Can electricity price hikes be blamed on a lack of competition in the coal markets

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WORKING PAPER – NOT FOR CITATION

1. Introduction

There have been 25 mergers in the coal industry between 2005 and 2012 with 14 of them being large mergers. A number of these mergers involved Glencore subsidiaries or companies that Glencore would ultimately acquire. By the Glencore Xstrata merger in 2012 Glencore had risen to the ranks of a so-called 'major' coal supplier in the South African coal markets with market shares in the top three in each of the tied domestic, residual domestic and export markets. The concentration is immediately apparent from the C4 ratios in the tied domestic, residual domestic and export markets of 90%, 60% and 75% respectively.

At the same time, demand for electricity in South Africa has increased, putting increased pressure on Eskom power stations. The long term life of mine contracts became insufficient with the increased level of output of the power stations. Eskom thus began to source additional volumes from the residual domestic market. In addition, Eskom has, since about the year 2000, adopted a strategy shift away from life of mine contracts and increasing sourced coal from the residual domestic market.

During these changes in the South African coal markets, demand in India and China increased significantly. This resulted in increased demand for RB3 specification coal and directly caused a stark and rapid change in the composition of South African coal exports from RB1 coal to Europe to RB3 coal to Asia. This change in exports changed the dynamics in the South African coal supply markets given the mechanics of the washing process. Domestic customers are facing the double edged sword of relatively lower coal volumes and relatively poorer grades of coal.

It is immediately apparent that higher prices for coal, and the fact that this is not likely to be a fleeting trend, is going to have far reaching negative consequences in the South African economy. South Africa has a number of industries that are likely to lose competitiveness to imports should their electricity costs increase dramatically. Likewise, there are a large number of South African households that would battle to absorb large electricity price increases. It seems likely then that this issue is going to need to be resolved in the near future. It is important to understand the cause for the coal price increases in order to craft the welfare maximising government intervention should it reach that point.

This article seeks to address this issue particularly in the context of the submissions made by Eskom in their witness statement in the Glencore/Xstrata merger. Here Eskom were concerned

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that the recent consolidation in the market, combined with the fact that Glencore is an export oriented firm, is problematic to Eskom and undermining their ability to source low cost coal. In order to evaluate the concerns raised by Eskom this paper unpacks the various potential theories of harm and whether or not the merger is likely to cause a substantial lessening of competition. In order to identify the root cause of the of the coal price increases, this paper then proceeds to evaluate Eskom's coal price problems in the context of the various changes that have taken place in the market. Finally, it ends with a very high level discussion of the various options available to the government should they seek to intervene in the market.

2. History of the South African coal market

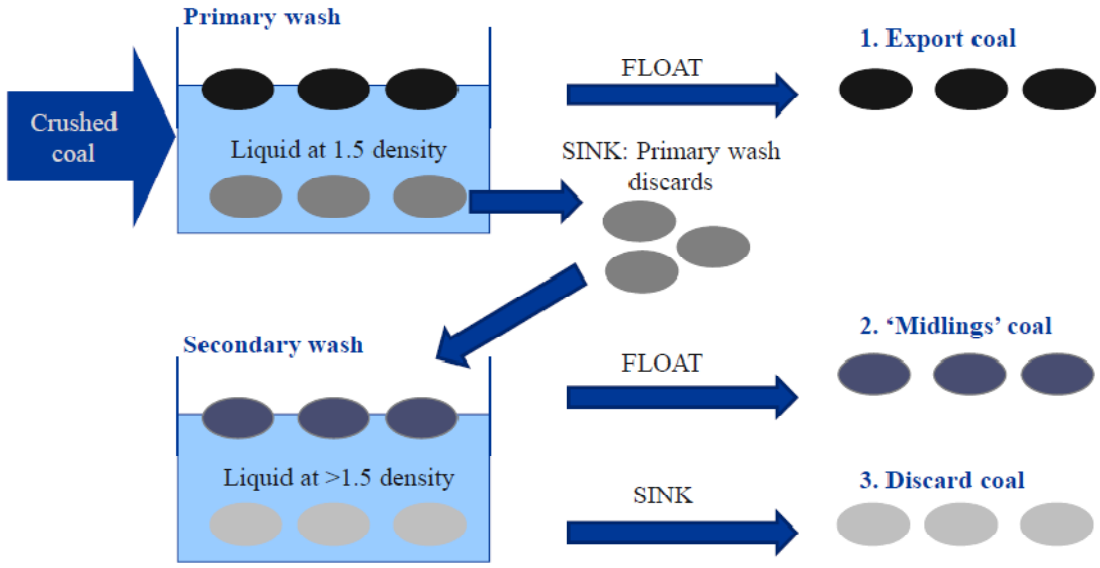
Coal is formed by the subterranean fossilisation of plant matter over time. The peat first fossilises into lignite then sub-bituminous coal, bituminous coal and finally into its most pure form: anthracite. The rank of bituminous coal is categorised into thermal coal or steam coal and a higher rank bituminous coal called metallurgical coal. The coal in South Africa is relatively young and so of a lower rank than other coal producers. The typical South African colliery produces a low grade of thermal bituminous coal which accounts for 96% of South Africa's coal reserves. The remaining 4% of coal reserves in South Africa are divided equally between metallurgical coal and anthracite. [The Department of Minerals and Energy, South Africa's Mineral Industry 2001/2 Report]

Power stations are calibrated to burn a certain grade of coal and have a low tolerance for variances without expensive recalibrations of the plant. This fact, together with the poor grade of South African coal relative to that in Europe, meant that South African coal had very little export value and, indeed, only very small volumes were exported before the 1970s. A process of washing coal was developed for South African coal in order to produce a grade of coal demanded by potential customers who were, at this time, Europe and Japan.

Washing coal is a sorting process where the run-of-mine ("RoM") coal is sorted into various categories of density using the principle that the lower the density of the coal the higher it's calorific value per weight and the higher its grade. The process is depicted in Figure 1 and involves crushing the RoM coal and submerging it in a liquid with a certain threshold density. The threshold will determine which grades of coal will float in the liquid and which grades will sink. For example, in order to produce a grade of coal for export to Europe (RB1 specification coal), the liquid density used would be 1.5 times the density of pure water (ie. 1500kg/m^3). Anything which floats in this suspension is collected and kept separate as RB1 coal.

While the float from the primary wash is the greatest value coal, the coal which sank in the primary wash is likely to have some value too. Depending on the quality of the RoM coal, it may be of sufficient quality for power generation without applying additional washing. Alternatively, if the grade needs to be improved, a liquid with a greater density than in the primary wash is used to perform a second wash on the coal. The float from this wash is typically of a quality which can be used by Eskom with the sink being discarded.

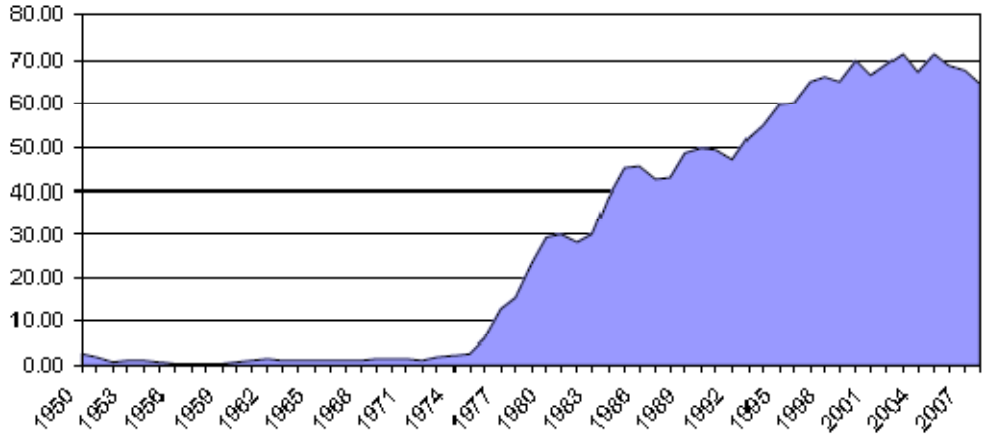
Figure 1: Washing process



Source: Eskom Coal Outlook: presentation to the National Planning Commission, presented at the McCloskey South Africa Coal Conference 2011

The South African economy at large owes a great debt of gratitude to the development of this seemingly simple washing process. The first benefit was immediate growth in exports of coal in the 1970s as depicted in Figure 2. South African exports grew rapidly necessitating the opening of a dedicated coal terminal, the Richards Bay Coal Terminal (RBCT), in 1976. It reached maximum capacity of 12mtpa within 2 years and was expanded to a 24mtpa facility in 1979. Rapid growth in exports necessitated further expansions in 1984, 1991, 1999 and 2008 to 44mtpa, 66mtpa, 72mtpa and 76mtpa respectively. In 2010 the port capacity was increased to 91mtpa, however, logistical infrastructure cannot yet support this capacity. These exports create significant employment and help bring South Africa's trade balance closer to parity.

Figure 2: South African coal exports, 1950 – 2008 (mtpa)

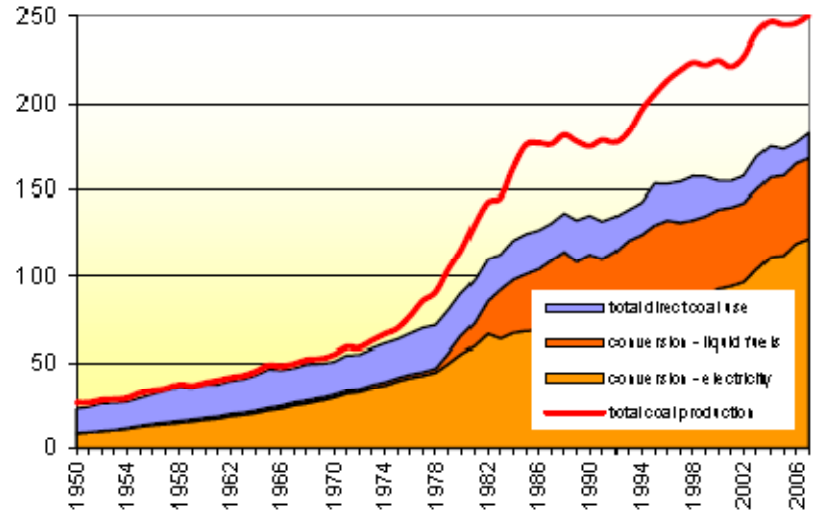


Source: Marquard [2007] in Eberhard [2011]

Without belittling the aforementioned benefits, they pale in comparison to value to the economy of incredibly cheap electricity which South Africa enjoyed, and indeed continues to enjoy to somewhat a lesser extent. Eskom's input costs would have been exponentially higher were South Africa's coal of a higher grade and not requiring of washing. This is because the supply of lower grade coal to the domestic market was a fatal arising of the production process for the supply of coal to the export market. The high demand for export coal from South Africa, rather than diverting volumes from domestic customers in favour of higher priced exports, resulted in growth in domestic supply.

Figure 3 shows the 3 categories of domestic consumption: 'electricity' is effectively Eskom; 'liquid fuels' is effectively Sasol; and, the remaining domestic use is in industries such as cement and paper production. The difference between total production and domestic consumption is export volumes. The massive growth in export volumes from the 1970s occurs simultaneously with growth in sales to domestic customers at a rate which far exceeds the historic trend. In the 20 years from 1950 to 1970 total coal production in South Africa increased by less than 25mtpa compared to an approximate 100mtpa increase over the period from 1970 to 1983. More pertinently, export volumes increased by approximately 30mtpa from 1970 to 1985 with domestic supply increasing by approximately 70mtpa. In the 12 years from 1973 to 1995, domestic production grew by an additional 50mtpa of which 30mpta was growth in exports and 20mtpa was growth in domestic sales.

Figure 3: South African coal production, consumption and exports, 1950 – 2007 (mtpa)



Source: Marquard [2007] in Eberhard [2011]

Evidence of the type depicted in Figure 2 and Figure 3 are not deterministic in concluding that there exists a causal relationship between growth in exports and increased supply to the domestic market. It is entirely plausible that the surge in exports and a structure shift in demand occurred simultaneously. Indeed the 1973/74 oil crisis and subsequent rise of Sasol explains a significant proportion of the increase in domestic consumption volumes. Similarly there could be a common causal factor such as a surge in global economic growth and corresponding growth of the South African economy resulting in increased demand for coal by both export customers and domestic customers alike. This is an unlikely explanation given the patterns of global and domestic economic growth over the period as well as the pariah status of South Africa at the time.

The most likely explanation is that the high margin earned on exports attracted significant investment to the industry and massive growth in coal production. The sunk costs of investment, the poor grade of South African coal, and the middlings produced when washing coal resulted in large volumes of lower quality coal being produced as a by product of export quality coal with a close to zero marginal cost in some instances. Collieries would have been forced to sell their middlings at very low prices. Industry experts explained that this conforms to industry wisdom and shows that the development of washing and the rise of exporting was, until recent years, a blessing for Eskom rather than a curse.

An important driver of this conclusion is the number of mines that were unprofitable if they were only able to sell to Eskom, but became profitable when exporting a portion of production and selling the middlings to Eskom. Such mines would often enter into a life of mine contract with Eskom for the sale of middlings and use this in the business model to motivate for financing. In a number of instances, Eskom themselves financed the mine on condition that the middlings were made available to Eskom.

At the heart of the growth in South Africa's coal industry is a symbiotic relationship between Eskom and export customers. The major beneficiaries of this have been domestic and commercial consumers of electricity as well as Sasol's shareholders. This symbiosis is, however, a fragile one that can be undermined by a number of seemingly benign changes in the market. It is the hypothesis of this paper that it is a breakdown in this symbiotic relationship which is the root cause of the increases in coal prices to Eskom in recent years rather than diminished competition in supply of coal. To be fair to the latter hypothesis, the next section sets out the history of recent consolidation in the industry before beginning to critically address potential issues of competition in the coal markets.

3. Recent merger activity and consolidation in the South African coal markets

There have been a significant number of mergers in the coal market in South Africa in recent years. Table 1 lists the 25 coal market mergers filed with the Competition Commission from 2005 to 2012 with 14 of them being large mergers decided by the Competition Tribunal. While some of these mergers are incidental or take place in adjacent markets to coal supply, the majority have sizable market share accretion. While some of these mergers have had conditions attached to their approvals, none have given rise to a likely significant prevention or lessening of competition without potential remedy necessary for a prohibition.

Table 1: South African Coal Mergers, 2005 - 2012

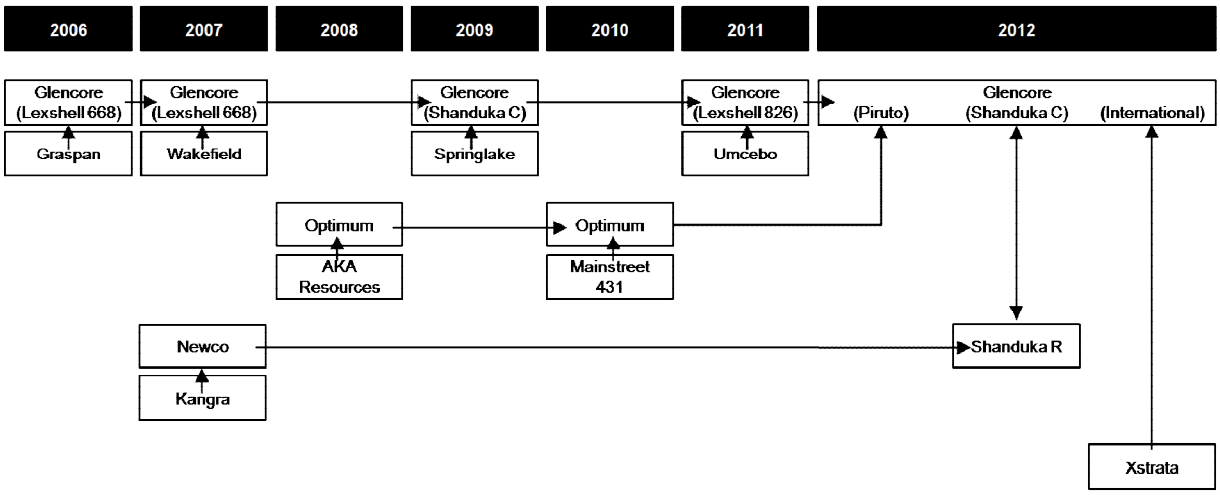
	Large Mergers*	Intermediate Mergers*
2005	AngloCoal/Arnot	Zululand Anthracite Colliery/Ingwe
2006	Lexshell 668/Graspan Lexshell 676/Xstrata Mainstreet 432/Koornfontein Mainstreet 333/Kumba	Wescoal/Anker Coal
2007	Lexshell 668/Wakefield	Newco/Kangra Coal Oxbow/SSM Coal GVM/Coal of Africa Scharrig Mining/Mainstreet 432
2008	Optimum/AKA Resources	
2009	Shanduka Coal/Springlake	Eurasian Natural Resources/CAME Coal of Africa/Nucoal Wescoal/Khanyisa
2010	Optimum/Mainstreet 431	HolGoun/Warrior Coal
2011	Lexshell 826/Umcebo Rio Tinto/Riversdale	Keaton Energy/Leeuw
2012	Shanduka Resources/Shanduka Coal Piruto/Optimum Glencore/Xstrata	

Source: Competition Commission of South Africa

** The delineation between a large merger and an intermediate merger is based on assets and turnover as defined in the Competition Act and is periodically revised by the relevant minister.*

The mergers in Table 1 seem for the most part to be unrelated to one another. If this were the case the consolidation would be fragmented throughout the industry rather than centring on a single firm and potentially creating market power. This lack of relatedness is only nominal with Glencore being directly involved in 7 mergers and 3 mergers indirectly. The acquisition of market share by Glencore reached its crescendo when it acquired Xstrata in 2012 and become one of the largest coal producers in South Africa. These acquisitions (both controlling and minority interests) are traced in Figure 4 below.

Figure 4: Glencore acquisition path, 2006 - 2012



Source: Competition Tribunal decisions in the various mergers

** Note that the Shanduka Resources/Shanduka Coal merger resulted in Glencore reducing its interest in Shanduka Coal to 49.99%, however, gaining minority ownership in Kangra Coal.*

By the time Glencore acquired Xstrata in 2012, Glencore had various interests in coal mining in South Africa. These included: a 49.99% interest in Shanduka Coal which owns the Middleburg Townlands and Graspan Collieries; a 43.66% in and joint control of Umcebo Mining which own Klippan, Middelkraal and Kleinfontein collieries; and an effective shareholding of 67.01% in Optimum Coal Holdings which owns the Optimum and Koornfontein Collieries. Likewise, Xstrata was also a large producer of Coal in South Africa with various interests including: a 100% share in Duiker Mining which controls Tavistock Collieries and Duiker Coal; a 49% interest in the Goedgevonden Joint Venture; a 49% interest in ARM Coal; and an interest in the Tweefontein complex; an interest in the iMpunzi Mining Complex [Tribunal reasons in Glencore/Xstrata].

The Tribunal has historically evaluated mergers in the coal industry in 3 separate relevant competition markets: the tied domestic market; the residual domestic market; and, the export market. The competitive mechanism in each market has been sufficiently different to justify analysing each separately. The most obvious evidence, but by no means the only reason for this classification, is the very different pricing levels in each market. This classification was again used in the Glencore/Xstrata merger, although the Tribunal noted that increasing the boundaries between these markets are disappearing. This merger was a very good example of concerns being raised in the domestic markets for coal based on economic realities in the export market for coal.

Using the 3 market taxonomy with the caveat that demand and supply side effects can permeate the borders of these markets, we can quantify the extent of Glencore's acquisition of market share. Glencore's market shares following the merger with Xstrata were 10-20% in the tied domestic market, 20-30% in the residual domestic market, and 20-30% in the export market [Tribunal decision in Glencore/Xstrata, ranges are used to retain confidentiality]. This positions

Glencore as the third largest supplier to the tied domestic market, second largest supplier to the residual domestic market, and second largest exporter of coal from South Africa.

While Glencore has not created a monopoly position for itself it has contributed to the concentration in the industry. After the merger with Xstrata the 4 largest coal producers supplied approximately 90%, 60%, and 75% of the tied domestic, residual domestic and export markets respectively. Perhaps more importantly, and of greatest concern to Eskom, is that the top 2 firms supplied more than 50% of the residual domestic market with all other firms supplying less than 10% [Aggregation of confidential data used in the Commission's analysis of the Glencore/Xstrata merger].

It's important to note that Glencore cannot be 'blamed' for consolidation in the coal market. The supply of coal had high levels of concentration historically. What can be fairly observed, however, is that Glencore has systematically brought into the Glencore fold a number of firms that were beginning to undermine the historic levels of concentration.

Along with the consolidation in colliery ownership that these mergers brought, there was an equally concerning consolidation in ownership of RBCT. Glencore's pre-merger interests in RBCT were through Optimum and its minority interest in Kangra via its minority interest in Shanduka Coal. This made Glencore the 4th largest shareholder in RBCT. Add to this Xstrata's direct shareholding in RBCT of 16.54% and indirect shareholding of 3.52% through ARM Coal and Glencore became the largest shareholder of RBCT.

While the shareholding in RBCT affords Glencore greater control of the strategic direction of the terminal, the more important consideration are the export allocations afforded to it by virtue of this shareholding. In addition to these shareholder allocations are export allocations currently given to Umcebo, Shanduka and Tweewaters through the Project Quattro and Phase V programmes. These allocations are shown in Table 2 below:

Table 2: Glencore and Xstrata RBCT allocations and exports, 2011 (metric tons '000s)

	Allocation at port capacity (mt '000)	Allocation at 2011 rail capacity (mt '000)	2011 export volumes (mt '000)
Umcebo	1 197	143	542
Shanduka	205	244	826
Tweewaters	242	240	
Xstrata and ARM	18 250	12 468	12 112
Optimum and Koornfontein	8 000	6 279	6 315
Total	**27 894**	**19 374**	**19 795**

Source: non-confidential Commission report filed in the Glencore Xstrata merger

RBCT current potential capacity is 91 million mtpa meaning that Glencore now controls 31% of this capacity. This is not an immediate competition concern because South African coal exports compete with various other exporting countries. Where this might become a concern, and one which is addressed more completely in the next chapter, is where a firm is able to use exports

as a vent for coal supply and short the domestic market thus raising prices to supra competitive levels.

4. Eskom's current predicament

The mounting pressure on Eskom created by rising coal prices, amongst other economic and political pressures, prompted them to become increasingly more interested in the mergers filed with the Commission in the years leading up to the Glencore Xstrata merger. These concerns reached a head when Eskom filed for, and were granted, the right to intervene in the Glencore Xstrata merger after the Commission had recommended a conditional approval of the merger. Eskom's concerns are succinctly put by their head of procurement in her witness statement to the Tribunal:

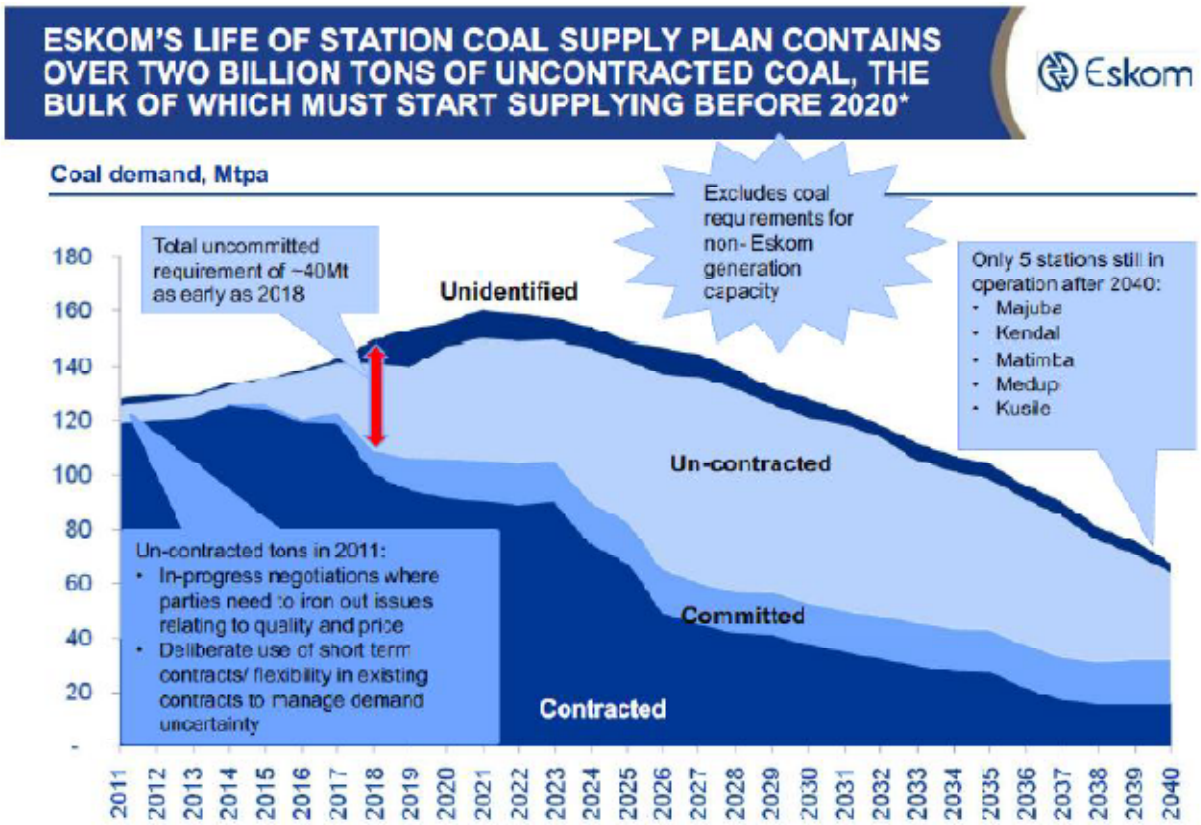
> *"Eskom has become increasingly concerned about consolidation in the supplier market. This is most evident in Glencore's recent merger activities, in terms of which Glencore has sought to buy up a number of smaller producers." – [Maharaj, 2012: para 25]*

Coal comprises approximately 77% of Eskom's primary energy requirements, and as such coal is a significant input cost to Eskom and driver of electricity prices in South Africa. Eskom's procurement strategy had been, for a number of decades, to enter long term or 'life of mine' contracts with a colliery to supply a given power plant's coal requirements. Two pertinent factors have changed in recent years: increased demand has resulted in some power plants operating at levels which require more coal than is considered by life of mine contracts; and, Eskom has changed its procurement strategy to one which increasingly procures coal from the spot market rather than entering into long term supply agreements.

Figure 5 shows the extent to which the strategic shift away from using life of mine contract is projected to alter the composition of Eskom's sources of coal procurement. A small percentage of Eskom's coal was procured from un-contracted sources on the sport market (the residual domestic market) in 2011, however, this will rise steadily with un-contracted procurement of coal exceeding contracted procurement shortly after 2025.

Despite the seemingly small proportion of Eskom coal demand supplied by the spot market in 2011, it created considerable problems for Eskom. This is because this small proportion amounts to between 5 million mt and 10 million mt of coal. These volumes had to be sourced from the residual domestic market on which there is only approximately 15 million mt of coal traded annually. Put differently, a 10% increase in coal demanded by Eskom will require the residual domestic market to almost double quantity supplied.

Figure 5: Projected sources of Eskom's coal procurement



Eskom note: Assumes 50 year life for all stations except Arnot, Hendrina and Kriel. Tutuka, Lethabo and Matla under consideration for extensions.

Eskom source: IRP2010 plan and Feb2011 burn plan, moderate scenario – assumes no new coal fired capacity by Eskom and ~200Mt for IPPs between 2010 and 2030

Note: source data not publically available, only the graphic was made public

Source: Eskom presentation at McCloskey Coal Conference

It is for these reasons that Eskom has become susceptible to changes in the spot market price of coal and so highly sensitive to issues of concentration where it may previously have been less concerned. Their specific concern with the increasing concentration is not a simple unilateral exertion of market power in the residual domestic market, but rather a somewhat nuanced concern linking the domestic and export market. In broad terms this concern is that:

> *"the merger will add considerable critical mass to Glencore's production activities and access to the RBCT, which will enhance its ability to influence the market in a way that is detrimental to Eskom." – [Maharaj, 2012: para 36]*

Specifically, Eskom sees these detrimental consequences as being:

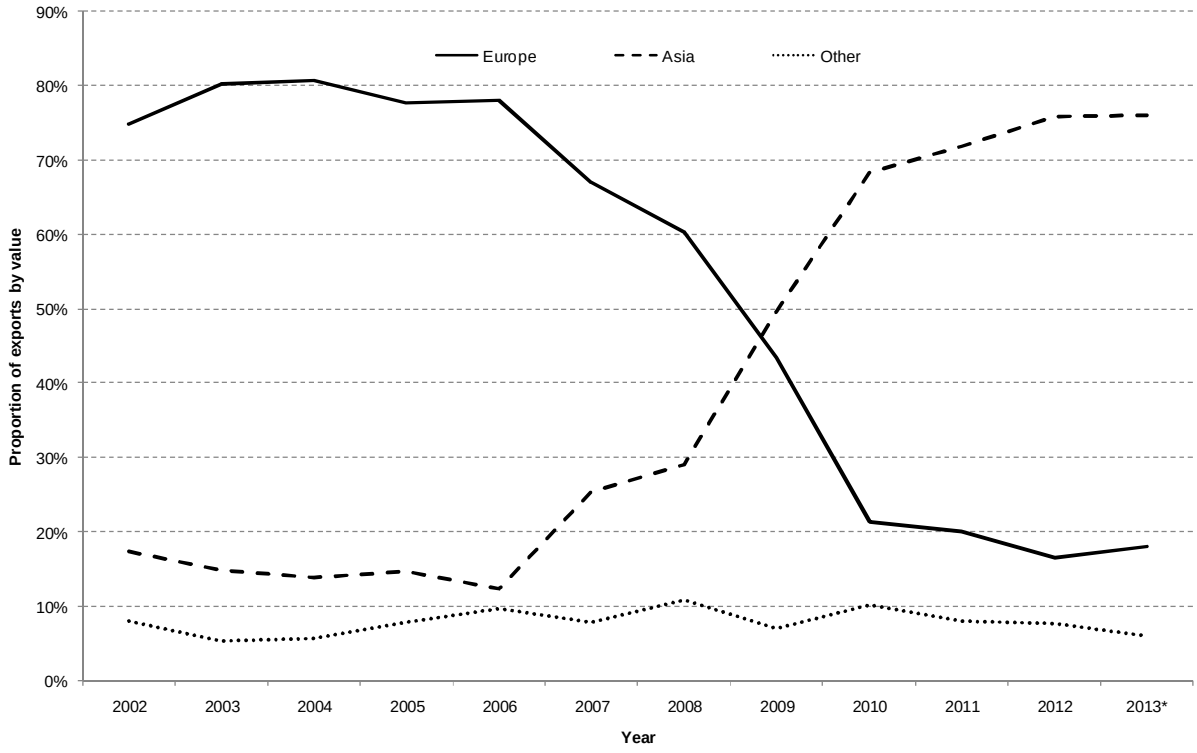
> *"[3.1] possible shortages in coal supply to Eskom occasioned by the transaction;*

[3.2] a reduction in the quality of coal supplied to Eskom (with resultant detrimental effects on the stability of Eskom's generation equipment and the increased possibility of unplanned outages and load shedding); and,

[3.3] a likely increase in the exporting of coal with the concomitant consequences for domestic prices of coal to Eskom (in order to prevent increased coal exports, Eskom would be required to match the economic return gained from exporting the relevant quality of coal by subjecting itself to export parity pricing.)" – [Maharaj, 2012: para 3]

Eskom's concerns are exacerbated by a dramatic and sustained change in the customer base for South African export coal. Figure 6 shows that this switch happened in the course of 2009. Europe was the destination for almost 80% of South Africa coal exports in the years prior to 2007 with Asia receiving in the region of 15% and the rest of the world less than 10%. In the years following 2010 it is Asia which is the recipient of approaching 80% of South African coal exports and Europe receiving less than 20% with little change in the quantities exported to the rest of the world.

Figure 6: South African bituminous coal exports by destination, 2000-2013* (%)



** 2013 statistic is for the 6 months from January 2013 to June 2013 (inclusive)*

Note: The proportions in Figure 6 are calculated on the Rand value of exports rather than on volumes. If volumes were used, the shift would be even more dramatic as exports to Europe are of higher value.

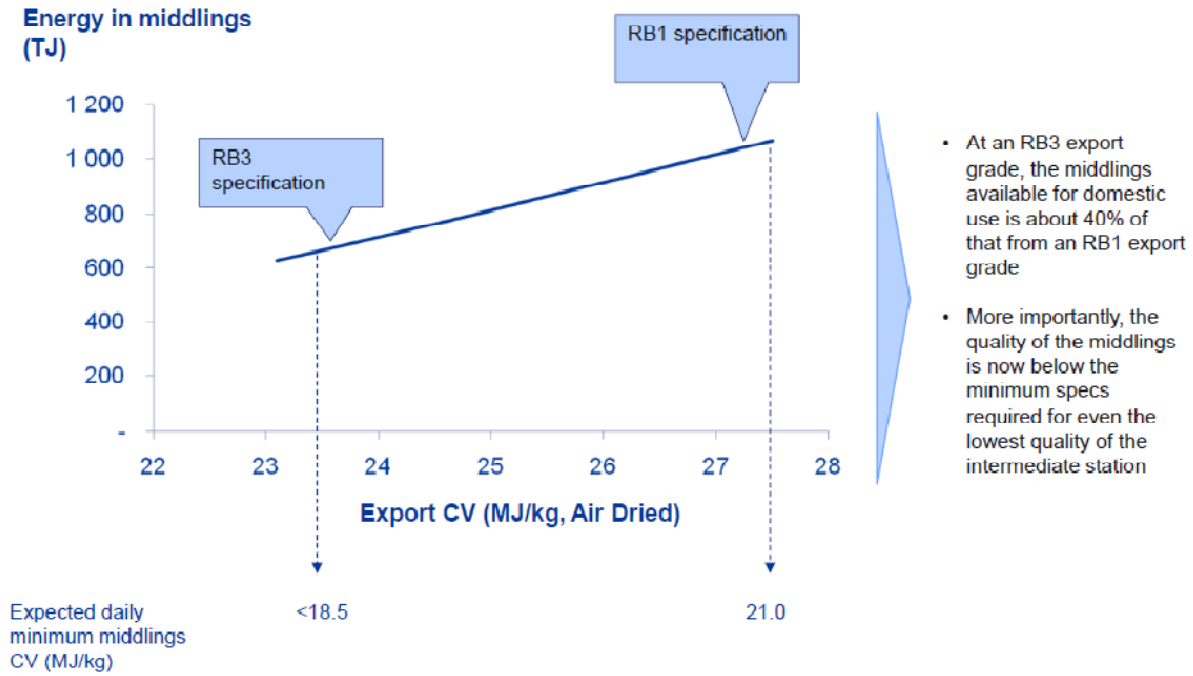
Source: Authors own calculations using SA Trade Data from Quantec

Outside of political economy considerations, who actually purchases the exported products ordinarily matters little to domestic suppliers and customers. Exporters are looking for the best fob price and, while domestic customers might be concerned by the volume of exports, they are indifferent about the destination of the exports that are occurring. It is, however, this very point which is at the heart of Eskom's concerns in the coal market as a whole, and the root of their objection to Glencore's acquisition of Xstrata. The rationale for Eskom's concern lies in the fact that Asian customers' demands are significantly different to those of European customers, and that the implications on the washing process have significant impact on the coal made available to Eskom.

European power utilities were built in an environment where high grade coal was abundant, and so coal fired power stations were calibrated to use this RB1 grade of coal. Coal deposits on the Indian sub-continent are more akin to those in South Africa, and so coal fired power stations in India have, and are being calibrated to use lower grade coal of the type that some Eskom power stations use. This has come to be known as RB3 specification coal. Chinese power stations have also been calibrated to burn lower grades of coal with their dominant course of imports being sub-bituminous coal from Indonesia. Ultimately then, the swing in export destinations resulted in a dramatic shift in the type of coal being exported from South Africa from exports of RB1 specification coal to RB3 specification coal. It is this consequence of the changing customer base which is of concern to Eskom.

There are two reasons why Eskom is concerned with the increase in the volume of RB3 exports and the decrease in RB1 exports: some of Eskom's power stations use RB3 grade coal and so are potentially losing volumes; and, when washing to RB3 coal specifications the middlings produced are of poorer grade and lower volume. Figure 7 illustrates this latter point succinctly. If an exporting colliery washes coal to an RB1 specification with a calorific value (CV) of 27.5 MJ/kg, then it would yield middlings with a minimum CV of 21 MJ/kg. If, however, the exporting colliery switched from exporting RB1 specification to RB3 specification coal with a CV of 23.5 MJ/kg, then it would yield middlings with a minimum CV of less than 18.5 MJ/kg as well as being 40% of the volume of the middlings yielded when washing to an RB1 specification. What is not shown on the figure, but which is an important point in the context of an export swing, is that there will be a greater volume of export coal produced when washing to a RB3 specification than when washing to a RB1 specification.

Figure 7: Middlings output at differing degrees of washing



Data provided to Eskom by a coal mining firm

Source: Eskom presentation at McCloskey Conference

The drop in the CV of the middlings produced from 21 MJ/kg to less than 18.5 MJ/kg is a significant drop given the sensitivity of power stations to the quality of coal used. Table 3 shows the minimum CV content of coal than can be used by each Eskom power station (the 'expected quality' of coal) as well as the volume of coal required by each power station in order to run at maximum output (the 'max burn' of the plant). IT is evident from this table that Eskom calibrated their power stations in the expectation of utilising middlings from washing coal to an RB1 specification.

The first concern of direct competition with RB3 exports applies to Camden, Arnot and Kriel (units 1 – 3) which have coal requirements in the region of 23.5 MJ/kg. This is approximately 11% of Eskom's coal requirements at full capacity and once the new power stations are operating. The power stations which require coal of a quality produced as middlings when washing to a RB1 specification include all those from Tutuka down to Kendal. This amounts to approximately 70% of Eskom's requirements at full operation. Lastly, the power stations that can run optimally with middlings yielded from washing to a RB3 specification include Lethabo and, to be conservative, Kusile. This amounts to approximately 19% of Eskom's coal requirements at full operation.

Table 3: Eskom stations' coal volume and coal CV requirements

Eskom Station	Max burn (M mtpa)	Expected quality CV (MJ/kg)*
Camden	7	24.2
Arnot	8	23.8
Kriel (units 1 - 3)	6	23.1
Tutuka	13	22.5
Hendrina	8	22.2
Duvha	14	21.9
Grootvlei	6	21.4
Majuba	14	21.4
Komati	4.5	21.0
Kriel (units 4 - 6)	6	20.6
Matla	15	20.5
Matimba***	15	20.4
Medupi***	17	20.4
Kendal	16	19.2
Kusile**	17	18.8
Lethabo	18	16.0

** CV measures on an air dried basis; note that other quality parameters (ash, sulphur, volatiles, abrasiveness) are as important as CV. Each station has a daily reject limit that is lower than the expected quality.*

*** Resources committed, but project is still under development*

****Coal is of a different quality to the Mpumalanga coal, with very high volatiles*

Source: Eskom presentation at McCloskey Conference

The drastic changes that have taken place recently in the market spurred by the growth in demand in India and China have placed the majority of Eskom's operation at risk. There are two factors which explain what Eskom is still able to operate: its long term contracts; and, capacity constraints at RBCT. The long term contracts protect Eskom from losing volume, however, to a large extent, the contracts don't protect Eskom from quality degradation of the middlings. The shift from RB1 to RB3 must not have been foreseen by Eskom's legal team when the contracts were drafted. More pressingly, Eskom themselves have changed their strategy from making use of long term contracts to, increasingly, sourcing coal on the spot market.

The RBCT capacity constraints are also of little comfort. This is because the terminal capacity is already about 20 million mtpa above current export volumes. The constraining factor is the rail capacity to the terminal, a constraint which Transnet is, apparently, ardently working to ease. In fairness to Transnet they have achieved an approximate 7 million mtpa increase in delivery to RBCT in recent years to reach an annualised capacity of 72 million mtpa. RBCT are of the view that, given engagements with Transnet, rail capacity will increase to 81 million mtpa by 2015/16 [Chirwa, 2011].

In the absence of these constraints, or new constrains being implemented, Eskom's costs will increase drastically. To the extent possible, power stations can be somewhat re-calibrated to use poorer quality coal. This is an expensive procedure, and as a general rule, becomes less possible the older the station. For the most part, Eskom will be forced to compete with exports for coal and hence pay an export parity price for coal.

5. Much ado about Glencore

The previous section addressed the industry wide changes that have taken place in recent years. Eskom argued that Glencore's acquisition of Xstrata would exacerbate the problems currently being experienced by Eskom given Glencore's overarching strategy. Eskom explained their view of Glencore's strategy in their witness statement to the Tribunal:

> *"Glencore's primary trading philosophy is centred on buying-up medium term production and selling that on the sport-market. In order to generate maximum short term profits for shareholders, Glencore needs to export increased volumes of lower grade coal (previously earmarked for Eskom) or achieve higher prices in South Africa based on export parity pricing. Ultimately, Eskom perceives Glencore's "end game" to be the introduction of an export market-related pricing for coal supply agreements." – [Maharaj, 2012: para 17]*

It is entirely plausible that this same philosophy is adopted by other players in the market, and most pertinently by Xstrata too. Were this the case then the there would be no merger specific harm. Eskom, however, were of the view that Xstrata did not adopt this approach and that, were Glencore to acquire Xstrata, Xstrata would adopt the Glencore strategy to coal supply to the detriment of Eskom and the economy at large. This conclusion mainly hinged on historic dealings with the two companies:

> *"Eskom is concerned that the proposed merger will significantly contribute to the challenges being experienced. In this regard, the witness will testify that Eskom noticed clear differences in the pricing strategies of Glencore and Xstrata in their dealings with Eskom, presumably because Xstrata has less access to international markets when compared to Glencore. It offers Eskom better prices than Glencore does – in their dealings with Eskom, the witness has noticed that there is a strong correlation between Glencore's prices and export parity pricing, whereas Xstrata uses cost-based prices." – [Maharaj, 2012: para 13]*

This theory of harm pertaining to this merger put forward by Eskom rests in part on Xstrata not extracting full value from their domestic sales, and in part on Glencore being more efficient at placing coal on the international market. These are factual issues that would have been tested fully had Eskom continued to have challenged the merger. They did not, but rather settled their disagreement with the merging parties out of court with a confidential set of conditions. Nevertheless, there is sufficient evidence to suggest that these claims may be overstated. More critically, it is not clear whether such claims are pertinent to a proper merger analysis.

That Glencore views domestic prices in South Africa approaching export prices seems to be a correct observation by Eskom. Indeed, Clinton Ephron of Glencore gave this submission as early as 2007 in relation to negotiations for sale of coal to PPC in the Lexshell 668 / Wakefield merger [see the Tribunal decision, para 62 – 69]. This is, however, not an indictment on

Glencore. Profit maximising coal suppliers in an unconstrained market with exports should price to the point at which they are indifferent as to the destination of their final ton of coal sold. This results in domestic customers paying the export parity price for coal. The only reason South African coal customers pay less than export parity prices for coal is due to the export capacity constraints. This results in an inefficient allocation of supply in favour of domestic customers.

The irony at the centre of Eskom's concerns then are that Glencore are more efficient at exporting and will do so to a greater extent than Xstrata resulting in a more efficient market outcome. This is not harm to the competitive mechanism, but rather harm to one customer segment that are currently being favourably serviced due to a structural inefficiency in the market. The harm to this customer segment is, however, not something that should be ignored. Were Eskom to pay export parity prices for all its coal procured on the residual domestic market there would be far reaching negative consequences for the economy. The appropriate question then, one which is returned to shortly, is: "What would be the correct mechanism to address this harm?"

Returning to Eskom's theory of harm, there are only three potential ways that a merger, even a hypothetical merger to monopoly, can harm Eskom.

The first is that Xstrata are charging significantly below Eskom's willingness to pay and that Glencore are more informed on this score. It is difficult to see why Xstrata would be at a disadvantage to Glencore in understand Eskom's demand given that Xstrata have been supplying Eskom for a longer period of time and, until the Glencore Optimum merger, with greater volumes of coal than Glencore. Also, if for some reason Xstrata were not pricing up to the market price, doing so as a result of a merger is not an exertion of new market power, but simply a transfer of rent from Eskom to Xstrata. Lastly, and rather paradoxically, were a merger prohibited on this basis, Xstrata would still increase its price to Eskom given the revelation. The counterfactual market outcomes thus mirror those of the approved merger outcomes and hence the merger should be approved.

The second explanation, and the one which seems to be that for which Eskom argues, is that the merging parties will be able to export additional volumes post-merger and force domestic prices upwards to export prices. Glencore's core capability of sourcing international customers and placing all types of coal in their highest return market leveraged across Xstrata's output is argued to result in harm to domestic customers. The fact that the residual market is relatively thinly supplied – it's approximate 15 million mtpa is far exceeded by the exports of between 60 million and 70 million mtpa and the tied domestic market of over 130 million mtpa – means that small increases in exports can significantly reduce supply on the residual market. For example, a 1.5 million mtpa swing from the residual market to the export market would be a mere 2% increase in exports, while constituting a 10% reduction in supply on the residual domestic market.

The thin supply to the residual domestic market is exacerbated by the fact that its major customer, Eskom, is highly price inelastic. More pertinently, Eskom is not only the largest customer but also the marginal customer: Eskom's increased demand for coal is driving prices

in the residual domestic market. This means that for s small reduction in quantity supplied on the residual domestic market, prices will be bid up significantly.

As is always the case with merger analysis, and as required by the Act, the theory of harm must explain how the merger necessarily causes the significant lessening of competition. The first point to note here is that Xstrata already uses Glencore to place their export coal with international customers. The merger does nothing to increase the efficiency of exporting coal by Xstrata. Furthermore, the merger does not change Xstrata's incentives when making supply choices between the residual domestic and export markets. Export prices, for all grades of coal, are more attractive to suppliers. This is apparent from confidential facts in the case, but also inherent in Eskom's concern that they will be forced to pay the export price for RB3 coal. Throughout the years starting in the 1970s, export volumes have quickly increased to match the port and rail capacities. This outcome was in no way dependant on Glencore's participation in the market, but rather the outcome of profit maximising firms acting rationally. Indeed, Table 2 shows that Xstrata utilised almost 100% of their export allocations in the year preceding the merger (there are generally always small deviations because of unpredictable circumstances such as rainfall). Xstrata were incentivised to, and did export to their fullest potential pre-merger. This theory then, at least in its 'vanilla' form, does not seem to stack up to the facts or incentives apparent in this market.

The third explanation is quite an interesting variation on the previous explanation. Here the theory of harm remains the same: that Glencore is export focussed and will influence Xstrata accordingly. The new angle is that, given current market constraints, it is impossible to currently take advantage of the premium earned on exports compared to supplying the residual domestic market. Thus, what a firm can do is underutilise a coal resource leaving more coal in the ground for extraction once the export capacity has increased. This essentially results coal that would have been supplied to the domestic residual market in the current time period being sold on the export market in a future time period. Prices on the residual domestic market, given the previously discussed demand characteristics, would react quickly until the point that firms are indifferent between leaving coal in the ground for export in the future and supplying the residual domestic market in the current time period.

If we assume that the international market for coal is achieving efficient outcomes of the type predicted by Hotelling's Rule [Hotelling, 1931], then the export price is increasing at the discount rate. Domestic suppliers would use this to predict the expected future price for export coal once export capacity constraints are eliminated, and discount to present value in order to identify the price at which they would be willing to sell to domestic consumers in the current time period. With differences in discount rates being accounted for by expected changes in the exchange rates, this assumption rich theory would suggest that price level at which domestic suppliers would be indifferent between supply domestic customers now and export customers in the future is the current export price.

There are two problems with this at a high level, and one problem at a Glencore Xstrata merger specific level. The two high level problems are that the South African government includes so-called 'use it or lose it' provisions when allocating mining rights. This can be circumvented,

however, but simply underutilising a resource rather than not using it at all. The second high level problem is that smaller coal suppliers in South Africa are highly dependent on sources of finance to support their activities. Financial institutions are unlikely to roll debt over for a long period of time until such time as export capacities are expanded. As such they need to bring in revenues in the current time period even at the expense of higher expected real profits from exporting the same coal in the future.

The problem with applying such a theory to the Glencore Xstrata merger is that Xstrata has significant financial resources pre-merger. As such it is unlikely that such a theory would have gained much traction in the Tribunal were it to have been raised in the course of the merger. This theory might, however, have had some applicability in Glencore's acquisition of Optimum who, although a larger coal producer, did not have substantial financial resources.

While the propositions made in this section could not be rigorously tested in a contested merger hearing at the Tribunal because Eskom settled with Glencore, it seems that there is no valid merger specific theory of harm. In the course of various merger and industry investigations it has become apparent that Eskom is already paying higher prices for coal, and that this trend is likely to worsen given both market characteristics and Eskom's own strategy stances. Neither mergers nor competition policy at a high level are the correct context for these discussions. The proper context is discussed in the following section with brief direction on where the issue should proceed more appropriately.

6. What is the real source of harm

Large export oriented coal suppliers are only a cog in the market mechanism and are not the cause for Eskom's current coal supply issues. Eskom's issue of increasing coal prices for the grades they require is desperately in need of proper context. Indeed, it is axiomatic that a high price is only a high price because there is some expectation of a lower price. This expectation for Eskom comes in the form of the previous prices that Eskom used to enjoy. The question then is whether or not the current prices are 'too high', the previous prices were 'too low', or perhaps some combination of these two.

The historical prices that Eskom enjoyed were during a period when Eskom had monoposony power over coal suppliers. This existed because coal suppliers were producing RB1 coal for Europe and produced middlings for which there was only one potential customers. Eskom could, and indeed did, negotiate very favourable contracts with coal suppliers during this time. These were life of mine contracts where prices were first set at cost plus a reasonable margin and later cost plus an escalation factor for inflation. It seems that Eskom were able to ensure that coal suppliers did not earn any rent for holding rights to the scarce resource. Any rents earned by the supplier would have to be earned through exports.

In the current time period additional customers have entered the market for the same grades of coal used by Eskom. This means that Eskom has to compete with India and China for the supply of coal either in the current time period or, perhaps, also intertemporally. Given that coal is a non-renewable scarce resource, coal suppliers can legitimately extract rents irrespective of

market structure or the degree of competition. A portion of these rents are transferred to the state through license fees and taxation.

What can be said, then, is that the historic price that Eskom used to enjoy was below the competitive level for coal, and that the export parity price of coal is the competitive level where competition is competition for coal by customers. Any price below the export parity price for coal is an exertion of monopsony power by Eskom, and any price above the export parity price of coal is an exertion of market power unilaterally or collectively by coal suppliers.

Whether or not Eskom having to pay the competitive price for coal is in the best interest of the country is a normative industrial policy question. A similar question is made in the motor industry where the government has decided to allow higher motor vehicle prices to persist in the interest of employment and building expertise. Welfare is lost by one party, in this instance consumers who pay a higher price and consumers who would have been able to afford a motor vehicle at a competitive price, and welfare is enhanced for employees and the producers. The balancing act is something that South African's have to trust their government to perform accurately and in the best interests of society.

The first option for the government in how to perform the balancing act in the domestic coal supply market is to not interfere at all. If NERSA allows cost increases to translate into higher electricity prices then industry and households would face higher costs. Exactly how high is an issue for more research. If the government deems these projected price increases to not be in the best interest of the country, then it can use NERSA to keep electricity prices at a given level and subsidise Eskom's losses. This solution has the negative consequence that Eskom will lose its incentive to minimise monopoly inefficiencies which the current regulatory regime attempts to ensure. It obviously also has the consequence that tax payers still pay for the increased costs at Eskom even though it will be in a less obvious way to them.

If the government decides that the costs should be borne by domestic coal suppliers, they can increase costs to the firms through the licensing policy or taxation regime. This would not affect the pricing levels because these are set by the export price. It would simply be a rental transfer from coal supplier to the government in order to compensate for Eskom's higher input costs. The problems with this are that: it's very difficult to use taxation to perfectly compensate for the higher costs at Eskom, either there will be over- or under-taxation; if the tax is on output then there would be a reduced level of total supply and so reduced exports and so reduced employment and foreign earnings; if the tax is not directly or indirectly related to output then it is difficult to see how the government would equitably distribute the tax burden; and levying a tax to compensate Eskom does not solve other domestic customers' higher costs such as the cement industry and paper milling.

The final alternative is for the government to influence the domestic price of coal. This can be done either by imposing an export tax or an export quota. The export tax will now mean that coal suppliers will price in the domestic market to the point that they are indifferent between selling to a domestic customer and exporting at the export price net of tax. Ultimately this solution will result in a domestic price which is lower than the export price by the level of the export tax. This has the added benefit that it will simultaneously address both Eskom's problems

as well as other domestic customers of coal. The negative consequences that the tax will have on employment and foreign earnings will, however, remain because coal suppliers' costs to export will increase.

The export quota is a solution which is effectively in place at the moment, but only because Transnet have been sluggish in responding to increased demand for rail infrastructure to RBCT. As such coal suppliers are limited in their ability to export and domestic customers continue to enjoy prices below the export price. This difference has been reducing in recent years and will continue to do so with increases in export capacity. The government can curb this by placing actual export quotas to ensure that a certain proportion of domestic supply gets supplied to domestic consumers. If it is clearly calculated as a quota which will result in a certain domestic price for coal, then it may even be possible to ensure that incentives to invest in export capacity is not undermined. The problem with this is that the planning involved in order to achieve the intended outcomes are inherently very difficult, and indeed, identifying the socially optimal outcomes to set as the original target are equally difficult. Were the government to impose an export quota, is should coordinate this with Transnet lest Transnet make capacity expanding investments only to be undermined by export quotas.

Ultimately, as export capacity increases, and as Eskom increasingly relies on the residual domestic market for coal supply, the government is going to have to make a decision on what it is going to do in the coal market. While it is not a foregone conclusion, it seems highly likely that the electricity price increased suggested by projected coal price increases will be counter-developmental. The government is going to be forced to intervene in this market and it is not clear at this stage that there is a clear frontrunner on how such an intervention should take place.

7. Conclusion

The recent consolidation in the South African coal markets and the creation of a new 'major' after Glencore's acquisition of Xstrata is not the root cause of escalating coal costs to Eskom. None of the various potential theories of harm which arose in the course of the coal market merger investigations by the authorities held sufficient merit to prohibit the number coal mergers in the past decade. This is because the increases in coal prices are caused by other fundamental changes in the market rather than the consolidation. Perhaps the most important fact here is that domestic prices have remained below export prices for similar grades of coal. The opposite would be expected were there to have been the creation and exertion of market power in the domestic supply of coal.

The recent fundamental changes in the market are the increases in export capacity through RBCT and the increased degree of competition for coal directly or indirectly used by Eskom. Demand for coal by India and China have increased dramatically resulting in South Africa exporting increasing quantities of RB3 specification coal rather than the RB1 specification coal exported to Europe. Some of Eskom's power stations use similar grades of coal while the others require coal produced as a by-product when washing coal to RB1 specification coal. As such Eskom has been hit with a double edged sword by suppliers' profit maximising decisions to switch increasingly to exports of RB3 specification coal.

While it does not seem to have reached this point as yet, the domestic market will reach its equilibrium when domestic prices equal export parity prices. This pricing level is significantly higher than the prices Eskom was able to extract whilst having monopsony power over coal suppliers. The loss in monopsony power by Eskom, the increasing export capacity through RBCT, the increasing dependence by Eskom on the residual domestic market for coal supply, and the known inelasticity of Eskom's demand to price will all conspire together to increase Eskom's coal costs until they reach export prices.

Eskom's increased costs, because the increased prices are not caused by any anticompetitive activity in the market, cannot be solved through competition policy. Rather the government, should they deem it socially optimal, will need to intervene through ordinary trade and industrial policy mechanisms such as taxes and quotas. Each potential mechanism will have both positive and negative consequences in their attempts to reach some level determined to be socially optimal. Indeed, identifying the socially optimal domestic price or quantity of coal is in itself a problematic proposition. This does not give license to shy away from the problem, but rather highlights the need for balanced thought as well as a unified position between all the government departments and state owned entities.

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