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Some Like Them Rough:

The future of Diamond Beneficiation in Botswana

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Abstract

The paper considers the development of diamond beneficiation in Botswana and the reason why there has been relatively little opposition from the private sector. The shift in the position of De Beers, stemming in large measure from its decline as a monopolist is in large measure responsible for its willingness to accept beneficiation in Botswana. The industry has created 3,200 industrial jobs in Botswana and is now the largest manufacturing sub-sector in the country. The reasons for the willingness of the De Beers sightholders to accept an implicit beneficiation tax stems from the benefit of access to rough diamonds. The diamond cutting and polishing industry is of doubtful sustainability after the main rough diamond deposits are exhausted in the 2030's.

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Acronyms

CSO	Central Selling Organisation
DTC	Diamond Trading Company
DTCB	Diamond Trading Company Botswana
EU	European Union
SADC	Southern African Development Community

1. Introduction

Just after independence in 1966, Botswana discovered a very large kimberlite deposit of diamonds at Orapa. This Orapa mine was, by global standards, an exceptional deposit. In 1982, a second mine, though much larger and richer was opened at Jwaneng. Jwaneng is commonly reputed to be 'the richest piece of real estate on earth' where the operating costs to extract a dollar of diamonds over the first 25 years of its life has been US$0.10. As a result, over the last thirty years since the opening of Jwaneng, the country has been the world's largest producer of diamonds by value. In 2008, diamond production peaked at some 33 million carats and has not yet recovered to levels seen before the international economic crisis. Diamonds and the revenue that has accrued primarily from the dividends from the joint venture with De Beers, where the Government of Botswana and De Beers which own 50% of the subsidiary company Debswana, has provided the necessary condition for Botswana experiencing the highest rate of economic growth in Africa from 1970-2000. The sufficient condition was a political elite that, unlike so many neighbouring countries, did not undertake a wholesale pillage of those resources.

Since 2000, with no new significant discoveries of diamonds or other precious metals, the growth rate of the economy stalled and is, over the last decade, below the sub-Saharan African average. In order to deal with the growth rates of around 4% on average over the last decade and a persistently high rate of unemployment the government has introduced a policy to diversify the economy. One of the most successful elements of this has been the policy of diamond beneficiation, i.e. down stream processing of rough diamonds, which were previously exported as rough diamonds and processed elsewhere. The cutting and polishing industry, which is highly capital intensive in Botswana, employs around 3,000 people and is the largest manufacturing sub-sector in the country.

This paper examines the international trade in rough and polished diamonds and the move to diamond beneficiation by Botswana[1]. The Southern African Development Community (SADC) as a group was responsible for 58% of world diamond production in 2008[2]. This paper addresses the question of diamond beneficiation from the perspective of Botswana and also the other diamond producing SADC countries. The paper begins with a discussion of the global rough diamond trade and the role that De Beers has played in the trade over the last century. Historically, De Beers was an opponent of downstream processing in Africa and has only recently shifted its position to one that is largely supportive. The demise of the De Beers cartel and its metamorphosis as a dominant oligopoly at the end of the last century marked a fundamental shift in its relations not only with its own customers or sightholders,[3] but also simultaneously with its main sources of supply in the SADC region. It was this weakening of De Beers in the international market and its continued reliance on African supply that smoothed its shift in policy in favour of beneficiation. The third section of the paper considers the costs of beneficiation and why it occurs in SADC.

1 The world's biggest producer of diamonds is China, which in 2009 produced 5.5 billion carats of synthetic industrial diamonds (USGS). China has almost no mined diamond capacity. It is responsible for over 90% of world production by volume. In 2009, largely as a result of the way in which Russia produces and markets diamonds it became for the first time, the world's largest producer of gem quality diamonds by volume and value. It is expected that Botswana will, once the figures for 2010 are available reflecting recovery from the global financial crisis and the substantial downturn in production, become the world's biggest producer by value.

2 Data from the Kimberly process dated July 2009 for the calendar year 2008. 2008 was used because 2009 figures were distorted because of the effects of the international financial crisis on shares. http://mmsd.mms.nrcan.gc.ca/kimberleystats/public_tables/Annual%20Summary%20Table%202008.pdf

3 A 'sightholder' is a company on the Diamond Trading Company's (DTC) list of authorized bulk purchasers of rough diamonds. (http://en.wikipedia.org/wiki/Sightholder)

2. The Origins and Concept of Beneficiation

The early works of Canadian scholars Innis[4] and Mackintosh[5] in the 1920's and 1930's developed the *Staples Thesis* or approach that is the basis of the contemporary debate on beneficiation and linkages between staples and the manufacturing sector. Innis argued that countries tend to fall into a 'staples trap' whereby they would tend to fall back into the export of staples and that growth would occur, but not economic transformation. Mackintosh argued that development spread through backward linkages and that sustained transformation could occur in a staples economy. Almost a century later the debate on industrial development and transformation in much of Africa continues to mirror these same divisions regarding the Staples Thesis. The one significant difference between Canada and Australia and the small developing countries of Africa is the very significant size of the staples base and the long passage of time, which allowed the creation of such linkages in the case of Canada. Only in the case of South Africa, with its very substantial base and long history of staples exports, have backward linkages developed.

The work of Innis and Mackintosh lies at very heart of much of the early economic literature about African development and indeed much of the 'Dependency Theory' literature of the 1960's is based on these works. The work of Professor Hirschman on linkages in development has sparked the contemporary policy debate over beneficiation. Hirschman argued that the strongest linkages are in fact those forward and the ones most likely to be durable over time.

Of late, a significant body of economic literature has developed, with considerable financial assistance from the World Bank, arguing against beneficiation or down-stream processing[6]. Indeed the work of Professor Ricardo Hausmann[7] has been specifically aimed at the arguments of Hirschman[8] and demonstrating that beneficiation is a poor policy paradigm and should not be pursued. Related to this is the most recent work on linkages between the commodity sector links between resource sectors by Morris et al.[9] who has argued pursuing down-stream processing in mineral rich economies will not be successful in the mining sector and that countries should follow the path of 'US-Sweden-Canada-Australia' which is to pursue backward linkages to the mining input sector. While such an approach may be useful in large mining provinces such as Zambia or South Africa, it remains of limited application in a country like Botswana, which has only one or two large mines with a relatively limited life.

3. De Beers and its role in Southern African Beneficiation

3.1. SADC, Botswana and De Beers

Over the years diamond mining has extended throughout those countries that were part of the Southern African Development Community. De Beers had been involved in the mines in Botswana, South Africa Namibia, Lesotho as well as in Angola and Tanzania. While De Beers is not involved in the diamond

4 Innis (1923), (1930), (1956), and (1980).

5 Mackintosh (1923) and (1939).

6 The World Bank in Southern Africa has provided consistent funding for studies aimed at demonstrating that countries should not pursue down-stream processing. A most significant example was not only the funding of visits by Professor Hausmann to South Africa and Botswana in 2010 to argue against beneficiation. The World Bank also provided funding for the study by Nathan Associates 2011 'World Bank -Zambia 2011'How Can Zambia Increase the fabrication of copper products? Dispelling the Myth that domestic production of copper is an advantage'.

7 Hausmann, Klinger and Lawrence (2008), Hausmann and Klinger (2010), and Hilgado *et al.* (2007).

8 Hirschman (1968).

9 Moris, Kaplinsky and Kaplan (2012). www.commodities.open.ac.uk

industry in Zimbabwe, that country is rapidly emerging as an important global supplier. The most important mines are in Africa and from the late 1970's onwards it became clear that the future of De Beers as a diamond cartel rested with Botswana given the enormous size of its diamond deposits at Jwaneng, as well as at Orapa. Approximately 70% of De Beers profits have of late come from its operations in Botswana. Without the control of Botswana's diamond mines, the control by De Beers of the global diamond market would have vanished and, indeed, its very existence as a company in its current form would have been in question. Hence, the relationship between the Government of Botswana and De Beers was vital to the company's survival. What emerged was a relationship that was unique in post-colonial African history. There has been no known attempt to nationalize the company in Botswana, but rather a progressive increase in the country's holdings in the parent company despite what were at times acrimonious disputes over the terms of mining and marketing contracts. The role of Botswana will remain central to the continued profitability of De Beers even following the sale of the Oppenheimer family interests in the company in 2011.

3.2. The Decline of the De Beers Cartel

The diamond industry over the last century and a half has been inextricably intertwined with the history of Southern Africa and the De Beers name[10]. The De Beers Mining Company was formed by Cecil Rhodes in 1874 following the discovery of diamonds in the Kimberly region of South Africa[11]. De Beers eventually came to control 98% of South African production[12]. The Oppenheimer family began to control De Beers in the 1920's and has been closely associated as well as through Anglo-American and the control and association with those two names have continued until the acquisition of shares in the company by the Government of Botswana in 1987[13].

De Beers has always been cited by economists as the 'black swan' of industrial organization i.e. the counter-example to the general conclusion arrived at by industrial economists that cartels are neither stable nor sustainable[14]. However, the diamond trade has many of the economic and institutional characteristics, which explain the unprecedented longevity of the De Beers cartel[15]. These include the extreme difficulty of finding new diamond deposits, the very limited number of actors, the relatively price inelastic demand of diamonds and the ability of De Beers to punish cartel members and most interlopers that did not co-operate[16]. Thus, the three qualities needed to assure the stability of a cartel, i.e. co-ordination, control of entry and methods of controlling cheating were all addressed by De Beers during its cartel years. As diamonds are perceived as scarce, they are also a store of value and this creates a unique problem for cartel co-ordination. The key element that rendered De Beers so successful in maintaining a cartel over such a long period was its ability to control both supply and effect demand down the relevant portion of diamond pipeline.

However, since 1990, De Beers' share of global diamond trade has diminished dramatically and it is no longer able to overtly manage global supply and prices as in the pre-2000 period when it was a cartel. There are numerous reasons cited for the decline of De Beers' market power. These include the growth of

10 The De Beers name comes from the two South African farmers upon whose land sizable diamond deposits were found. The other deposits were in the Kimberly region.

11 Chilver (1939).

12 Even-Zohar (2007). The Rothschilds have been closely associated with De Beers since the 19th century and in 2000 when the company became a private company it was Rothschild's that financed the operation.

13 In 1987 Debswana, the local subsidiary of De Beers and the Government of Botswana, sold its stockpile of diamonds to De Beers and in return was given a 2.63% share in De Beers. By 2010 the share of the government of Botswana had grown to 15% of De Beers, K. Jefferis, "Botswana and Diamond-Dependent Development", in Edge and Lekorwe (1998).

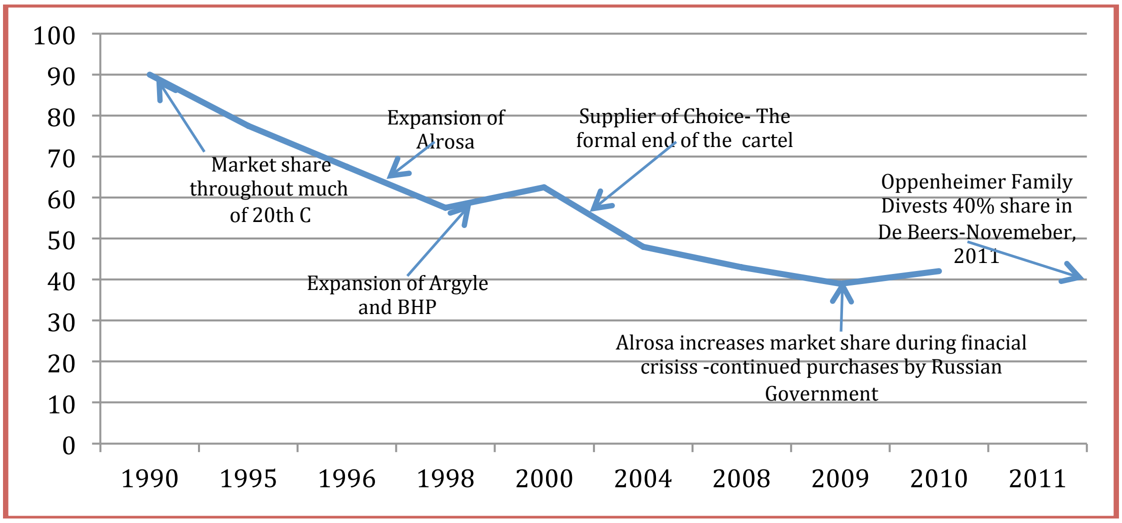
14 Stigler (1964).

15 For a complete review of cartel success see Levenstein and Suslow (2006).

16 Bergenstock, Deily, and Taylor (2006). The evidence suggests that De Beers managed departures from cartel practice by punishing recalcitrants.

production in Australia[17], Canada and Russia, which were increasingly willing to trade outside the Central Selling Organisation (CSO) - De Beers' marketing arm, the increased anti-trust activities in both the US and the European Union (EU), the shock to its corporate reputation from 'blood diamonds' when it was involved in the purchase of Angolan diamonds on the open market in the mid-1990's, along with development of new and very powerful new firms which were willing to challenge the dominance of De Beers in the global market[18]. De Beers can now be classified as a dominant oligopoly, which maintains strong control over its buyers or sightholders. It is also instrumental in working with its partners in Africa to restrict supply, for example in the wake of the 2008 international financial crisis[19]. The shares of the dominant players in the global market are presented in Figure 1. The market relationship and extent of co-ordination of pricing between the various oligopolistic producers is unknown.

Figure 1 The Decline of De Beers Market Share (percentage)



Source: European Commission (De Beers –LVMH Decision 2001 Official Journal of the European Commission), De Beers Annual Reports, RBC, Author's estimates.

3.3. 'Supplier of Choice' and Beneficiation

De Beers' existence as the pre-eminent 20th century cartel ended with a shift in corporate policy and strategy that came with the introduction of the 'Supplier of Choice' strategy in 2000. The supplier of choice strategy was very much a response to the shifts that occurred in the market in the 1990's that rendered the century old model of the diamond cartel headed by De Beers which was able to buy all excess supply as largely obsolete. The rise of new suppliers, its association with purchasing conflict diamonds and the inability to control the value chain meant a change in strategy was essential. The weakening of De Beers in the 1990's lead directly to the shift in De Beers' position from that of being vehemently opposed to diamond beneficiation in the 1990's to being amongst its strong advocates following the renegotiation of mining agreement stems from the need to maintain the SADC member countries on-side. The position that existed

17 Shigley, Chapman and Ellison (2001).

18 Economist (2004).

19 The Russian state diamond monopoly Alrosa became the world's largest producer of rough in 2009. "In spite of the recession in its sector," the company communiqué says, "ALROSA managed to preserve jobs and maintain its production levels, and produce in 2009, in the aggregate, 34 m carats of rough diamonds. This enabled the Company to rank first in the world in terms of physical volumes of diamond production." John Helmer 'Alrosa unveils production to beat De Beers' http://johnhelmer.net/?p=2842 19th March 2010, downloaded 4th June 2010. The only reason for this was a difference in corporate strategy of the two companies. Whereas Alrosa, as a state monopoly was able to continue production and stockpile by selling to the Russian state stockpile agency Gokran, De Beers, as a private commercial entity had no choice but to cut production in order to avoid unsustainable stockpiles. However, the burden of the 2008/9 crisis was unevenly felt throughout the De Beers Group, with mine closures predominantly occurring in Botswana and Namibia, but not in South Africa.

prior to the shift to the Supplier of Choice Strategy in the 1990's is best typified by the statement by Gary Ralfe, managing director of De Beers:[20]

"... Particularly in the case of Botswana [the absence of manufacturing] is a recognition of economic realities. Botswana's best interests are served precisely by having diamonds polished in the places where they can most economically be polished. Botswana is such a major [rough] producer and the Botswana government has such a clear view about these matters, that they recognize the truth of this. For a major diamond producer like Botswana, it would be *national folly* to prescribe that any percentage of their diamonds needed to be beneficiated locally. What Botswana, as the world's major producer of diamonds needs to do, is to ensure that diamonds reach the place where they can achieve the highest price and that gives by far and away the best returns in terms of fiscal revenue." (*emphasis added*)

Just six years later, the position of De Beers under a new Managing Director, Mr Gareth Penny, who was responsible for the Supplier of Choice Strategy, had been completely reversed[21]:

"For the African diamond producing countries, beneficiation is not optional, not a passing whim motivated by political correctness, but an imperative, an absolutely essential and critical part of their macroeconomic policy designed to uplift their economies to provide education and jobs and healthcare for their people and to make poverty history.... We [De Beers] don't embrace this out of misguided enthusiasm or altruism. No, we embrace it because it makes good business sense and because it is the right thing to do."

The most obvious question is how and why De Beers saw this as good business sense. While having some cutting and polishing capacity, De Beers remains largely absent from this middle portion of the diamond pipeline even after the introduction of the Supplier of Choice strategy. Cutting and polishing is a vital, but relatively competitive and unprofitable portion in the value chain but the choice of location of the processing does not substantively effect the profitability of De Beers at the other end of the diamond pipeline, i.e. retailing, where it has also strategically located. In the 1990's, De Beers had sufficient market power that it could disregard the resource nationalists in Botswana and elsewhere in SADC. But once weakened, if De Beers were seen to indefinitely object to the development of diamond processing facilities when many of the countries of the SADC region were calling for this, it ran a thoroughly unnecessary risk of undermining its position in Botswana where, at the time, it was renegotiating leases over the Jwaneng and Orapa mines.

It is the maintenance of the control of production from the main mining areas in the SADC region that remains until this day one of the main commercial strengths of De Beers as a company and supporting the development aspirations of Botswana and other SADC members and using its choice of sightholders to reinforce those aspirations strengthened its position. Moreover, the added cost of cutting and polishing in Botswana would be passed to sightholders who were now to become responsible for a host of new activities such as branding and marketing which, prior to the Supplier of Choice Strategy, had been the responsibility of De Beers. The Supplier of Choice Strategy was a response to its weakened market position and, as a result, De Beers played a pivotal role in championing beneficiation in Southern Africa.

20 Gary Ralfe, Managing Director, in 2001, Even-Zohar (2007).

21 Gareth Penny, Ralfe's replacement as Managing Director of De Beers, in John Helmer 'Alrosa Attacks African Diamond Beneficiation' at http://johnhelmer.net/?p=289, downloaded on 4th June 2010.

4. Why do the Cutters and Polishers come to Botswana?

While the cost of diamond processing is relatively high in Botswana compared to low cost Asian centres, there is no evidence that costs are any lower in South Africa or other parts of SADC. The estimates of the relatively high costs of processing in Southern Africa were confirmed from a South African Fridge Report, which compared South Africa to other producers and more recent data from the Botswana Diamond Hub are used below[22]. This means that for countries like Botswana, Namibia and South Africa, that all aim at beneficiation, the only products that are profitable are likely to be relatively high value stones though there are a number of producers that are able to process relatively small diamonds. Indeed as we shall see below, all countries import very high unit value rough specifically for processing.

For the moment, there exists abundant public data on the cost of rough diamonds used in processing because rough diamonds have, until the recent 2011 marketing arrangement between the government of Botswana and De Beers, all been imported from DTC in London. However, sorting will be repatriated from the Diamond Trading Company (DTC)[23] in London to DTC Botswana (DTCB) by the end of 2013[24]. As long as these diamonds are internationally traded, or at least those that are declared by traders data are readily available. In Botswana, this will almost certainly cease to be the case once the rough diamonds are no longer imported from the DTC in London for processing. It should be noted that diamonds imported into Botswana along with other SADC countries appear to be at the very high unit cost end of the range and amongst the most expensive average import prices of any countries reporting to the Kimberly process[25]. This means that sightholders are able to receive from De Beers the high value rough diamonds for processing, which remain the commercially viable production possible in high cost locations.

The normal industry rule of thumb for cutting and polishing is that the cost of cutting and polishing should not exceed 10% of the value of the rough. An implicit beneficiation tax can be derived from the difference between the estimated maximum cost of processing in Botswana and the estimated world average actual costs of cutting and polishing, as illustrated in Figure 2. Accordingly, DTC imposed in 2009 a US$ 31.17/carat implicit tax on processors by requiring local beneficiation in Botswana, equivalent to 4.5% of the value of the rough diamond imports. If the estimated costs of processing have decreased as dramatically as the recent government data indicates, then such an implicit tax would simply not exist. While costs of production are relatively high and there is an implicit tax imposed on firms based on 2009 data the costs to firms are outweighed by the benefit of gaining long terms access to Botswana's rough diamond supply. However, while sightholders are anxious to obtain more rough, should the implicit tax rise as a result of government attempts to increase employment in the sector before productivity has increased, then the expansion of production will cease. Alternatively, should the differential between the sightholder price paid by purchasers and the world market price equivalent decline over time as the industry becomes more competitive, the advantage of access to rough also declines and the incentive to processing in Botswana will diminish *pari passu*.

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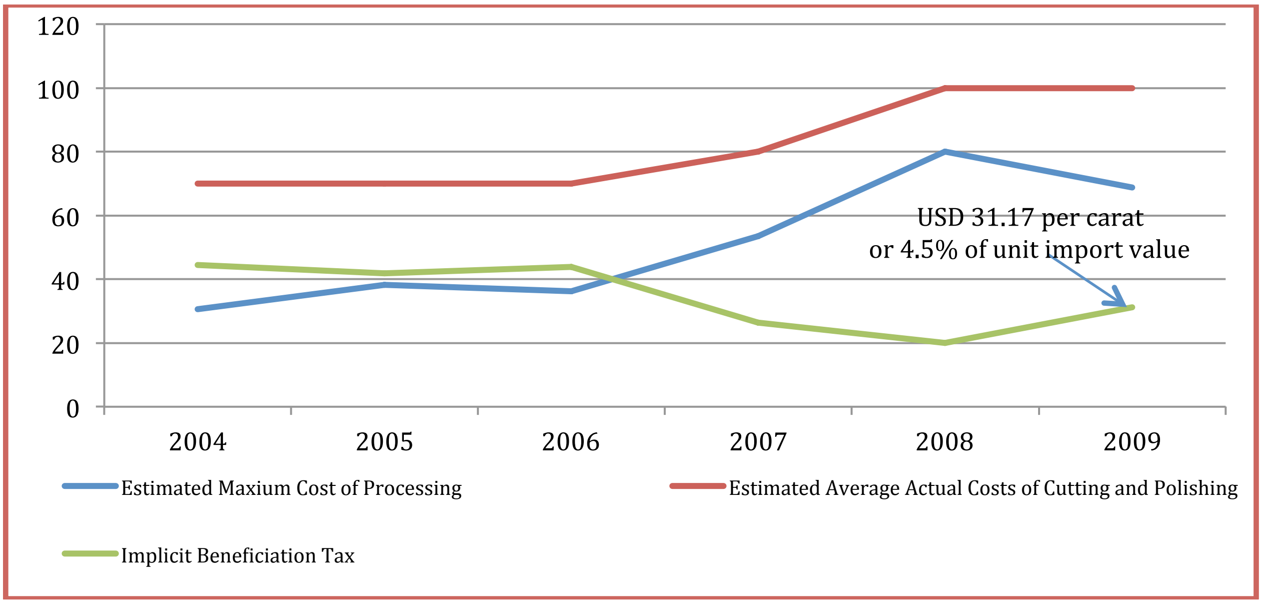
22 Kaiser Associates (2005).

23 The Diamond Trading Company (DTC) is the rough diamond sales and distribution arm of the De Beers Family of Companies. The DTC sorts, values and sells a very significant portion of the world's rough diamonds by value. The DTC has a combination of wholly owned and joint venture operations in South Africa (DTCSA), Botswana (DTCB), Namibia (NDTC) and the United Kingdom (DTC). (http://en.wikipedia.org/wiki/Diamond_Trading_Company) DTC Botswana is part of the De Beers group and is the successor of the De Beers', Central Selling Organization, which controlled the global diamond trade up until the 1990s. This shift is part of the evolution of the De Beers marketing chain which saw the fundamental shift away from a traditional cartel arrangements with the' Supplier of Choice Model' DTC Botswana is 50% owned by the Government of Botswana and De Beers and with 15% of De Beers owned by the Botswana Government.

24 http://www.debeersgroup.com/en/Media-centre/Press-releases/2011/Botswana-and-De-Beers-sign-10-year-Sales-Agreement/ (2011), see also Even-Zohar (2011).

25 For the SADC region, the preparation of the stones for cutting is often done in high cost destinations before the product is ultimately cut and finished in Southern Africa. This also explains the very high unit import prices observed in the data.

Figure 2 Estimated Unit Cost of Cutting and Polishing and the Implicit Beneficiation Tax (USD)



Source: Data on actual costs of cutting come from various Diamond Hub presentations 2008-2009. The estimated maximum is based on the standard rule of thumb in the industry that diamond cutting cost should be no more than 10% of the value of the rough. Rough values are based on Botswana import data, Kimberly Process website. http://mmsd.mms.nrcan.gc.ca/kimberleystats/public_tables/Annual%20Summary%20Table%202008.pdf

The cost data presented above, along with more recent estimates beg several important commercial questions that bear upon the development of one of SADC's most important export industries. The first question is that if the cost differentials are as large as suggested between that of SADC producers and lower cost cutting and polishing countries in Asia then why are there beneficiation activities beginning to occur throughout the SADC region? Second, if costs are such an important factor in determining the location of where diamonds are processed, why are so many diamonds still cut in countries like Israel, Belgium and the USA, where costs are considerably higher than in India or in Southern Africa?

The answer to the first question, as argued above, is that De Beers has adapted to the changing demands of the developing countries in which it has mining operations and has over the last decade created a new system of marketing diamonds that is seeing sightholders cutting and polishing diamonds in each country where the diamonds are mined. These sightholders are selected on the basis of several important criteria, one of which is the extent of domestic beneficiation. In Botswana the criteria used by the DTC Botswana for allocation of supply of rough depend, *inter alia* upon local beneficiation [26]:

"The criteria used to *determine individual supply levels* included global competitiveness criteria, which assesses technical; marketing and distribution efficiency; as well as local criteria, which sought to promote skills development; job creation; *and local manufacturing*."

The actions of DTCB are a result of government policy which were outlined in Botswana's 10th National Development Plan[27] as well as in many statements by policy makers at the highest level[28]. The

26 Downloaded on 10th April 2010 from http://www.dtcbotswana.com/sightholders.php

27 The National Development Plan (page 166) states that: By 2010, US$ 550 million worth of rough diamonds will be allocated by DTCB annually, with up to 80% of those diamonds polished in Botswana factories. This comprises 4% of global rough production of US$13 billion. By 2016 the proportion of locally traded rough will increase to a level mutually agreed by the government and the suppliers.

development of the diamond processing industry in the country is a result of a long-standing desire by strongly nationalist elements of the Botswana Government to move in this direction of beneficiation[29]. Unfortunately the decision to proceed with processing was very late in the economic life of the country's known diamond deposits. Had these occurred in the 1980's after the initial development of Jwaneng, Botswana workers would have had 20 more years to develop the cutting and polishing skills and infrastructure needed in the industry[30].

All this perhaps answers the question why De Beers moved in the direction of beneficiation but not why their sightholders were willing to co-operate in what is in effect a tax on their profits is quite another question. The reason ultimately rests in the economics of being a De Beers sightholder and having access to the primary diamond market as opposed to secondary or non-mined market for rough. The price at which 'boxes' of diamond are sold to sightholders from De Beers have recently sold at 20-30% below the price at which these stones can be purchased in the secondary market. This access to rough along with the margin of profit, keeps sightholders wishing to remain in the De Beers group. It is upon this advantage that De Beers is able to impose the cost of domestic beneficiation.

For the sightholder, as long as price differential between the De Beers price of rough and what the equivalent rough would cost on the secondary diamond market is greater than the differential cost of cutting and polishing in Botswana, then they will agree to beneficiate in Botswana. In 2008, it should be recalled, Botswana exported approximately US$100 million in polished diamonds from a rough allocation for polishing purposes of US$ 300 million[31]. This would indicate that depending on the efficiency of cutting, only 30-35% of rough imported was actually processed in the country and the balance re-exported. Some sightholders indicated that even with the high cost of processing in Botswana, they are able to produce profitably because of cross-subsidization from their own factories in lower cost areas, such as India and China. As long as the rough was also provided to those factories, they could accept the cost of processing in Botswana. Along with the price differential between the De Beers' sightholder prices and those prevailing on the secondary market, an important commercial benefit to the sightholder is the assurance of a consistent supply of diamonds, which would not come from purchases either on the secondary market or from other producers. In part, this consistency of supply also compensates for the beneficiation tax imposed on cutters and polishers.

A third very important potential benefit to those DTCB sightholders involved in processing is that in 2009 Botswana only imported only 485,000 carats from DTC out of a total production of 17.7 million carats. It is the intention of the government to shift the sorting to Botswana and move to allocate rough through DTCB sightholders. There is nothing that stops the Government of Botswana from raising this ratio of processing to allocation from the current 2.7% to much higher levels and the existing sightholders would most likely benefit through increased access to rough. It should be noted that in 2009, production figures reflect the depth of the global recession and hence are not typical of Botswana's normal production, which was severely curtailed. In 2008, a more 'normal' year, production in Botswana was 32.3 million carats and, if Botswana moved to localise more of the processing, a greater proportion will be available to those sightholders. A further potential benefit is that the Government of Botswana has in the past been more than

28 State of the Nation Address by HE Lt General Seretse Khama Ian Khama, to the 2nd Session of the 10th Parliament, 8th November 2010, Gaborone. He said 'All 16 diamond cutting factories are operational, with a combined workforce of just over 3000, representing an 18% increase over last year. As of September 2010 the factories had cut and polished diamonds worth over P2 billion, a value already above last year's total. One of the companies will also soon be starting up jewellery manufacturing'.

29 Magang (2008).

30 Revenues from diamond mining are expected to decline precipitously post-2018 when the diamond deposits at Jwaneng are expected to go into decline (see 10th National Development Plan). Two new diamond mines are expected to open in the coming years, but their size is not expected to replace the decline in Jwaneng.

31 Matsheka and Tombale (2009).

willing to provide financial assistance to the diamond processing and jewellery sectors and in the 1990's provided considerable grants to many large firms to locate there[32].

However, processing of diamonds also occurs in very high cost destinations such as Antwerp, Tel Aviv and New York. Clearly for these locations, where costs are considerably higher than in India, China or in SADC countries, production, nevertheless, remains profitable. Cutting and polishing of very high value diamonds is normally done in these destinations where considerable technical expertise exists in the local diamond industry, thereby minimizing the risk of damaging a very high value gem. This then leads to the second question of whether the price of cutting and polishing matters in terms of choice of location. The answer to this depends very much on the quality of the diamond in question. At the top end of the market, with the largest and most valuable gems, the cutting cost is relatively insignificant. This is not the situation for small, low quality diamonds where the cutting price is all-important. Indeed, the very entry of India into the diamond-processing sector was a direct result of the fact that in the late 1960's and early 1970's, when diamond processing began to accelerate in Surat and Mumbai, the Indian processors were able to capitalize on a market niche due to their low labour costs[33]. India could process stones of such size and volume that were previously considered not to be economically viable. It is on this basis that the Indian processing sector was able to export some US$14.1 billion in processed diamonds in 2008, while net imports of rough diamonds were US$8.8 billion [34]. India has created a cutting and polishing industry that did not exist 40 years ago with employment of some 800,000 workers with no rough diamond production in the country whatsoever[35]. African countries view this record of employment generation in India with envy and seek to replicate this outcome. However, it is the very presence of the diamond deposits and the ensuing high incomes that the rents in the mining sector has generated, that has meant that processing, especially of low cost, labour intensive diamonds, is simply not commercially viable without significant state support to producers.

5. Conclusions

Several important conclusions stem from this analysis of the diamond beneficiation. The first is that beneficiation in Botswana and throughout SADC region was made possible by a fundamental shift in De Beers' corporate strategy. Prior to 2000, De Beers was overtly hostile to local beneficiation of rough diamonds. With the advent of the Supplier of Choice strategy, the fragmentation of the market and the increased role of sightholders in the process of marketing and advertising and product differentiation became central to De Beers' own strategy. This strategy was very much consistent with the desire of De Beers to be supportive of the interests of its mining country stakeholders in Southern Africa and thus the sightholder regime which links access to rough to domestic processing in SADC was developed.

Diamond beneficiation, in the form of cutting and polishing, would not naturally occur in Botswana at this point in the country's development if it were not for the criteria for selection and allocation of rough to the DTCB sightholders. This confers a significant benefit on those sightholders in the form, amongst others, of the price differential between the De Beers and secondary market prices and potential future access to

32 In Botswana the government has invested heavily in the development of the older generation of down stream processing firms. Through the Financial Assistance Policy the Government helped establish the Teemane (Debswana) factory with a grant of P5 million. Lazare Kaplan Diamond cutting received Pula 10 million in 1993 and in 1992 Orobot enterprises received the largest ever FAP grant of Pula 26 million to establish a jewelry factory.

33 Rao (2009), see also Roberts (2007).

34 The net imports is the measure after re-exports. The gross imports into India were US$ 9.6 billion and re-exports were US$ 0.8 billion.

35 India imports roughly 147 million carats or 40% of world rough diamonds imports by volume in 2008. These are generally very low priced diamonds at an average of US$ 64.90 in the same year. While it does not produce any diamond,s India no longer processes only the cheapest rough and exports some 38 million carats of rough diamonds at an average price of US$ 22 per carat.

Botswana's very substantial reserves of rough diamonds. Perhaps equally significant is the benefit of a consistent supply of diamonds, which could not otherwise be guaranteed through either secondary market purchases or from alternative producers. Thus, cutting and polishing in Botswana incurs a cost on producers over that which would otherwise be the case and in this way the obligation to beneficiate acts as a tax. Cutting and polishing of diamonds, unless there is a considerable expansion in the allocation of rough to sightholders, is unlikely to create significant jobs over and above the 3,000 currently employed in the industry. By the end of 2011 employment had not recovered to pre-financial crisis levels. Beneficiation in the diamond sector involves other activities beyond cutting and polishing and, with sufficient investment, these may well materialise and prove profitable.

The Government is keenly aware that unless Botswana succeeds in lowering production costs through investments in ancillary infrastructure, the sector will not be likely to survive longer than the allocation of rough diamonds by De Beers. A sectoral development plan for diamonds should therefore be the preferred approach to the development of the industry for, only with those positive investments, will the incentive to remain in Botswana outlast the rough diamond supply.

What Government has not determined at a macro level is whether such a large investment in the required ancillary infrastructure over a protracted period of time is worthwhile for Botswana or whether there are, in fact, better investments for its scarce public capital. In the final analysis, developing a genuine comparative advantage is akin to obtaining an education, but on a national scale. Like obtaining a good education, acquiring a national comparative advantage in the production of a product is time consuming, expensive and riddled with mistakes along the way. It is only in retrospect that it is possible to know, and even then with no certainty, whether the education was a worthwhile investment or not. What is certain is that it is not possible for a nation to acquire a comparative advantage in too many activities as the cost is prohibitive and, therefore, nations must choose to base that investment on a combination of rate of return and likelihood of success. This analysis needs to be done for the case of diamond beneficiation.

It would almost certainly have been better for Botswana's development had it pursued this policy of beneficiation in 1982 with the opening of the huge Jwaneng mine, for it would have given workers and entrepreneurs in Botswana almost an entire generation to acquire the necessary skills for beneficiation to become profitable. Unfortunately, the position of De Beers on beneficiation at the time and its relative power made that impossible and thus Botswana is pursuing processing at a time when its publicly known reserves are in decline. The process of beneficiation may succeed but there certainly appears to be no clear plan as to how the implicit beneficiation tax will be compensated for once the country has fully exploited its diamond deposits. Without an effective plan to lower processing costs, the industry will certainly leave once the supply of rough diamonds decline.

The real long term development issue for Botswana should not be whether there will be a sustainable cutting and polishing industry after the diamond mines are exhausted. Revenues from these mines will decline dramatically post-2027, when mining at Jwaneng is likely to either go underground or continue open-cut with a much deeper mine. However, mining from existing known diamond deposits is likely to continue for a period of at least 30-40 years with much reduced profits and reduced output. This period is of sufficient duration for many dynamic development effects to result from the cutting and polishing industry, especially if a domestic commercial cutting and polishing industry ultimately develops. And while it seems likely that the cutting and polishing of diamonds in Botswana are unlikely to survive beyond the supply of rough, in the words of Hirschman, 'one thing may lead to another' and hence other related commercial activities may develop as large numbers of Batswana are trained in a relatively sophisticated industrial process.

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