

Asset Valuation and Pricing – Some Popular Myths and Misconceptions

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“Economists are people who know the price of everything and the value of nothing.” George Bernard Shaw.

I Introduction

The conclusion of Sasol Chemical Industries Limited v Competition Commission (“Sasol”) heard before the Competition Appeal Court (“the Court”) has further clarified the meaning of excessive pricing under section 8(a) of South Africa’s Competition Act 89 of 1998. Importantly, the Court ruled that the standard in which actual price is to be compared to under section 8(a) is that of a hypothetical competitive market, and in calculating cost a notional objective market standard is to be utilised. On this basis the test of excessive pricing was considered within a price-cost framework.

While one finds a considerable body of knowledge related to normative analysis of tests of excessive pricing such as provided by das Nair (2008),² Evans and Padilla (2005)³; and Roberts (2008)⁴ there appears to be less to draw on in regard to positive analysis of price-cost tests. By this I mean the practical aspects of constructing price-cost tests *taking as given* the particular framework under which excessive pricing is to be assessed.

Indeed, the need for additional analysis in this area was highlighted by the Court in conclusion to its Judgment noting that had additional evidence been provided “with regard to the evaluation of capital assets, the level of capital reward / return on capital, the allocation of group and commotion cost, this

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² des Nair (2008), *Measuring Excessive Pricing as an Abuse of Dominance – An Assessment of the Criteria Used in the Harmony Gold/Mittal Steel Complaint*, South African Journal of Economic and Management Sciences.

³ Evans, D., and A. J. Padilla, *Excessive Prices: Using Economics To Define Administrable Legal Rules*.Jnl of Competition Law & Economics (March 2005) 1 (1):97-122

⁴ Roberts, S. (2008) *Assessing Excessive Pricing: The Case of Flat Steel in South Africa*, Journal of Competition Law & Economics, Vol. 4, issue 3 p 871-891

evidence may well have shed a different light on this case.”⁵ Notably, these are matters familiar to regulatory practitioners and which a considerable body of thought can be applied.

It is this aspect of the Sasol Judgment that provides the focal point of analysis, and joins together relevant aspects of competition law and regulatory economics. In doing so I have been cognisant of fundamental differences between the two fields of study, and that one must be careful if utilising the tools of economic regulation to test for excessive pricing. In this regard I am reminded of the words of Abraham Maslow in that “I suppose it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail.”⁶

Having due regard for the warnings suggested above explicit attention is given to the criteria in which the Court made its ruling on excessive pricing and what that might imply in utilising the tools of regulatory economics. More specifically, I have aimed to create a logical and internally consistent framework in which to undertake a comparative assessment of asset valuation methodologies. This is done within the context of the Sasol case, but it is envisioned that this approach can be applied to a range of cases where price-cost tests are utilised.

Following the broad scope of study summarised above, the structure of this paper is as follows. First, the basis of the Sasol case is briefly summarised as it relates to the assessment of excessive pricing under section 8(a) and construction of the price-cost test. Salient aspects of the regulatory approach to cost based pricing are then presented and areas in which the tools of regulatory economics can be appropriately applied to the price-cost test are identified. This framework for analysis is then used to undertake a comparative assessment of asset valuation methodologies as applied to the price-cost test for excessive pricing under section 8(a) of South Africa’s Competition Act 89 of 1998.

II. Excessive pricing within the context of the Competition Act

The starting point for this analysis – and the basis of the Sasol case is summarised in the paragraph (1) of the Judgment.⁷

“(1) This case concerns the meaning and the scope of s 8(a) of the Competition Act 89 of 1998 (the Act”) (sic) which provides that a dominant firm may not charge an excessive price to the detriment of consumers. Section 1(1) defines an ‘excessive price’ as a price for a good or service which (aa) bears no reasonable relation to the economic value of that good or service, and (bb) is higher than the value referred to in sub paragraph (aa).”

The Court then framed the two fundamental issues of debate in application of section 8(a) of the Act in terms of (i) the proper interpretation of the phrase ‘economic value’; and (ii) the manner in which the reasonableness of the relation between price and economic value is to be assessed” As summarised by Oxenham and Currie the Court further determined that:⁸

⁵ Competition Appeal Court South Africa, Sasol Chemical Industries Limited and Competition Commission. Judgment, 17 June 2015. Case 131/CAC/Jun14 (para 183)

⁶ Abraham. Maslow, (1966) *The Psychology of Science: A Reconnaissance*. Harper and Row

⁷ Para 1, op cit

⁸ Oxenham, J., and D. Lewis, *South Africa Excessive Pricing – An Evaluation of the Sasol Chemical Industries Decision*. American Bar Association Fall Forum.

“,, the “economic value” of a product is its competitive market price, that is, its price in a hypothetical competitive market and that for the purposes of calculating costs, a notional objective standard should be utilised. “

In constructing a price-cost test within this context we need to further understand what is meant by a ‘competitive market price’ or as others have put it – a price that would occur under ‘effective competition’.

At the risk of covering ground well-travelled, the Sasol Judgment points to the case of Mittal Steel South Africa Ltd and Harmony Gold Mining Company Limited (hereafter referred to as “Mittal”) in which the concepts of a long run competitive equilibrium and a competitive market price are given practical meaning within the context of section 8(a).

[40] “,,, What the legislature must be taken to have intended by ‘economic value’ is the notional price of the good or service under the assumed conditions of long-run competitive equilibrium. This requires the assumption that, in the long run, firms could enter the industry in the event of a higher than normal rate of return, or could leave the industry to avoid a lower than normal rate of return. It does not imply perfect competition in the short-run, but rather competition that would be effective enough in the long run to eliminate what economists refer to as ‘pure profit’ – that is a reward of any factor of production in excess of the long-run competitive norm which is relevant to that industry or branch of production.”⁹

The ‘long-run competitive equilibrium’ considered in Mittal is of course different from the competitive general equilibria presented by mathematical economists such as Pareto, Cournot, Walrus, Debreu, and Arrow, and the models of partial equilibria developed by Marshall, Hicks, and others. The key point to be made here is that standard textbook prescriptions related to the optimality of a competitive equilibrium and welfare maximisation cannot be assumed to hold a priori.

Of course the point above is neither novel or unique to the application of section 8(a). The Theory of the Second Best comes to mind whereby standard prescriptions for enhancing economic efficiency are made invalid if moving away from the assumptions of a perfectly competitive market.¹⁰ In any case, given that the Court has explicitly moved away from the assumptions of a perfectly competitive market one must be careful if attributing standard dictums of economic theory that depend on those stringent assumptions.

By way of example, pricing at marginal cost has little or no intrinsic meaning for an economist – and only comes to life within the context of well-defined economic model. Some of the more commonly cited alternatives to the model of perfect competition, and their relevance to the test of excessive pricing are explored below.

An imperfectly competitive norm

While not explicitly referenced in this manner, the competitive norm formed in Mittal and Sasol could be seen as a synthesis of related models of imperfect competition such as those developed by distinguished economists such as Robinson, Chamberlain, Kaldor, and Harrod, and which others since have built on.

⁹ Competition Appeal Court of South Africa, Mittal Steel South Africa Ltd and Harmony Gold Mining Company Limited. Judgment 29 May, 2009. Case No. 70/CAC/Apr07

¹⁰ Lipsey, R. G.; Lancaster, Kelvin (1956). "The General Theory of Second Best". Review of Economic Studies 24 (1): 11–32.

Importantly, in citing Mittal, the Court speaks to the long run equilibrium in which entry and exit is assumed to eliminate pure profits. While not referenced in the summary Judgment of Mittal or Sasol – this may have been inspired by work such as that of Baumol, Panzar and Willig (1982) in which they develop the concept of contestable markets and conditions of frictionless entry and exit in which pure profits are driven to zero.¹¹ That the Sasol Judgment did not explicitly speak to these models of imperfect competition or contestable markets does not make them entirely irrelevant to our analysis.

Indeed, it is more likely that the Court fully understood the tenuous link between entry and zero profits of Mittal (see, for example para 40, *op cit*) and simply referred to a competitive norm in which pure profits are eliminated – *no matter what the causal factor*. Within the context of testing for excessive pricing under section 8(a) this assumption allows us to set aside matters of structure and conduct that might have otherwise been warranted. Ours is a (relatively) simple matter of constructing a price-cost model consistent with zero excess profits.

Application of the price-cost test

‘A job worth doing is worth doing badly’ (Attributed to G.K. Chesterton)

And

“Measuring whether a price is above the level that would exist in a competitive market is rarely an easy task. The fact that the exercise may be difficult is not, however, a reason for not attempting it. ,,,”¹²

As referenced in the Mittal Judgment (para 48) the difficulties associated with construction of the price-cost test do not provide sufficient reason to dismiss the exercise. While perhaps not directly relevant to the study at hand, it is perhaps worth noting counter arguments such as that of Evans and Padilla (2005).¹³

“Consequently, any policy that seeks to detect and prohibit excessive prices in practice is likely to yield incorrect predictions. In some instances, the authorities may conclude that prevailing market prices are competitive when they are not. In some others, they may conclude that prices are excessive when in reality they are competitive.”

While we would question whether “any policy,,, is likely to yield incorrect predictions” one can see the merit in applying the concept of type I and type II error in normative analysis – particularly where the legal standard is based on concepts of consumer welfare. The same study also considers ‘pragmatic legal rules’ such as where “a price is excessive if it is X percent greater than cost” which (if taking a bit of liberty in restating this in terms of X percent **or** greater) would be similar to that of the price-cost test of section 8(a). In this example Evans and Padilla conclude that the test is;

“,, bound to cause errors: supra-competitive prices will be blessed in some instances, while competitive prices will be condemned in others. Any legal standard for excessive pricing will therefore result in “false convictions”— or “type I errors” in the standard terminology of decision theory—and/or “false acquittals – or type II errors. To use the criminal justice system

¹¹ Baumol, WJ, JC Panzar, and RD Willig, *Contestable Markets and The Theory of Industry Structure*, Harcourt Brace Jovanovich, 1982

¹² Napp Pharmaceutical Holdings Pty & Others v Director General of Fair Trading (2002) CAT para 392.

¹³ Evans, D., and A. J. Padilla, *Excessive Prices: Using Economics To Define Administrable Legal Rules*. CEMFI Working Paper No. 0416 September 2004

as an example, a type I error would be the equivalent of jailing an innocent person, whereas a type II error would be allowing a guilty party to go unpunished.”

It is tempting to use similar logic in questioning if the guilty are never convicted, and the innocent never set free? Nevertheless, it is important to construct a test with sufficient probability of rejecting the null when it is indeed invalid, and a matter we will come back to when considering the calculation of excess profits.

II Economic regulation and cost based pricing

Economic regulation of prices has as its basis perhaps more commonality with competition law than might be generally assumed. For example, in review of Bonbright’s seminal work on Principles of Public Utility Rates one finds familiar discourse on the value of service as defined by consumer demand theory; the competitive market standard in which both consumer demand and cost of production determine value; the ‘workably competitive’ standard in which recovery of fixed costs and other norms of the industry are accounted for; and the cost of service as an objective standard for determination of regulated prices.¹⁴

In discussing these various standards Bonbright references the often cited case, *Federal Power Commission v. Hope Natural Gas* (1945)¹⁵ in which the US Supreme Court established the following (cost of service) standard for setting regulated tariffs..

“From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business.

These include service on the debt and dividends on the stock... By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks.

That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.”

Of course Bonbright was speaking to US ‘rate making’ and as described by Grout and Jenkins (2001)¹⁶ these matters were the subject of numerous court cases in the US reaching back over 100 years. With this in mind it may be helpful to look at a more recent example of economic regulation of prices in South Africa.

One example is found in the Electricity Regulation Act 4 of 2006 in that the setting or approval of prices,

“(a) must enable an efficient licensee to recover the full cost of its licensed activities, including a reasonable margin or return;

(b) must provide for or prescribe incentives for continued improvement of the technical and economic efficiency with which services are to be provided;

¹⁴ James C. Bonbright, Principles of Public Utility Rates, Columbia University Press. 1961.

¹⁵ US Supreme Court, *Federal Power Commission v. Hope Natural Gas* 321 U.S. 591 (1945).

¹⁶ Grout, P.A. and A. Jenkins, (2001) *Regulatory Opportunism and Asset Valuation: Evidence from the US Supreme Court and UK Regulation*, CMPO Working Paper Series No. 01/38

(c) must give end users proper information regarding the costs that their consumption imposes on the licensee's business;

(d) must avoid undue discrimination between customer categories; and

(e) may permit the cross-subsidy of tariffs to certain classes of customers.”

Noticeably, these conditions make no mention of competitive outcomes and prices. In their place one finds conditions related to the recovery of costs (where returns are typically thought of as the cost of capital).

If continuing with the example above, the National Energy Regulator of South Africa published regulatory methodology provides that regulated tariffs are to be determined on the basis of the cost of supply. Importantly, the relationship between costs and regulated tariffs is based on economic value – not strict adherence to accounting standards or factors unique to the financial reporting conventions of the regulated entity. Practically speaking, allowed (annual) revenue, and thus price is built up from deemed values of operating costs; depreciation (as an annualised recovery of capital expenditure); return on capital; and tax.

In casting our net across various regulated sectors and jurisdictions one finds that regulators typically utilise a combination of recent actual costs of the regulated entity and benchmark values representing a notionally efficient comparator firm in construction of cost based prices. In the case of asset value (thus depreciation and return on capital) regulators often apply a ‘used and useful’ criteria in build-up of the asset base, although other criteria come into play as well and a combination of actual and benchmark values might be used in build-up of the asset base.

Asset valuation and tariff setting

Asset value is a key input to the cost-price build-up of economic regulation, and the price-cost test of excessive pricing. While not directly relevant to the discussion of asset valuation methodology per se, it may be helpful to remind that asset value enters the calculation of cost based prices in two forms – (i) as an annualised return *on* capital; and (ii) as an annualised return *of* capital. These two concepts are easily explained if we quickly agree, as the Court did in Sasol, that the Weighted Average Cost of Capital (WACC) is an appropriate way in which to represent a company’s cost of capital.

Keeping in mind that we are working with annualised values of costs, revenue, and excess profit, the return *on* capital is expressed as the product of the WACC and asset value, and represents the economic opportunity cost of invested capital. The return *of* capital is the amount in which asset value is depreciated in a given year and represents the consumptive use of fixed assets.

The discussion might end here were it not for the fact that there are various methods to choose from in valuation of fixed assets – that the application of competing methods often has a material impact on the assessed value - and there is not a global standard in which to guide the choice of valuation methodology.

In Sasol the Court considered two broad methods of asset valuation - commonly referred to in practice as Historic Cost, and Replacement Cost valuation.¹⁷ As a starting point only, the following passage on

¹⁷ Noting that in Sasol replacement cost was calculated on the basis of actual costs indexed over time – which is best thought of as a proxy for Replacement Cost and is observed often in regulatory practice.

International Accounting Standards on Property, Plant and Equipment sets out how these are to be applied for the purpose of financial reporting.¹⁸

“ An entity shall choose either the cost model or the revaluation model as its accounting policy and shall apply that policy to an entire class of property, plant and equipment.

Cost model: After recognition as an asset, an item of property, plant and equipment shall be carried at its cost less any accumulated depreciation and any accumulated impairment losses.

Revaluation model: After recognition as an asset, an item of property, plant and equipment whose fair value can be measured reliably shall be carried at a revalued amount being its fair value at the date of the revaluation less any subsequent accumulated depreciation and subsequent accumulated impairment losses. Revaluations shall be made with sufficient regularity to ensure that the carrying amount does not differ materially from that which would be determined using fair value at the end of the reporting period.”

The “cost model” (i.e. Historic Cost) references the original construction cost of the asset, and when applied to regulated tariffs just recovers the return of and on invested capital. The “revaluation model” (i.e. Replacement Cost) is an estimate of the current cost of replacing an asset of the same service characteristics as the asset being valued.

Application to Section 8(a)

To place the matter of asset valuation back in its rightful context we go back to the Court’s review of the Tribunal’s Decision in which it referenced a short passage from evidence provided by the Commission stating that:

“the book value of the assets of a company need bear no relation to their market value and tells one nothing about the cost of replacing them today or at the end of their lives. “(sic) ,,, the historical cost basis of accounting provides only for the replacement of the asset at the end of its life at its original historical cost. It makes no provision for the impact of inflation, because it values assets at the price at which they were purchased.”¹⁹

While perhaps literally correct, the statement above is without useful meaning until placed within its rightful context.

First, it is important to note that the term ‘historic cost’ is one of convenience only. If looking at International Accounting Standards (IAS 16. op cit) it is the cash price equivalent of an asset at the recognition date. Or alternatively put – the cost at an asset at the time costs are incurred. In replacing assets one does not look back to some point in history to place a value on these newly recognized assets – one applies the costs of the day. It is true however, that book value (based on historic cost) will not signal current or future asset values – but that is not the objective we have in mind. In constructing a price-cost model of excessive pricing we are attempting to compute a price in which excess profits are zero over the long run, and which the historic cost model is well suited to achieve.

The point above also speaks to the matter of financing the replacement of assets over time. If pricing is based on the cost of production, then by definition when an asset is replaced its pricing would adjust

¹⁸ IAS 16, Property, Plant and Equipment para 30 and 31

¹⁹ Competition Tribunal South Africa, The Competition Commission of South Africa and Sasol Chemical Industries Limited Decision. Case no. 48/cr/aug10. para 245

accordingly to the new cost level. This is exactly as done in regulatory practice and which is aptly summarised by G. Bertram in review of New Zealand's experience with Replacement Cost valuation in stating that:

*"The crucial incentive requirement is that all new capital expenditure is rolled into the ratebase at actual prudent cost so that a competitive return can at all times be reasonably expected on a going-forward basis".*²⁰

However, the Tribunal appears to have had other concerns as illustrated in para 247 of that Decision.

"The book value of an asset, at historical cost less depreciation, declines over its life and then spikes when the asset is replaced. ..., Economic value based on these costs would follow the same spike every time that there is a replacement. At a conceptual level it therefore cannot be correct that one adopts a system of economic costing which inevitably allows the economic value of a product to decline over time and then spike when capital assets are replaced".

As well understood by regulatory practitioners one does indeed obtain a series of spikes (or 'saw tooth' relationship over time) in both asset values and price when using depreciated historic costs as the basis for pricing. Moreover (keeping in mind that we are talking about *depreciated* asset value) a saw tooth price dynamic will be obtained when using Replacement Cost or Historic Cost valuation methods for pricing as the return on capital component of costs (i.e. WACC times depreciated asset value) diminishes over time as the asset is depreciated.

Nevertheless, given the apparently unattractive price dynamic provided by regulated markets, it is more likely that the Tribunal assumed that competitive markets would not provide a saw-tooth shape in prices over time. Regardless of the intuitive appeal of this premise (i) it can neither be supported as a general characteristic of competitive markets, or (ii) in the Court's notional model of 'workable competition'.

(i) In regard to a general statement we can imagine factors that lead to saw tooth price dynamics within competitive markets. By way of example, one well understood example as developed by Halbrook Working and others through the first half of the 1900's is the case of storage of agricultural commodities whereby factors such as convenience yields and carrying costs drive up price of a storable commodity in a systematic manner - only to fall on the next year's harvest.²¹

(ii) For the notional 'workably competitive market' of section 8(a) all but one characteristic of the market remains undefined (i.e. no excess profits in the long run). Lacking needed definition, one is not able to obtain an analytical solution to intertemporal pricing in our notional market. The point being that one cannot make a general statement on price formation in our notional market based on analytical reasoning alone, and one cannot say whether or not such spikes would be found in a notionally competitive market without considerably more information.

At this point it is probably worthwhile to examine characteristics attributed to the Replacement Cost methodology (both perceived and real). Starting with regulatory applications, there is a recurring stream of thought found in regulatory practice in regard to the role of Replacement Cost valuation in price signalling. As an example the following passage was taken from a regulatory determination of

²⁰ Bertram, G, "The Optimised Deprival Value Methodology and the Objectives of Utility Sector Reform in New Zealand", 2000

²¹ Working, H, (1949) *The Theory of Price of Storage* The American Economic Review, Vol. 39, No. 6 (Dec., 1949)

Ireland's Commission for Energy Regulation and which we could find in a number of similar regulatory determinations:²²

"Using some form of replacement value has a very strong economic foundation. A precise valuation results in tariffs that provide an accurate price signal of the cost of using the transmission network. Therefore, if tariffs were based on asset value that were too small, the value of the network would be understated with a dilution of the impact of any locational signals. Further, it would also encourage inefficient investment in the future. Thus, taking a replacement cost approach is more likely to result in the correct level of network investment."

First, as a sunk asset the 'economic cost' of using the transmission asset is zero so we would question the precise economic foundation being referred to. In terms of signalling future investment one would need to think more deeply as to the nature of investment in that particular market. While not meaning to diminish the potentially powerful role of price signalling and its impact on behaviour, in a regulated market, current price need have no bearing on future price levels, and investments will take place on the basis of expected regulatory outcomes (which may or may not result in the "correct" level of investment.)

Moreover, as noted by Johnstone (2003) if the aim is to obtain a price that promotes new investment one will likely be disappointed.²³ Again reminding that we have been assuming the use of depreciated asset values when determining price, the price obtained from a depreciated asset will be less than that of the cost to an entrant purchasing new assets. It is not clear that a price 'closer' to the new entrant price (i.e. as compared to that using Historic Cost) would be helpful or not.

Authors such as Ezrachi and Gilo (2010) question the validity of these assumptions in general, and question the assumed "self-correcting" role to be played by excessive prices in eliminating pure profits in the long run.²⁴ In their study they discuss the importance of post-entry prices as opposed to pre-entry prices. Indeed, this is an area in which economists such as Fudenberg and Tirole (1984) and others have developed game theoretic models to assess strategic behaviour and investment.²⁵

Concluding thoughts

The aim of this initial study has been to demonstrate how the tools of regulatory economics might be appropriately applied to cases of competition law – and in this regard perhaps the 'regulatory hammer' inspired by Maslow has proved to be useful.

In looking at methodological issues inherent to the price-cost test of excessive pricing under section 8(a) it appears that one can form a robust and internally consistent approach to asset valuation– and the same is expected to follow from an examination of profitability measures, depreciation, and return on capital in future research.

²² CER, Transmission Price Control Review, 2005.

²³ Johnstone, D., (2003) *Replacement Cost Asset Valuation and the Regulation of Energy Infrastructure Tariffs*, CRI International Series 8.

²⁴ Ezrachi, A, and G. Gilo (2010), *Excessive Pricing, Entry, Assessment, and Investment: Lessons from the Mittal Litigation*, Antitrust Law Journal No. 3, Volume 76. p 873 – 897.

²⁵ Fudenberg, D., and J. Tirole, *The Fat Cat Effect, The Puppy Dog Ploy, and the Lean and Hungry Look*, American Economic Review, Vol 74, No2 (May 1984).

In returning to other thoughts referenced in this paper – the price-cost test, as for economic regulation will always struggle under information constraints. As a practitioner one must therefore be committed to the words of Chesterton and appreciate the job worth doing badly.

Whether economists ultimately know the price of a thing or its value – I would suggest that Mr Shaw was miss-guided. I think that economists know much about value, but it is indeed very difficult to put a price on it.

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