TRANSNET NATIONAL PORTS AUTHORITY TARIFF APPLICATION 2013/14

This report, which has been produced at the request of the South African Association of Ship Operators and Agents (SAASOA), has been compiled by colleagues associated with the Unit for Maritime Law & Maritime Studies and the School of Accounting, Economics & Finance at the University of KwaZulu-Natal. The report deals with aspects of the TNPA Tariff Application for 2013/14 and is submitted to the National Ports Regulator of South Africa, for consideration by the Regulator.

1   The basis of the 2013/2014 TNPA tariff application

The Transnet National Ports Authority (TNPA) Tariff Application for 2013/14 differs from the Applications submitted in the last three years in several quite important respects. While the technical and conceptual basis retains a revenue requirement methodology, this does not generate a simple "one size fits all" request for a tariff increase applicable to all items in the harbour tariff. Instead, the TNPA has submitted a more wide-ranging Tariff Application for the fiscal year 2013/14, at least in comparison with its predecessors. In several areas, the Application challenges the basis for many of the tariff items contained in the harbour tariff book, and also reconsiders the broad contributions to overall Authority revenue that may be generated, respectively, by the three principal revenue pillars of marine infrastructure and services; cargo dues; and rental income deriving from lease arrangements with various terminal operators and other leaseholders occupying sites owned by the Authority.

This section of our submission will address certain of the higher-level or more conceptual dimensions that render this Application different from those in earlier years. Section 2 deals in a little more detail with certain of the tariff changes proposed in the 2013/14 Tariff Application, Section 3 contains a technical critique of the Authority's basis for the calculation of its cost of capital and return on capital, Section 4 addresses the specific matter of the proposed introduction of a bunker levy in the port of Durban, and Section 5 offers some concluding comments.

A reconsideration by the Authority of the basic architecture of the TNPA tariff arises from an acknowledgement that the existing tariff structure is sub-optimal in many ways. These include concerns that individual tariff items are not clearly based upon

sound cost foundations, that the various broad categories of functions performed by the Authority do not necessarily contribute appropriate proportions of revenue (essentially because prices are not right), and that various sets of port users (the most important of which are vessel owners/operators, cargo owners and terminal operators/leaseholders) do not face a range of charges that are equitable or efficient. These concerns are well founded, and have also been articulated in various ways in the comments made by the authors of this document in their treatment of previous tariff applications.

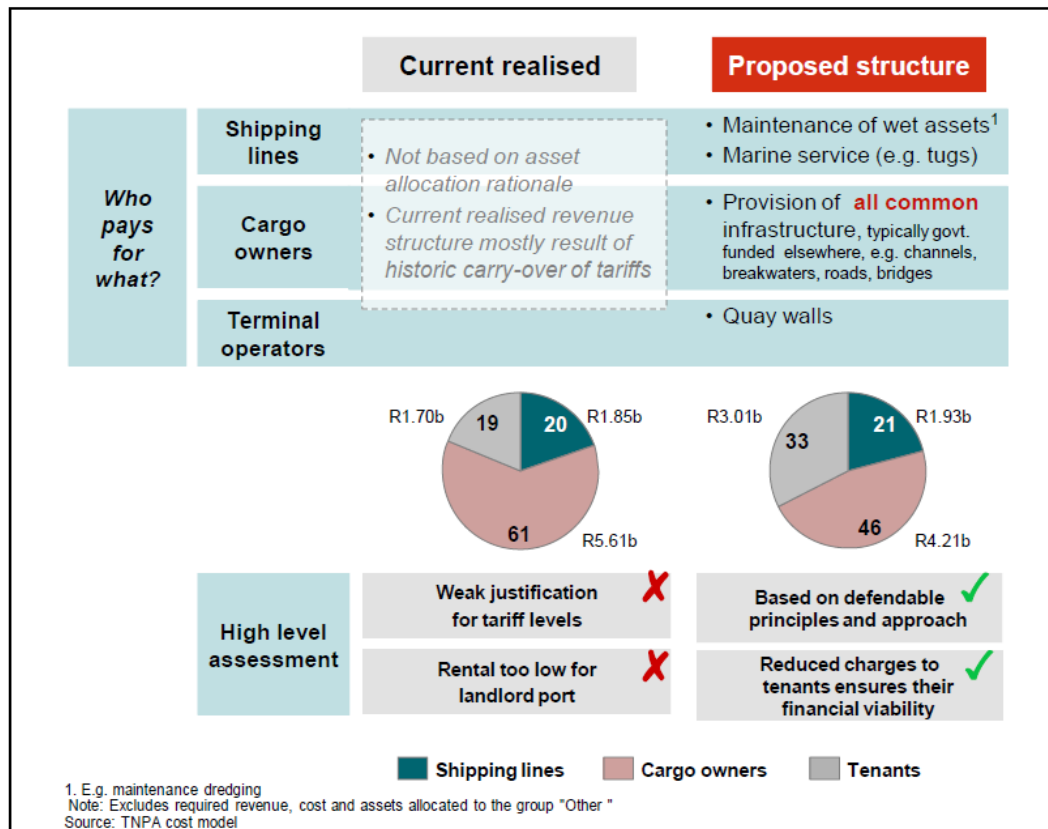Some of these key elements and arguments are set out in sub-section 8.4 of the Application. These include:

- A recognition that cargo dues are far too high in general, particularly in comparison to other major ports, but also that these cargo dues are applied to both broad (such as containerised cargo) and narrow (mainly specific bulk and breakbulk) commodity classes in a haphazard manner that is neither soundly cost-based, nor well aligned to national strategic considerations, such as export promotion in general and promotion of value-added or beneficiated exports in particular. *Our comment here is that this recognition is well founded, very welcome and long overdue. It has been our contention for some time that the South African port tariff system is unduly burdensome for cargo owners, in the sense that excessively high and non-cost-based cargo dues constitute a severe disincentive to port traffic growth, since marginal parcels of cargo, most notably high-value containerised cargo, are discouraged by the tariff structure.*

- An assertion that charges for marine services (and by implication also port dues as charges for the ports' basic marine infrastructure?*) are in some sense too low, in the process "resulting in the cross subsidisation of some services" (Application, p.53). *Our comment here is more equivocal. A tariff structure in which cargo charges are too high relative to vessel-related charges, in other words crudely where ports are relatively expensive for cargo owners and relatively cheap for ship owners, is seriously unfortunate for the same growth and disincentivising reasons expressed in the first comment above. There is abundant evidence that the South African ports are expensive for cargo owners, and to an excessive degree, but any allegation that marine-related charges are too low requires more serious analysis, including a detailed analysis of related costs on an appropriate cost basis. This analysis is not provided in the Application, while cost studies conducted*

by Maersk Line show the ports to be high-cost ports in most areas other than pilotage. The latter is, in any event, largely a matter of physical port geography, so simple comparisons are not easily made. Marine charges, both infrastructural charges such as port dues and charges for marine services such as pilotage, tug and berthing service charges, have also risen substantially, indeed by some 500 per cent, from the last year before the 2002 tariff reform process, to the current levels.

- An assertion that revenue generated from the real estate business of the Authority, which was not included in previous Applications, is low in relation to comparator ports that operate as landlord ports. This generates key tariff implications that will unfold over time, and which will be dealt with more fully below.

Some very significant recommendations flow from these arguments. The most pivotal high-level recommendation is that the Authority's overall revenue cake should be cut into very different slices, when viewed from the broad revenue contributions made by the carrying lines, cargo owners and terminal operators/leaseholders, respectively. Sub-section 8.5 of the Application shows that cargo owners contribute the lion's share of port charges (61%) through cargo dues, that the shipping lines contribute some 20% through port dues and marine service charges, while rental income makes up the remaining 19%. A radically new demarcation of these revenue boundaries is proposed, with the weight wielded by cargo dues falling substantially but unevenly across commodity classes to 46% of total revenue; with shipping lines paying somewhat higher tariffs, such that their overall contribution rises to 21% of total revenue; while the contribution of terminal operators (leaseholders) is planned to rise by a whopping 77% to reach a revenue share of 33%. This will certainly not be attained through the tariff changes recommended in the current Application, but the latter does set out (p. 54) a longer-term view of this unfolding process, at least as it is planned:

Diagram 5: Proposed structure of required revenue

Who pays for what?		Current realised	Proposed structure
	Shipping lines	*Not based on asset allocation rationale* *Current realised revenue structure mostly result of historic carry-over of tariffs*	• Maintenance of wet assets[1] • Marine service (e.g. tugs)
	Cargo owners		• Provision of **all common** infrastructure, typically govt. funded elsewhere, e.g. channels, breakwaters, roads, bridges
	Terminal operators		• Quay walls

Current realised:
- R1.70b — 19
- R1.85b — 20
- 61 — R5.61b

Proposed structure:
- R3.01b — 33
- R1.93b — 21
- 46 — R4.21b

High level assessment	Weak justification for tariff levels ✗	Based on defendable principles and approach ✓
	Rental too low for landlord port ✗	Reduced charges to tenants ensures their financial viability ✓

Legend: ■ Shipping lines ■ Cargo owners ■ Tenants

1. E.g. maintenance dredging
Note: Excludes required revenue, cost and assets allocated to the group "Other"
Source: TNPA cost model

While an arrangement that shifts the charges burden away from cargo owners (if that is indeed what would transpire, and that outcome, as will be argued below, is far from certain) is welcome, this schema contains some quite bizarre conceptual dimensions. If the proposed structure is taken as it stands in Diagram 5's apportionment of "Who pays for what?", the carrying lines are responsible for the financing of the *maintenance* of wet assets, such as fairways, access channels, internal port channels, general water depth and dredging to maintain it, maintenance of buoys and navigational aids and the like; as well as paying for marine services (tugs, pilots, berthing gangs) on a user pays basis. The latter should present no problems, provided (a huge proviso) that costs are determined appropriately. The first dimension is argued to be highly problematic conceptually, but this cannot be addressed sensibly until the collective cargo owners' "who pays for what" is considered. Taken directly from Diagram 5, cargo owners are to be deemed to be responsible for "(p)rovision of **all common** infrastructure…. e.g. channels, breakwaters, roads, bridges". So, then, it is proposed that cargo owners pay for the establishment of all common infrastructure, including the marine infrastructure, and that the carrying lines pay only for the maintenance of the latter. With due deference

to the Authority, this is a truly weird apportionment that would be replicated in few if any other major port systems. What, then would the carrying lines pay for in this regard? Marine infrastructure is by its nature large, lumpy, initially very costly, of extremely long life and confers benefits on all port users in a highly diffuse way. Costs are consequently both fixed and sunk[1] in nature; operating costs are minimal and essentially limited to maintenance dredging costs in ports that require that form of maintenance dredging, while marginal costs of additional infrastructure use are zero – entry by an additional ship, whether large or small, imposes no costs, other than momentary congestion cost, on a ship channel. This would suggest that there is little or no basis for charging what are traditionally termed "port dues" – charges for a port's basic marine infrastructure – other than in ports that require on-going dredging or its alternative, such as a sand by-pass scheme as planned for Durban. A crude application of this tariff philosophy would imply that carrying lines would face virtually no port dues in a non-dredging port such as Cape Town, but would do in Durban, East London or Richards Bay. Such an approach is argued here to be absurd; valuation of marine infrastructural assets and the determination of appropriate prices is a difficult exercise, but it should not be shied away from by subsuming these costs into a homogeneous cost pot to be financed by cargo owners

A third dimension reflected in the diagram above is that terminal operators should pay for quaywalls, but not on a simple cost basis. Whatever the basis for the associated charges are, the charges that terminal operators might face are set to rise gigantically over time. It is through this mechanism that overall rentals as a percentage of the Authority's revenue are planned to be raised from its current 19% to some 33% of total revenue. This is the aspect of the Application that has generated the most intense attention in the press[2] and in reaction from organised commerce and industry [3] . This attention is entirely understandable, with commentators interpreting this re-apportionment of revenues as a reaction on the TNPA's part to three years of frustration in its attempts to gain the Port Regulator's approval for double-digit increases in overall tariffs: in 2010/11 the TNPA applied for a 10.62 percent increase in tariffs across the board and received 4.42 percent; in

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[1] Sunk in the sense that, once installed, elements of a port's marine infrastructure are captive to that location. The (deepened) port access channel of the port of Durban cannot be relocated to Cape Town, nor could the expensive marine infrastructure of Ngqura be moved to a the new DIA port site in Durban, however appealing that prospect might be!
[2] See, for example, Terry Hutson's entertaining and well-argued "Tariff application a wolf in sheep's clothing" in the Natal Mercury, 14 November 2012.
[3] See, for example, the comments emanating from the Cape Chamber of Commerce as reported in "Ports & Ships" (www.ports.co.za), 9 November 2012.

2011/12 the Authority applied for 11.91 percent but received 4.49 percent; while in 2012/13 a considerably more ambitious application was made for an increase of 18.06 percent but the Regulator approved 2.76 percent.

In this context, a wholesale shift of major sources of revenue away from cargo dues and towards rental payments may well be seen as a way of "getting round the Regulator", since the latter has no oversight over the pricing levels of either TPT, the Transnet in-house port terminals operator that controls container, automotive, some breakbulk and a few dry-bulk terminals, or over the tariffs charged by private terminal operators, who dominate the liquid-bulk trades, coal and many other dry bulks. These terminal operators, whether inside or outside the Transnet family, may reasonably be expected to pass increased real estate costs on in the form of higher end-user charges, hence the burden falls, as before, foursquare on the community of cargo owners. This process will presumably unfold over a period of time, although the critical TNPA/TPT relationship may be quicker to manipulate and also more challenging for the Regulator to manage. This whole matter has been dealt with here not because of its immediate impact on the 2013/14 Application, but because of its deep longer-term implications, and the regulatory challenges it raises. Indeed, our understanding is that rental levels will, as the Application states, "not (be) a subject of tariff increase requested in this application" (p. 48).

It is clear from the Application that a process of engagement with the Regulator over a new tariff architecture is incomplete, as is engagement over the Authority's intention to institute a multi-year tariff application process with a smooth tariff trajectory holding over a 5-6 year time horizon, rather than the submission of discrete annual applications with varying requested tariff increases that follow peaks and valleys in capital spending. That said, it is equally clear that the current application constitutes a first, planned step in these processes.

2   Key elements of the 2013/14 Tariff Application

Application of the revenue requirement methodology utilised by the Authority in its current and recent applications, and on the basis of the Authority's estimates of the cost of capital (rather than the more modest estimated values set out in this report in section 3 below), generates a revenue requirement of R10 978 million, comprising real estate business revenue of R1 856 million and marine business revenue of R9 122 million. The achievement of this required revenue would be associated with an overall tariff adjustment of 14.2 percent for the fiscal year 2013/14, where, as

before, such tariff increment is positively related to the discrepancy between the required revenue and the expected revenue for the current fiscal year, and is negatively related to expected growth in port traffic (vessels and/or cargo volumes).

The 2013/14 Application does not, however, call for an overall 14.2 percent upward tariff adjustment across the full gamut of tariff items, but rather presents a more complex and nuanced set of requests.

The first of these relates to the trajectory of future tariff adjustments. With major spikes in expenditure in future years as a consequence of the Authority's capital expansion projects, a lockstep application of the revenue requirement methodology would produce applications for spiked tariff adjustments. Although current regulations do not allow for a smoothed, multi-year application approach, the Authority clearly plans to follow such an approach, and is engaged with the Regulator to do so. That may be reasonably good news, but if and only if the Authority's cost base is estimated appropriately and therefore if and only if the requested adjustments are consistent with those properly-calculated costs. A negative dimension of the current discrete year-by-year application process is that tariff adjustments (or at least requested tariff adjustments) operate pro-cyclically rather than anti-cyclically. Other things being equal, the lower is the level of traffic growth, the higher proposed tariff hikes will be, and vice versa. A distressed sea transport industry therefore always faces higher potential port price increases than an industry that is prospering on the back of strong traffic growth. A damping down of these pro-cyclical tendencies would be welcomed.

That is the good news; the bad news is the steepness of the flight path of the proposed smoothed tariff trajectory. What is further galling is that the Authority presents this trajectory as a grudging concession to its developmental role. It would like to call for a multi-year annual increase of 9.68 percent up to fiscal year 2018/19, which would equate roughly to CPI + 4% over this 5/6 year period, but "mindful of Transnet's commitment to reducing the cost of doing business in South Africa", and "in anticipation that a multi-year tariff application approach will be adopted by the next tariff application FY 2014/15", the Authority indicates that it "could sustain a 8.5% per annum tariff adjustment (CPI + 3%) over the remaining years of the Transnet MDS" (all p.7), although this generous inflation-plus scenario does not include the construction costs of the proposed dig-out port in the former Durban International Airport (DIA) site. This is very different from the Regulator's earlier but now

discarded mantra of (CPIX – X) as a broad tariff guideline. With the prospect of six years of (CPI + X) escalation in the costs of conducting seaborne commercial operations through the ports, it is imperative that the Regulator interrogate very closely the cost basis upon which this inflationary scenario is predicated. This matter, notably the basis for the Authority's estimates of its costs of capital, is taken up in much greater technical detail in section 3, below.

When seen against the prospect of this long, uphill user-cost trek, the current application presents somewhat more modest adjustment requests. The Authority proposes to cap its revenue requirement at R10 275 million (a figure that we contend is still excessive) for fiscal year 2013/14, comprising R8 419 million from marine business and R1 856 from real estate business. This translates into a 5.4 per cent increase in general marine- and cargo-related related tariff items, with the exception of special treatment of certain cargo dues. These exceptions are:

- Minimum cargo dues of R6-00 per ton for all exports of dry-bulk and breakbulk commodities[4], as a first step towards a simplification of the current quite complex and at times idiosyncratic range of cargo dues magnitudes attracted by specific commodities, but with the expectation that many of these rates will increase further in the future. The immediate impact of this cargo dues floor will be on the high-volume export trade in thermal coal, while other affected commodities will be chrome ore, cement/clinker and magnetite;

- Quite significant reductions in average cargo dues on exports of motor vehicles on their own wheels; and

- Significant downward adjustments in the cargo dues treatment of full export containers and more modest reductions in import full box rates. Some further detail of the proposed automotive and container cargo dues is set out below (excerpt taken from the Application – Table 35).

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[4] A few import rates, on commodities such as sulphur and salt, remain marginally below this R6-00 per ton export floor, as per the proposed tariff book.

Table 35: Container & Automotive export

	Tariff book tariff12/13	FY 12/13 export cargo dues discount programme	Tariff book tariff12/13 after discount	13/14	Dev. R tariff 13/14 vs 12/13	Dev. % tariff 13/14 vs 12/13
Container Full export:						
6m/20' containers R	1 082	740	342	614	-467.37	-43.2%
12m/40', 13m/45' containers R	2 163	1 820	343	1 228	-934.76	-43.2%
Container Full import:						
6m/20' containers R	2 178	-	2 178	1 866	-312.07	-14.3%
12m/40', 13m/45' containers R	4 355	-	4 355	3 731	-624.10	-14.3%
Automotive export:						
Motor vehicle own wheels average tariff	**430.00**	**200.00**	**230.00**	**315.12**	**-114.88**	**-26.7%**

These reductions of 43.2 percent in cargo dues on full container exports, 14.2 percent on full container imports and 26.7 percent on vehicle exports are welcome, and also embody some attractive strategic dimensions, provided that gains are not eroded by later unregulated increases in TPT tariffs once increased rentals work through, should this eventuate. A reduction in the costs of conducting export business in containers, particularly in relation to conducting breakbulk or parcel-bulk business in the ports, may have the positive impact of increasing the container penetration ratio of these exports, in the process mitigating some of the current liner trade imbalances that witness a fair incidence of empty export containers. This would be good news for cargo owners, the carrying lines and the ports.

Some more minor comments of a critical nature are that the proposed container tariff changes will widen even further the discrepancy between charges on import and export full boxes (from roughly 2 to 1 to a little more than 3 to 1). These variances are not cost based, since from a terminal and cargo infrastructure point of view "a box is a box", whether that box is shipped or landed. Holding down the cost of landed imports is also consistent with a reduction in overall industrial costs in South Africa, particularly in the case of landed capital goods and intermediate goods that serve as inputs in local production processes. A more nuanced, commodity-specific approach, may therefore warrant tariff consideration.

A further observation is that in the authors' view the maintenance of rates for 12m/40' boxes at twice the levels attracted by 6m/20' boxes is unfortunate and non-strategic. One of the objectives of an optimal port tariff structure is to promote efficient

behaviour on the part of port users. In this case, a greater utilisation of larger as opposed to smaller containers would be a strategic plus for potentially congested container terminals and congested terminal/landside distribution processes. The carriage of larger containers also does not impose appreciably greater costs on the common wet and dry port *infrastructure* that cargo dues are designed to finance. Consideration of a reduction in the higher cargo dues imposed on 12-metre container would consequently be strategically sensible.

The greatest concerns this report has with the Application and with the wider view that the Authority takes of the price-making process, are not related to individual tariff items, but to the broader question of whether port prices are related reasonably to associated port costs, and consequently whether the Application as a whole rests on an appropriate and convincing cost foundation. The most significant component of these costs is capital costs, unsurprisingly so, given the capital intensive nature of port operations, and the costly but long-lived nature of port assets. Our strong view is that the Application does not rest on a robust cost foundation, and particularly not on an appropriate estimation of the cost of capital. A technical discussion of this aspect, and the technical heart of this report, follows in section 3, below.

3 The costing methodology in the application – the cost of capital

3.1 Introductory comments

The point of departure in determining the Port Authority's Revenue Requirement is the estimation of its Return on Capital.

The Port Authority calculates its Return on Capital using the following formula:

$$ROC = RAB \; x \; WACC$$

where WACC refers to a Real Vanilla WACC. The Regulator has accepted the Real Vanilla WACC methodology.

The Port Authority has estimated a Regulatory Asset Base (RAB) of R66 315m and a Real Vanilla WACC of 8.33%. Accordingly, the Port Authority estimates a Return on Capital of R5 525m as follows:

ROC = R66 315m x 8.33%

= R5 525m

This submission will evaluate the Port Authority's estimate of the Real Vanilla WACC and accordingly its estimated Return on Capital. It is submitted, for reasons which will be set out below, that the Real Vanilla WACC estimate is excessive.

3.2 The Real Vanilla WACC

The formula for the Real Vanilla WACC is:

$$WACC = gK_d + (1\text{-}g)K_e$$

Where:

- g is the gearing applicable to the Port Authority
- K_d is the real pre-tax cost of debt
- K_e is the real after-tax cost of equity

Gearing is equal to Debt / (Debt + Equity).

Estimates of the real cost of debt and real cost of equity rely on an inflation rate estimate of 5.4%. This is assumed to be correct.

Two of these inputs – the gearing and the real pre tax cost of debt – cannot be readily challenged based on the limited information supplied by the Authority in its application. This paper assumes that these inputs are correct.

The Port Authority estimates that:
- Its gearing (D/(D+E)) is 36%. This implies a debt-to-equity ratio of 56% (D/E);
- Its pre-tax nominal cost of debt is 9.76%, which translates to a real pre-tax cost of debt of 4.14% ((1.0976 / 1.054) – 1).
- This further translates to a nominal after-tax cost of debt of 7.0272% (9.76% x (1 – 0.28)) and a real after-tax cost of debt of 1.54% ((1.070272 / 1.054) – 1).

The Port Authority estimates that its real after-tax cost of equity is 10.69%. This estimate is with respect, excessive.

3.3 The cost of equity estimate

The cost of equity reflects the post-tax required rate of return on equity. The cost of equity is almost always a post-tax estimate because an equity interest is a residual

claim on a firm's assets – the tax authorities have a prior claim to a share of an entity's profits.

The real after tax cost of equity is the [after tax] cost of equity adjusted, using the Fisher relation.

The standard method of determining the cost of equity is the Capital Asset Pricing Model (CAPM) and this approach has been followed by the Port Authority:

$$k_e = r_f + \beta \; x \; MRP$$

The model requires three inputs: an estimate of the risk-free rate (r_f), an estimate of the Authority's CAPM beta (β), and an estimate of the expected market risk premium (MRP).

3.3.1   The risk-free rate

The Port Authority proxies the risk-free rate using the R186 government bond. This is an acceptable proxy. Using a macroeconometric forecasting model, the Authority estimates a yield to maturity for the bond of 8.36% and adopts this as its estimate of the nominal risk-free rate.

The Port Authority does not supply any information that would permit an assessment of the statistical validity of its forecasting model. Nevertheless, the estimate of 8.36% seems reasonable given that over the 60 month period December 2007 to November 2012, the average end of month yield to maturity (MTM) of the R186 is 8.54%, the median end of month yield is 8.59%, the highest end of month yield was 10.48% (June 2008) and the lowest 7.16% (December 2008) (the mid-point between highest and lowest yields is therefore 8.82%).

The estimate of a real risk free rate of 2.81% ((1.0836 / 1.054) – 1) is therefore acceptable.

3.3.2   The market risk premium

The market risk premium (MRP) adopted by the Port Authority is 6.3%. This is based on the Regulator's record of decision.

In a major study of South African financial managers' capital budgeting practices by Correia and Cramer (2008: 43-44), it was found that the average market risk premium adopted by South African financial managers is 5.35%.

Credit Suisse's Global Investment Returns Yearbook 2012 (citing Dimson, Marsh and Staunton (2012)) reports the following historical market risk premia for the South African market:

Figure 2
Equity risk premium over 10 to 112 years
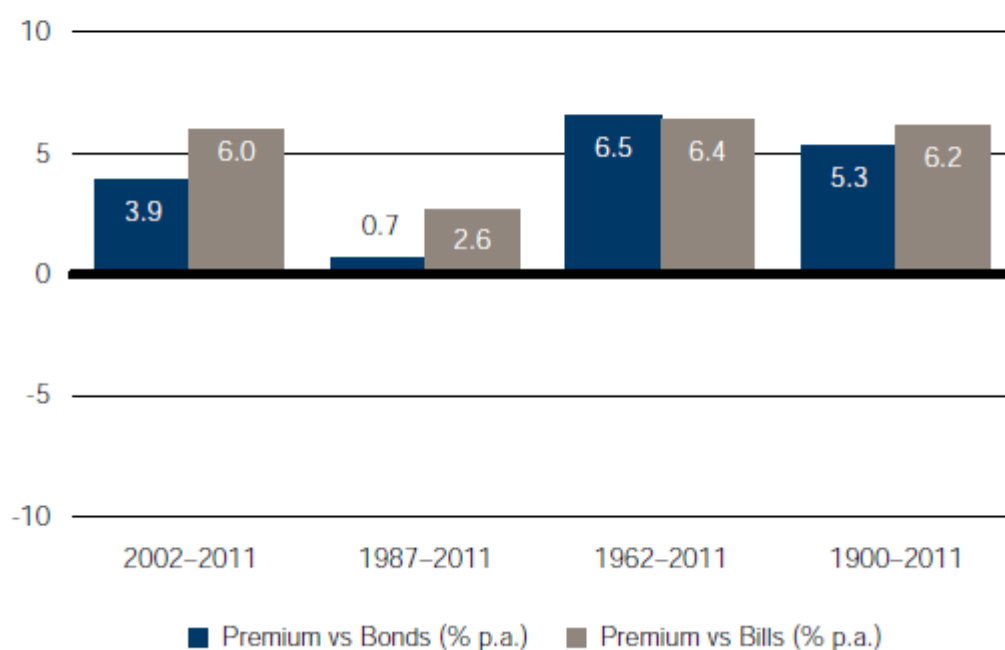
The Authority has adopted the R186 bond yield as the basis of their risk free rate, and therefore the average long-term MRP is 5.3%, while the average over the past 10 years is just 3.9%. The temptation to regard the recent fall in historical average market risk premia arising from the economic difficulties experienced globally from 2007/2008 as a statistical anomaly should be resisted. Economic crises happen. The absence of a crisis this significant for so many decades has arguably had the effect of inflating market expectations of returns, because these expectations are generally determined with reference to historical returns (see Fernandez et al (2011:11)). It is submitted that there is no reason why a more conservative estimate of the MRP should be adopted going forward. An MRP estimate of 5.3% (reflecting the revised

historical average) is therefore proposed as an alternative to the Port Authority's
suggestion of 6.3%.

3.3.3 The CAPM beta

In terms of the standard CAPM model adopted by the Authority, the cost of equity is
directly linked to the exposure of an asset to systematic or market risk within its
domestic market. Systematic risk or market risk is risk that cannot be diversified
away through the construction of a portfolio of assets – it is therefore the risk that is
inherent in a particular financial market. By assumption, the domestic market
portfolio, typically proxied by the index of the domestic stock exchange, is regarded
as embodying the systematic risk present applicable to domestic firms. Accordingly,
beta is measured as the covariance of the asset's returns with those of the market
index, normalised by the variance of the latter (see Elton et al, 2011: 133, 282-8).

The Port Authority, being an unlisted entity, has experienced considerable difficulty in
determining the appropriate beta to be used. In consequence, the Regulator has
adopted an asset beta of 0.50, namely that used by the Queensland Competition
Authority (QCA) for ports.

For its 2013/2014 application, the Port Authority has proposed the use of the beta of
the JSE Top 40 Companies Index on the basis that the companies reflected in the
index "are fairly active in the domestic, regional and international space and their
exposures to market risk can be considered a fair reflection of global risk" while "[t]he
Authority provides a platform for the South African market (import & export) to trade
and compete globally with 98% of seaborne cargo moving through the port system."

With all due respect to the Port Authority, this suggestion is ludicrous. The
companies comprising the Top 40 Companies Index are private enterprises that are
obliged to compete with both domestic and foreign competitors. They must constantly
strive to obtain competitive advantage if they are to remain viable. The Port Authority
is a regulated monopoly operating in an industry for which demand is largely
inelastic. While the Port Authority may be exposed to the same market risk factors as
the companies making up the Top 40 Companies Index, there is no reason to believe
and indeed considerable reason to doubt that its operations are as sensitive to these
risk factors.

By proposing the use of the Top 40 Companies Index as a beta proxy it is noteworthy that the Port Authority arrives at an asset beta of 0.8907, considerably higher than the asset betas of 0.62 and 0.83 it proposed in its 2011/12 and 2012/13 tariff applications, respectively.

It must also be pointed out that the Top 40 Companies Index is closely correlated with the All Share Index, given that its constituents represent a substantial proportion of the total market capitalisation of the JSE.

If the price returns for the Top 40 index over the past 60 months (December 2007 to November 2012) are regressed on those for the All Share Index,[5] an estimated beta of 1.065 is obtained. Furthermore, over the past 60 months, the Top 40 Companies index has a mean monthly return of 0.50% with a standard deviation of 5.74% while the All Share Index has a mean monthly return of 0.52% with a standard deviation of 5.36%. In essence, then, the Port Authority, in seeking to adopt the Top 40 Companies Index as its beta proxy, is suggesting that it faces the same systematic risk structure as the South African equity market as a whole.

A more appropriate approach would be to estimate the betas of foreign comparator firms with reference to a common market portfolio, such as the world market portfolio, proxied by the MSCI World Index. Such an approach would imply adoption of what is known as the ICAPM model, which simply substitutes a world index for the domestic market index (the domestic risk-free rate is retained);

$$K_e = r_f + \beta(E[r_w] - r_f)$$

Given the increasing integration of international financial markets, including South Africa's, there is a strong case for using the ICAPM on the basis that the domestic CAPM does not fully take into account the opportunities for investors in domestic markets to take advantage of international portfolio diversification to diversify away domestic systematic risk, and accordingly offers an inefficient and excessive estimate of the cost of equity.

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[5] Applying the commonly used market model approach to beta estimation i.e. $R_{it} = a + bR_{Mt} + e_{it}$.

In the case of the Authority, due to its domestic monopoly, and the lack of domestic comparator firms, it is submitted that the ICAPM should be employed based on practical considerations.

To give a simple illustration of how the ICAPM might work, as well as the difficulties in the approach adopted by the Port Authority, returns data on the following indices were obtained from MSCI-BARRA for the 60 month period December 2007 to November 2012: Australian Infrastructure Index, Emerging Markets Infrastructure Index, the South Africa (Large and Mid Cap Index) and the World Index (Large and Midcap). The two infrastructure indices are proposed as (admittedly crude) proxies for the Port Authority, the South Africa index as a proxy for the Top 40 Companies Index while the World Index becomes the market index for use in the CAPM. Returns are measured in dollars.

Credit Suisse's Global Investment Returns Yearbook 2012 provides an estimate of the market risk premium for a proxy world portfolio of 3.5% per annum (measured in US dollars and based on the historical market risk premia of 19 countries, including South Africa, over the period 1900-2011) and reports that the historical average real return on bonds for the countries making up the proxy world portfolio is 1.7% per annum (also measured in US dollars). The latter figure is used as a proxy risk free rate.

Regressing the infrastructure and South African indices on the proxy world index,[6] the following betas and estimates of the real cost of equity (measured in US dollars) are obtained:

	AUSTRALIA INFRASTRUCTURE	EM INFRASTRUCTURE	SOUTH AFRICA
Beta	0.94	0.91	1.24
MRP	3.50%	3.50%	3.50%
Beta x MRP	3.28%	3.20%	4.34%
Real Risk free rate	1.70%	1.70%	1.70%
Real Cost of equity (USD)	4.98%	4.90%	6.04%

It is submitted that there is no reason why the Port Authority should not be able to apply an ICAPM model in estimating the cost of equity. Furthermore, the above

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[6] I.e. estimating the betas using a market model.

estimates strongly suggest that the Port Authority's approach to determining beta leads to an excessive estimate of the cost of equity, given the nature of its operations.

Accordingly, it is suggested that until such time as the Port Authority adopts an appropriate model for estimating the beta and is able to substantiate the validity of such model, the Regulator should continue to apply an asset beta of 0.50 in line with its recent decisions.

3.3.4 The levered cost of equity

It is submitted that the Port Authority has used an incorrect method to determine the equity (levered) betas. The Port Authority has applied a form of the Hamada method - $\beta_e = \beta_a(1+(1-t)(D/E))$ - that is suitable only for entities that have risk-free debt, while at the same time assuming that its debt is risky. This is apparent from the spread of 1.4% between the nominal risk-free rate (8.36%) proposed by the Authority and its estimate of its nominal pre-tax cost of debt (9.76%). The required rate of return for risky debt, just like that for equity, can be estimated using the CAPM:

$$K_d = r_f + \beta_D \text{ x MRP}$$

The appropriate form of the Hamada equation when an entity has risky debt is as follows:[7]

$$\beta_e = \beta_a + (\beta_a - \beta_d)(1-t)(D/E)$$

Here β_d represents the beta of the entity's debt beta. If the debt is risk free, this beta is zero, and the equation reduces to that used by the Authority. It follows that if the cost of debt, risk-free rate and MRP are known, the debt beta can be computed as:

$$\beta_D = (K_d - r_f) / MRP$$

When the Authority's cost of debt estimate is plugged into a CAPM model along with its inputs for the risk free rate (8.36%) and its MRP estimate of 6.3%, it can be seen that its debt beta is:

$$\beta_D = (9.76 - 8.36) / 6.3 = 0.22$$

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[7] S Ross et al *Corporate Finance* 5 ed (1999) p449

If the revised MRP estimate of 5.3% is used, the debt beta will be slightly larger:

$$\beta_D = (9.76 - 8.36) / 5.3 = 0.264$$

Assuming an asset beta of 0.50, the equity beta obtained using the form of the Hamada method employed by the Authority would be as follows:

$$\beta_e = 0.5(1 + (0.72)(0.56)) = 0.702$$

Assuming an asset beta of 0.50, the equity beta obtained using the proper form of the Hamada method would be as follows:

$$\textit{If MRP} = 6.3\%: \beta_e = 0.5 + (0.5 - 0.22)(0.72)(0.56) = 0.612$$

$$\textit{If MRP} = 5.3\%, \beta_e = 0.5 + (0.5 - 0.264)(0.72)(0.56) = 0.595$$

The equity beta actually used by the Port Authority is 1.2514.

3.3.5   Revised estimates of the real cost of equity

The Port Authority's estimate of the real cost of equity, based on an MRP of 6.3%, an asset beta of 0.8907 and an equity beta of is determined as follows:

$K_e = r_f + \beta \times MRP$

= 2.81% + 1.2514 x 6.3%

= 2.81% + 7.88%

= 10.69%

The following table sets out revised estimates of the real post-tax cost of equity assuming that an asset beta of 0.5 is used (as per the QCA and as adopted by the Regulator), depending whether the correct (debt beta) version of the Hamada method is used to determine equity betas, and depending on which estimate of the MRP is used, 5.3% or 6.3%:

ESTIMATES OF POST-TAX COST OF EQUITY

Asset beta	0.5	0.5	0.5	0.5
MRP	5.30%	5.30%	6.30%	6.30%
Correct Hamada model	**No**	**Yes**	**No**	**Yes**
Debt beta	0	0.264	0	0.22
Equity beta	0.702	0.595	0.702	0.613
Real Risk Free Rate	2.81%	2.81%	2.81%	2.81%
Risk Premium	3.72%	3.15%	4.42%	3.86%
Real Cost of Equity	**6.53%**	**5.96%**	**7.23%**	**6.67%**

For the reasons given above, it is submitted that the most appropriate estimate of the post-tax cost of equity is that obtained using the correct Hamada method and an MRP of 5.3%, namely 5.96%. If the Regulator were to retain an MRP estimate of 6.3%, then the post tax cost equity using the correct Hamada method would be 6.67%.

3.4   Revised Real Vanilla WACC and ROC estimates

Using the revised estimates of the post-tax real cost of equity, the following revised estimates of the WACC and Return on Capital are obtained:

ESTIMATES OF WACC AND ROC

Real Cost of Equity	**5.96%**	**6.67%**
Post Tax Real Kd	4.14%	4.14%
Gearing	36%	36%
Real Vanilla WACC	**5.31%**	**5.76%**
RAB	66315	66315
Return on Capital	**3519.71**	**3819.74**

Using what is submitted to be the appropriate cost of equity of 5.96% (reflecting an MRP of 5.3%), the Real Vanilla WACC drops from 8.33% to 5.31%, and the Return on Capital is reduced by a little over R2 bn.

3.5   Revised Revenue Requirement

To determine the revised Revenue Requirement, it is necessary to establish the tax implications of the reduced ROC. An approximate estimate of the change in tax is

obtained as follows (ROC is a post-tax amount; therefore a reduction in ROC of R1 indicates a reduction in Revenue by some larger amount that is reduced by a tax saving):

$\Delta TAX = t(\Delta ROC + \Delta TAX)$

$\Delta TAX = t\Delta ROC + t\Delta TAX$

$(1-t)\ \Delta TAX = t\Delta ROC$

$\Delta TAX = t\Delta ROC\ /\ (1-t)$

Where t denotes the corporate tax rate of 28%.

Using a revised ROC of R3 519.71m, the tax saving can be estimated as follows:

ESTIMATE OF TAX REDUCTION

TNPA'S ROC ESTIMATE	5525
REVISED ROC	3520
ΔROC	-2005
T	0.28
ΔTAX	-780

Depreciation, operating expenses and clawback (which is historically determined) are unaffected by the change in WACC and ROC.

Accordingly, the revised revenue requirement would be as follows:

ESTIMATED OF REVISED REVENUE REQUIREMENT

TNPA'S REVENUE REQUIREMENT	10978
ΔROC	-2005
ΔTAX	-780
REVISED REVENUE REQUIREMENT	8193

The reduction in Revenue of R2 785m comprises a reduction in the tax charge of R780m (0.28 x R2 785m) and a reduction in the ROC of R2 005m (0.72 x R2 785m).

The estimated revised Revenue Requirement is therefore R8 193m. If the Real Estate income of R1 856m is subtracted from this, this leaves permissible Marine

Business Income of R6 337m. This represents a reduction on the estimated 2012/13 Revenue.

This reduction is explained by a significant reduction in the cost of funds due to changing market conditions, as well as a proposed correction to the Authority's method of determining equity betas:

1. The nominal risk free rate proposed by the Authority, 8.36%, reflects a drop of 0.1% relative to the 2012/13 rate of 8.46%.
2. The pre-tax real cost of debt proposed by the Authority is a reduction of 0.37% over the 2012/13 rate of 4.51%.
3. It is recommended that an MRP of 5.3% rather than 6.3% be used, to better reflect the long-term historical average MRP. This reflects a 1% reduction on the MRP estimate used in 2012/13.
4. The Hamada formula used by the Authority (and accepted by the Regulator) in 2012/13 overstates the risk of equity attributable to the Authority. The version of the formula used in 2012/13 (and which the Authority proposes be used in determining the 2013/14 tariff) would only be appropriate if the Authority's debt is risk free, which according to the Authority's own measurement, it is not.

The revision to the Revised Revenue Requirement also implies an extremely low effective tax rate. However, this is not surprising given that the Authority enjoys a fairly generous special allowance in terms of section 12F of the Income Tax Act 58 of 1962, which provides for an annual capital allowance of 5% per annum in respect of the cost of "port assets", which are defined as "any port terminal, breakwater, sand trap, berth, quay wall, bollard, graving dock, slipway, single point mooring, dolos, fairway, surfacing, wharf, seawall, channel, basin, sand bypass, road, bridge, jetty or off-dock container depot, and includes any earthworks or supporting structures forming part of such terminal, breakwater, sand trap, berth, quay wall, bollard, graving dock, slipway, single point mooring, dolos, fairway, surfacing, wharf, seawall, channel, basin, sand bypass, road, bridge, jetty or depot and any improvements thereto." Indeed, even on the Authority's own estimates of the revenue requirement, the effective tax rate is fairly low.

4   Introduction a bunker fuel levy in the Port of Durban

A final aspect of the 2013/14 tariff application to be considered here concerns the proposed introduction of a R15-00 per ton levy on the provision of bunker fuel to vessels in the port of Durban. This is dealt with in sub-section 8.6 of the application.

The basis for the levy is argued to be the need for additional wharf and berthing infrastructure in the Island View 10 area to allow two bunker barges to be loaded simultaneously. The need for this additional infrastructure arises from the greater utilisation of barges to deliver bunker stems to vessel in various parts of the port, following the phase-out of quayside pipeline delivery. The application indicates than "an amount of R57.5 million for the execution phase of the project has been approved" (p.58) and that the initiative is supported in principle "by industry". It is not clear what particular section of the industry is referred to here.

The introduction of such a levy raises a number of concerns. In principle, where very specific groups of port users are the beneficiaries of an initiative, both the "user pays" principle and the benefit principle in simple public finance theory would suggest that a levy of broadly this nature might make some sense, and there are other recent examples from other major ports that have followed this line[8]. A broader view of the proposed levy is, however, taken here, and indicates that its introductio may make little sense in terms of direct revenue terms for the Authority, and even less for the wider port community.

Some comments of a contextual nature may be appropriate here. Approximately 2 million tons of ships' bunkers of various grades are delivered to vessels in the port of Durban annually. Two very distinct sets of users may be identified. The first comprises vessels making use of Durban as a terminal port, and taking bunkers as part of this process. On the basis of a study undertaken in 2005 by one of the

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[8] One quite interesting example of a focussed levy may be found in the port of Melbourne, where the costs of deepening certain approach channels in Port Philip Bay were financed by an infrastructure fee applicable to larger vessels, but not to smaller short-sea and Bass Strait vessels that would not require the additional water depth, and therefore would not be direct beneficiaries of the channel deepening. Such an approach may make some superficial sense, although it may be less defensible in broader terms, just as the Durban bunker levy is argued here to be, on grounds that the short-sea vessels may indeed benefit from greater transhipment and feeder business that would result from an ability to attract larger and more cost-efficient container vessels to a putative "hub" port.

authors of this submission for the then ASABOSA[9], these "terminal" callers accounted for roughly three-quarters, or some 1.5 million tons, of bunker volumes delivered. This set of users is largely captive to the port, though not necessarily to the bunker industry, as the vessels may take bunkers at other ports of call on their respective voyages. The second set of users may be termed "genuine" bunker or transit callers, insofar as the sole or at least principal purpose of their calls to Durban port is to take bunkers, although while doing so, they may also utilise the services of ship chandlers, effect minor repairs, and use other services in the port-ancillary community. More importantly for this exercise, though, these vessels also utilise the marine infrastructure and marine services provided by the TNPA, and they pay accordingly. This second set is the junior partner in the bunker supply market in Durban, absorbing (on the basis of the 2005 bunker study), roughly one-quarter of volumes delivered. The attention in this submission will be rather more on this smaller category, on the grounds that this group of port users is considerably more footloose, in the sense that there is no other reason for these vessels to call at South African ports, except if the latter present the least-cost option for such bunker/stores calls. The demand for port calls on the part of these vessels is consequently quite highly price elastic, since patronage may switch to other bunkering centres (such as possibly Las Palmas, Santos or Singapore, dependent upon vessels' voyage routes) if South African port costs are raised. The strategic nature of this set of callers has been recognised in the Authority's tariff structure in the past, by offering a fifty percent discount on port dues to bunker callers whose port stay does not exceed 24 hours, with a further 15 percent discount attracted by callers that are in and out of the ports in 12 hours or less. Any increase in the cost of doing business in the South African ports is likely to deflect this business to other competing ports, of which there are many more in the bunker arena than in the cargo-working arena. Indeed, numbers of bunker callers to the port of Durban in particular, have declined quite markedly over the last three years; TNPA data on vessel movements in Durban show the following:

Financial year	No of bunker callers	Tonnage (grt)
2009/10	1153	21 970 510
2010/11	999	21 439 788
2011/12	796	17 503 811

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[9] "The provision of services to bunker callers in the Port of Durban – A survey of the economic impact on the Durban metropolitan economy", Trevor Jones, School of Economics & Finance, University of KwaZulu-Natal, August 2005.

The decrease has been particularly noticeable from 2010/11 to 2011/12, but over the last three years the data show that bunker activity in Durban has fallen by nearly one-third, or from an average of just over three vessel callers per day to some 2.2 callers per day. The consequences of a decrease in bunker/transit traffic are serious, both for the Authority and for the wider port community. The most obvious impact is on the Authority itself, in the form of lost marine revenue. Table 1 below sets out the expenditure on the part of a 20,000 grt bunker caller to the port at 2012/13 tariff levels.

Table 1 TNPA spend for a 20,000 grt vessel making a bunker call in the port of Durban, and spending less than 24 hours in port (all magnitudes at current 2012/13 tariff levels)

Item/service	Expenditure R
Port dues (tonnage charge)[1]	10 048
Port dues (time charge)[1]	3 013
Light dues	12 208
VTS charge	6 800
Pilotage (basic charge)[2]	19 403
Pilotage (vessel size driven charge)[2]	2 028
Tug charges (basic charge)[2]	40 139
Tug charges (vessel size driven charge)[2]	8 858
Berthing services (basic charge)[2]	2 921
Berthing services (vessel size)[2]	2 852
Total TNPA Expenditure[3]	**108 270**

Notes
1. Port dues are calculated on the basis that a typical vessel will attract the 50% discount available to genuine bunker/transit callers that have a port turnaround of less than 24 hours. In cases where callers are in and out in less than 12 hours, a further discount of 15% is applicable.
2. Pilotage, Tug and Berthing service charges are incurred on arrival/docking and undocking/departure. The double services are included here.
3. Other more minor services that are provided by the TNPA, such as running of ships' lines when coming alongside at certain berths, refuse removal, fire protection services in the case of tankers and vessels transporting flammable cargoes and the supply of fresh water, have been excluded. The SAMSA levy is also excluded.

What Table 1 shows is that a typical bunker caller generates TNPA revenue of some R108,300 per port call. A very similar revenue injection of some R112,750, if expenditure patterns estimated in the 2005 bunker study are reflated to 2012 prices, accrues to other income recipients within the port-ancillary community, with the largest beneficiaries being the ship chandlers/suppliers and the ships' agents. All of

these magnitudes pale into insignificance in comparison with the bunker fuel spend itself, which on the basis of an average stem of 600 tons of marine fuel oil (IFO 180) and 30 tons of Gasoil (MGO) at current bunker prices and $/R exchange rates[10] amounts to approximately R3.21 million per caller. On this basis, if 2011/12 activity is maintained at some 800 bunker callers per annum, the first-round expenditure in the Durban port community amounts to:

- R86.62 million in TNPA revenue;
- R90.2 million in private port "cluster" revenue; and
- R2.896 billion in bunker fuel purchases themselves.

From the perspective of the Authority and of cargo-working port callers, this activity is sustained at very low opportunity costs. With barge rather than wharfside pipeline supply now the norm, bunker vessels are no longer captive to the Island View area, but may be handled in any port areas in Durban where spare berths are available, without compromising working vessels. Also, with a clear priority ranking in place in respect of the provision of marine services, with container vessels and car carriers at the top of the ranking, working ships are not relegated in the service queue by transit callers. The bunker and transit traffic base of the South African ports, not simply the port of Durban, represents a lucrative source of business for the port communities in their widest sense, and to jeopardise any portion of this price-sensitive group of port users makers little or no strategic sense.

It is also not clear from the Application whether the proposed levy is envisioned as a one-off event, or at least as a burden of short duration. On a fuel supply base of some 2 million tons per annum, the levy will generate revenue of R30 million in the first year of application and will pay for the berth infrastructure costs in less than two years. This approach, should any levy at all be contemplated, is at odds with the spirit of much of the rest of the Application, which argues against one-off or occasional price shocks and in favour of smoothed price adjustments, over a five- to six-year interval. As a worst-case intervention, the extended barge berth infrastructure could be financed through a R5 per ton levy over a fixed period of six years, before falling away, but that is seen here very much as a second best. A first-best strategic solution would see no levy in place at all; at the end of the day, should the levy deflect ten percent of the port's bunker callers, the loss in TNPA marine

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[10] As of the end of the first week of December 2012, IFO 180 was on offer in Durban at $616 per ton and MGO was priced at $1110 per ton. A Rand/Dollar of exchange rate of 8,68 has been used, as ruling on 10 December 2012.

revenue would exceed the cost of the berth infrastructure modifications in less than seven years.

5   Concluding comments

This report has sought to interrogate several dimensions of the 2013/14 NPA Tariff Application. We highlight the following principal observations and concerns, which are presented to the office of the Ports Regulator for its attention:

- An acknowledgement on the part of the Authority of concerns with the current tariffing regime, and its commitment to develop a pricing strategy that is more principle based, are welcomed, but we hold the view that the Regulator should be engaged in detail with the principled base and the disaggregated detail of any major structural reconsideration of the tariff, before any irrevocable structural changes are made;

- We welcome a re-examination of the basic revenue shares made by port users to the Authority's revenue, in particular a reappraisal that generates a reduction in cargo dues; but in the same context

- We are deeply concerned that any reduction in cargo dues may be replaced by an increase in lease costs faced by terminal operators, since these will also ultimately fall on cargo owners, and we express our even deeper concern that such a process may render greater areas of port business and in particular the costs to users of that business, outside the purview of the Regulator;

- The introduction of any form of multi-year, smoothed tariff adjustment process must attract the most detailed scrutiny from the Regulator, to ensure that tariff adjustments are based on an appropriate cost base, and that port users are not locked into charges that escalate above the rate of inflation, or that are not based on robust and convincing estimates of cost;

- We view the estimates of costs embodied in the current application as neither robust nor convincing. These concerns centre on the calculation of the real weighted average cost of capital, which our analysis shows to be excessive, driven by an excessive estimate of the Authority's after-tax cost of equity. All of this results in an over-estimation of the Revenue Requirement by over R2 billion, which in turn removes the basis for any upward adjustment in tariffs.

- Finally, and on the narrower canvas of the port of Durban, we argue that the proposed introduction of a bunker fuel levy can be supported neither by longer-term considerations of TNPA revenue nor in strategic terms.

The overall Application should also be viewed in terms of broader rules of reason, and in terms of the overarching economic function of seaports. This function is to lower the generalised cost of through transport in general, and in particular to lower the cost of doing business in and with Southern Africa. The dominating characteristics of the South African ports are that they are high-cost and low-productivity ports when compared with other relevant ports, but they are also ports that are administered by a National Ports Authority that has succeeded in sustaining an excellent record of profitability over a protracted period. Within that context, the prospect of six years of tariff increases well above the level of inflation, towards which this Application is a first step, is not consistent with any rule of reason.

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