales, etc. Such *due diligence* is a normal activity (consultants do this regularly). Some case histories (real, adapted or made up) are worth note:

- One telco was assumed to be in such a mess and the assets so old, the investor spent little time on what was in existence. A total modernisation was needed and no one trusted any figures such as revenues or even customer numbers. It was assumed many customers had free lines depending on “connections” with staff in the telco. So almost all assets would be new. A new business plan was the basis for decisions, not dubious lists of old equipment. So investment values were defined from a new business plan, to build an almost completely new network. Book values and even customer numbers were not a robust basis for company valuation.
- An investor might see huge benefits from the company and the synergies are so huge the value of the assets is not material. The staff and intellectual property (IP) matter. Could this trust in the management’s statements on the IP and future cash flow projections all be OK, and can be trusted? Is anyone actually able to assess the IP or invention? You *could* trust the CEO. Or maybe send in some subject/technical experts. Can the new medical test equipment or telecoms switch *really* do 10x more and be 25% the size and half the price of anything to date? Experience shows that subject-experts talking to lower grade technical staff and managers might well pick up on reality.
- A company may be “vapourware.” An investor or buyer could have total trust in the company and CEO. “After all we are gentlemen and would never lie. The other CEO must be like us, as we are in in the same industry.” Once upon a time a major buy out was made. Managers at lower levels than the CEO or CFO *then* flew out. Buildings and warehouses were mostly empty. Things were “missing.” The purchasing company was brought down. The seller’s attitude was: if you are so stupid as not to check the actual assets, that is certainly not our fault. It is the buyer’s fault. The morality does not really matter if the purchasing company was brought down. *Caveat emptor* is always relevant. Trust no one, do your own checks. Problems are rarely found but they can be enough to cause company failure. Check the actual assets and their values.
- The above vapour company could be valued by the books and asset data. “*This can be trusted. It was audited.*” Perhaps this is not worth as much as many believe. There are endless company calamities that seemed to come from nowhere. Many readers may recall some situations where perhaps a few industry observers or press were worried, but were dismissed and the Accounts were used to show the company was totally sound. In one case even the government spoke up for the “fine company,”

and nasty foreign press comments were all wrong. Then it collapsed. Sometimes accounting procedures alter as a result if the failures were severe. *Ex Post* audit standards? Then another accounting scandal happens.

- Consultants in a review are very unlikely to find clever accounting games, but they can assess solid items like physical assets and this extends into other numbers and aspects. Are system numbers enough to carry the claimed traffic or customers? If something smells to a seasoned consultant and accounting team, do flag it to the partner and investor or client. It just might lead to an iceberg of problems hiding away.
- Once upon a time a major telco had huge profits and the shares went ballistic. Employees often bought share holdings. The company market valuation was massively more than the physical assets. Adjusted EBITDA positive! But not clear to some, just how this adjustment worked. Huge revenues existed to make adequate current assets and so lots of loans were given for more expansion and to pay the opex. But, revenues were often *swap deals*. A telecom company needs more capacity or to cover another region. They each swap capacity and systems. No money is exchanged. But it appeared in some accounts as revenues (!) as if the capacity was sold *and* got reported as a larger network of physical assets. The fact it simply swapped assets, was not mentioned and the swap seemed to be revenues. Could this have ever happened? Could it happen again? Yes, it did happen and was allowed in accounting rules of the time. It remains relevant as seemingly rule-compliant accounts may not be what they seem. The asset base was wrong and might have been seen if a skilled consultant was able to investigate. Maybe the investors were at fault for not forcing such checks or was it the accountants' fault? Or the fault of the stock market investors who did not or would not investigate the assets and business sales properly? Market values and EBITDA were far from the reality – it went bust and was sold for *far less than the asset book values*.
- An investor sent out a due diligence expert to look at the assets. Rather than look at just the FAR and books or even at Network Management System<sup>12</sup>, the expert asked to see some of the assets. A drive was needed to different sites. Some were unserviceable (U/S) or non-existent. The expert was not surprised and was able to easily find the U/S equipment. The company chief tried to refute the finding. This led to a dispute between the company and the review consultants. The investor's real concern was surely that the company was not open and honest. Finding false asset values showed that management were not open and so were misleading. The fact that actual assets were less than in the books perhaps was not a deal breaker. Potentially, being open would not have altered the investment decision. The work shows how an industry expert is often needed – covering technical, financial and valuation issues. This is surely true of all industries. Another moral is: do not accept

---

<sup>12</sup> A network management system (NMS) enables one person to check most physical assets on a screen. Are the switches there: how many interfaces? What capacity? How many customers? What nodes connect to which other nodes etc. This engineering tool is very sophisticated, and also often easy enough for "even" this author to use. It needs some telco technical expertise. You can see every card and alarm light anywhere. It is a source for checking if assets are there and also if capacities and system numbers align with the plans and asset lists in accounts and reports

the given story, if you have doubts. There are often reasons why you leave a meeting and think things might not be as they seem. Investigate further if needed.

- If people and skills are the real asset, then these are very liquid. Once they are paid, in a buy out, they may well walk. An old adage is: one third walk; one third you want rid of; and one third are the ones you want. Can you get the right third to stay? Note: the useless staff are likely to be the ones who most want to stay. Good ones can get a better offer and: who wants to stay with a failed company? Beware of people and skills as the primary asset. This needs complex management plans to benefit from such liquid assets. Aside: management consulting firms are often bought by larger firms. How often did the teams disappear soon after, and the purchase might then have cost very little.
- Can you assume the due diligence has already been done? Some investors back a business and invest. Then that investment is sold on to other smaller investors. Sometimes to retail investors (ordinary folk). The main investor has little risk: that risk and the debt has been sold on. The smaller investors have limited access to make their own assessment. They trust the initial major bank or Private Equity firm. Did the primary investor *really* assess the plan, the accounts and the assets? Were any technical specialists involved – who had the skills to check out medical testers, new car battery technology, or even telecoms business plans? These investigators in the company and assets might not be *total* experts but can they ask some sensible questions? If the primary investors were to sell-on the loan, then maybe they did not bother. How could this ever happen you might well wonder. Of course this happens.
- Is the business too good to be true? If it *seems* almost too good, then it possibly is too good to be true.
- An IT & telco company had a review prior to investment to expand. It was a growth play and the CEO was upbeat. The business plan was good and the future cash flows seemed like safe assets – almost cash in the bank subject to a bit of time-based discounts. The due diligence team *did know* the technology and markets, and competition seemed to be more scary than planned for by the chiefs. They spoke to lower grades who were more open to talk to the review team. Cash flow projections were deemed rather less certain. The CEO refuted the assessment, so the team partner had a meeting with the chief. Partner was attacked by the CEO – “your team does not know what they are doing.” The easy way was to side with CEO and not the team. He chose to include a CEO letter but backed the team. Next came that difficult call with the investor: “we have discovered a problem, and business is not as good as predicted.” The fortunate outcome was that the investor also thought there was a problem or two, but waited to see if the consultants discovered it from an independent review. Several deep lessons should be seen from this. One is that, to assess a plan or the assets, you need some subject matter skills and an ability to probe the right people in the right ways. Do they understand the assets and markets? Answers are not usually in a DCF<sup>13</sup> spreadsheet and ten-page plan. Problems are rarely open and managers have a reason to bias stories certain ways.

---

<sup>13</sup> Discounted cash flow

- Beware of the ten page plan. A business and its assets might be fine but they may be based on a short term plan and the long term revenues and margins are not viable to replace and expand the assets. The hope is that some other company will buy the company out before the financial crisis happens. A nice plan and aspiration. Of course the buy out did not happen and the company was sold off for a low value – as if a fire sale company [see below], as it was not long term viable. Short term plans and assets that cannot be replaced based on realistic revenue plans should be spotted in any company review. Such failures did seemingly happen (see the many failures in telecoms of c 20 years ago).

A number of lessons can be taken on asset values. Sometimes the values *really are* not very relevant. But if the “seemingly inconsequential values” are *false*, then: have a deep think. Other things are likely to be not what you hoped to see. The stories show a number of consulting tasks and the need for complex understanding. Consulting is not always relatively simple investigations, but sometimes it must show deeper understanding and so it can find unexpected insights. Any consultant might be in a position of discovering business plan errors or asset values that are not what they appear to be or should be. Lack of good investigations and reviews surely helps to explain why some company failures were unexpected outside the CEO and top team. They surely know of problems but were not open on the matter.

## 2.5 It is a fire sale! Maybe the asset values do not matter

Bankruptcies (“Chapter 11”) never end, and telecoms has seen far more of these than anyone could have expected. This seems to come in waves as lemmings (CEOs, and investors) follow a trend. Or markets evolve and businesses do not. Most telco consultants should be able to list such disasters. If not, you are maybe not a *full* telecom expert. Most consultants, and others, have been or will become involved in telcos around a company’s bankruptcy period.

Contrary to some views, the accounting value of the assets may have little bearing. It is reasonable to think the assets can be sold and so the book value is decent start point for the sale price (value). Sometimes true, often not.

A not uncommon basis is 5-10c paid for every dollar book value of assets. The seller company and some consultants might be shocked. “But the equipment is worth lots more and surely it has only depreciated by a few years?” Remember: the asset is only worth what a buyer will pay. If the company has failed then others will probably be in similar states, so second-hand assets might be rather too common. All are looking for a buyer. Also the upper hand is with a buyer who is willing to risk taking on a failure. The seller is not in a strong negotiating position: they are already proven to be not able to run a sound company and perhaps cannot refuse an offer.

A company had 200million of assets built. It collapsed and the buyer bought it for 5million and this included 20million of spares in a warehouse. So the buyer had a cheap telco business with lots of assets and with no short term cash flow concerns for new asset equipment. Spares were in the warehouse. Payments are needed “only” for residual staff and other bills. Can enough revenue be found to cover this, when last management failed? No matter the asset base, it is running out of cash that really matters. So the buyer did not have a guarantee of success, it had to make the company cash flow positive when the original plan was clearly seriously wrong. Just because it was “asset rich” and had little need to buy assets, other operational costs had to be covered. In grim competitive markets other players

might cut prices so that longer term asset costs were partly ignored and left to be solved in later years.

This is a situation where looking hard at the accounts and assets on paper, does not really matter. They are almost meaningless and so the asset values are written down. Hugely. Loans to buy the assets may have been written off (hence the company bankruptcy). If the margin between the amount paid and the actual assets' purchase cost is huge, maybe not many checks are needed. Even if only 100million of assets were really there, the buyer can still be happy given only the 5million paid. *But* a company that fails probably was not a well-run business, so the asset data-set and accounts are potentially more likely to have had "adjustments." Some checks may still be sensible. Ensure a sample of the listed assets exist. Is there really a full warehouse of spares?

The net value, post fire sale, is more of a decision for the buyer. Economists and accountants may argue and define what the business-value of the assets is, and what gets put in the phoenix company asset register and accounts. In any event defining an asset value is a critical aspect in the sale, and in the new company business plan, as that in turn indicates future capital investments that are needed.



## 3 Practical asset valuations

In this section some ways to define asset values are described. This builds on the discussions in Section 2.2. The discussions cover how to recover the investment as well as how to define a value. The recovery of the investment over time is important as that is a key factor that impacts prices.

The section begins by looking more at accounting-based values. Then it moves to how more economic-based values and cost recovery methods that are used. This includes a partial tutorial, but this is not complete – that needs a small training course or much longer document. However, the basics are defined and this enables readers to have the key understandings required. Most readers should be able to expand the work and make their own models and demonstrators to define the asset values over time and the required costs to recover. This can often be done in a few lines of Excel for basic insights. This also enables prices to be developed that cover the costs over time. Such prices can be set to rise or fall over time, and if the predicted volumes are included then a business can cope with changing asset values and the long term costs. Contact Telzed if formal assistance is required. The focus here is on the asset values and related costs over time. Prices need *additional* modelling and assumptions.

### 3.1 Using historical cost accounting (HCA) of asset values – no revaluation

It is sensible to understand that basic method that underpins most accounts, has worked for years and is enough for many (maybe most) analyses. Some economists might not like it, but it is a vital foundation.

The key assumptions are:

- The price paid defines the asset value in year 1 (the purchase value, or gross book value)
- The asset lifetime is defined. The asset depreciates over this period and the investments must be recovered over this time. This is usually set by Accountants, but they are informed by technical staff and experience. This lifetime is not usually altered
- The as-new asset price remains constant or if it alters then the asset value in this calculation is not changed.

This is what is done in most company accounts. This is often termed Historical Cost Accounting (HCA). So the asset costs per year and the asset value is based on the historical decisions and prices paid when it was bought.

This can be understood by simple modelling. Assume an asset with:

- Purchase value \$1000
- Lifetime 5 years
- Company cost of capital (CoC or WACC) set to 10%

- Depreciation is linear.

The first year starting asset value is \$1000. Then \$800, then \$600, and after five years (in sixth year) the asset has no value. Note that it might still work but most assets become obsolete or have more faults after a time and tend to get replaced roughly as per the lifetime.

The annual depreciation is \$200. But the economic cost can be added in, and this is not in company accounts. So each year there is a CoC of 10% of the value: \$100 in year 1, \$80 in year 2. So annual costs are \$300, \$280, \$260 etc.

This might seem odd if a company (or regulator) wants cost-based prices as the notional price, if cost based, falls over time (annual cost/volume). This is often not a concern as:

- This example is a one-asset company (idealised)
- Real companies have many similar assets bought every year, so most are not bought in year 1. So they average out over time, if other assets are bought in years 2, 3, 4 etc so the average annualised cost is also an average of these other assets' values.

So annual costs can be sensibly derived from HCA based costs.

It is vital to understand that this method of defining cost for each year is valid. It enables the investment to be paid for over time and so the company gets \$1000 over time to buy a new asset after five years. This is shown by defining the net present value (NPV) of the future costs of 300, 280 260 etc. The discount rate is (of course) the CoC. The NPV of future costs (i.e. revenues if prices at cost) is the same \$1000 paid. Therefore the company is sustainable and gets enough money to buy new assets ad infinitum.

NB some complications could be added such as using average capital employed per year, but the same essential result and analysis applies. The examples here assume asset values (capital employed) at the beginning of the year.

The method has an additional logic as the profit is weighted to the early years. So profit is \$300 less \$200 of depreciation, then \$80, then \$60. This is actually a sensible business approach – charge more and make more profit in early years as the future is uncertain and it is likely that unknown items such as volumes in year 4, are not totally predictable. It should be obvious that there is an enhanced business risk to assume the asset is mostly paid for only in years 4 & 5. This weights the same total cost to later years with smaller costs to recover in the early years. Some do think this...

### **Example: Assets with no price change and using HCA**

This figure below shows an asset with five year life and linear depreciation and no price changes,

**Figure 1** HCA based values. 10% Cost of capital

	Year 1	Year 2	Year 3	Year 4	Year 5
Opening value	1,000	800	600	400	200
Depreciation	200	200	200	200	200
Closing value	800	600	400	200	0
Cost recovery:					
Depreciation	200	200	200	200	200
WACC x op. value	100	80	60	40	20
Total cost recovery	300	280	260	240	220
<i>Present value of cost recovery</i>	1,000				

#### **Profit and loss account**

Revenue	300	280	260	240	220
Depreciation	200	200	200	200	200
Profit	100	80	60	40	20

Source: Telzed. Note how the P&L reports shows the revenue (price x volume) and cost, if cost-based prices were used

This shows a standard “Accounting view” of the asset and cost recovery. Note how the Net Present Value of costs (and prices if cost based) allows the economic recovery of the investment. So, the accounts are economically valid. Note how cost recovery is weighted to earlier years. The price (if we assume a one asset business) = cost/volume. So prices should be higher in early years. In reality the recovery of the costs can be done with any price trend desired and it is simple to devise the prices and volumes over time to give the same NPV. Simply define the volumes and desired price trend and adjust the base price so that the NPV covers the investment.

Note how the depreciation sums up to cover the investment and so a new asset can be bought after five years.

## 3.2 Using current cost accounting of asset values – a single revaluation

### 3.2.1 Example: single step re-valuation

It is common that asset prices do change. So, if the as new price alters the value of the bought asset also changes. Think: if you buy a car then the manufacturer reduces prices by 10% the value of your second hand car drops as well.

This is simple to model and important to understand. The same asset as above in Section 3.1 is assumed to have the price fall 20% in year 3. This would not impact the above HCA analysis and normal accounts. It *does affect* the asset values if we consider Current Cost Accounting (CCA), as this provides a more “economic valuation” than using unchanging HCA values.

So the as new asset values are now: \$1000, 1000, 1000 [800 at the year end], 800, 800. Note the 20% reduction due to supplier price changes in year 3.

The depreciation is 200, 200, 200, 160, 160. But this does not sum up to the purchase price. So pricing and business plans based on this will cause a loss. The depreciation is termed an operational cost so just recovering this is termed Operational Capital Maintenance (OCM). Pricing covers the operational costs. In this case just the depreciation – we are ignoring any additional staff or electricity costs.

In year 2 the asset value is 800, but at the end of year 3 it is an 800 asset, now three years old (in third year). So valued at  $800 - 3 \times 160 = 320$  at the year end. This means the asset value drops in the one year from 600 (value end year 2) to only 320. So the full annual depreciation is 280. This is more than the OCM depreciation of 160. The *additional* depreciation is 120. The company lost 20% of the asset value of a three year old asset (120), plus the depreciation of the devalued asset (160).

This full depreciation of 280 is termed the Financial Capital Maintenance (FCM) depreciation. This has to be recovered to ensure the capital within the company remains in place the business capital is maintained. Using FCM, the real CCA depreciation to recover is, as follows with the asset value using CCA:

- Depreciation: 200, 200, 280, 160, 160. This is the full FCM depreciation
- Asset value Year opening): 1000, 800, 600, 320, 160. This defines the annual CoC (asset value *at opening value* of year  $\times$  CoC%)
- If only the OCM depreciation is used then this is: 200, 200, 200, 160, 160. Total = 920.

The OCM method is simpler (but FCM is only a trivial increase in complexity) but clearly the sum of depreciation is less than the investment so there is a loss of value in the business, if the prices are set to recover these costs. OCM under recovers the investment if asset prices fall. If asset prices rise (such as may happen for buildings or land) then cost-based prices using OCM depreciation *over recovers* the investment. OCM is therefore rarely used, and the additional calculations of FCM are trivial - everyone has Excel or a cost calculation tool.

The interesting year is year 3 when the normal straight-line depreciation of the asset (200 in each year) is radically changed. The total depreciation (loss of value) in that year is 280. There is an additional loss of value in the business. The capital asset base is reduced, not only by the depreciation but a loss of “capital holding” in the business happens so a *holding loss* is seen. Holding *gains* happen if asset values rise. Most analysts will focus on the total depreciation of 280 – that needs to be recovered somehow. If prices are set to, or based on costs, this will NOT normally mean a sudden jump up in prices – the depreciation can be recovered over time, in other years’ prices. Furthermore, the example is of a one asset model. A real business has many assets bought in different years. Some are recent and others almost fully depreciated. Also many diverse asset types exist in a real business. So only a few would show this sudden loss of value. It is still instructive to understand this one asset example.

Example: Asset with step change in price in year 3.

**Figure 2** Market reduction in asset values. In year 3 the as-new value (price) falls 20%

	Year 1	Year 2	Year 3	Year 4	Year 5
Opening value	1,000	800	600	320	160
Depreciation	200	200	280	160	160
Closing value	800	600	320	160	0
Cost recovery:					
Depreciation	200	200	280	160	160
WACC x op. value	100	80	60	32	16
Total cost recovery	300	280	340	192	176
<i>Present value of cost recovery</i>	1,000				

#### Profit and loss account

Revenue	300	280	340	192	176
Depreciation	200	200	280	160	160
Profit	100	80	60	32	16

Source: Telzed. Note how sum of depreciation = 1000, as in previous figure

Here the asset value reduces in year 3 by 20%. The sudden loss of value must be recovered. Of course, this need not be done by a one-year price increase but can be spread over other years. Note that OCM depreciation is then 160 (an 800 asset, if bought new, now depreciates over 5 years). But the loss in value means additional 120 in depreciation to give the full FCM depreciation. This results in the end of year value of just 320: it is an 800 valued asset that is three years old:  $800 - 3 \times 160$ . 160 is the annual depreciation of an asset valued at 800 new with 5 year life. This 160 is the OCM depreciation value. Note how in years 4 and 5 there is no asset value change due to market effects so the full FCM depreciation equals the OCM depreciation.

The additional 120 depreciation is due to the loss in capital value or holding loss: the asset base is reduced by more than just annual depreciation.

Not how the devalued asset depreciation shows the replacement cost *after* year three. A new asset is not costing 1000 (as in example 1) but only 800 new, so we have lower depreciation. The depreciation cost to include in prices is only needed to pay for a lower asset replacement price.

### 3.2.2 Summary notes on asset revaluations and CCA

Key points from this example include:

- When markets change or prices alter, then the value of assets, both new and old, change. This is an economic principle, and is seen if anyone has a car, or house and markets change
- Normal accounting ignores these changes. This is Historic Cost Accounting - HCA
- Value changes result in a holding loss (or gain) in addition to the depreciation. The sum of both gives the total depreciation or loss in the asset's value in the year
- CCA methods result in the accounts being far more in line with economists' thinking

- FCM considers the holding gains/losses, but OCM only considers the depreciation, so OCM is rarely used for major asset categories<sup>14</sup>, where the inherent errors in OCM could be significant. FCM considers the loss (or gain) of capital value in the company as assets' prices change – there is a loss of value in the company balance sheet, not only that caused by the basic depreciation of OCM – value /lifetime
- **It is recommended that OCM is understood then almost totally ignored.** FCM is simple and gives economically robust results. OCM is not economically valid
- The Operational Capital Maintenance term reflects an accounting-type view where depreciation is deemed an *operational* cost of the business. To operate long run, depreciation is a cost. Some economists may disagree, but in most accounts, the depreciation is a cost to operate the company and so is part of the P&L report.

In practise the CCA calculations are a little more complex in some accounting systems. For most purposes, practitioners simply need to understand the full loss of value in the year, and the capital value in that year. Cost based pricing covers the return on capital on the asset (or cost of capital which is usually set using the WACC value) plus the loss of value or “full depreciation.” In simple terms:

$$\text{Full depreciation (real CCA depre)} = \text{holding gains (losses)} + \text{basic CCA depreciation,}$$

$$\text{where basic CCA depreciation} = \text{OCM value}$$

The supplemental depreciation is the difference of CCA and HCA values.

Practitioners and those wishing to get into the accounting aspects of asset values may wish to do more research and, in this case, they can find that CCA depreciation can be defined in more complex ways that look at the depreciation differences in CCA and in HCA etc. Additional factors such as backlog depreciation can also become part of the formulae.

This paper is not a tutorial on accounting formulae. Instead the focus is on the principles and essential factors to be understood. A much longer paper or course is needed to cover the potentially more complex ways to report the changes in value each year. Readers can consult the literature on CCA, especially in directions by regulators on telecom regulatory accounting.

The primary understanding needed is in the above description of CCA depreciation which is (of course) the difference in value between the current year and the previous year. That includes any devaluations.

The major issue is of course: how to define the asset value in the first place. The example shown above is where the equipment price from the supplier has a step reduction. This is a realistic example and serves to show the fundamental impact on the asset value and the annual depreciation.

---

<sup>14</sup> For insignificant assets it does not matter if OCM is used as the errors introduced are not causing major distortions

### 3.3 Example of CCA depreciation and asset values: multiple value changes over time

This section expands on the last section 3.2's introduction to re-valued assets.

The following shows a number of revaluations and how they impact the asset values and the depreciation. These then show how the costs to be recovered vary year on year. Implicit in the thinking is that the annual depreciation is part of the cost-based recovery. The recovery of costs is notionally the price, where prices are cost-oriented. The cost to recover = unit price x volumes. For simplicity we can simply define the cost to recover (which can be done by 1000 or 1million products or by many products of different types).

$$\text{The cost to recover} = \text{depreciation (using FCM)} + \text{WACC} \times \text{CE}$$

The Capital Employed (CE) defines an economic cost of capital in the business. The capital investments are assumed to require the recovery of the total cost of capital employed. This is equal to the WACC (defined as a percentage) x the capital employed. If this is recovered then the business makes enough money to satisfy the investors (debt investors and shareholders). The WACC x CE is the notional profit needed, to satisfy these investors. Good companies make more than this return, and poorly run ones make less. From an economics view, a return = WACC% times the investment, is deemed fair. Regulators expect this level of return. Economic theory considers the WACC as the return expected from competitive markets. It is fair/good as investors should be happy (satisfactory returns) and customers especially other operators get the low/fair price that competitive markets should produce.

In this analysis Section 3 we ignore the potential for a company to be able to have high prices and make far more than the WACC based return on CE. This additional profit is termed super-profits, which is a "nice business to have" but may be eroded if the market is competitive. We only consider the essential cost of capital, as defined by the WACC number, as the economic cost that must be recovered.

Example 3: Falling asset values

**Figure 3** Falling asset values (-10% per annum)

	Year 1	Year 2	Year 3	Year 4	Year 5
Opening value	1,000	720	486	292	131
Depreciation	280	234	194.4	160	131
Closing value	720	486	291.6	131	0
Cost recovery:					
Depreciation	280	234	194	160	131
WACC x op. value	100	72	49	29	13
Total cost recovery	380	306	243	190	144
Present value of cost recovery	1,000				

**Profit and loss account**

Revenue	380	306	243	190	144
Depreciation	280	234	194	160	131
Profit	100	72	49	29	13
	Year 1	Year 2	Year 3	Year 4	Year 5
GRV Year beginning	1,000	900	810	729	656
GRV Year end	900	810	729	656	590

Source: Telzed

This shows falling asset values. Note the effect: it weights cost recovery and prices to the earlier years. This is sensible business practice. With knowledge of falling asset values, it is sensible to recover the investment sooner rather than later.

Note how the asset value after (say) year three shows the depreciation to be recovered. To replace that asset. The asset value (new) has eroded 10% from each previous year. So looking forward, an asset value of  $1000 \times (1-10\%)^3$  is the expected replacement investment. This is the power of CCA – the asset value and depreciation are set sensibly to replace the asset as seen in year three. This point is important. This model example shows continued devaluations of 10% per year. But a business or regulatory price decision only knows the prices in year three and forward looking prices are set on that basis. This is neutral and safe. Therefore pricing at end of year three should be based on the asset values at that time.

Decisions based on an assumption of yet more falls in price may seem sensible but that adds risk, and so the assumptions need weighted to account for this: discounting of the possible impact of the lower prices in the later years to account for the risk of wrong price trends. What if prices do not continue to fall? The future is not known.

Some key lessons from this accounting type view of asset values and using them for prices can be inferred from the above. The Figures show how CCA provides sound basis to account for changing prices and should be used as a basis for price setting and price controls. The figures also show how accounts and especially the CCA accounts with changing prices alter the asset values and how cost-recovery (prices) alter. With falling asset values in later years, less is needed to pay for the lower-priced replacement. The CCA asset value correctly indicates the costs to recover over the remaining year to buy the replacement.

This should not be a surprise. CCA was developed to meet the problems with only using HCA. Note how the CCA method is valid from an economics point of view and ensures cost recovery and replacement of the future assets. As a result of this it was incorporated into



many regulations for regulatory accounts and price controls. When there was huge inflation, the HCA asset value was often so low the Accounts were close to useless for business evaluations (a replacement might be priced 10x what was paid). The same follows for falling asset values which is more common in telecoms. The replacement price is much lower than was paid. CCA and revaluation of assets provides a sound basis for understanding the business and making decisions. The future cash flows are defined by the asset replacement values in sound CCA work.

Of course to get the sound CCA based asset values and so a projected cash flow needed for network asset replacements, asset valuation is required. Which is the focus of this paper.

### 3.4 Summary of the key messages from the revaluation examples and CCA

Key messages include the following:

- Accounting values based on HCA with no asset value changes are often acceptable and reasonable but if values change significantly, they no longer set a sound basis for prices and cost recover business plans
- HCA values are sound as they are usually related to Audited values, but Audit-needs diverge from the economic insights and thinking needed to run a business when prices (values) alter
- A business is never a one asset business (as show in the examples above). Thousands of assets exist in many 100s of categories. Each have varying price trends. Also, some assets are new or almost so. Some are at the end of their life. So a more complex analysis is needed. However the key points should be used from the above examples to revalue old and recent assets. The asset values of each differ, but the method remains valid. So using this economic/accounting thinking, a valid cost basis can be derived
- Some assets may rise in value (say buildings or civil works) and some fall electronic systems. The effects may partly balance. However this perfect balance is unlikely and falling values are more often seen in telecoms. This is true of 2022, but a jump in inflation in 2022 might cause some price increases. This gives an important lesson: the future is never certain and seemingly “known facts” such as falling prices might not be true. Hence risks are a factor and the impact of an assumption must be discounted given the risk and uncertainty of the assumption. The WACC discount factor is a start. Some assumptions far into the future could be given an even higher discount factor
- Asset categories with low total value or very short life could be valued as HCA as any CCA changes will have negligible effect
- Adjusted accounts using sound CCA *do* provide a sound basis for prices and business decisions. The CCA basis is, in most cases, far more solid than HCA and aligns with economic thinking
- Economic views for cash flow, pricing and investment recovery are reasonably shown in CCA. Accountants and economists can (and should) agree on this point of convergence.

### 3.5 Accounting values using CCA, in more detail

The previous section 3.3 shows CCA revaluations. This approach is economically valid for decisions. It can be done as price trends of equipment can usually be defined. This valuation is returned to later. The general principles are shown in the accounting examples.

In the following we look at the accounting examples and expand on them to show how such data can be reflected in the full business with many assets of different vintage. A real business of course has more than one asset, as shown in the examples.

For illustration we take the example of the asset that falls 10% per year in value – the purchase price (GRV) falls and so the asset's value must also fall. The one asset with falling value means that the cost recovery should be weighted to early years, as the asset's value is lower in the later years and a replacement asset will cost less. Therefore the costs to be recovered in (say year 4 or 5) is less than if no revaluation is done. The costs to be recovered is geared to replace the lower-priced asset. There is no point having high prices then as an expensive asset is not needed as a replacement.

Important information is the net asset value over time – the NRV. This was shown in Figure 3 above. The GRV is also valid – this is the price or value off the new asset. This defines the capital investment needed for additional or replacement assets. For example, a new asset, with same technical features, may be bought in year 4 to cope with additional capacity. After year 5 a replacement asset must be needed. The asset cost will not be 1000, but it will cost less since prices fall 10% per year.

The GRV defines the as new price (market value). Note that the price can be defined at the year beginning or year end. In reality prices do not change smoothly over time. So a trend of 10% per year is only an approximation. In reality prices tend to change in steps as vendors alter price lists. However trends per year are a valid approximation. Price indexation data is often aggregated from several sources so the trend or change is “for the year” and not specific to a month. This is worth noting: price revaluations inherently have an approximation built in: when in the year is the price change to be assumed, and when in the year are new assets assumed to be bought.

The example below shows the values from Figure 3 above.

---

**Figure 4** Beginning and year end values if bought new

	Year 1	Year 2	Year 3	Year 4	Year 5
GRV Year beginning	1,000	900	810	729	656
GRV Year end	900	810	729	656	590

Source: Telzed

---

This shows GRV values that indicate the capex needed to buy new assets. Note how a replacement after 5 years is only 590, and not the 1000 at the beginning.

If demand rises then some assets might be bought at the beginning of Year 4 at 729. The original asset is worth only 292. In this case the net asset value in the business is 292+729 = 1021. So the network could have two assets in place but the capital employed is almost the same as at year 1 (1000). This shows key effects of asset price changes:

- The total costs in the business often do not rise even as demand and capacity rises. Here double the assets exist after year 4 for more services to meet the demand

- Asset prices fall and this has often balanced the need for more capacity. This is shown in this example and by telecoms revenue and margins remaining roughly constant over time. It is a general myth that more traffic from (say) Netflix and Facebook etc has increased costs. More assets *are needed* for the capacity, but the cost of the additional assets falls
- As mobile and fixed traffic rises roughly 10x every 7-8 years the lowering costs to replace and add assets has enabled telcos to cope with the demand increase.

So assets get cheaper due to lower prices and (more importantly) due to technical advances that make new assets effectively cheaper.

The accounting view of assets and costs in each year is shown to be economically valid for business understanding and price decisions. The CCA values are used by regulators.

The accounting view can be enhanced, depending on the needs and decisions:

- The Figures above show the cost of capital based on the start of year asset values.  $CoC = CE \text{ year beginning} \times WACC\%$ . Some forward looking decisions could consider the year end values. However these are not known until that year end.
- The forward price and business decisions need to be based on the data in that year of the decision. So a price decision in Year 4 cannot assume (with no risk) that the prices continue to fall over time and definitely will be 10% in Year 5. So the prudent decision is based on the values in year 4 and price and investment managers should use that cost of capital and the forward capital values in the year. That logic means that prices using this basis will enable assets to be replaced and a fair return on investment can be obtained (the WACC based ROCE). So for best forward views the latest year end data should be used.

A regulator needs to set prices and usually needs to look at past performance. Past performance can show if past years' cover the costs or exceed the fair costs (excessive returns). These past years' analysis may be better based on the average capital employed (Mean Capital Employed) in each of the previous years. This is seen in some regulatory accounts. Using MCE is a simple extension of the data in the above Figures using beginning and end of year values. This is not shown as this report focusses on basic principles and using just opening and year's closing values keeps the examples simple.

Both regulatory and business pricing are essentially forward looking decisions. But the latest data on assets is from the actual year in question. So the actual year might be year 4. The accounts for year five do not yet exist. So prudent pricing is based on the asset values in the current year (*current* cost accounting!). A forward looking price based on that year's asset values is a sound basis for initial pricing. Regulators will normally base their prices on this data, if they have access to CCA regulatory accounts. NB these accounts do exist in many countries, but are not public like the statutory accounts.

The asset prices (GRV) are indicated in the example 3 above see Figure 3 and Figure 4 above. The example of a price trend shows an assumed market price change and how it impacts the business costs. The GRV shows implied capex to replace some assets or to add new assets to meet rising demand.

The asset price values will need to be based on real data and real trends:

- *Ideal* asset prices can be based on market data and vendors' information. These can be used

- *Actual* asset prices can be used – as paid to the company's suppliers
- The price data can be used to show capex in the current year or extrapolated to show capex (using demand forecasts to define asset numbers needed) in future years.

The choice of actual and ideal prices is significant. Arguably the real value of any asset is what the market price is and if other vendors have lower prices then the company's own asset only has this market value. But it might not be practical to change vendors. So, the actual vendors prices could be used. The decision depends on the circumstances and the manager's or regulatory view. A movement to more efficient supply (normally a good thing) would use the efficient asset and so the prices of alternative suppliers. No one solution is totally correct in all situations.

In summary:

- Actual prices and ideal market prices are often not be the same
- A company vendor may have a fixed price list for 3 or 4 years so market trends might not be actually obtained by the operator. But maybe the fixed price considered the predicted costs averaged over time. A well negotiated supply deal could have factored in cost trends, but agreed to the fixed prices. This is not fundamental contradictory.

The vendor's price could also be because purchasing department negotiated a fixed piece deal that is detrimental, as market prices fell. The likely price and cost changes were not in the supply contract. This paper's author has seen this<sup>15</sup>.

A fixed price might have included beneficial support service etc. Perhaps the business could not migrate to other suppliers due to technical lock-in to the original vendor. So the real price trend has to be a price that the operator can realistically have obtained. The headline equipment price is not always representative if support is included. Lesson: price data always needs to be looked at carefully and as part of the wider supply deal (what is included or excluded).

CCA data can help to show if the actual prices paid are following market trends.

CCA data can show possible capex values. The GRV data can show if supply deals and prices are following market trends. The information is not precise, even in the calculations are exact: price trends are only approximate and price changes vary over time and are usually step changes and not set at end or year beginning. That said, revised asset values using CCA does normally give a better basis for understanding the business and for making decisions. The key need is to define robust values. Another lesson: CCA revaluation always has some assumptions and estimations. Concerns over "decimal places" in numbers is likely to lead to wasted effort.

---

<sup>15</sup> "Roger, look at this supply contract, and see if something can be negotiated. BTW the person who signed it has been sacked." The vendor persuaded the buyer (over lunches?) to agree to a long-term supply deal when telecoms prices were falling. Contract terms protected the vendor but the buyer was locked in for five years and prices had no discounts the reflected the true costs over time. There were also no provisions for price reviews. Lesson: big mistakes can happen and supply deals need to understand the market trends

## 4 Revaluation methods

This section explores some commonly used methods to revalue assets. Revaluation defines the value of the assets as seen today (or at a defined “current” year, that may be in the past). Revaluations over time show the asset base value as seen at that time.

The values can be used for many decisions and insight. So how can they be defined?

### 4.1 Historic or HCA values

This method requires no revaluation. Yet it is still very useful and widely used in CCA based systems.

#### 4.1.1 Overview of asset data in accounting systems

As the asset data is recorded in the company database data it is important to understand this before other valuations are made. The foundations for many revaluations start with the same HCA asset database

These HCA accounting values are reported on in the statutory accounts. This provides the value in the just-passed year and previous year. Other statutory accounts define assets over time. Depreciation and capital expenditures are reported on. Statutory accounts rarely define assets in much detail: just a few aggregated items. So the assets used for fibre to the home or to mobile masts are not separated.

The total capital employed values, depreciation and capex are still useful for evaluations and some insights. Company ROCE measures are simple examples. Total Capital Employed and capex are also useful: rising or falling? CE tends to be roughly constant or may rise as the business expands.

Some useful indicators include:

- Annual capex. This may vary year to year. An expansion may create new mobile masts or fibre to the home. Subsequent years need little further investment as these items are used by expanding service numbers. Of course, if capex is low for many years then perhaps the company has no money to spare and has to “soak the assets” and utilise them to the maximum. Good business practice or short term only?
- HCA depreciation. This is the accounting view of the assets’ cost averaged over time – the annual “cost.” Economists may dispute if depreciation is a cost, but it is a useful base and in this paper we have shown that it is economically valid. If a business is unable to cover the cost of depreciation then it is unlikely to be able to replace the assets or to expand with new assets. So depreciation is a sensible cost for decisions
- CE. This is the basis for ROCE measures and price setting to ensure the return is above the WACC value. Large CE might reflect recent investments and in the longer run the revenues and traffic will “fill up” the assets’ capacity. Evaluations often need to be done over time as a one year view might not be realistic. Alternatively some predicted revenues or traffic are needed to get a sensible view of the returns from the asset base, if it were built for future demand (which is normal).

These points show that the asset data, even in statutory accounts which only has aggregated values<sup>16</sup> for the entire business, are still useful. This is why they are in statutory accounts!

Within the accounting system, far more data exists. The assets are in the Fixed Asset Register (FAR). This has details of thousands of assets: purchase date, purchase value, type of asset, lifetime, additional investment (an asset such as office building may be repaired or expanded), net book value (purchase value minus accumulated depreciation) etc. Many items are listed – so there might be 1000 investments in different locations over time just for fibre to the home. There are also 1000s of other investments for another category of asset.

It is normal to group the assets by type:

- Office buildings
- Fibre to the home
- Mobile masts
- Switching systems
- Land, etc.

These aggregated assets are easier to process and understand. A telco might have 20,000 assets listed but only 100 asset categories. Categories are manageable for analysis and to understand where the investments are (mobile masts or fibre or offices). With additional processing, the CE and depreciation can be used to define the cost of a service. This needs a complex *cost model* and must include operational costs of staff to get the full cost of a service such as broadband. A service is far more than an asset or two. This paper does not cover cost models that convert the assets' data and the operational costs into services<sup>17</sup>. Telzed and other consulting and accounting firms can assist with this product-costing. The processing enables the CE per product and so the ROCE per product, or per market. See regulatory accounting directives and the few published accounts (UK and Ireland).

Many asset databases follow a strong 80:20 rule. 20% of categories (asset types) have 80% of the costs and many categories have low values and very few systems. This is not incorrect these smaller assets (in terms of value) may be critical to the business or to some products. The numbers be used in analysis and product cost calculations. The asset numbers are relevant for revaluations and so may be critical for the products that use these assets.

Note that this can lead to huge amounts in just one or two generic assets categories. "Buildings" may be offices and exchanges and technical centres. "Fibres" may have core and access and international link fibres. "Fibres" might also include the digging costs<sup>18</sup>. So aggregated costs are often exist, yet the asset base can still be used. If needed, some asset

---

<sup>16</sup> Only a few numbers are shown in the statutory accounts

<sup>17</sup> Telzed has worked on many cost models that use the accounts to define product and customer costs (and profits). In this paper we only consider the asset, not the services that use the asset.

<sup>18</sup> Consultants, regulators and telecom business experts should know where the major investments are made and what is within the asset costs. Fixed operators are often dominated by the access network – copper and fibre to the home, plus the huge civil works of duct/digging, manholes and poles. The end copper or fibre asset may have all digging and installation included. Everyone should understand the general cost structures. Fibre cable typically costs ~£5000/km. But the duct/digging and install costs are ~£20,000-100,000 per km [city centre costs are high]. So capitalised costs of constructions can dominate over the physical cable asset

totals could be split to smaller items, but this needs additional analysis. Note, from the footnote how part of the asset may be labour related (digging and install) that has a different trend from the fibre asset. The two sub-asset values might need separate revaluations, if a complex/thorough method is employed.

#### 4.1.2 HCA asset summary

The historic accounts form the basis for other valuations, so these should be understood. The summary features are:

- Assets are recorded at purchase value (price): PV or GBV
- Lifetime and depreciation are defined and calculated
- Net present values (NPVs) are defined
- Information on individual assets often exists (one mast in location X or router Y on floor 5 of exchange D)
- Asset data can usually be aggregated to sensible categories for valuations. 1000s of items need not be processed individually
- The asset information may be audited, as the same data is used in the statutory accounts.

Some additional insights include:

- The purchases can be complex orders to vendors for many parts and systems. The invoice and payments need to be assigned to asset categories. Errors may be made and so some asset registers are not totally accurate – assets in wrong categories
- If a company is bought or merges, then the two asset data bases need to be combined. This can lead to aggregated numbers and loss of values by detailed category. This causes uncertainty – are the combined numbers correct and are some assets combined in a way that is not useful for valuations. Values might not be defined correctly using the same category definitions
- The asset data leads to large databases. This may help to define asset types from the detailed information (look at invoice descriptions). Also sub-category codes may be used such as: a general category of “cables” might have sub categories for “copper” or “fibre”
- Many assets include capitalised labour. The vendor’ asset is installed and tested by the telco’s own staff. Their time and costs are then deemed part of the asset’s cost, in much the same way the vendor’s staff costs are part of the bill for the asset. This is important for some asset revaluations.

The complications of valuation, may lead to investigations to understand what assets and systems are within any category and if they can be treated as one generic system that can be valued in the same way. The information is in a database and it may be possible to probe into details of categories and assets’ data. It may be possible to trace back to the purchase order and even the staff who processed the order and entered the information in the asset database. Potentially deeper investigations can correct wrong-category assignments or so identify two assets types within one category - which could be useful.

### 4.1.3 Using HCA asset values

The questions to be answered from HCA data depend on the problem to be tackled. Defining all business questions is beyond the scope of this paper, but the following assumptions help to show how the asset data can be used:

- Remove non relevant assets. So overseas business and activities that do not relate to the telco business of interest can be removed
- Some assets that are irrelevant to future decisions can be removed. So old systems that will never be replaced might be removed. This is a debatable point as there is an investment and its costs may still need to be recovered
- Inefficient business costs could be removed (say 10% of office space) if an efficient forward looking asset base is needed. Again debatable
- Subsidiaries may also be removed
- Renting out of office or exchange space might not be part of the real telco business (might rent to a bank's staff) and possibly that building space asset is not relevant. But this depends on the scope of business assessment. This leads to a percentage of assets being removed or allocated to other businesses and products. This is a short step in the longer process to turning the asset base, plus all operational accounts into a model of all service and customer costs with profit measures. That is beyond this paper's scope
- Assets for small items like staff restaurants or museums might be removed as they are not really part of the *telco* business.

The aim is often to get a restricted definition of the network and business assets that are relevant for understand the business. Exclusions are not normally large (but can exist).

The key values to be used are the Net Book Value and depreciation. Purchase values are sometimes useful. The current (or last year) asset NBV numbers provides a sound basis for the CE, and hence CoC values ( $WACC \times CE$ ). The full CE = asset CE plus net working capital, but this is detail is ignored in this paper's discussions, to simply the formulae.

As shown earlier the NBV and depreciation are valid for understanding the assets costs when the NBV is combined with the CoC% (or WACC%).

If HCA is deemed relevant, then this analysis forms the foundation for assessments and decisions. **Often HCA is adequate.** A number of regulators and surely many businesses do use the asset base to assist with pricing, investments and forward planning. Regulators are aware that HCA accounts are not perfect for future cost definitions but they are sound for past evaluations (such as high or low profit margin checks).

HCA is valid for:

- Assets with short lifetime
- Assets with low price changes over time
- Assets where the aggregate value is not significant.

Therefore many asset can use HCA even if the *overall approach* is CCA. Using HCA is accurate enough and reduces the amount of processing needed – the HCA values already exist.



For some assets the HCA numbers *do* reasonably indicate the future costs. Many telcos have a very high investment rate. About 30% of the revenues were used for capex in a report seen summer 2022. As revenues are usually roughly equal to total costs (margins are notoriously low in telcos in 2022), then clearly the investment levels are high. With this in mind, few assets are old. Most assets are new/recent. Therefore revaluations of the old assets have little impact. The recent assets dominate and revaluations have little impact of items that are new/recent.

This dominance of recent asset values is even more profound in expanding networks. So major new 5G investments may dominate the asset base and so older 3G assets have little impact. So why change from the HCA values? They are probably good enough and they are a small % of the total.

Regulators are well aware that CCA should provide better economic data. But some only use HCA. Perhaps because most assets are new and networks modernise rapidly. Another reason is: if they doubt the CCA re-valuations done by the operator. CCA values can be done in different ways and so errors or poor values might result. HCA may not be perfect but there should be no serious errors.

New assets' values are unlikely to change in value much under any revaluation scheme. So remaining with HCA is then reasonable.

Some additional understanding is required:

- New assets might not be fully used in early years as traffic expands later. So unit costs per service might be high. This can be included in business plans and pricing, along with the asset recovery schedule. This is shown in the asset data base and in Section 3.1 and Figure 1 but this has no volumes and for simplicity assumes a “one asset” business
- Sometimes a telco has old assets that will need to be upgraded but that investment is delayed. Example: old copper under HCA has low or zero value and depreciation. As this is not a sound capital base for decisions, prices could be maintained to recover *more* than the current HCA values so that prices are able to be used for *future* FTTH or other FWA investments. This approach means price reductions (from low valued copper) are not reversed a few years later by higher FTTH broadband prices. This is understood to be how Ofcom regulated BT prices with old copper. So higher than the costs based on assets, *can* be sensible
- Some telcos were investing in copper in recent years – say to provide service in unserved areas or for expanding markets. The copper values are high as assets are still new. The HCA numbers may need to be treated with care if fibre is starting to replace the copper. This also leads to the “cost hump<sup>19</sup>” where two networks exist in parallel as this increases costs until copper is removed
- A few telcos have not invested and so the asset base has declined and they “soak the assets” and get as much revenue out of the systems. Possibly leaving the upgrade re-investments to others (such as a foolish buyer)

---

<sup>19</sup> This obvious concern was discussed by this paper's author and others ~15 years ago

- Some evaluation games are possible such as looking at the depreciation x asset life relative to asset values. If well below 50% then there may be a lack of investment. It is likely to be above 50% in telcos that modernise and invest but could tend to 50% in a steady business. But telcos are rarely steady businesses – major service and technical changes are normal. Such guide figures are approximate and rough guides only
- Asset data by category (FTTH, offices, masts, core switching et al) enables understanding is where investments lie, are being made and hence where pricing and re-investments are needed. HCA is quite adequate for this.

## 4.2 CCA revaluation by assessment (expert appraisal)

A simple yet powerful revaluation is possible for some assets:

- Examine the assets using valuation experts. So office market values can be defined by companies that buy/sell/rent buildings. They can define the market value relevant to sell (or buy) the office. Some other assets like land can be similarly assessed. Equipment is less easy
- This defines a new NBV of the asset and therefore the implied GRV. The lifetime is not normally altered so depreciation is the GRV / lifetime or the difference in value from last year and current year.

This may be tedious or expensive to do annually. If done once, then the value can be further adjusted annually from the solid valuation, by general office price-trends data. That is commonly available in most countries and city centres. This can advance the value through next few years. Another assessment/appraisal can then be carried out when/if needed.

The key foundation is a market-based valuation. What is the value of the asset in the current market of that country/region?

Care is needed so that a move from the HCA values to this new CCA does not cause large errors from the sum of depreciation in all years not equalling the purchase value. This can be dealt with or may not be a significant factor anyway. Note that a move from HCA to CCA (using this or any CCA revaluation method) can always cause a possible one-off devaluation or step up in values (for the few telcos assets that rise in value). As some assets rise and others fall in value the net impact of a change to CCA from HCA is often ignored. But this needs consideration by the management, advisors, accountants and regulator. As CCA is generally considered “better,” the downside of the step change to CCA can often be accepted or ignored. Some telcos might find a one-off loss of capital involved in the initial move to CCA. But once implemented, *CCA should always ensure sum of depreciation = the purchase price*. With this principle, using CCA as a price basis means that the investment is always recovered as cost-based prices result in the investment costs and depreciation being part of the price.

As noted in the last section CCA might not be needed at all and HCA can still be used and this change-to-CCA-concern is avoided.

Summary: direct valuation is useful, but best used for a few high value assets and probably *then* advanced to other years using trend data. If the company is evaluated by external parties, then the asset base and accounts might not be trusted. So some surveys and checks of the assets’ existence by an expert team and relating these to market prices is a worthwhile

task. The result is that major assets are valued based on physical examinations and known market prices to form a solid asset value.

Some readers might think that a company being investigated for a buy-out will have correct asset data and can be trusted by the buyer and they only look at the asset base in the accounting system. This is *usually* true but due diligence is strongly recommended so that the physical assets are assessed. Consultants with experience will recall company buyouts that only after the deal was closed the buyer found out the real assets were rather different to what was assumed or stated in documents or in the asset data systems. Do not assume, check using network, business, technical accounting *et al* staff. The due diligence can do some absolute valuations.

If the revaluation is for internal use, of course such suspicions should not be needed, unless (say) local managers made independent decisions and invested too much or too little and the asset data base is incorrect. Could that ever happen?

As noted, the valuation assessment causes a possible one off change from the HCA to CCA. But the CCA value (NRV) is then used for adjusted values in subsequent years, which is robust.

### 4.3 Absolute valuation

This is a common method. It is both powerful and deceptively simple. Some CCA experts and regulators even prefer it, but all methods each have strengths and weaknesses so no one method is the best in all situations.

The principles are:

- Define the assets within a category (say small masts and large masts that are within a generic “mast asset” category)
- Count the number of each type of masts. This data is often within the network inventory systems or sometimes can be inferred from the asset accounts – number of mast-build purchase orders and build projects. Network teams know how many items exist. Why do projects sometime not talk to the network teams?
- Define the latest prices for small and large masts using vendor price data
- Get the GRV (replacement asset value as if new) as numbers x prices
- Define the NRV and depreciation by the ratio of GRV to GBV – use this to define the NRV and CCA depreciation from the HCA NBV and depreciation values.

This is a fairly simple task. The numbers of systems within a business are known, else: the company may have serious problems. The network inventory systems are very powerful but separate from the asset accounting data. This inventory enables the numbers, locations and configurations of most equipment to be defined. These systems are centralised, so a user can check all of the systems and status of any one remote mast, or the capacity of a router switch. This in turn enables system numbers of different types or sizes to be defined.

Aside: the systems can often enable every interface and line card to be investigated. Entire switching systems can be seen in diagrammatical form. Even a consultant can do it! The network diagrams show where systems are and how many exist. Lists can be made so that numbers of (say) 3G antennae can be found. What exists in the network (and so in network management systems and inventories) is likely far more robust than the entry of purchase

order information into an accounting system and asset register. Few data entry clerks might understand the systems from technical terms and part numbers. This has led to huge errors where assets were wrongly assigned to categories and had incorrect description in the data base descriptor fields.

Issues for using this method include:

- Are accounting data and real numbers of systems aligned? This relies on purchase orders to be processed and assigned correctly to the right asset categories. This is non-trivial as a single mast construction will have a huge list of small project costs and vendor systems. Were mast constructions separated from the electronic systems and antennae costs? Purchase engineers may be able to do this, but it might have to be done by junior clerks processing invoices into the asset systems. Errors will exist – are they small enough?
- What is the price of a small or large mast? This seems simple but in reality few are identical: most are bespoke orders for a location and construction, planning and build costs depend on the site. But, a representative *average price* is needed. This is harder to define than might be thought. 10% error in this average price assumption leads to proportional value errors.

The method is really a Bottom Up model. This is an economic/technical model of a telco. They are widely developed by regulators to understand the costs of the telco. They have demand as an input and this then defines numbers of systems needed based on technical factors (how the traffic drives the need for more systems and capacity). System numbers define capital costs and operating staff costs for the equipment. In turn the capital values of all assets are then defined (numbers x price – the same method as in absolute valuation).

BU models are useful but almost always under-estimate the true costs as the complex network designs and equipment overheads needed in every system to make it reliable, are hard to model in a spreadsheet. It has to model the work of 100s of planning and design engineers and the procurement team. Consultants must be wary of claiming their BU model is as good as these teams. A *good guess* of the average cost of a mast is a fair claim. Accurate average costs of a core data switch or the antennae-systems on a mast or the base station systems are hard to define: they likely are different in detail (and cost) for every mast.

The absolute method is only robust if the system numbers are robust and prices for each system are known or sound average values are known.

Extensions of the absolute valuation approach could look at alternative vendors' prices for same/similar equipment. Or it might note that one new system, at say 10% more in price, can do as much as four older systems, as bought. So fewer systems are now needed at far lower cost per unit of traffic carried. This can be modelled in absolute methods. The alternative equipment of *other vendors* arguably really defines the network's worth. If someone building it anew, then they would not invest in the older systems they would buy the lower cost vendor. So the current real GRV is set by the new systems. This is termed the Modern Equivalent Value – MEA. This is what could be used today to replace the older systems.

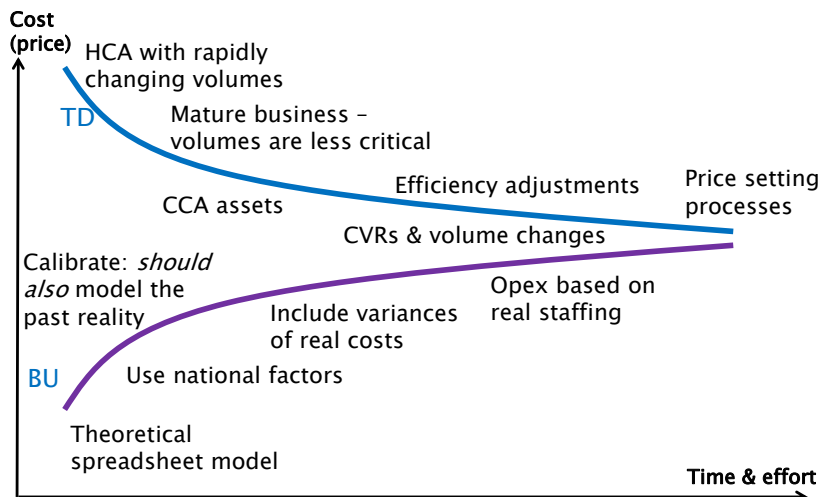
MEA pricing in absolute valuation is relatively easy. Most significantly is the MEA when it is based on new, larger-capacity systems that might not cost much more. This models the technical obsolescence. Many old switches with 1Gbit/s capacity can be replaced by just a few new switches each with 5Gbit/s capacity. The *effective cost is 20% of the old asset* or slightly more if the 5G asset costs say 10% more. This is an important aspect of telecoms that impacts values profoundly. For the same price or slightly more, a new asset has many

times the function of the old assets. The impact is to devalue assets rapidly – this is shown in the example CCA shown earlier but the impact is even larger if a 10% cheaper asset has twice the capacity.. Old assets in proper CCA terms may have very little real economic or accounting value.

This optimised approach is valid. Technical advances are real so older systems devalue rapidly in real terms. However the purpose of the valuation exercise and strategic or regulatory directive can impact the choice of system numbers, system type (MEA choice) and costs.

This paper cannot discuss BU models in detail. They contrast to the asset analysis that is essentially top down – therefore the total asset values and numbers in the accounts are considered. This is start point. These may be broken down to smaller assets such as those within one category. This is deemed top-down modelling<sup>20</sup>. NB in this paper we consider only the assets costs, and not additional operational costs such as staff and power, which are part of full top down or bottom up models,

**Figure 5** TD accounts-based modelling and BU models can differ hugely but can converge, if proper adjustments are carried out



Source: Telzed. This compares BU and TD models in general. So opex costs are in full models and cost-volume-relationships are also used in some models. But the essential asset-related features are relevant to the absolute method. For example national asset values are needed, and not global prices

An absolute valuation is essentially BU modelling and so uses current asset values and prices. So the asset values should be robust and not initial BU model guesses (as is done by some consultants without access to real system numbers, national prices and configurations). The full modelling includes opex (staff and overheads), but in this asset valuation discussion paper, that can be ignored.

<sup>20</sup> See papers on top down and bottom up models in the literature such as regulator's papers. This [Telzed paper](#) discusses BU and TD modelling

Absolute modelling likely under-estimate the true asset base unless system numbers and prices for each robustly reflect the complex reality where any two system are often different in the details of the design and configuration.

The message from the figure is that absolute and BU modelling is good so long as the approach is not too complicated and it has costs that relate to the volumes used in the accounting-data. Else the method is not modelling the same asset numbers in the accounting data. A make-up model? Some BU models are like this (author's opinion).

## 4.4 Indexation

This is a common method that enables the (hopefully) sound HCA asset value to be adjusted to the values as if bought today.

Every asset in a category has a known Purchase Value (price) and purchase date. Exact prices for the same asset systems (line card, interface port, power supply or mast type) might not exist or are hard to define for any one asset. But a trend for assets for that general type, is often known.

Office buildings have known trends over time: shown by costs per m<sup>2</sup> over time. Land values are often defined. So a 2022 land price might be 20% more than the same land if purchased on 2018.

Indexes can be found. National indexes often exist. Specialists collate data so that index trends can be defined – some such data sources are sold.

If an index exists and it relates to an asset category, then the value of the asset can be defined for today, using the date information. A 2022 value is X% more or Y% less than the 2017 purchase date. This is simple to apply in principle – all assets in each year are “moved” to have a value as if bought in the latest year (say 2022).

A few problems arise:

- Index values are not usually accurate to a month. They only approximately indicate the relative costs for year X versus year Y. So some small errors exist if assets are bought near year start or year end. These are unlikely to be a major concern
- Index data might be international – as if bought on the global market in US\$. Exchange rates need to be included as national currencies then impact the true price change
- Knowledge is needed for how the index data was collated and how it was assumed to be used. The revaluation might not be using the source data in the right way or the index might not be fully relevant to the company asset category. Are definitions the same? Are they similar asset types?
- Are the index values robust and valid in the country and operator in question? National prices and supply options might be very different. All countries are not the same. Some products might not even be sold in the country in question. A project may be needed to define a specific index for an asset type in a particular country.

It is vital that a user is aware of the limitations.

Price indexes can be made using a supplier's price list. The equipment supply contract usually has prices and these are updated over time. So an index can be developed. This

also ensures the index is for the same equipment items actually bought and so it re-values those assets to the current year. This is a positive aspect. But other vendors' prices might set the real market value of system. If another vendor sells same or similar equipment for 50% of the usual vendor's prices then the real market price falls 50% and the company vendor is likely to follow soon or its contract of sale will soon be terminated. Making good indexes is often not simple.

This author was often involved in supply contracts for telcos. Price lists were always useful bases for business modelling, and so valued within consulting teams. A colleague announced that one vendor said that its price list was no longer valid: their prices would all simply match that of another new vendor which provided huge price reductions. It knew it would sell nothing if it did not follow that market change. Better to sell something even if at a slight loss than to sell nothing.

Lesson: market prices do change other suppliers' prices and arguably the value of the asset is set by what could be built now, using other suppliers, and not based on the system supplier actually used. This technique may not always be used – changing vendors might not be possible due to compatibility problems or high costs to change suppliers.

Some deeper issues with indexation exist:

- How did the index-supplier make the index?
- Is this method valid?
- Does it consider technical advances and related technical obsolescence?

This is not easy to find out. Telzed experience and investigations of some indexes show there are inherent problems that can make some indexes incorrect for some purposes.

Examples:

- An index may look at total spends of telcos and numbers of systems bought. So routers are bought in large numbers and so results might seem to be robust. But a "router" is now not the same as ones bought say 4 years ago. Index data might show a few % increase or decrease in price. But the new routers have 5 or 10x the capacity. So one new router could replace 5 old ones. The effective price is 20% of the old one due to technical advances. This is disguised as traffic rises and so similar numbers of new routers are needed. This a profound issue – the older assets are not revalued properly. How the index was defined therefore might need to be studied to see if it is relevant
- Some indexes and price lists revalue the same asset. The same old asset is often sold for many years, perhaps at just a few percentage discount. This is useful for maintenance – the same unit can be used to replace a faulty one. This revaluation is often valid
- A vendor will also have newer routers with much more features and capacity and so many older routers can be replaced by one new one. Should the older asset be revalued at replacement price or revalued using the new router price taking account of the say 5x increase in capacity? This is a profound effect. This means that older systems drop rapidly in *effective* value. Look very closely to see if this is being considered in the index material. Else: the devaluation of an asset (as new replacement price) over time is much too low, or might even rise a few percent. Old

electronic systems normally have very low relative value due to the technical advances.

A good example of technical advances are the costs of sub-sea cables. Many telcos have part ownership of a sub-sea cable. This is often bought on an IRU basis or leases. The IRU is like an asset – the Indefeasible Right of Use for say 50Gbit/s capacity is bought for the 20 year life of the cable. The telco can use and resell the capacity. It forms part of the company asset base.

It is possible that a new cable has roughly as much capacity of all previous cables to the country. Some years later another cable will be built and may have 10x the capacity of that cable. The total cost of this new cable might be only slightly more. So the value of the older cable drops hugely after perhaps just 5 years. Cable capacities have risen exponentially for a long time, especially since the first fibre cables. A cable system has not risen significantly in price.

The net effect is lower cost per Gbit/s for the cable, the IRU and other leased capacities. This is compensated for by rising demand for more Gbit/s. There is still no way round the fact that older cables reduce in value. This is also true for many systems in telcos: mobile masts; fibre transmission systems; routers and switches etc.

Data on sub-sea cable and the investment costs are available. TeleGeography has data. Cable consortia often define the investment and capacity that will be available. The capacities are traded and can be seen as IP transit services – the price of this service over (say) Europe to USA can be used to show the effective price trend.

Using an index is relatively easy: the asset purchase data can be matched to the index data or that year and so the current value of the asset calculated. In turn this defines the net value and depreciation

## 4.5 Revaluation problems

A number of detailed problems may arise and might be ignored or accommodated, depending on the information available and need for accuracy. Some of these are discussed in the following.

- Asset upgrades. Asset data will often show later upgrades to the original asset. Say new cooling system in an office or addition of a back-up power supply to some electronics system. This adds investment but at a later date. Normally the lifetime remains unchanged. So the asset GRV changes after perhaps three years. The GRV used when the CCA is done is probably on the new (larger GRV) and the effect of additions can be ignored. But some detailed adjustments might be needed to ensure all depreciation over all time = the initial GRV plus the additional investment
- Capitalised labour. The asset GRV is the sum of equipment and capitalised labour. Arguably the physical equipment might devalue fast, but the staff contribution could rise in value as staff costs rise and so a replacement would have more expensive labour. So two revaluations are needed – equipment and capitalised labour. This may be too complex to be worth doing or the labour cost proportion is not known or only a small percentage of the total (so ignore). The methods defined here can then be adjusted if really needed
- Fully depreciated assets. Some systems remain in use and therefore generate revenues. One can argue that the asset still has a value and so this can be re-



entered into the asset systems and this value depreciates over another three years or so. This is NOT normally acceptable as then the principles of cost recovery are broken. The sum of depreciation is more than the investment. This has been seen. For a few assets this does not matter. Some assets are terminated before the accounting life is reached – so the issues balance. If old assets get “a new life” then the business model is radically altered and this thinking is best avoided<sup>21</sup>

- Land values. Land has no depreciation so the value is the key item (value x WACC). An issue is that land values might rise rapidly in some countries. The telco may own a lot of land. It may have been given land free by governments – may telcos were government owned or still are. With privatisation, land was a “free gift.” This it may be a relevant asset in company valuations and CCA values may be relevant. But if the land is not used or unlikely to be used then perhaps it can be removed from price and business decisions. An asset modeller might “park the asset” as not relevant to the decisions and long run costs of services. Ventures into non-telecom business are also costs that are possible to be “parked.” Land might be considered part of a land investment business – to justify the asset removal
- Accounting details. This paper has tried to minimise too much of the accounting details needed when calculating the final CE value (NRV) and the new CCA depreciation. The key number is the full CCA depreciation using FCM principles: the change in NRV from one year to the next. Accounting complexities can define this from the HCA depreciation plus supplemental depreciation, holding gains/losses and backlog depreciation. This complexity of reporting can be derived from accounting and regulatory accounting literature. The focus should be on understanding the principles and setting the new asset values. Full FCM depreciation is the single key number needed. So how it is made up from other detailed numbers is less relevant. If needed, engage consultants and accountants. The one full depreciation value (FCM) is usually all that is needed
- Complex calculations. This report covers the principles. Of course an implementation of CCA revaluation may need a number of calculations, and many revaluation data. So absolute methods need numbers of systems and price (a small bottom up model), indexing need index values (indexes of the different categories) that need to be linked to assets’ categories and purchase years. Year end or opening year values or year-average values might be needed. Small projects may be needed to generate national-specific indexes or absolute system prices and to convert indexes to the national situation. Asset upgrades at a later date, might need to be considered, if large. In summary: the principles may be easy to understand but in practice revaluations may need a number of calculations. This may become a complex model or set of Excel systems. Complex calculations create potential for errors and need more assumptions – do these additional complexities really make the results more accurate?

---

<sup>21</sup> It is understood (author’s interpretation) that BT in UK had a lot of old copper with low value or possibly fully depreciated. Ofcom did not consider these assets to have a value in pricing controls. Yet Ofcom was still able to set prices for access network services above the cost from the accounts. This was not by creating asset values but in price control rules so that prices remained high enough to enable FTTH build in later years. Lesson: even if there is a logical need for above-costs-from-accounts values, it was not sensible to allow old assets to get a new life and new value

- Complex calculations summary. It is recommended that the focus is on the major numbers (assets and critical valuation data) and too much detail is avoided, if possible. CCA is not a precise science – there are choices of methods and the input data is not absolutely precise. With this in mind, the details might not be relevant, so long as the primary method, calculations and input numbers are solid. Perhaps even the source asset data is not very solid (errors in posting to categories or some assets not recorded), so a very complex methods might add specious accuracy
- Copper. See later.

In addition to the above, CCA work must remember what it is intended to achieve. Are the CCA values and reports really going to be used for critical decisions? If price controls by a regulator are based on CCA, then the method is more critical than if it is just a general input to management for understanding the business and investment options: these are driven by strategic needs and the CCA probably only confirms the focus areas and insights. Precise numbers might not matter.

## 4.6 Copper valuations

In this section the value of copper is discussed. The general CCA principles could be applied and copper revalued, perhaps by indexing. The value of copper cables varies over time as copper is a commodity. Therefore global demand for copper can impact the copper cables' prices. So revaluation is highly relevant as it is an asset that can even rise in value.

The fundamental CCA principles of this report can be applied. But some wider issues can be considered:

- What services will pay for the asset costs?
- If the asset values are written down because the copper will not be used in (say) two years, even though the copper has ten years potential life, then what service (if anything) is assigned the write down?
- Is there really any *cost* of writing off copper? Is this real and needs to be paid for or is it “a number on a piece of paper” and so is purely an accounting number that is not relevant to pricing and investment decisions
- Some countries have already written off most of the copper value in the asset base (old), but others were still building a lot of copper networks just 3 or so years ago, yet the move to FTTH was already well known. What to do with the large and recent copper investment? Does the choice not to build FTTH impact the copper values and how copper is dealt with?
- Some countries never had much copper so went straight to fibre with little copper investment. There are few issues in such countries.

Copper issues matter for two main decisions:

- Is copper relevant to price controls and to regulated prices, in particular for prices to other operators (wholesale prices)
- Are the copper values relevant to internal business decision and prices for copper based services or for FTTH services that replace copper?

The issues can raise a lot of discussions. Telzed has examined copper in several investigations. There was remarkably little clear consensus or public decision being made by the telcos or regulators until later 2021 when BEREC started a consultation. The issues go beyond valuation and there are major technical issues with copper termination (or turn off):

- Should copper based customers be served on copper or forced to move to fibre? If they are moved what prices will apply?
- There are many legacy services that use copper and might be hard to force customers to stop using them. Can they be migrated to alternatives (likely fibre)?
- Can copper be removed (there is a value in scrap copper)? This *can* be done and copper then sold, but would removal risk damage to other cables and services in the same duct? Scrap values might then be ignored
- Is there notional or accounting value in a cable that exists but only has a few copper wires used? Some may argue the copper value is based on the full cable's cost (minus depreciation), but others might say the value is a tiny percentage of the cable investment as there are few live copper wires on the large-asset of the entire 1000 pair cable
- Is the cable really a *liability* as it is fault prone, expensive to maintain and holds back modernisation because efficient networks use fibre. Fibre enables fewer exchange sites (node sites). Removing sites and so reducing costs is not possible with copper because copper customers need a core node site within ~5km of the customer. This is due to basic electrical limits as signal decay with distance. Fibre signal go further to the efficient asst base with fibre could be much lower.

Some telcos and regulators did not clarify the approach, yet FTTH was happening. Clearly there were solutions being applied internally. These were for pricing and for treatment of the copper costs in accounting reports (statutory or regulatory) and for prices. How are services priced and do they change with copper being terminated?

There are broadly three lines of thinking:

- The incumbent telco view. The copper termination needs write off costs and the accounting values must be compensated for in wholesale services or in retail services using copper or even in alternative services like FTTH – they must pay for the devaluation of assets
- The alternative telco view. The costs are accounting numbers and not a long run cost. The copper issue is for the incumbent to deal with and alternative players are able to build fibre and do not have a significant copper issue, so the alternative operators and their consumer prices are not impacted. The alternative telcos should have no copper based costs to deal with
- The business manager's view in the incumbent (copper telco). The new FTTH services are what matters. Copper should have been long paid for as copper termination was known to be due to happen for 20+ years. So none of the copper should impact the manager's portfolio of services such as FTTH. The manager must compete with the alternative telcos who are unencumbered by the copper burden. Any mistake of investing significantly in copper in recent years is a problem for other managers and the CFO. It not a cost burden that the new service manager should need to deal with. The copper asset therefore should have been paid for even if there is an asset value in the accounts.

A full analysis of copper needs a large report (ask Telzed). The following proposes a simple solution that is arguably what is being done in some countries already:

- Copper costs remain in the asset base and accounts
- Some revaluations are possible
- The value write-down costs are not relevant to any price setting
- The assets values are mostly not relevant to any services other than copper-based services
- Copper based services will not have prices altered: they are regulated or market-set so a sudden cost increase (write-off) can be ignored
- The net impact is that all copper issues can be “parked.” They are not relevant to the telco forward investments in fibre and do not impact the prices. There may be copper values and write-downs in statutory or regulatory accounts but services’ prices are not altered.

The logic for this is that copper write downs and fibre replacements were long known. There is NO basis to any claims that the telco has “unexpected write-downs of copper” or “needs to recover the copper investment.” Only the dumbest telco manager did not know they were moving to fibre, so copper investment recovery must have been thought about and been part of pricing and profit analysis. This is surely true even if copper investments were recent. Fibre was the obvious solution or 30+ years.

So the copper costs - large write downs - are simply ignored for most business purposes. They do not affect prices. This means that accounting costs’ depreciation can be dealt with by accountants in any way (HCA or CCA) and reported on in the accounts or costing system. but they are almost all removed from the cost base that matters. The costs are not a long run cost. The asset will not be replaced. Depreciation is, in this situation, not a proxy to average costs over time (which *is* often a legitimate principle as shown in this report) as the fast depreciation is a cost that must have been predicted and so the investment has been mostly already fully recovered, even if the asset is notionally given a value with a large depreciation cost. This is an example of where depreciation as a cost is less valid and the economists’ view where future capex is needed, is more relevant/sensible. The copper capex *was* a cash flow several years ago or much longer ago, but can now be ignored. The capex that matters is fibre, and that is in the accounts and will be in future asset numbers.

Managers must have known that copper termination was due, unless they were clueless about the technical evolution seen in most of the world.

When copper services were a major on-going major business, it is logical to use normal CCA and re-value the copper, based on the current prices of the cables. This was the case say some 10+ years ago. But even then the future of copper was known. This has happened long ago and visionaries saw the future in the 1980s. Readers should understand why the movement to fibre is not happen, yet it did happen in places like Sweden, Korea and Japan. Various factors led to this including regulation. The threat of unbundled access or low priced resale of the fibre bit stream services. This led the incumbent telcos not building any fibre. Or else using dubious methods like FTTcabinet. It encouraged use of fibre PONS that make fibre unbundling harder even though it is arguably not the best technology in the long run. This is an example of “sensible regulation” not being sensible as it caused the opposite of what was desired. Did regulators think this through? What assets are correct to use in revaluations?

This outcome and late movement to fibre is worth understanding and deeper analysis. It is also related to why copper is still used – and this increases the long run costs over an efficient technical choice.

Telzed could help with a full discussion of copper write-off and how to deal with its termination.

## 5 Conclusions

This Telzed report provides a summary of asset revaluation methods and related issues. The focus is on Current Cost Accounting methods and thinking. This is a good approach and it has been used in telecoms for a long time. The principles apply everywhere, especially where there are significant valuation changes of assets over time. The effect of value changes is, of course, largest with long lifetime assets where, over the longer time, technical and economic factors significantly alter the replacement costs and hence the asset values. Telecoms has significant assets with long life: cables and digging. These are often the largest investments in a telco. Masts are also major investments, again with long lifetimes (though the mobile electronics and antennae on the mast are often replaced as technology advances).

Good management and pricing decisions should understand the asset price trends and update the cost-recovery to match. This ensures that the investment is recovered and there is sufficient income over time to invest in the replacements. Good CCA based costs provide the basis for prices that achieve this aim. This report provides the foundations needed to achieve this.

This report shows both general principles and also detailed calculations. Strategic management can understand the key issues. Furthermore cost accountants can benefit from the detailed system calculations which can be put in place using the examples given.

Different revaluation methods are described and used as a basis for managing the business. The best choice depends on many factors. There is no one method that is always the best. The choice depends on the needs and information available,

The report covers a lot of details of telecom and these insights are relevant and should provide valuable information for dealing with investments and prices. Examples from Telzed experience provide further knowledge to help in many decisions.

Please contact Telzed for further advice and help

See Telzed web site for additional papers

