

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

16

The
South African Government,
the Pharmaceutical Companies
and Access to HIV/AIDS Drugs

submitted in partial fulfilment of
Masters in Arts (Economics)

University of Cape Town

September 2001

Susan Cleary

Abstract

In 1997, the South African government passed the Medicines and Related Substances Control Amendment Act, No. 90 of 1997. Shortly thereafter, the Pharmaceutical Manufacturers' Association of South Africa challenged the constitutionality of the act, and argued that it contravened South Africa's obligations as a member of the World Trade Organisation.

Before the start of the case, the Amendments Act was seen in the eyes of the public and the media as an attempt on the part of the government to increase access to HIV/AIDS medications. This generated positive publicity for the government's HIV/AIDS strategies. Once the case had been settled, it became apparent that the government was not going to use the Act to increase access to antiretrovirals.

On the part of the government, the court case has both international and domestic linkages. On the international front, there are links to intellectual property rights for pharmaceuticals, as defined by the Trade in Intellectual Property Rights Agreement, and to a broader World Trade Organisation bargaining strategy. There is also evidence of a link between the court case and the attraction of Foreign Direct Investment to South Africa. On the domestic front, the government's motivations in the court case are a function of domestic economic goals, most notably fiscal restraint. The behaviour of the government in these spheres is examined in detail in order to rationalise them into an effective utility function.

Pharmaceutical companies are profit maximisers. Their motivation is to protect the patent system. The difficulty is that profit maximisation can become morally objectionable. In the case of HIV/AIDS, their reputations can be damaged (which impacts the patent system) if they are seen to be obstructive to the access to antiretrovirals.

Once utility functions have been derived from observed behaviour, the dispute between the players is modelled using classical game theory. The first game models the situation from the start of the dispute until the end of 1999. If the interaction between the players had been resolved in this period, it is likely that the outcome would have been decided by a court of law. However, various events modify this situation, so that when the game is played in its final form, the players settle out of court. Under the settlement, the government agrees to implement the law in a manner that will have very little effect on the profits of the pharmaceutical companies.

Given this behaviour, the only possible conclusion is that the government had no intention of using the Amendments Act to increase access to antiretrovirals.

Acknowledgements

I would like to gratefully acknowledge the input of my supervisors, James Hodge and Don Ross. Both have brought great insight to the issue. I would also like to thank Andrew Myburgh and Alberto Behar for their input. Finally, Toby Kaspers of MSF has been extremely helpful in providing me with some rare papers on the pharmaceutical industry, and insight into what was going on from the activist's point of view.

University of Cape Town

Contents

GLOSSARY

ONE – INTRODUCTION

TWO – INTELLECTUAL PROPERTY RIGHTS

- 1. Intellectual Property Rights – rationale for protection*
- 2. Intellectual Property Rights in South Africa*
 - 2.1 The Patents Act*
 - 2.2 The Trade in Intellectual Property Rights Agreement (TRIPS)*
- 3. Remedies for patent abuse*
 - 3.1. Remedies for patent abuse under the Patents Act*
 - 3.2. Remedies for patent abuse under TRIPS*
- 4. The Medicines Act of 1997 and Section 15C*
 - 4.1. Section 15C*
 - 4.2. The background to the court case and PMA's Notice of Motion*
 - 4.3. The settlement reached between the government and the PMA*
- 5. Conclusion*

THREE – SOUTH AFRICAN GOVERNMENT UTILITY FUNCTION

- 1. Addressing Poverty and Inequality*
- 2. HIV/AIDS treatment strategy*
- 3. The Amendments of the Medicines Act*
- 4 The empirical evidence*
 - 4.1. No antiretroviral treatment is to be offered in the public health sector*
 - 4.2. The court case's public relations component*
 - 4.3. Weakening intellectual property rights would diminish the chances of attracting investment or obtaining certain reforms in the next WTO round*
- 5. Conclusion*

FOUR – PHARMACEUTICAL COMPANY UTILITY FUNCTION

1. *The Pharmaceutical Industry*
2. *The Patent System: awarding market power to drug developers*
 - 2.1. *The cost of drug development*
 - 2.2. *Two general problems with DiMasi's study*
 - 2.3. *Problems specific to antiretrovirals*
 - 2.4. *Recalculating DiMasi's figures*
3. *Events leading to lower prices for antiretrovirals*
4. *Conclusion*

FIVE - GAME THEORY

1. *Lawsuit Game*
 - 1.1. *Pruning the Game Tree*
2. *The Game Changes*
3. *SAG and PMA play Poker with Bluffing*
 - 3.1. *Pruning the Game Tree*
4. *Equilibrium*

SIX - CONCLUSION

REFERENCES

APPENDIX

Appendix A - Time Line of Events

Appendix B - Threshold values of s , given p , q and δ

TABLES

Table 1: Antiretrovirals Sorted by Therapeutic Class

Table 2: Development Times for Antiretrovirals

Table 3: Expected phase costs per marketed NCE (in millions of 1987 dollars) versus costs for antiretrovirals and costs for AZT

Table 4: After-tax Development Costs for Antiretrovirals and AZT

Table 5: Threshold Values of s , given p , q and δ of 0.2 or 0.8

FIGURES

Figure 1: The Pharmaceutical Firm: Fixed Costs and Increasing Returns

Figure 2: The Decline in Antiretroviral Prices

Figure 3: Law Suit Game

Figure 4: Poker with Bluffing Game

Figure 5: Threshold of s with sigma of 0.2

Figure 6: Threshold of s with sigma of 0.8

University of Cape Town

Glossary

Amendments Act	Medicines and Related Substances Control Amendment Act, No. 90 of 1997
ANC	African National Congress
ART	antiretroviral treatment
CBO	Congressional Budget Office (United States)
Cosatu	Congress of South African Trade Unions
DTI	Department of Trade & Industry
FDA	Food and Drug Administration (United States)
FDI	Foreign Direct Investment
IP	Intellectual Property
IPRs	Intellectual Property Rights
Medicines Act	Medicines and Related Substances Control Act, No. 101 of 1965
MSF	Médecins Sans Frontières
NDA	New Drug Application
NIH	National Institute of Health (United States)
PhRMA	Pharmaceutical Research Manufacturers of America
PMA	Pharmaceutical Manufacturers Association
SAG	South African Government
TAC	Treatment Action Campaign
TRIPS	Trade in Intellectual Property Rights
USTR	United States Trade Representative
WIPO	World Intellectual Property Organisation
WTO	World Trade Organisation

Chapter One

Introduction

In 1997, the South African government passed the Medicines and Related Substances Control Amendment Act, No. 90 of 1997. Almost immediately thereafter, the Pharmaceutical Manufacturers' Association of South Africa challenged the constitutionality of the act, and argued that it contravened South Africa's obligations as a signatory of the World Trade Organisation.

After three years of dispute, the case finally came to court in March 2001. By April 2001, the PMA settled out of court.

The interaction between the government and the PMA has often been confusing and contradictory. It was the popular opinion that the government would use the Amendments Act to increase access to antiretrovirals. Unfortunately, this has not proved to be the case. If this is so, what motivated the government's involvement in the court case? The answer is simple on one level, but on another level it becomes much more complex, because the government's strategy with respect to the access to antiretrovirals is part of a broader trade and economic growth strategy. This thesis provides an accurate description of the government's motivations with respect to the court case and the access to antiretrovirals on both the simple level and the broader level.

This dissertation was motivated by a desire to add to the body of knowledge on HIV/AIDS and the access to medicines. Back in 2000, when I first became interested in this issue, there was an incredible amount of negative publicity surrounding the government's stance with respect to HIV/AIDS. Their interaction with the PMA appeared to be one instance where they were fighting for the interests of HIV/AIDS victims. I recognised that this was an anomaly, and that it would be interesting to find out what was going on behind the scenes.

The first step towards gaining an understanding of the court case, is to gain an understanding of how intellectual property rights work on both the local and the international level. For this reason, the thesis begins with an explanation of the legal and economic issues of intellectual property rights. Intellectual property rights are defined by domestic law, but have to meet a minimum standard of protection as given by the Trade in Intellectual Property Rights Agreement, to which South Africa is a signatory.

When the government passed the Amendments Act, this was immediately challenged by the PMA. The PMA argued that Section 10 of this act, which introduces Section 15C to the Medicines Act of 1965, was unconstitutional and violated South Africa's TRIPS obligations.

The third chapter examines the behaviour of the government in detail in order to derive the most effective utility function to rationalise these behaviours. The finding is that the government's priorities are to maintain fiscal restraint, to attract foreign direct investment and to increase exports in order to grow the economy in the long run. In order to increase South Africa's export market access, the government has a very specific World Trade Organisation bargaining strategy. These goals are in opposition to the provision of antiretrovirals.

The fourth chapter develops the utility function of the pharmaceutical companies. This is clearly to maximise profits. However, in the context of HIV/AIDS, pharmaceutical companies can suffer from negative reputation effects if they are seen to put profits before the lives of AIDS sufferers. This type of loss of moral capital can have repercussions for the strength of the patent system. In order to maintain the public's belief in the benefits of the patent system, it would be wise for pharmaceutical companies to improve access to antiretrovirals in poor countries.

The fifth chapter models this analysis using classical game theory. Two games are modelled. The first game represents the interaction between the two players from the beginning of 1998 until the end of 1999. The second game is from the period leading up to the court case until settlement. The court case defers some negative publicity

from the government's HIV/AIDS policies by making pharmaceutical companies the scapegoats. In the process, the prices of antiretrovirals are drastically reduced as pharmaceutical companies bow to pressure from activists in conjunction with negative media attention on the court case. The PMA settles out of court and the government enjoys the glow of victory. In the background, the new regulations of the Medicines Act do not allow compulsory licenses for any kind of medicine.

University of Cape Town

Chapter Two

Intellectual Property Rights

Any understanding of the strategies of the players in the game has to be prefaced by a thorough knowledge of intellectual property rights.

Once South Africa became a signatory of the World Trade Organisation Uruguay Round agreements, domestic intellectual property rights laws had to be amended in order to conform to the minimum standards given by the Trade in Intellectual Property Rights Agreement (TRIPS). While amendments were made to meet the required standard, the Amendments to the Medicines Act were highly contentious because they appeared to weaken intellectual property right protection for medicines in a manner that could even contravene TRIPS. Although there were objections to many sections of the Amendments Act, this thesis concentrates on Section 15C, which was designed to allow parallel importation and compulsory licensing, depending on its interpretation.

A medicine is said to be parallel imported if, once it is sold by the patent owner or a licensee in one country, a third party sells it on in another country. For instance, if the price of GlaxoWellcome's AZT were relatively low in Thailand, a third party could buy AZT in Thailand and parallel import it into South Africa. Parallel imports are only viable if there are significant price differentials between countries.

Compulsory licenses allow a generic manufacturer to produce a drug before the patent on the brand name drug has expired. Usually a royalty is paid to the patent owner. Compulsory licenses are awarded domestically, usually in response to patent abuse. This is explained in detail in section 3.

On the international front, the amendments to the Medicines Act lead to two years of trade pressure from the United States government. On the domestic front, the members of the South African Pharmaceutical Manufacturers' Association (PMA)

challenged the Amendment Act's constitutionality. In early 1998, the PMA filed the Pharmaceutical company lawsuit against the Government of South Africa. This effectively blocked the government from implementing the amendments until the case could be decided in court. The case finally came to court in March 2001, and was resolved in April, when the PMA offered an out of court settlement.

In the first section, the rationale for intellectual property protection and the motivation for the inclusion of intellectual property rights in the WTO agreements is discussed. The second section describes intellectual property right protection for medicines in South Africa. The third section outlines the choices open to countries that wish to remedy intellectual property abuses for medicines. After this background information has been established, the chapter discusses the 1997 Medicines and Related Substances Control Amendment Act (the Amendments Act) which introduces Section 15C to the Medicines and Related Substances Control Act of 1965 (Medicines Act).

1. Intellectual Property Rights - rationale for protection

Intellectual property rights are legal rights that are awarded to the creators of new technologies or ideas. These rights are designed to allow inventors to enjoy the fruits of their creativity, and thereby to provide the incentive to invest in ideas so that the greater public may enjoy their benefits.

According to Jones (1998) the economics of growth and development defines technology as the means by which production transforms inputs into output. Ideas or innovations are said to improve the technology of production, and to allow a given amount of input to be transformed into more, better or different output. This leads to economic growth.

Sustained economic growth is a very recent phenomenon. Douglass North (in Jones, 1998) and other economic historians have argued that the development of intellectual property rights is responsible for modern economic growth. According to Jones:

“It is not until individuals are encouraged by the credible promise of large returns via the marketplace that sustained innovation

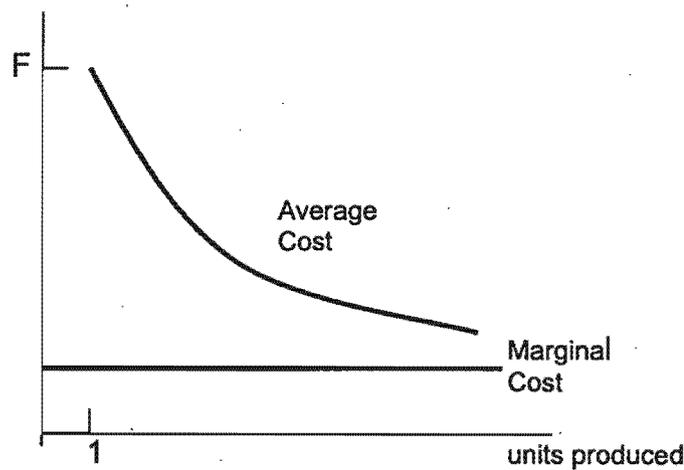
occurs....The Industrial Revolution – the beginning of sustained economic growth – occurred when the institutions protecting intellectual property rights were sufficiently well developed that entrepreneurs could capture as a private return some of the enormous social returns their innovations would create” (1998: 81, 83)

Intellectual property rights are argued to be essential to provide the incentive to invest in ideas. This is because ideas have a number of characteristics that sets them apart from ordinary goods. An important characteristic of ideas is their nonrivalry. This means that one person’s usage of the idea does not preclude someone else from using it (Jones, 1998). For pharmaceutical products, it takes many years to develop new chemical entities, but once a drug has been developed and brought to market, it is relatively easy for a generic manufacturer to produce a copy. This type of competition would destroy the incentive to invest in new drug development.

The initial development of a new chemical entity is associated with very high fixed costs, but the marginal cost of producing each unit is very low and approximately constant. In the context of a competitive market with marginal cost pricing, the drug developer would make a loss because average costs are always above marginal cost. Entrance from competitors who employ marginal cost pricing would effectively remove the incentive to invest in drug development. Figure 1 illustrates this situation. Because of the high initial fixed cost of F , setting price equal to marginal cost would lead to a loss for the firm. As the fixed cost is spread over more and more units, the average cost declines. This illustrates that, with increasing returns to scale, average cost is always greater than marginal cost. For pharmaceutical firms, this implies that the firm would be unwilling to enter into R&D for new drugs unless they could price above marginal cost.

Figure 1:

The Pharmaceutical Firm: Fixed Costs and Increasing Returns



Source: Jones, 1998: 78

Pharmaceutical products are protected by patent rights. Patents give drug developers a legally backed monopoly over the marketing of a particular new chemical entity for (usually) twenty years. In exchange, the drug developer must make the nature of the invention public. This allows other developers to build on the innovation. After the patent has expired, generic manufacturers are free to enter the market (Church & Ware, 2000).

For South Africa, intellectual property rights are seen as a necessary condition for Foreign Direct Investment and technology transfer. For foreign firms, protection of their intellectual property is an important consideration when choosing to invest in a country. In addition, multinationals would be reluctant to transfer technology without intellectual property protection (Wolson, 1997).

The TRIPS agreement prescribes a minimum standard of intellectual property protection for WTO members. For industrialised nations, intellectual property protection is particularly important because their competitive edge lies in R&D in high technology fields. Without strong intellectual property protection, it would be difficult for these countries to ensure an adequate return on their investment into new technology. On the other hand, before TRIPS, countries that lacked the capacity to

develop technology often resorted to pirating. Developing countries argued that intellectual property protection could be harmful to their development because it would raise the price of technology and prevent them from benefiting from the opportunity to imitate. Eventually, TRIPS was included as part of the final Agreements of the Uruguay Round. It is possible that some developing countries agreed to TRIPS because it was negotiated as part of the whole WTO package (Wolson, 1997).

TRIPS is not the first international intellectual property agreement, but is more powerful because of the large membership of the WTO and because it has stronger enforcement mechanisms. Issues of non-compliance can be brought before the Dispute Settlement Mechanism. If it is found that a country has failed to carry out its TRIPS obligations, the complainant country is entitled to institute cross-retaliation in the form of trade sanctions. These sanctions can be brought against any sector of the economy (Tandon, 1999).

For pharmaceuticals, the standard pro-patent argument is that drug patents provide the incentive for companies to develop new drugs. This argument does not hold in a Third World context. Even with patent protection, drug companies are unlikely to develop the drugs that treat Third World diseases because the market is too small. There is said to be a trade-off between providing the incentive to invest in drug development, versus the loss in consumer welfare. One could argue that the loss in consumer welfare is higher in developing countries than in the industrialised nations (McCalman, 1999). In recognition of this, TRIPS contains various mechanisms to remedy patent abuse. Third World nations have been advised to use the flexibility in TRIPS to increase access to medicines (*TRIPS Council Meeting on Access to Medicines*, 2001). This topic is discussed in the third section of this chapter.

2. Intellectual Property Rights in South Africa:

2.1. The Patents Act

In South Africa, patent rights are protected by the Patents Act, No. 57 of 1978. A patent can be obtained for an invention which is novel, involves an inventive step and

which can be used or applied in trade, industry or agriculture. The Patent Office falls under the jurisdiction of the Department of Trade and Industry. Patent litigation is instituted in the Court of the Commissioner of Patents. Commissioners are judges of the Transvaal Provincial Division of the High Court of South Africa. Appeals are made to the Full Bench of the Transvaal Provincial Division and thereafter to the Appellate Division. This means that litigation is exceptionally costly (Wolson, 1998).

Patents have always enjoyed strong protection in South Africa. Generally speaking, the courts have taken a pro-patentee stance and have refused to grant compulsory licenses for alleged patent rights abuses, even though the law allows compulsory licensing under certain circumstances (Wolson, 1998).

2.2. The Trade in Intellectual Property Rights Agreement (TRIPS):

In TRIPS (World Trade Organisation, 1994) a patent confers on its owner the following exclusive rights for a period of 20 years from filing date (Article 33):

- Third parties may not make, use, offer for sale, sell or import the product obtained directly from the patented process without the owner's authorisation (28:1b)
- Patent owners, however, may choose to grant voluntary licences on the patent (28:2)

Members can refuse to grant patents on two grounds that relate to public health (Article 27). These are:

- Inventions whose commercial exploitation needs to be prevented to protect human, animal or plant life, or health (27:2)
- Diagnostic, therapeutic and surgical methods for treating humans or animals (27:3a)

(TRIPS and pharmaceutical patents: fact sheet, 2001)

3. Remedies for patent abuse:

At times it may be necessary to limit or override the power of the patent. In the context of this thesis, the relevant remedies are compulsory licensing and parallel importation.

Compulsory licenses are awarded domestically. If a patent right is being abused, countries can award a compulsory license to a generic manufacturer. This allows the generic manufacturer to produce the drug legally before the patent has expired. In South Africa, compulsory licensing is possible under the Patents Act, although with considerably less flexibility than TRIPS.

Theoretically, countries should be able to work the TRIPS flexibility into local laws. In practice, however, countries may not feel confident to use the flexibility of TRIPS, especially as TRIPS is a complex and potentially ambiguous document (*TRIPS Council Meeting on Access to Medicines*, 2001). This situation is exacerbated by pressure from the United States government on countries to implement TRIPS-plus protection. However, there have been moves in the WTO to make countries feel more confident to use the flexibility in TRIPS for pharmaceuticals.

Parallel importation occurs when a third party buys a drug from a patent owner or licensee in one country and sells it in another country. This is important for health care in South Africa, because there are substantial price differentials for pharmaceuticals in different markets. These differences in prices are based on market conditions in the countries in question, such as differences in intellectual property rules (because certain countries do not have to be TRIPS compliant until 2005, or because certain countries take advantage of the flexibility written into TRIPS), differences in income in countries, and the degree of competition amongst producers.

Drug companies often argue that the highest prices are charged in countries with the highest income or ability to pay. However, this is not always the case, and it appears that the full range of market conditions is influential. For example, a drug patented by SmithKline Beecham (Amoxil) costs \$8 in Pakistan, \$14 in Canada, \$16 in Italy, \$22 in New Zealand, \$29 in the Philippines, \$34 in Malaysia, \$36 in the USA, \$40 in

Indonesia and \$60 in Germany (*Health Care and Intellectual Property: Parallel Imports ?*). Unfortunately, there is a downside. Parallel importation would encourage a narrowing of the price differential, which might hurt developing countries.

3.1. Remedies for patent abuse under the Patents Act:

Parallel imports are not permitted under the Patents Act, but compulsory licensing is allowed under Section 56. An interested party may apply for a compulsory licence at the Patent Office. A decision to allow compulsory licensing is made by the Court of the Commissioner of Patents (Wolson, 1998).

Section 56 reads as follows:

- 1) "Any interested person who can show that the rights in a patent are being abused may apply to the commissioner in the prescribed manner for a compulsory licence under the patent....
- 2) The rights in a patent shall be deemed to be abused if-
 - (a) the patented invention is not being worked in the Republic on a commercial scale or to an adequate extent, after the expiry of a period of four years subsequent to the date of the application for the patent or three years subsequent to the date on which that patent was sealed, whichever period last expires, and there is in the opinion of the commissioner no satisfactory reason for such non-working;
 - (b)
 - (c) the demand for the patented article in the Republic is not being met to an adequate extent and on reasonable terms;
 - (d) by reason of the refusal of the patentee to grant a licence or licences upon reasonable terms, the trade or industry or agriculture of the Republic or the trade of any person or class of persons trading in the Republic, or the establishment of any new trade or industry in the Republic, is being prejudiced, and it is in the public interest that a licence or licences should be granted; or
 - (e) the demand in the Republic for the patented article is being met by importation and the price charged by the patentee, his licensee or agent for the patented article is excessive in relation to the price charged therefor in countries where the patented article is manufactured by or under licence from the patentee or his predecessor or successor in title."

(Patents Act, 1978, s. 56)

3.2. Remedies for patent abuse under TRIPS

Both parallel imports and compulsory licenses are permitted under TRIPS. The right to parallel import depends on the domestic legal system's definition of exhaustion of rights, otherwise known as the first-sale doctrine. Under certain legal systems, rights are exhausted after the first sale of the good, and the patent owner cannot control the resale of a legally purchased good. The TRIPS Agreement makes it clear that this issue cannot be challenged under the WTO dispute settlement mechanism as long as there is no discrimination on the grounds of the nationality of the patent holder (Article 6, *Pharmaceutical patents and the TRIPS Agreement*, 2000; *Health Care and Intellectual Property: Parallel Imports*). In TRIPS, exhaustion of rights is dealt with as follows:

“For the purposes of dispute settlement under this Agreement, subject to the provisions of Articles 35 and 46 nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights” (in *Health Care and Intellectual Property: Parallel Imports*, p2)

All countries have trade in parallel imports, although this is sometimes limited to certain goods. In the USA, for instance, regulatory authorities restrict parallel imports in pharmaceuticals. The EU, on the other hand, has significant parallel trade in pharmaceuticals amongst members (*Health Care and Intellectual Property: Parallel Imports*).

Once a patent has been granted, Article 30 states that members may make limited exceptions to the exclusive rights conferred by a patent. However, these must not unreasonably conflict with the rights of the patent holder, taking account of the rights of third parties in this context (World Trade Organisation, 1994).

Article 31 of the agreement deals directly with the issue of using patents without the authorisation of the right holder (World Trade Organisation, 1994). Any usage without authorisation needs to be done with reference to the specific laws of the member (The Patents Act in South Africa). Such usage includes compulsory licensing, and use by government for its own purposes. According to the WTO's

TRIPS and pharmaceutical patents: fact sheet (2001), compulsory licensing is part of “the agreement’s overall attempt to strike a balance between promoting access to existing drugs and promoting research and development into new drugs”.

Before use is made, the proposed user must make efforts to obtain authorization from the patent-holder on “reasonable commercial terms”. Such efforts must be unsuccessful within a “reasonable period of time”. However, this requirement may be waived in cases of “national emergency” or “extreme urgency” or “public non-commercial use”. In the first two cases, the patent holder must still be notified as soon as reasonably possible. In the third case, the right holder must be informed immediately if the government knows that a valid patent is in existence (World Trade Organisation, 1994: 332; *TRIPS and pharmaceutical patents: fact sheet*, 2001).

Therefore, there are measures that allow for fast tracking of compulsory licensing if the government is prepared to offer drugs in the public sector, or to declare a national emergency. This interpretation of Article 31 is in keeping with interpretations in the WTO’s own documents, and with the European Union paper (European Union, 2001) submitted to the TRIPS council special discussion on intellectual property and access to medicines.

According to Love (2001a) many developed countries (United States, United Kingdom, Ireland, Germany) give government very broad powers to authorize use of patents for public non-commercial use (as allowed in section 31:b) and developing countries need to work this into their national laws. Before signing NAFTA (North American Free Trade Agreement) Canada would regularly issue compulsory licences for pharmaceutical drugs. Compensation was based upon royalties, and was usually set at 4% of the patent holder’s sales price.

If use is made without authorisation, this will be limited to the specific purpose for which it was authorised in scope and duration (31:c). It will also be mainly for supply of the domestic market (31:f). Such use will be terminated as soon as the particular circumstances have ended (31:g). The patent holder will be paid “adequate remuneration ... taking into account the economic value of the authorization” (World

Trade Organisation, 1994: 333) (31:h). All of this will be subject to judicial review in the member. (31:i; 31:j).

In cases of anticompetitive practice (Article 40) one may make use of the patent without a national emergency (31:b) and not only necessarily produce for the domestic market (31:f). The need to correct anti-competitive practice will be taken into account when determining remuneration to the patent-holder (31:k). According to Love (2001a) production for export is possible under TRIPS if, through local administrative processes, a patent is seen to lead to anticompetitive practice and to create a barrier to access.

According to article 44, if use of a patent is granted in terms of article 31 provisions, then the only remedy available to patent holders is that of remuneration in accordance with 31:h.

It seems, therefore, that TRIPS is fairly permissive when it comes to unauthorized use of patents, especially in the case of HIV/AIDS, which is widely recognised as constituting a national emergency.

The primary problem with getting antiretroviral drugs through public provisions and public non-commercial use, is that the South African government only treats opportunistic infections. A way around this dilemma would be by way of Article (31:b). It entails declaring a state of emergency and issuing compulsory licences. This would allow generic manufacturers to begin providing cheaper drugs in the private sector, subject to paying royalties to the patent holders.

4. The Medicines Act of 1997 and Section 15C

The Medicines Act was designed to correct some of the distortions of the Apartheid years, where private sector health care was very expensive, and the public sector health system charged prices in excess of those in neighbouring countries. Along with other provisions, there were two measures introduced to encourage reductions in prices. The first - generic substitution - entails prescribing a generic drug once the

patent has expired on the brand name drug as long as the generic is cheaper. The second is parallel importation.

The large pharmaceutical companies vigorously opposed these amendments to the old Medicines Act of 1965. Some of their opposition appears to be unreasonable, but they were correct in their argument that parallel importation was a violation of the Patents Act. In layman's terms, this is because the Patents Act does not allow for exhaustion of rights once a product is sold for the first time. This means that the patent owner has the exclusive rights to sell the product. Instead of amending the Patents Act, the government introduced Section 15C to the Medicines Act.

4.1. Section 15C

This section was designed to override the exhaustion of rights problem by giving the Minister of Health certain legislative rights. According to knowledgeable sources, the text of 15C comes directly from a WIPO document, which was designed expressly to allow only parallel importation. Therefore, there is a legal precedent of this type of language being used to allow parallel importation. The text of 15C is quoted below:

“The minister may prescribe conditions for the supply of more affordable medicines in certain circumstances so as to protect the health of the public, and in particular may-

- (a) notwithstanding anything to the contrary contained in the Patents Act, 1978 (Act No. 57 of 1978), determine that the rights with regard to any medicine under a patent granted in the Republic shall not extend to acts in respect of such medicine which has been put onto the market by the owner of the medicine, or with his or her consent;
- (b) prescribe the conditions on which any medicine which is identical in composition, meets the same quality standard and is intended to have the same proprietary name as that of another medicine already registered in the Republic, but which is imported by a person other than the person who is the holder of the registration certificate of the medicine already registered and which originates from any site of manufacture of the original manufacturer as approved by the council in the prescribed manner, may be imported;
- (c) prescribe the registration procedure for, as well as the use of, the medicine referred to in paragraph (b)” (Department of Health, 1997).

Unsurprisingly, it is the clause “The minister may prescribe...” as well as section 15C (a) that particularly upset the PMA. It was believed that this section could be used for both parallel importation and compulsory licensing of certain medicines.

4.2. The background to the court case and PMA’s Notice of Motion

According to PMA’s Notice of Motion issued in 1998, Section 10 of the Amendment Act, introducing Section 15C of the Medicines Act, is unconstitutional on one or more of the following grounds:

1. It allows the Minister of Health to prescribe the conditions for the supply of more affordable medicines. It does not set out any guidelines which would limit the power of the minister in this regard
2. It allows the minister to decide on the extent to which rights under a patent shall apply, irrespective of the provisions in the Patents Act
3. It allows the minister to deprive the patent owners of their property without any provisions for compensation
4. It only discriminates against patent owners in the pharmaceutical field. This is in conflict with TRIPS, which has been given effect in South Africa by the passing of the Intellectual Property Laws Amendment Act of 1997

(Pharmaceutical company lawsuit (forty-two applicants) against the Government of South Africa (ten respondents), 1998).

Intense pressure was put on the South African Government by both the PMA at home, and PhRMA (Pharmaceutical Research and Manufacturers of America) and the United States Government abroad to change Section 15C. The United States government was heavily involved in this pressure from 1997 until mid-1999. It was standard practice for the US to pressurise countries into maintaining TRIPS-plus protection. Although parallel importation is TRIPS compliant, the US, PhRMA and the PMA wanted to avoid even TRIPS-compliant flexibilities. Highlights of this pressure include the placing of South Africa on the United States Trade Representative’s Special 301 Watch List (mainly because of the Medicines Act) in May 1998. (*Time-line of Disputes over Compulsory Licensing and Parallel Importation in South Africa*, 1999; Department of Health, 2001a). An example of the

level of feeling against Section 15C is evident in a US Department of State Report (*US Government efforts to negotiate the repeal, termination or withdrawal of Article 15(c) of the South African Medicines and Related Substances Act of 1965, 1999*).

According to the report:

“All relevant agencies of the U.S. Government, the Department of State together with the Department of Commerce, its U.S. Patent and Trademark Office (USPTO), the Office of the United States Trade Representative (USTR), the National Security Council (NSC) and the Office of the Vice President (OVP) – have been engaged in an assiduous, concerted campaign to persuade the Government of South Africa (SAG) to withdraw or modify the provisions of Article 15 (c) that we believe are inconsistent with South Africa’s obligations and commitments under the WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)

...

Since the passage of the offending amendments in December 1997, U.S. Government agencies have been engaged in a full court press with South African officials from the Departments of Trade and Industry, Foreign Affairs, and Health, to convince the South African Government to withdraw or amend the offending provisions of the law, or at the very least, to ensure that the law is implemented in a manner fully consistent with South Africa’s TRIPS obligations”

For further details of this pressure, refer to the Timeline of Events in Appendix A.

The PMA insisted that Section 15C was too broad and could be used for compulsory licensing (the “broad” interpretation of the act), while the government initially insisted that their intention was only parallel importation (the “narrow” interpretation). However, in 1998, having been told that the law could be used more broadly than initially envisaged, the government appears to have considered using the law for compulsory licensing. Although compulsory licensing is possible under the Patents Act, it is a slow and costly process. Section 15C would allow the government to bypass the Patents Act and issue “fast track” compulsory licenses on pharmaceutical patents (Love, 2001b). This measure had the benefit of keeping pharmaceutical patents separate from other patents. This was necessary because the Department of Trade and Industry (DTI) did not wish to weaken intellectual property rights under the Patents Act.

On February 18, 1998, the Pharmaceutical company lawsuit (forty-two applicants) against the Government of South Africa (ten respondents) was filed. By the time the case would reach court, the number of applicants had decreased to 39 (the most notable exception was Pfizer).

By mid-1999, the issue, which was initially about increasing access to *all* drugs, had become about HIV/AIDS. Intellectual property rights activists who were against the actions of the pharmaceutical companies, so a way to get their message across via the vehicle of HIV/AIDS. Note that this was not the South African government's interpretation. After mass demonstrations by activists, particularly against the Gore presidential campaign, the United States government dropped its trade pressures against South Africa. A "Joint understanding between the governments of South Africa and the United States of America" was issued by the South African Department of Trade and Industry (1999). In this agreement, the US government agreed to remove pressure from South Africa. South Africa agreed that:

"It is the express position of the South African Government that, in the implementation of provisions of the Medicines Act – which permits parallel importation and compulsory licensing of patents for pharmaceuticals – it will honour its obligations under the TRIPS Agreement"

(Department of Trade and Industry, 1999: p.1).

Notice that this statement shows the government's intention to use the Medicines Act for both parallel importation and compulsory licensing.

From September 1999, the companies in the litigation announced that they would suspend their lawsuit in order to enter into negotiations over a settlement with the government, but the government was still blocked from using the amendments in the Medicines Act. There was no movement for about a year, and it was the popular opinion in South Africa that, if the government were to win the court case, it would authorise the domestic production of generics or would import cheap generic HIV/AIDS drugs. Eventually, believing that government was not negotiating seriously, the PMA took up the suit again ("World Trade Rules and Cheaper Drugs", 2001).

According to Love (2001b: 3)

“...in several policy forums people in and out of government expressed the belief that if the government won its court case over 15C it would authorize domestic production or imports of cheap generics of HIV drugs”.

Wide readings of newspaper articles, as cited in the chapter on the Government's utility function, support this point of view.

By the time the case came to court in March 2001, the government had changed its stance. Two events were instrumental. The one was the failure of the Seattle Round of the WTO negotiations at the end of 1999. Seattle was a learning experience for the government. They learnt that they would have to consolidate their WTO strategy in order to gain any headway at the Dohar Round (to be held at the end of 2001). In addition, once activism made Section 15C about increasing access to antiretrovirals, it was no longer in the government's interests to implement a “broad” interpretation of the act. By the time the case reached court on 5 March 2001, the government heads of argument indicate an intention to argue that the law could only be used for parallel importation, whereas the PMA (who presented their case on the first day of proceedings) was arguing that it could also be used for compulsory licensing.

Love (2001b) who attended the proceedings in Pretoria, writes:

“..the PMA made a strong case that as written, 15c would permit the importation or local production of generics.... The PMA said that it was improper for the parliament to delegate ‘legislative’ authority to the Minister of Health, and said 15c did this by giving the Minister the discretion to override rights in the patent law”.

4.3. The settlement reached between the government and the PMA

The Treatment Action Campaign (TAC) was admitted as amicus curiae (friend of the court) on 6 March 2001. This caused the proceedings to be delayed until 18 April 2001. When the case reopened in April, the PMA immediately offered to settle out of court. A “Joint Statement of Understanding between the Republic of South Africa and the Applicants” was released and is available on the ANC Today site (“Historic

agreement lays the basis for co-operation towards health for all", 2001). In this statement, the government agreed to seek measures to protect public health (including the enactment of section 15c) within its international (TRIPS) obligations, while the PMA agreed to work with the government towards this end. This settlement was hailed as a victory by the government, by activists and by the media.

The draft regulations of the reformatted Medicines Act were released by the Department of Health on 1 June 2001. They do not contain any means for compulsory licensing, only for parallel importation. This is defined as:

"the importation into the Republic of a medicine under patent in the Republic that has been put onto the market outside the Republic by or with the consent of the patent holder in respect of such medicine." (Department of Health, 2001b).

How is this a victory for the government? The PMA will only lose a very small amount of market power through parallel importation. There has been very minimal weakening of intellectual property protection. No additional TRIPS-compliant mechanisms to override patent abuses have been implemented. Clearly, this is a victory for the PMA. If all the government wanted was parallel importation, by 2001, this would have been easy to achieve. Instead, they chose to write the ambiguous and contentious Section 15C to supposedly get around the exhaustion of rights problem. This led to two years of trade pressure from the United States, and almost four years of legal action on the part of the PMA. These anomalies are cleared up in the following chapters.

5. Conclusion

The only legal vehicle for compulsory licensing is the Patents Act in South Africa. Parallel importation for medicines is to be allowed in terms of the Medicines Act, once it is passed by parliament. The new format of the Medicines Act does not resemble Section 15C. It is useful for long-term right sizing of prices charged for drugs in South Africa, but is not useful if it is your aim to get cheaper antiretrovirals through compulsory licensing. Compulsory licensing is still possible under TRIPS and the Patents Act, but the flexibility that is offered under TRIPS is greater than the

flexibility in the Patents Act, especially as the chosen form of due process in South Africa involves high court litigation. If the government were dedicated to getting generic antiretrovirals in South Africa, it could do this through the Patents Act as it stands, or it could do this by modifying the Patents Act to take advantage of TRIPS' flexibility. Alternatively, the government could show a stronger interest in reworking the TRIPS agreement at the next World Trade Organisation round. Unfortunately, there appears to be too little evidence of an interest in this regard, which means that there is very little hope of getting antiretrovirals to HIV/AIDS sufferers via the public sector.

University of Cape Town

South African Government Utility Function

Governments are vote-maximizers. They pursue policies to enhance political power within their budget and institutional capacity. In vote-maximising, the South African government can afford to take a longer run perspective. They obtained nearly two-thirds majority in the elections held in 1999 and there is no serious opposition party threat. As the liberation party and first democratically elected government in the country, voters will continue to vote for them irrespective of their performance in the medium term. This means that they can get away with introducing some painful short-term reforms.

In the long run, however, they need to address poverty and inequality, or their political power could be threatened by a loss of confidence in democracy or in ANC-lead government. In a *Guardian* interview, Mbeki said:

“What I fear is that, if we go on too long with these disparities, particularly when you have too many people who remain poor, I think they would rebel against democracy. Because it hasn’t brought them anything.” (Mbeki in Holiday, 2001)

The government’s utility function is derived using the Principle of Charity (Davidson, 1984). In the context of economics, this principle requires that agents have roughly acyclical preferences, and that their behaviour is guided by these preferences. Starting from this premise, the behaviour of the government was studied in detail, and the most parsimonious utility function to rationalise this behaviour was derived. This utility function is described in the next section.

1. Addressing Poverty and Inequality

The government sees economic growth as the main tool for addressing poverty and inequality. The government’s economic strategy is contained in the Growth,

Employment and Redistribution (Department of Finance, 1996) document. GEAR aimed to introduce strategies which would stabilize the economy and move it onto a higher long-run growth path.

In order to stabilize the economy, the government cut down on spending. During fiscal year 1993/94, the fiscal deficit was 7.9 percent of GDP. By the year 2000, it was 2.3 percent. Although attempts were made to restructure spending, fiscal restraint has limited the delivery of social services and the building of infrastructure (Ayogu & Hodge, 2001). In order to achieve a higher long run growth path, increased investment and exports are needed (Department of Finance, 1996). These three: fiscal restraint, increased investments and increased exports are significant for the government's utility function for antiretrovirals.

Part of the strategy to increase exports is a WTO bargaining strategy. The government is aiming to enhance the country's export market access at the next WTO round which will be held at the end of 2001 or in early 2002. WTO agreements are negotiated on a quid pro quo basis – you give me something I want and I'll give you something you want. But, some countries have more bargaining power than others. The South African government is following a careful strategy in order to get what they want. The strategy has been to fully uphold the Uruguay Round agreements, and to argue that the quad countries (United States, European Union, Japan and Canada) have not upheld the spirit of the agreements.

South Africa wants to emphasise agriculture, textiles and technical assistance. To choose to emphasise these areas means that South Africa has to maintain the high ground with respect to TRIPS. This is the nature of quid pro quo. To increase bargaining power, South Africa has formed alliances with other developing countries. This is part of what is behind the New African Initiative and the African Union.

Why doesn't South Africa choose to concentrate on TRIPS at the Dohar Round? As regards drug patents, TRIPS is already more flexible than South African patent law. This means that it is already possible to increase the flexibility of domestic intellectual property law. WTO Director-General Mike Moore has encouraged developing countries to feel free to utilise the flexibility of TRIPS for medicines.

For a middle-income country such as South Africa, intellectual property rights protection is seen as a necessary condition to attract foreign direct investment. For these reasons, the government is focussing on expanding exports and investment.

In the long run, therefore, the government is hoping to grow the economy and in this manner, to alleviate poverty and inequality. In the short run, they are confronted with the HIV/AIDS health crisis. How could the government cope with this crisis while keeping an eye on the long run goals?

2. HIV/AIDS treatment strategy

The government currently offers treatment for opportunistic infections and prevention of mother to child transmission on a small number of pilot projects. To understand government's options with respect to antiretroviral treatment, a quick discussion of the basics of HIV/AIDS care is needed. Currently, an estimated 4.7 million South Africans are HIV-infected, with between 100 000 and 350 000 deaths per annum attributable to AIDS-related diseases (Achmat, 2001). It is estimated that by 2004 there will be 6.5million adult HIV cases which is 29.33% of the adult population. By 2009, it is estimated that there will be 7 million cases or 30.35% of the adult population (*HIV 2000: Major and Emerging Markets*, 2000). This points to an incredibly heavy burden of treatment.

A healthy immune system has a CD4 cell count of between 600 and 1200. HIV kills these cells. An immuno-compromised person has less than 500 CD4 cells.

Opportunistic infections become prevalent once the CD4 cell count is less than 500. The TAC suggests that antiretroviral therapy should be initiated once the CD4 cell count drops to 350. Antiretroviral treatment increases the number of CD4 cells and decreases the HIV viral load in the body, thereby decreasing the incidence of opportunistic infections (Achmat, 2001).

Although antiretrovirals have been around since 1987 (when GlaxoWellcome's AZT came on the market) antiretroviral combination therapy was first used as recently as 1996. This involves the combination of usually three different antiretroviral drugs. The various combinations offer different benefits and different side-effects although

only between 3 and 15 percent of people suffer serious side-effects (Achmat, 2001). Unfortunately, because the treatment is new, it is difficult to predict long-term results in terms of both side-effects and the development of drug resistant HIV. Currently, no ANC-led provincial government offers antiretroviral treatment in the public sector. In the Western Cape, under the Democratic Alliance, antiretroviral treatment is offered on a Médecins Sans Frontières (MSF) project and in drug experiments.

The government cites many reasons for not providing antiretroviral treatment. These include the cost of the drugs, the cost of building health care infrastructure, the cost of administering the drugs (includes the cost of running viral load and CD4 cell count tests), toxicity and problems with patient adherence to the drug regime. It is believed that poor adherence is a key factor contributing to the development of drug resistance (*HIV 2000: Major and Emerging Markets*, 2000).

Considerations of cost feed back to the government's strategy of fiscal restraint. The cost of triple therapy ranges between R689 to R1800 per month for patented drugs. This is an improvement on a cost of between R2500 and R4200 two years ago. However, generics are still cheaper at between R250 and R300 per month (Achmat, 2001).

It might be interesting to gain an idea of the cost of antiretroviral treatment. This is just a back of the envelope calculation. Assume that the government were to provide antiretroviral treatment for 350 000 patients from the beginning of 2002. Why the estimate of 350 000? It is argued that patients should be treated when their CD4 cell count drops to 350. The period from AIDS to death is 1 to 3 years and 350 000 is Achmat's (2001) estimated upper limit of AIDS-related deaths per annum. It seems reasonable to expect, therefore, that at least 350 000 patients would need treatment in the first year.

Assume triple therapy costs R689 per month, which is the lower limit given by Achmat (2001). Using these assumptions, the annual cost to the government would be R2.894 billion. However, the cost will escalate in each year as the number of people seeking treatment increases, given that patients must stay on treatment for life. In addition, the costs of administering the drugs can be high when one considers the

costs of testing. Although it is probably unwise to take this calculation further (there are many variables influencing the cost of antiretroviral treatment¹) one could see that it is a potentially expensive intervention².

For a government interested in the effective treatment of AIDS, there would be a difficult trade-off between treatment of AIDS, fiscal restraint, and intellectual property protection. In order to provide antiretroviral treatment, the fiscal deficit would be increased, and possibly, intellectual property protection would be weakened. Unfortunately, this conflicts with the government's WTO goals.

The government's most notable strategy for Aids is to continually contextualise it as a disease of poverty. This is not entirely untrue. There are ways in which poverty contributes to disease. Obvious ones for HIV/AIDS are that chances of transmission are increased if people are malnourished or are weakened through poor health, especially STDs. In addition, it takes longer to become AIDS-sick if you have the correct nutrition, vitamin supplements and support.

However, this argument is incomplete. There are economic simulations that suggest that AIDS may lead to increased poverty and a contraction in economic growth. Tricky, if your Aids strategy is to let the disease be addressed as and when economic growth addresses poverty.

3. The Amendments of the Medicines Act:

The Amendments of the Medicines Act is a misnomer in the AIDS treatment drive. In itself, the act has done nothing to increase access to antiretrovirals. But, through the shadow that it cast, there were achievements. One example is the reduction in the prices of some antiretrovirals. This was caused by worldwide activist pressure and unwanted media attention on PMA. At the time of the court case, there was already strong activist pressure on the pharmaceutical companies to drop their prices. The

¹ It is possible that the costs of treating opportunistic infections will decrease if patients are on antiretroviral therapy.

² On the other hand, in the latest budget, the government allocated R16 billion in "additional money to provinces to strengthen social service delivery and enhance the capacity of the provinces to deal with HIV/Aids" over the next three years (Department of Finance, 2001: 3).

court case contributed to the pressure because it attracted bad press worldwide for PMA and PhRMA.

Furthermore, the AIDS crisis itself is receiving increasing international media coverage. This is placing pressure on OECD countries in the form of activism, as seen most recently at this year's G8 Meeting in Genoa. It is becoming more difficult for rich countries to ignore the poor. This is good for South Africa's bargaining power at the WTO. It is essential for the Third World to have the support of the humanitarian lobby. If activists push for causes that enhance the bargaining power of the First World, as was seen in Seattle, the chances of the Third World to gain at Dohar are diminished. This means that yet another AIDS-related public relations disaster needs to be avoided in the short term.

Positive publicity for the governments HIV/AIDS strategies was also sorely needed on the domestic front. This is especially true because the government would not want any (further) strained relations with Cosatu, especially as Cosatu has joined forces with the Treatment Action Campaign to demand better HIV/AIDS treatment.

The court case has therefore achieved a number of objectives: it has helped to bring about reductions in the prices of antiretrovirals, it has fed into pressure on OECD governments, and it has temporarily deferred some of the negative publicity the government was getting about its HIV/AIDS strategies.

The government does not really deserve this positive publicity. As has been shown, the draft regulations of the Medicines Act do not provide for greater ease of compulsory licensing. In addition, it seems most likely that the government has no intention of providing antiretrovirals in the public sector, at least not now.

This leaves one feeling that the court case was a public relations exercise. The government has prioritised its long-run economic growth strategy over treatment of HIV/AIDS.

4. The empirical evidence

This utility function is well supported by empirical evidence. In addition, it is consistent with the idea of the Principle of Charity. This principle urges charitable interpretation of the thoughts and words of others, meaning interpretation that maximises the rationality, reasonableness and seriousness of the observed behaviour.

To allow ease of ordering of the empirics, the information will be divided into categories that support various ideas presented above.

Information has been gathered from speeches made by Thabo Mbeki on all topics from 1997 to the present; government documents on HIV/AIDS, foreign policy, and trade; government legislation relating to health and property rights; information on HIV/AIDS contained on the ANC cite *ANC Today* (www.anc.org.za), any other relevant information contained at the government web site (www.gov.za); any relevant information on TRIPS and trade at the World Trade Organisation web site (www.wto.org), sites of activists and NGOs with a particular interest in HIV/AIDS and intellectual property rights (www.tac.org.za; www.cptech.org); local newspapers (*Mail & Guardian* and *Business Day* and their online equivalents and www.woza.co.za which has subsequently closed); international publications (*New York Times* and *The Economist*); electronic journals; and various other sources including personal conversations with informed people. It is obviously not possible to include all of these directly, so the empirical information below is representative of the general trends that were revealed.

4.1. No antiretroviral treatment is to be offered in the public health sector

1. The context within which HIV/AIDS is placed in speeches and documents

The government is exceptionally careful about the context in which HIV/AIDS is placed. Most often, it is called a disease of developing countries or of the poor. It is often linked with diseases such as malaria, tuberculosis and other communicable illnesses. None of the various plans to cope with AIDS promote the usage of

antiretrovirals except in the mother-to-child transmission programme or as a short course for rape survivors (although as will be shown, the government has been highly obstructive in the implementation of these programmes).

Central to the government's campaign is the repeated insistence that poverty has an overwhelming role to play in the transmission of HIV/AIDS. At the ANC Today site ("ANC Message on HIV/AIDS: Prevention is our best defence", 2001) the following is written:

"Central to the ANC's campaign against HIV/Aids is the message that preventing the spread of the HIV virus is the best defence against Aids. This message reinforces the organisation's commitment to addressing the role of poverty in the spread of Aids;

...

While HIV/Aids can affect anybody, it hits the poor hardest. The programme to combat the epidemic must therefore be part of the fight against poverty: to make basic health services, clean water and sanitation accessible to all South Africans; to improve nutrition and food security; to fight against diseases such as tuberculosis, STDs and malnutrition; and to promote the empowerment of women and young people."

On the topic of antiretroviral treatment, they commonly refer to issues of affordability and to lack of infrastructure. They argue that public health interests can be better served through developing public health infrastructure to combat all the diseases of poverty.

This attitude is reflected in Mbeki's *Opening Address at the 13th International AIDS Conference* on 9 July 2000. Much of this address quotes directly from the *1995 World Health Report* which names poverty as the greatest cause of ill health in the world.

2. No acceptance by government of aid for antiretroviral treatment from other governments

There has been a general trend by government to refuse offers of aid or loans that could be used specifically to provide Aids medication in the public health system. For instance, an offer by the United States government to provide an annual \$1 billion in loans to finance purchases of anti-AIDS drugs in Africa was turned down by the

South African Government (Swarns, 2000a). Any loans would jeopardise the strategy of fiscal restraint.

3. Acceptance of donations from pharmaceutical companies, but ambiguous

Government has accepted some offers of donations of medicines used in the treatment of Aids, but they have also been obstructive to the delivery of these offers, or have refused the offers. Three examples are given.

Pfizer offered to provide free diflucan (a drug used in the treatment of opportunistic infections) in the public health sector. Although the government accepted the offer, it was over a year from the date of the initial offer, and eventual availability of the drug in the health system (Swarns, 2000b). It took the Medicines Control Council seven months to approve the tablet form even though the drug had already been approved in a different form ("HIV/AIDS Barometer" 2001).

A second example is Boehringer Ingelheim's offer of free Nevirapine for five years, for use in the prevention of mother-to-child transmission of HIV/AIDS (Swarns, 2000b). The cost-effectiveness of a programme using Nevirapine to prevent the mother-to-child transmission of the virus is relatively well documented (relative to generalised antiretroviral therapy). Nevertheless, obstructions were mounted by the government through the Medicines Control Council (Sidley, 2000). By March 30 2001 the MCC had yet to register the drug (Sidley, 2001c) because of issues about the development of resistance to the drug. According to Beresford (2001b) "The government has still not announced when it will fully implement a pilot programme to give Nevirapine to HIV-positive pregnant women that had been due to start in March".

This is after there were nationwide announcements at the end of January that treatment would begin "immediately" (Smith, 2001). Currently, pilot programmes are running in all of the provinces, but this is clearly not enough. The Treatment Action Campaign is currently taking the national Ministry of Health and eight of the nine

provincial Members of the Executive Council to court over failing to provide antiretroviral drugs to HIV-positive pregnant women (Beresford, 2001c).

Some NGOs that provide antiretrovirals have suffered from the government's resistance to their activities. The Greater Nelspruit Rape Intervention Project was evicted from state hospitals in Mpumalanga, where they had been counselling rape victims and supplying post-exposure packs of antiretrovirals to reduce the chances of contracting HIV from the rapist(s). Part of the reason for the eviction, according to the MEC, was that this caused pressure on all hospitals in Mpumalanga to deliver antiretrovirals. At the time, the Minister of Health defended the decision of the Mpumalanga government on the grounds that there was no conclusive proof that antiretrovirals would lower the chances of contracting HIV/AIDS from rapists. Ironically, some government hospital workers are treated with antiretrovirals after needle stick injuries to lower the chances of transmission. The point is that the logic should be the same: if antiretrovirals are useful in preventing transmission in needle stick injuries, they are also useful in preventing transmission after rape (Beresford, 2001b).

4.2. The court case's public relations component

Generally, Section 15C of the Medicines Act was interpreted as allowing parallel importation and compulsory licensing of medicines. It was believed that these measures would be used to increase access to antiretroviral therapy. It is overwhelmingly clear that this is not the case. In fact, once activists began to interpret the law as increasing access to antiretrovirals, the government changed its strategy. It was no longer in the government's interests to pass a law allowing compulsory licensing because they do not want to provide antiretrovirals in the public health system.

1. The pre-trial interpretation of the act

This interpretation of Section 15C was common in the local and the foreign press, and in statements by members of government and the PMA.

A *New York Times* (2000 – reference?) article claims that the Medicines Act allows for the “seizure” of patents for anti-Aids drugs. In the *Business Day*, Barber (2001a) writes:

“If 15C is upheld, government will have freed itself from its obligations under existing law not to import Indian or Brazilian knockoffs of drugs whose patents it hitherto recognised and protected”

Peter Goosen, who spoke at the World Health Assembly on behalf of the South African government on January 26 1999, said that the legislation allows for the issuing of non-exclusive compulsory licenses (government production) and for parallel importation (*South Africa Comments to WHA Executive Board on Revised Drug Strategy*, 1999).

Patricia Lambert, legal advisor to the Minister of Health in the lawsuit, told the *Economist* that if the government deems a drug to be too costly, the legislation allows it to license a local generic manufacturer to make it more cheaply or to buy a generic version from another country under the discretion of the health minister (“A war over drugs and patents” 2001).

Dr Glaudine Mtshali, representative of the South African Department of Health in the US, Canada and Brazil, said that if the court rules for South Africa, the legislation would be used to produce generic AIDS drugs locally (Barber, 2001b).

Mirryena Deeb, CEO of the PMA, said that: “the association had been compelled to institute legal action. Section 15(C) of the act, which deals with parallel importing of drugs, allowed government to override patent rights when it wanted” (Sidley, 2001a). Section 15C of the Medicines Act, would give the health minister “unfettered discretion to override patent rights for medicines in this country” (Boseley, 2001)

2 Although only parallel importation is to be allowed, the settlement is heralded as a victory for the government:

The case was billed around the world as “a David and Goliath contest between SA and the wicked multinational drug companies” but was in fact a “red herring” (Barber, 2001d). It has been shown that the new draft regulations do not allow for compulsory licensing. In addition, the government is not using the cheaper prices offered for antiretrovirals to increase access in the public health sector.

Nevertheless, government benefited from positive publicity. Sidley (2001b) writes in the *Business Day*:

“Government basked in the glow of positive publicity this week as it faced the multinational pharmaceutical companies in court...

For a moment there the past year of acrimony between government and HIV/AIDS organisations was forgotten.

No mention was made of the president’s questions about the causes of AIDS. Forgotten, too, was the case of the rape crisis workers in Mpumalanga against whom the provincial government had acted for supplying AZT to rape victims. No mention was made of babies born with HIV that might have been spared infection if at least one donation had been acted on earlier.

If the week’s events looked like a game of poker bluffing included the stakes were particularly high.”

The settlement reached in the court case was called a: “total capitulation of the drug companies in their legal action against the medicines legislation” (Sidley, 2001d).

The ANC (“Historic agreement lays the basis for co-operation towards health for all”, 2001) called the court case settlement an historic agreement. In the statement, HIV/AIDS is never once explicitly mentioned. Instead, it talks about “the diseases of poverty” and “the diseases that cause poverty”.

Belinda Beresford of the *Mail & Guardian*, who has won international awards for her reporting on HIV/AIDS, writes: “At the 13th hour the pharmaceutical industry backed down. The law it fought for three years to prevent being enacted will go ahead, unchanged” (2001a). “The law that the PMA has now accepted is the same as the one signed by then president Nelson Mandela three years ago”... “The government had drawn a line: it would not rewrite the disputed areas of the legislation”.

4.3. Weakening intellectual property rights would diminish the chances of attracting investment or obtaining certain reforms in the next WTO round

1. HIV/AIDS: in speeches called a disease of poverty, and linked with other developing country diseases

As discussed above, HIV/AIDS is regularly referred to as a disease of poverty. In a joint article, United Kingdom Prime Minister, Tony Blair and Mbeki contextualise the disease as follows: "HIV/AIDS, Malaria, Tuberculosis, other communicable diseases and diseases arising from poverty" (Blair & Mbeki, 2001). Again, as discussed, government hopes that growing the economy and creating jobs will make inroads on the fight against poverty (Department of Finance, 1996). In order to fight poverty, GEAR calls for increased exports and investment. Instead of aid for antiretrovirals, Mbeki is hoping to encourage industrialised nations to keep to the spirit of the WTO agreements.

2. News reports, especially in the USA that threatened trade sanctions on South Africa for weakening intellectual property rights

There is a link between the strength of intellectual property rights and trade and investment in an economy such as South Africa's.

The United States' African Growth and Opportunities Act gives African countries preferential trade treatment. There were calls to leave South Africa out of the deal because of supposedly lax intellectual property rights (Barber, 2000a). These calls came from (amongst others) the International Intellectual Property Alliance. While this was not specifically about the Medicines Act, it illustrates the crossover from one trade issue to another trade (related) issue in the international arena. Migra Textiles, a Cape Town based subsidiary of an Italian concern, announced their intention to relocate to China unless South Africa was included in the African Growth and Opportunities Act. This is an example of the manner in which trade issues can crossover to other parts of the economy – in this instance, the crossover threatened to harm foreign direct investment.

In order to qualify for AGOA: “countries must make ‘continual progress’ towards market economies that protect private property and the rule of law, [and] eliminate barriers to US trade and investment...” (Barber, 2000b).

In 2001, PhRMA brought a complaint against South Africa to the office of the US trade representative. They urged that South Africa be put on the “watch list” again. They called “the South African business environment ‘hostile’ and said this was resulting in widespread closures of industry related factories, costing jobs and training opportunities” (Barber, 2001a). For more details of trade pressure, refer to the timeline of events in the appendix.

3. WTO allows cross-sectoral trade sanctions

The WTO allows cross-retaliation. For instance, if a WTO Dispute Settlement panel finds in favour of the United States against South Africa on a dispute relating to TRIPS, the United States is given permission to impose trade sanctions on any sector of the South African economy (Tandon, 1999).

5. Conclusion:

The government’s goals of increasing exports and investment may be in opposition to the provision of antiretrovirals if access is increased through compulsory licensing. Why? Weakening intellectual property protection is contradictory to the government’s WTO bargaining strategy. It is also not good for foreign direct investment. The Amendments Act was initially devised to lower the prices for all drugs in South Africa. This was in keeping with the need to restrain fiscal spending. Once there was pressure to provide antiretroviral therapy, it was no longer in keeping with fiscal restraint to pass the law in its broad interpretation. On the domestic front, the court case earned the government positive press. This gave the government space to concentrate on their WTO trade goals. It would be helpful to avoid (yet another) AIDS-related public relations disaster if an alliance of developing countries at the WTO is to be achieved, especially as some large developing countries produce generic antiretrovirals.

Pharmaceutical Company Utility Function

For research based pharmaceutical firms, profits are maximised by developing drugs, patenting them and enjoying monopoly power for the effective patent life of the drug. Protecting the patent system would therefore be their number one priority. Recent estimates by the Boston Consulting Group have put the capitalized pre-tax cost of R&D at \$500 million for drugs launched in the 1990s (Public Citizen, 2001). Pharmaceutical firms use estimates such as these to convince the public and policymakers that the monopoly power provided by the patent is essential to the development of “life-saving” drugs.

The desire to protect patents explains the involvement of the PMA in the court case against the South African government. The fear was that the Medicines Act, especially Section 15C, would lead to a weakening of patents in South Africa for all drugs. In addition, it was feared that the actions of South Africa would set an example for other developing countries.

In 1998, blocking the implementation of the Medicines Act was standard practice for the pharmaceutical industry. They could rely on the big stick of the United States government to assist in the protection of their intellectual property rights. The United States Trade Representative (USTR) did not distinguish between property rights for computer programmes versus those for drugs. In fact, it was standard for the USTR to “encourage” countries to implement TRIPS-plus property rights protection, including for drugs. At this time, the issue was not about HIV/AIDS.

Blocking the implementation of the Medicines Act and using the United States government to coerce countries into implementing TRIPS-plus property rights protection was a profit-maximising strategy for PMA. However, this strategy led to what has been called a public relations disaster, and a potential turn in public opinion against the system that allows pharmaceutical companies to earn monopoly profits. It

was therefore profit maximising for the companies to settle the case out of court, and to drop prices on antiretrovirals.

This analysis focuses on the Big Five pharmaceutical companies, who are Merck, Roche, Boehringer Ingelheim, GlaxoSmithKline and Bristol-Myers Squibb. They are the main players in the antiretroviral market, are part of the UNAIDS Accelerating Access Initiative, and reportedly called for settlement in the court case.

1. The Pharmaceutical Industry

The pharmaceuticals industry is imperfectly competitive. It is divided into a number of small markets – one for each therapeutic class of drugs. While the industry as a whole is characterised by a large number of firms, individual therapeutic classes are fairly concentrated.

The first drug to use a specific mechanism to treat an illness is called a breakthrough drug. A breakthrough drug, by definition, has no close substitutes on the market. Demand is therefore fairly inelastic. However, patents do not prevent companies from developing different chemical entities that use the same basic mechanism to treat an illness. These are called “me-too” drugs. A Congressional Budget Office (1998) study estimates that a breakthrough drug has between 1 and 6 years of pure market exclusivity before a “me-too” drug enters the market.

These drugs do not offer a novel treatment, but may have fewer, or different side effects and may treat some patients more effectively (CBO, 1998). Demand for the breakthrough drug should become more elastic when “me-too” drugs enter the market, since close substitutes are now available. The demand may also decrease as consumers switch to substitutes.

Barriers to entry into individual markets limit the competition from “me-too” drugs. There are usually only a certain number of chemical entities that are effective in the same treatment mechanism. In addition, larger firms have an advantage in marketing and the Food and Drug Administration approval process. This is because a key element of competition is through advertising, and it helps to spread these high costs

across a large product line. In addition, studies have shown that New Drug Approvals from bigger companies were three times more likely to be approved than from less experienced companies (CBO, 1998).

Antiretroviral drugs are divided into three classes: nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors and protease inhibitors (Unicef et al, 2001). Table 1 provides a list of the various antiretroviral drugs available on the market today, divided by class and manufacturer. There are three different manufacturers of NNRTI's, three different manufacturers of NRTI's and three different manufacturers of PI's.

Table 1:

Antiretrovirals Sorted by Therapeutic Class

Compound	Zidovudine (AZT)	Didanosine (ddI)	Zalcitabine (ddC)	Stavudine (d4T)	Lamivudine (3TC)	Abacavir
Brand Name	Retrovir	Videx	Hivid	Zerit	EpiVir	Ziagen
Marketing Company	Glaxo	BMS	Roche	BMS	Glaxo	Glaxo
Protease Inhibitors						
Compound	Saquinavir	Ritonavir	Indinavir	Nelfinavir	Amprenavir	Lopinavir + Ritonavir
Brand Name	Invirase; Fortovase	Norvir	Crixivan	Viracept	Agenerase	Kaletra
Marketing Company	Roche	Abbott	Merck	Roche	Glaxo	Abbott
Non-Nucleoside Reverse Transcriptase Inhibitors						
Compound	Nevirapine	Delavirdine	Efavirenz			
Brand Name	Viramune	Recriptor	Sustiva			
Marketing Company	Boehringer Ingelheim	Pharmacia and Upjohn	Dupont / Merck			

Source: Unicef et al, 2001

For antiretrovirals, competition between brand name drugs comes about through price and quality. Certain drugs in the same therapeutic class may be more effective or have fewer side effects for some patients. However, it is a little more complex because treatment regimens are frequently a combination of two or three different drugs, from different therapeutic classes and different manufacturers. For example, the Médecins Sans Frontières project in Khayelitsha has recently started an adult triple therapy

programme. This is the only public sector project of its kind in South Africa. Their first line treatment is a combination of AZT, 3TC and Nevirapine. This is a combination of two NRTI's made by GlaxoSmithKline and one NNRTI from Boehringer Ingelheim. Their second line treatment is a combination of ddI, d4T and Nelfinavir. This is two NRTI's manufactured by Bristol Myers Squibb and one protease inhibitor made by Roche. While ddI and d4T are relatively inexpensive due to Bristol Myers' price cuts, Nelfinavir is expensive. This makes this treatment regimen the pricier of the two.

Part of the decision to pursue the first line regimen over the second must come down to considerations of cost. Médecins Sans Frontières may also prefer the first line treatment because the GlaxoSmithKline drugs are combined in one tablet, and are therefore easier to take. However, the regimens may be altered because of side effects relating to one of the drugs, or because of relatively low efficacy. This is an example of both quality and price leading to competition amongst drugs.

2. The Patent System: awarding market power to drug developers

Drug manufacturers usually apply for patents while promising compounds are still under development. This means that part of the patent term is consumed by the years of development, giving an effective patent life of around 10 years (depending on timing of patent application and the length of development) (NIHCM, 2000).

2.1. The cost of drug development

Providing the incentive to invest in R&D is the primary justification of the patent system. While certain drugs may indeed be expensive to develop, others are not. It is impossible to know for sure because drug companies do not provide a meaningful breakdown of their R&D costs. Most estimates of the costs of drug development are extrapolated from a 1991 study by DiMasi et al, using their methodology and data.

DiMasi estimates the pre-tax mean expected capitalized costs of drug development to be \$231 million in 1987 dollars. To calculate this figure, he obtained micro-level data on the cost and timing of development for 93 randomly selected New Chemical

Entities³ first investigated in humans from 1970 to 1982 in the United States.

Reported development expenditures run until 1987.

The process of drug development in the United States is divided into pre-clinical and clinical phases. The pre-clinical phase involves research by chemists and biologists to develop new compounds. Once a new compound has been discovered, it is screened for pharmacologic activity and toxicity. If this goes well, an Investigational New Drug Application is filed with the Food and Drug Administration (FDA). At this point, the compound enters the clinical phases.

Phase I testing is performed on less than 100 (usually healthy) volunteers, to obtain information about toxicity and safe dosing ranges. In Phase II testing, the drug is given to 50 to 200 people (some of whom may be ill) to attempt to gain evidence of efficacy. Phase III tests the drug on thousands of people to make sure the benefits are statistically significant. Long-term animal testing is done concurrent with phases II and III. After enough evidence has been gathered, the drug company files a new drug application with the FDA. Marketing of the drug may begin upon notification from the FDA (CBO, 1998; DiMasi et al, 1991).

Using his micro-level data, DiMasi calculates the average expected out-of-pocket costs of clinical testing for all New Chemical Entities to be \$11.1 million. However, because not all New Chemical Entities will be marketed, DiMasi includes a 67% risk of failure, or a success rate of 23%. This implies that the cost of New Chemical Entities that make it to market is \$48.1 million including the risk of failure⁴. To this is added the cost of long-term animal testing and an estimate of the cost of the pre-clinical phase (for which there is no micro-level data). This gives estimated uncanceled expected costs of each phase for a New Chemical Entity that makes it to market, including failures.

In order to calculate the opportunity cost of capital, DiMasi estimates a representative time profile. He finds that it takes approximately 12 years and 5 months to bring a

³ DiMasi et al (1991) define NCEs as New Chemical Entities never before tested in humans. In addition, these are self-originating: they are not licensed from another firm or developed with the aid of government

new drug to market. This is similar to the CBO (1998) study, which estimates a period of 10 to 12 years to develop a drug. Phase costs are assumed to be distributed uniformly over actual mean phase lengths and capitalized at the discount rate r . This is a real rate of return of 9%. Capitalized mean phase costs, c_j are calculated as follows, where index values 1, 2 and 3 refer to phases I, II and III respectively.

$$c_j = \int_{z_j-t_j}^{z_j} (x_j / t_j) e^{-rt} dt \quad \text{for } j = 1, 2, 3$$

Where x_j is the uncanceled cost of the particular phase, t_j is the phase-length and z_j is the time from the beginning of the phase until the drug is approved and brought to market.

Capitalized preclinical cost per NCE P_c can be given by:

$$P_c = \int_T^{T+tp} (P_u / t_p) e^{-rt} dt$$

Where P_u is the uncanceled pre-clinical cost, T is the total time for the clinical phases and tp is the time for the preclinical phase (DiMasi et al, 1991: p 118). Animal testing costs are capitalized in a similar manner.

In 1990, an OTA (Office of Technology Assessment) study recalculated DiMasi's figures using an opportunity cost of capital that decreases linearly from 14 to 10 percent from the beginning to the end of R&D to get a total of \$359 in 1990 dollars. This was assumed to be the upper bound of fully capitalized costs per successful chemical entity.

2.2. Two general problems with DiMasi's study

In general, there are two problems with the DiMasi et al study. Firstly, the data was obtained from a confidential survey of a group of twelve US-owned pharmaceutical firms (DiMasi et al, 1991). It is impossible for other researchers to verify the accuracy of DiMasi's out-of-pocket cost estimates. In addition, no project-level data was

⁴ this is calculated by dividing \$11.1million by 0.23 – the clinical approval success rate

available for the pre-clinical phase of drug development, so this estimate is based on aggregate industry level data. This data is likely to be less accurate than the data for the clinical period. Secondly, the calculations are pre-tax. A dollar invested in R&D is a dollar on which corporate profit taxes are not paid (currently at 34 percent). This means that every dollar spent on R&D costs \$0.66. The CBO (1998) study argues that DiMasi's figures should be recalculated to account for these tax concessions.

2.3. Problems specific to antiretrovirals

DiMasi's estimate is specific to innovative drugs that are discovered and developed entirely by one company. It is not applicable to most antiretrovirals, which were frequently developed with funding from the government, or in certain cases, were discovered by federal agencies and licensed to drug companies for marketing. Information on government aid in the development of antiretrovirals is widely available in activist circles, and increasingly in the media. In addition, this type of information would have been part of the Treatment Action Campaign's testimony in the court case (Love, 2001c).

1. United States Government involvement in development and funding for antiretrovirals

GlaxoSmithKline:

Glaxo owns the patents for AZT, 3TC, Ziagen and Amprenavir. The Michigan Cancer Foundation initially synthesized AZT on a grant from the National Cancer Institute. BioChem Pharma invented 3TC and licensed it to Glaxo for a 14 percent royalty. It is also probable that Yale and Emory played a role in development, while the US government sponsored more than 40 clinical trials for 3TC. The University of Minnesota invented Ziagen with support from the National Institute of Health. Amprenavir was discovered by Vertex but licensed to Glaxo for development. Amprenavir is a protease inhibitor and the National Institute of Health was pivotal in the discovery of protease inhibitors as an effective treatment for HIV/AIDS. The only breakthrough drug that Glaxo markets is AZT.

Boehringer Ingelheim

Boehringer Ingelheim owns the patent for Nevirapine, a breakthrough drug. The United States federal government was involved in clinical trials on Nevirapine.

Bristol-Myers Squibb

BMS manufactures ddI and d4T, both of which are “me-too” drugs. The United States government invented ddI and licensed the drug to BMS on an exclusive basis. d4T was synthesized by the Michigan Cancer Foundation on a grant from the National Cancer Institute. Yale University holds the key patent for d4T.

Roche:

Roche manufactures ddC and Saquinavir. ddC was initially synthesized under an National Cancer Institute grant at the Michigan Cancer Foundation. It was then exclusively licensed to Roche for the treatment of HIV/AIDS. In addition, the National Cancer Institute conducted the first clinical trials of ddC. It is a “me-too” drug.

Roche also holds the patent for Saquinavir, the first drug in the class of protease inhibitors. However, the National Institute of Health did much of the initial research in determining the efficacy of protease inhibitors in the treatment of HIV/AIDS. There was also government involvement in clinical trials for Saquinavir

Merck:

Merck manufactures Indinavir, and Efavirenz, both “me-too” drugs. Indinavir is a protease inhibitor. The US federal government was involved in the initial development of protease inhibitors as a treatment in HIV/AIDS. There was also federal involvement in the clinical trials for both drugs (Balasubramaniam, T. 2000; *Additional notes on government role in the development of HIV/AIDS drugs, 2000*)

2. Length of time for R&D

The calculation of the opportunity cost of capital is heavily reliant on DiMasi’s estimated representative time profile. For breakthrough antiretrovirals, the average length of time from filing a patent application to market is 3.13 years, as shown in

Table 3. Although the data does not indicate at what point of development the patent application was filed, it would be likely to be before the start of the clinical testing phase. To be safe, one could assume that the drugs took 3.13 years from the start of clinical testing until approval, which is less than half DiMasi's estimate. This means that the opportunity cost would be much lower. This difference also has implications for the effective patent life of the drugs. Drugs in DiMasi's study would have an effective life of about 8 years, while antiretrovirals have an effective patent life of 16.9 years. This increases the period of monopoly power and hence the profitability of the drug. A Tufts Center for the Study of Drug Development report shows antiretrovirals brought to market in 1996, 1997 and 1998 having the shortest development time from clinical to approval for all classes of drugs (Kaitin & Healey, 2000).

University of Cape Town

Table 2:

Development Times for Antiretrovirals

Nucleoside Analogue Reverse Transcriptase Inhibitors						
Compound	Zidovudine (AZT)	Didanosine (ddI)	Zalcitabine (ddC)	Stavudine (d4T)	Lamivudine (3TC)	Abacavir
Brand Name	Retrovir	Videx	Hivid	Zerit	Epivir	Ziagen
Marketing Company	Glaxo	BMS	Roche	BMS	Glaxo	Glaxo
FDA Approval	1987	1991	1992	1994	1995	1998
Filing of Patent	1985	1987	1987	1986	1989	1989
Total	1.5 years	4.2 years	4.9 years	7.5 years	6.8 years	8 years
Protease Inhibitors						
Compound	Saquinavir	Ritonavir	Indinavir	Nelfinavir	Amprenavir	Lopinavir + Ritonavir
Brand Name	Invirase; Fortova	Norvir	Crixivan	Viracept	Agenerase	Kaletra
Marketing Company	Roche	Abbott	Merck	Roche	Glaxo	Abbott
FDA Approval	1995	1996	1996	1998	1999	2000
Filing of Patent	1990	1995	1993	1994	1993	?
Total	5 years	0.9 years	2.9 years	5.7	5.4	
Non-Nucleoside Reverse Transcriptase Inhibitors						
Compound	Nevirapine	Delavirdine	Efavirenz			
Brand Name	Viramune	Recriptor	Sustiva			
Marketing Company	Boehringer Ingel	Pharmacia and	Dupont / Merck			
FDA Approval	1996	1997	1998			
Filing of Patent	1993	1994	1995			
Total	2.9	3.1	3.3			
Average Development Times:						
Breakthrough drug	3.13					
"Me-too" drugs	4.79					
Overall average:	4.44					

Source: Balasubramaniam, 2000; Unicef et al, 2001

2.4. Recalculating DiMasi's figures

To gain a more accurate estimate of the true after-tax capitalized costs of antiretroviral development, DiMasi's figures were re-estimated for all breakthrough antiretrovirals, and for AZT separately. For breakthrough antiretrovirals, the calculation retains DiMasi's estimate of preclinical development time, but prorates the clinical development times over 3.13 years. It uses the same uncanceled expected

costs as DiMasi. The different result is therefore entirely attributable to shorter development times leading to a lower opportunity cost of capital.

For AZT, the clinical development times are prorated over 1.5 years and the preclinical costs are assumed to be zero, because Glaxo did not carry out the preclinical development of AZT.

Drug development costs change over time, which means that DiMasi's estimates are most accurate for drugs first investigated between 1970 and 1982, with development continuing until 1987. The antiretrovirals currently on the market were developed between 1985 (although possibly earlier) and the year 2000. But, it is likely that the uncanceled expected costs of antiretrovirals would still be lower, because of United States government involvement and funding.

Table 3:
Expected phase costs per marketed NCE (in millions of 1987 dollars) versus costs for antiretrovirals and costs for AZT

Testing Phase	Uncanceled expected costs	Mean phase length DiMasi NCEs	Mean phase length antiretrovirals	Mean phase length AZT	Capitalized Expected Costs DiMasi	Capitalized Expected Costs Antiretrovirals	Capitalized Expected Costs AZT
Preclinical	65.50	42.60	42.60	0.00	155.60	110.86	0.00
Phase I	9.30	15.50	5.49	2.63	17.80	13.37	12.29
Phase II	12.90	24.30	8.60	4.12	21.40	17.69	16.67
Phase III	20.20	36.00	12.74	6.11	27.10	30.13	30.80
Long-term animal	5.30	33.60	11.89	5.70	8.20	7.00	6.63
Other animal	0.40	33.60	11.89	5.70	0.70	0.53	0.50
NDA Approval		30.30	10.73	5.14			
total	113.60	148.70	80.16	18.00	230.80	179.58	66.90

DiMasi et al, 1991 p 125

For DiMasi's figures, all costs were deflated using the GNP Implicit Price Deflator. To the phase lengths (monthly periods) is added the New Drug Approval review period, estimated to be 30.3 months. Animal testing was estimated to start 4.0 months into Phase II.

Costs were capitalized at a 9% real discount rate.

Costs are capitalized from start of phase until market.

All figures in 1987 dollars

This can be calculated to express the figures after-tax as in Table 4.

Table 4:
After-tax Development Costs for Antiretrovirals and AZT

Testing Phase	Uncapitalized Expected costs, after tax	Capitalized Expected Costs Antiretrovirals	Capitalized Expected Costs AZT
Preclinical	48.88	37.69	0.00
Phase I	6.94	4.54	4.18
Phase II	9.63	6.01	5.67
Phase III	15.07	10.24	10.47
Long-term animal	3.96	2.38	2.26
Other animal	0.30	0.18	0.17
NDA Approval			
total	84.78	61.06	22.74

using the current corporate profit tax rate of 34%

These estimates suggest that the length of time for drug development will change the estimates of opportunity cost of capital quite substantially. Reducing the figure to account for tax savings gives an estimated average after-tax capitalized cost of breakthrough antiretroviral development of \$61.06million in 1987 dollars. This is an overestimate for those drugs which were not developed solely by their marketing company.

This is why the estimated cost of AZT development is only \$22.74 million. Glaxo was not involved in the preclinical trials on AZT, and it took Glaxo 1.5 years to bring AZT to market.

A quick, back-of-the-envelope calculation can be made to estimate the break-even quantity of AZT. Assume a simple cost equation:

$$TC = k + xQ \quad [1]$$

Where TC is total cost, k is the cost of R&D, x is marginal cost (assumed constant) and Q is output (Crotty, 2000).

For drug manufacturers to be successful, the present value of their future profits from the sale of new products (discounted to the date the products were introduced) must exceed the capitalized cost of their original R&D investment (capitalized to the date

of market introduction) including investment in drugs that never make it to the market. Put simplistically, total revenue must exceed total cost. Where total revenue equals total cost, the firm will break even.

$$TR = TC$$

$$P \cdot Q = k + xQ$$

$$Q = k / (P - x) \quad [2]$$

Where Q is units sold, k is the estimated cost of R&D of \$22.74 million, x is the marginal cost, and is assumed to be Cipla's latest generic price for AZT of \$0.84 per daily dosage of 2 x 300mg tablets. P is the United Kingdom list price of \$8.58 for a daily dosage of 2 x 250mg tablets. These prices are the latest 2001 prices (Unicef et al, 2001) and are in 2000 dollars. Because of price cuts, P for AZT may have been considerably higher in preceding years.

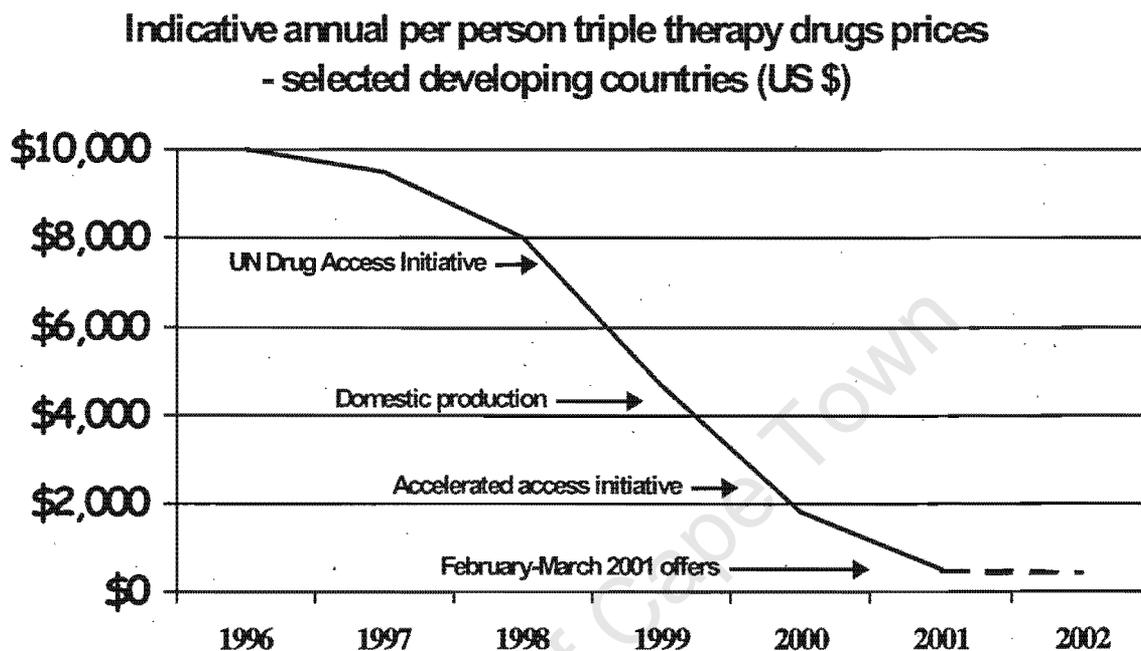
Solving for equation two reveals that Glaxo would break even after selling 2.938 million daily dosages of AZT, or after treating 8,049 people for one year. AZT has been on the market since March 1987 (14.4 years). They only needed to treat 559 people per annum to break even, at a daily price of \$8.58. In addition, the US patent only expires in September 2005, which gives them another 4 years to price above marginal cost. *HIV 2000: Major and Emerging Markets* (2000) reports that global efforts by Glaxo resulted in \$101million in AZT sales in developing countries *alone* in 1997. Médecins Sans Frontières reported to the South African government in 2000 that global sales on AZT less marginal cost had earned Glaxo \$694million between 1997 and 1999 (in Achmat, 2000). In other words, Glaxo has been profiting from sales of AZT for years.

This shows that the companies would not make losses on their investments if they were to lower the prices of antiretrovirals. On the other hand, it shows the extraordinary profitability of these drugs. This type of evidence was part of the Treatment Action Campaign's case as *Amicus Curiae* (Love, 2001c).

3. Events leading to lower prices for antiretrovirals:

The fall in prices of antiretrovirals has been dramatic, as shown in figure 2.

Figure 2: The Decline in Antiretroviral Prices



Source: Presentation by Dr J. Quick in *Report of the Workshop on Differential Pricing and Financing of Essential Drugs 2001*: 8.

The price cuts of BMS, and Merck are in line with, or cheaper than generic offers. Boehringer Ingelheim's Nevirapine is free for mother-to-child treatment but pricier than the generic for adult treatment. These prices are available in the private sector. Roche has offered price cuts through the UNAIDS Accelerating Access Initiative, but Roche's cuts have been the least substantial. As a result, Roche's antiretrovirals are the most expensive. These price cuts are only negotiated with governments so aren't privately available. Glaxo has also been reticent about its offers. No reductions have been offered for Abacavir, and its prices for 3TC and AZT are above the generic price. In addition, the price cuts are only available for governments or not for profit companies (Unicef et al, 2001).

What led the industry to cut prices so drastically? According to a report in the *Wall Street Journal*:

“These days, the world-wide drug industry is reeling from an unprecedented wave of public scorn. Coming from so many corners and with such ferocity, the attacks have put the hugely profitable and politically influential industry on the defensive as never before” (Harris, 2001: p. 2)

This turn in public opinion has been caused by the direct action of activists worldwide who have drawn media and public attention to the African HIV/AIDS crisis. The industry has been subject to a series of public relations disasters relating to access to AIDS medicines. A number of events have led to this public relations disaster.

In 1996, Brazil introduced free universal access to antiretrovirals for AIDS sufferers. These were locally produced generic copies. This was legal in Brazil, because they only initiated patent protection for drugs in 1996, and any drugs brought onto the market before 1996 were not patented. This action created a market for generic drugs, and therefore drove down the prices of generics (*TAC Fact Sheet: Brazil's HIV/AIDS Treatment Programme*). This was the first indication that brand-name drugs had huge profit margins.

Intellectual property rights activists and AIDS activists made the Medicines Act about access to AIDS-drugs. The US Health Gap Coalition initiated direct action against the Gore presidential campaign in mid-1999, which led to the end of the United States trade pressure against South Africa. This was an important signal to the Big Five that they could not count on the big stick of the US government.

Later in 2000, UNAIDS started an Accelerating Access Initiative in partnership with the Big Five who offered to sell their antiretrovirals at price reductions of up to 80%. However, the offers had many caveats, which made implementation very difficult. Ultimately, drugs were delivered to less than 2,000 people in Rwanda, Senegal and Uganda.

The industry's case was worsened when Cipla offered to deliver drugs at even lower prices. In other words the 80% reductions still gave the Big Five a mark-up over marginal cost. Currently, Cipla still has the lowest prices. It offers a drug for use in triple therapy that is a combination of AZT, 3TC and Nevirapine. The offer is to not for profit programmes at \$0.96 per day. Glaxo offers a combined AZT-3TC drug (called combivir) to developing countries for \$2 per day, and Boehringer Ingelheim offers Nevirapine for \$1.22 per day for adult therapy. This makes Cipla's offer 70 percent cheaper.

4. Conclusion

Why did pharmaceutical companies settle the court case? Why are some offering prices that are almost in line with generics? According to Merck CEO, Raymond Gilmartin:

“The actions we've taken with pricing and the settlement of the lawsuit in South Africa were important for taking away the notion that intellectual-property rights are a barrier to access”
 (“A Healthy Diagnosis, 2001: p.22)

Although pharmaceutical companies are profit maximisers, the public considers it to be immoral to profit out of some human suffering. To avoid further damage to their reputations, the pharmaceutical firms settled. In addition, it is easier to lower the prices of antiretrovirals as they cost less to develop and investments have probably been recouped. This is preferable to attracting further criticism.

Game Theory

This chapter applies the preceding analysis to the court case between the PMA and South African Government (SAG) using classical game theory. The interaction between the two players is divided into two separate games. The first game is a representation of the payoffs and the strategies of the players from the beginning of 1998 until the end of 1999. If nothing had changed, this is the way the case would have resolved itself. However, once the case took on the dimension of HIV/AIDS, the game changed for both players. This is represented by the second game, which has a different equilibrium.

1. Lawsuit Game

This game starts with the passing of the Amendments to the Medicines Act in 1997. The South African government passed the amendments in order to increase access to essential medicines and to decrease the costs of drugs in the public sector. At the time, the prices of patented drugs in South Africa were often higher than prices in neighbouring countries. This was a hangover from the apartheid days when drugs were priced for the white market.

Suppose that PMA sues the South African government (call them SAG) over some purported Evil Thing – the passing of the Amendments Act, which allows the South African Minister of Health to “abrogate” patent rights. The issue is initially about parallel importation of patented drugs, but increasingly, there is a distinction between broad 15C (TRIPS compatible parallel imports and compulsory licensing) and narrow 15C (parallel imports only). It is not clear whether the government means to use 15C in the broad or the narrow sense. The PMA is strongly supported by PhRMA and the United States government. Although parallel importation is allowed under TRIPS, the US is against this measure, and it is customary for the United States Trade

Representative (USTR) to see TRIPS as the lower limit of intellectual property protection, and to push for TRIPS-plus protection.

This situation is modelled in a similar way to Gintis's Nuisance Suit game (2000: 100). In Gintis's formulation of this game, it is essential for the plaintiff, PMA, to make their threat to sue credible. Clearly this is not a problem in this case, because the suit is not frivolous. This is because the cost of litigation is less than the value of the patent protection that the PMA might lose if 15C is implemented in South Africa. In addition, the PMA is supported by both PhRMA and the United States Government. Patent litigation is standard practice for PhRMA – they have lawyers permanently on retainer.

If PMA wins, the payoff is x : the expected value of avoiding compulsory licensing and parallel importation. If they lose, the payoff is 0 . Similarly, if SAG wins, the payoff is x : the expected value of implementing compulsory licensing and parallel importation. If they lose, the payoff is 0 .

If SAG offers to settle, and PMA accepts this, assume that PMA gets a settlement payoff of sx where s is some proportion of x such that $0 < s < 1$. SAG gets $(1-s)x$. Think of s as the expected value of avoiding compulsory licensing for PMA while $(1-s)$ is the expected value of parallel importation to SAG. In settling, therefore, SAG agrees not to use Section 15C for compulsory licensing.

If the PMA were to pursue the suit and set it down for hearing, they only have a certain probability of winning as given by p . The probability of the South African government winning is $(1-p)$. Players evaluate the expected values of lotteries as follows:

$$E[U] = \sum p_i x_i$$

For PMA, the expected value of the lottery is:

$$E[U]_{PMA} = px + (1-p)(0)$$

$$E[U]_{PMA} = px$$

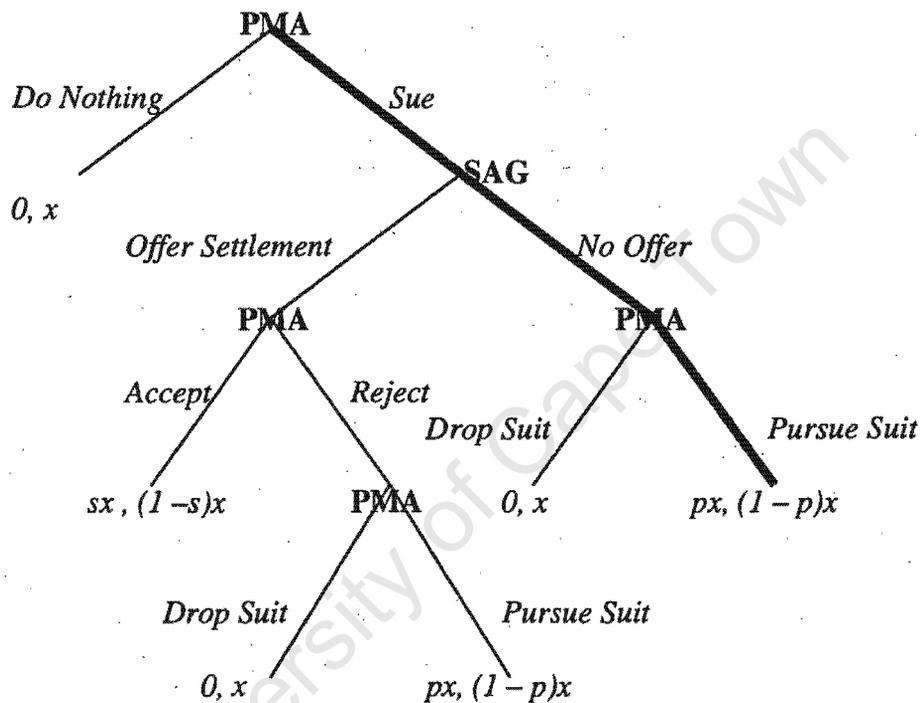
For SAG, the expected value of the lottery is:

$$E[l]_{SAG} = (1 - p)x + 0p$$

$$E[l]_{SAG} = (1 - p)x$$

The extensive form of this game is depicted in Figure 3.

Figure 3:
Law Suit Game



1.1 Pruning the Game Tree

Through backward induction, one sees that Pursue Suit always dominates Drop Suit for PMA, unless the probability of winning is zero, in which case the payoff from Pursue Suit is equal to the payoff from Drop Suit. If the SAG were to offer a settlement, the PMA would evaluate a payoff of sx against a payoff of px . In other words, accepting SAG's offer would depend on the values of p and s . If $p > s$ they will reject the settlement offer and visa versa.

SAG must evaluate $(1 - s)x$ against $(1 - p)x$ in deciding whether to offer a settlement or not. It could be argued that the odds of SAG winning the lottery are reasonable. However, the payoff of $(1 - s)x$ is a relatively small proportion of x because in settling they cannot compulsory license. Therefore, under certain values of p , No Offer would dominate Offer Settlement. Their observed behaviour during this time also supports No Offer dominating Offer Settlement. They staunchly refused to modify Section 15C even though they were under intense pressure to do so. If this game were to have reached a conclusion, the payoffs to the players would have been:

$$px, (1 - p)x$$

PMA sues, SAG offers no settlement, and the outcome of the game is decided by the court. This is a subgame perfect equilibrium.

2. *The Game Changes*

However, the game doesn't continue in this format. In 1999, a number of events changed the game for SAG. One was the outcome of the Seattle Round of WTO negotiations. At Seattle, many activists and NGOs were pushing for environmental and labour standards. These measures could be hijacked by the First World to decrease the market access of the Third World. This experience caused the South African government to consolidate their present WTO strategy of fully upholding the agreements and arguing that the First World has not stuck to the spirit of the agreements. In order for this strategy to be effective, any weakening of TRIPS would be avoided.

Secondly, intellectual property activists, who are opposed to the practices of pharmaceutical companies, saw the opportunity to get their anti-pharmaceutical patents message across via the vehicle of HIV/AIDS. Section 15C becomes about a poor country valiantly fighting the cruel pharmaceutical companies to increase access to antiretroviral drugs for their dying population. This was not the government's intention when they passed Section 15C, which was about increasing access to essential medicines. Essential medicines are defined by the WHO in the *Model List of Essential Drugs*. In 1997, AZT was added to the WHO's tenth MEDL solely for the

prevention of mother to child transmission. In 1999, Nevirapine was included in the MEDL, again exclusively for the prevention of mother to child transmission (Unicef et al, 2001). So, antiretrovirals, as used in adult therapy, are not essential medicines. Section 15C was not designed to secure access to antiretrovirals, but, once activists made the link, the media flew with the idea. This made things complicated for SAG: win the court case, and you might be stuck with provision of antiretrovirals. Alternatively, win the court case, don't provide antiretrovirals and suffer from yet another AIDS-related public relations crisis.

These two events point to a change of strategy for SAG. They begin to prioritise their WTO trade goals, and do not wish to weaken intellectual property rights. In addition, they no longer want the legal right to compulsory license as this would lead to intense pressure to deliver antiretrovirals.

Why didn't they settle at this point? They saw the opportunity to cash in on some moral capital by "taking on" the pharmaceutical companies. While the case continues, they earn moral capital through positive attention from activists and the media. The game becomes about bluffing. They know whether they actually intend to implement broad or narrow 15C, but the PMA does not. In Game Theory, this is known as private information. Their aim would be to let the PMA believe that they are still playing the first game.

For the PMA, the game has also changed. They no longer have the backing of the US Government. In addition, they get negative press as long as the court case continues.

3. SAG and PMA play Poker with Bluffing

Suppose PMA contemplates suing SAG over some Evil Thing (passing the Amendments Act). The PMA is no longer sure whether Section 15C will be "broad" or "narrow" in its implementation. Section 15C is broad if it implements TRIPS-compliant compulsory licensing and parallel importation. Section 15C is narrow if it only implements parallel importation. Game Theory has a straightforward way of modelling games of private information, due to Harsanyi (1967 in Gintis, 2000). Let H be a game in which SAG can implement broad or narrow 15C. Whether 15C is

broad or narrow is SAG's private information. To model this situation, construct a new game G as illustrated in Figure 3. Nature has the first move, and chooses broad or narrow, using a probability distribution $\{q_1, \dots, q_n\}$. The probabilities are common knowledge to both players. For each branch coming from the root node, append a copy of the game H . In other words, the game G has two copies of H because SAG may be playing broad or narrow. This means that the PMA will have information sets with two nodes. These information sets are joined by a dotted line.

The payoffs are different, depending on whether the game is broad or narrow. In the broad game, if PMA were to win, they get a payoff of x . If they lose, they get a payoff of 0 . In the narrow game, if the PMA wins, they still get a payoff of x . However, if they lose, the payoff is sx – the settlement payoff. This is because the government has no intention of implementing compulsory licensing if 15C is narrow.

For SAG, the payoff to winning under broad is the worst possible outcome for them. Winning under the broad interpretation implies a weakening of TRIPS and intense pressure from activists to begin provision of antiretrovirals along Brazilian lines. Failure to do so would lead to yet another AIDS-related public relations disaster. Call this payoff $-z$. The value of losing to SAG is 0 (they simply return to the pre-Medicines Act status quo).

If SAG wins under narrow, this is their second worst payoff. To win under narrow they would have argued in court that the law could only be interpreted as narrow. Those who have read their heads of argument know that it was their intention to argue for narrow, but this does not mean that they would have argued in this manner in court. It would have diminished their moral capital payoff by arguing narrow in court through negative activist and media attention. Call this payoff $-y$.

Finally, there are moral capital losses to PMA for playing this game. This is because the PMA suffers negative reputation effects for every round of the game, as given by δ where:

$$0 < \delta < 1$$

This works in a similar manner to discounting. For every round of the game played, the eventual payoff is diminished by δ . If δ is close to 0 , the PMA will wish to resolve

the case as quickly as possible. But if δ is close to 1, the negative reputation effects from taking SAG to court are small, and the PMA will be happy to let the case be drawn out over a long time.

The SAG gets positive reputation effects for every round of the game, as given by β where:

$$\beta > 1$$

In other words, their payoff is increased for every round of the game that is played, and it is in their interests to draw the procedure out to maximise their moral capital gain. This could be why PMA felt that SAG was not negotiating under good faith during 2000.

The other option for the players is to settle. Each player gets one opportunity to settle before judgement is passed by the court. The interesting thing about settling, is that the discussions happen behind closed doors. This means that the players can divide up the gains in a manner that benefits them both. It is clear that the PMA won the larger proportion of x in the settlement, but the SAG received a larger amount of moral capital. This was reinforced by media and government announcements of historic victory for SAG. Very few people are aware that the draft regulations of the Medicines Act imply a victory to PMA.

On the margin, the PMA gains more utility from maintaining profits by avoiding compulsory licensing and parallel importation. They would wish to keep as much of x as possible. Assume that in a settlement, the PMA avoids compulsory licensing, but allows the government to implement parallel importation. Call this payoff to PMA sx , which is some proportion of the full expected value of x . In settling, the government gets the remainder of x – parallel importation, as represented by $(1-s)x$. This implies that:

$$0 < s < 1.$$

If both players decide to pursue the suit, the outcome of the game is decided by the court.

Broad game:

In the broad game, the PMA wins x with a probability of p and loses 0 with a probability of $(1-p)$. The expected value of the lottery $E[l]$ for the PMA is:

$$E[l]_{PMA} = px + (1-p)(0)$$

$$E[l]_{PMA} = px$$

In the broad game, the SAG “wins” and gains a payoff of $-z$ with a probability of $(1-p)$ and “loses” and gains a payoff of 0 with a probability of p . The expected value of the lottery for SAG is:

$$E[l]_{SAG} = (1-p)(-z) + p(0)$$

$$E[l]_{SAG} = z(p - 1)$$

Narrow game:

In the narrow game, the PMA wins x with a probability of p and “loses” to gain a payoff of sx with a probability of $(1-p)$. The expected value of the lottery is:

$$E[l]_{PMA} = px + (1-p)(sx)$$

$$E[l]_{PMA} = x(p + s - ps)$$

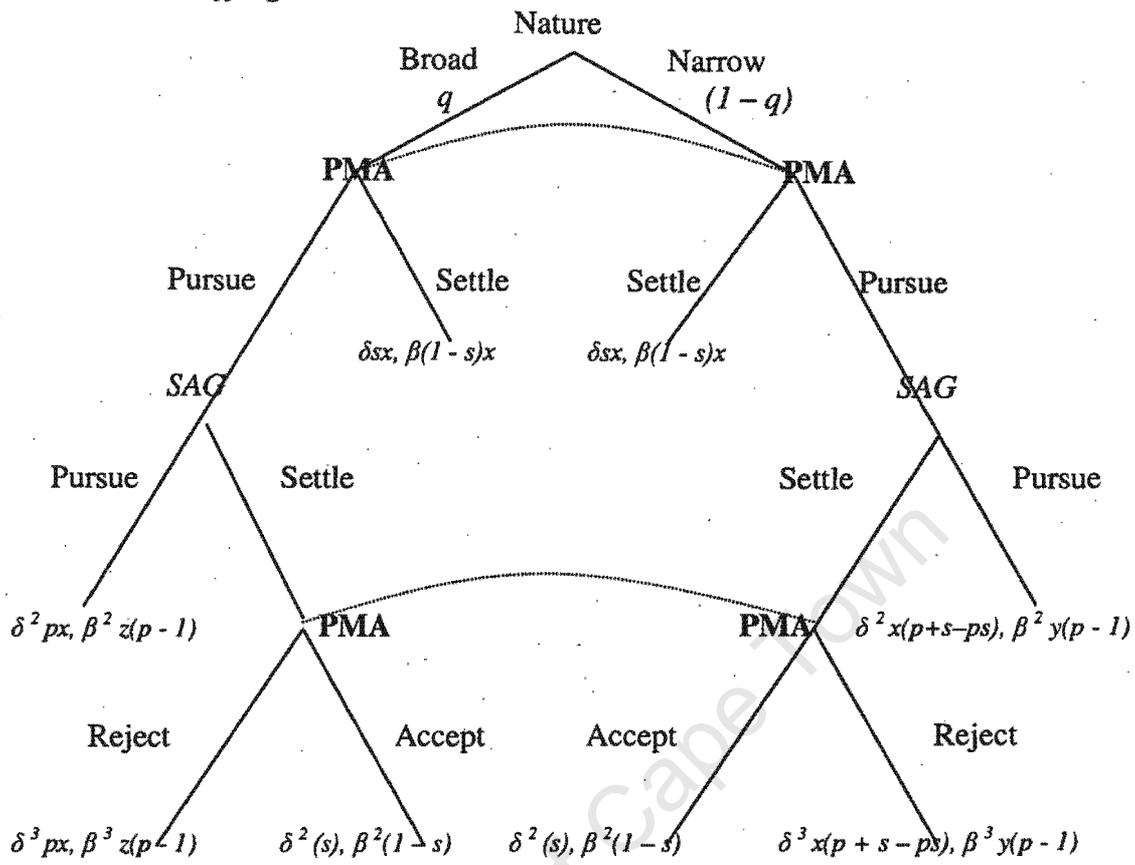
In the narrow game, the SAG “wins” a payoff of $-y$ with a probability of $(1-p)$ and “loses” to get a payoff of 0 with a probability of p , as follows:

$$E[l]_{SAG} = (1-p)(-y) + p(0)$$

$$E[l]_{SAG} = y(p - 1)$$

The extensive form of this game is depicted below:

Figure 4:
Poker with Bluffing Game



You will notice that if the PMA rejects the SAG settlement offer in the last round of the game, their payoff is reduced by δ^3 while if they accept the offer, the payoff is discounted by δ^2 . This is because by rejecting the offer, another round of the game will be played, although this is not shown in the diagram for simplicity's sake.

3.1. Pruning the Game Tree

If SAG were to settle, and PMA had the choice of accepting the settlement and gaining sx , or pursuing the case and entering the lottery, what would their choice be? The expected value of the payoffs to the PMA is q multiplied by the broad payoffs, added to $(q-1)$ multiplied by the narrow payoffs.

Their expected value of rejecting the settlement and entering the lottery is:

$$E[v]_{PMA} = qx(2p-1)\delta^3 + (1-q)x(p+s-ps)\delta^3$$

Their expected value from accepting the settlement is:

$$E[v]_{PMA} = qsx \delta^2 + (1 - q)sx \delta^2$$

$$E[v]_{PMA} = s \delta^2$$

If:

$$s \delta^2 > qx(2p - 1) \delta^3 + (1 - q)x(p + s - ps) \delta^3$$

Then the PMA will accept SAG's settlement offer. Clearly, it is difficult to know when accept will dominate reject without giving values to s , x , p , q and δ .

By solving for s , one can calculate the threshold level of s , where the PMA is indifferent between accept and reject, given various values of p , q and δ (x cancels out). At the threshold level:

$$s = \delta p / (1 - \delta + \delta p + \delta q - \delta q p).$$

This has been calculated using:

$$p = (0.1, 0.2, \dots, 1)$$

$$q = (0.1, 0.2, \dots, 1)$$

$$\delta = (0.1, 0.2, \dots, 1)$$

As expected, the threshold level of s increases as p and δ increase. As p increases, the PMA has a better chance of winning the suit, so the threshold value of s would be closer to 1. As δ increases, it becomes less costly to pursue the suit because their final payoff is discounted by less. The threshold level of s decreases in q because as q increases, there is a higher probability that 15C is broad, and rejecting the settlement and entering the lottery has a lower expected value if 15C is broad. Table 5 shows the threshold levels for ranges of p and q and δ of either 0.2 or 0.8. Figures 5 and 6 are graphical depictions of Table 5. For full details of the results, refer to Appendix B.

Table 5:

Threshold Values of s , given p , q and δ of 0.2 or 0.8

σ	0.20										
		q									
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
p	0.10	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	0.20	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	0.30	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
	0.40	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08
	0.50	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10
	0.60	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12
	0.70	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14
	0.80	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	0.90	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
	1.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
σ	0.80										
		q									
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
p	0.10	0.23	0.19	0.16	0.14	0.13	0.11	0.10	0.09	0.09	0.08
	0.20	0.38	0.33	0.29	0.26	0.24	0.22	0.20	0.18	0.17	0.16
	0.30	0.48	0.43	0.39	0.36	0.33	0.31	0.29	0.27	0.25	0.24
	0.40	0.56	0.52	0.48	0.45	0.42	0.40	0.37	0.35	0.34	0.32
	0.50	0.63	0.59	0.56	0.53	0.50	0.48	0.45	0.43	0.42	0.40
	0.60	0.67	0.65	0.62	0.59	0.57	0.55	0.53	0.51	0.50	0.48
	0.70	0.71	0.69	0.67	0.65	0.64	0.62	0.60	0.59	0.57	0.56
	0.80	0.75	0.73	0.72	0.71	0.70	0.68	0.67	0.66	0.65	0.64
	0.90	0.78	0.77	0.76	0.76	0.75	0.74	0.74	0.73	0.73	0.72
	1.00	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80

Figure 5:

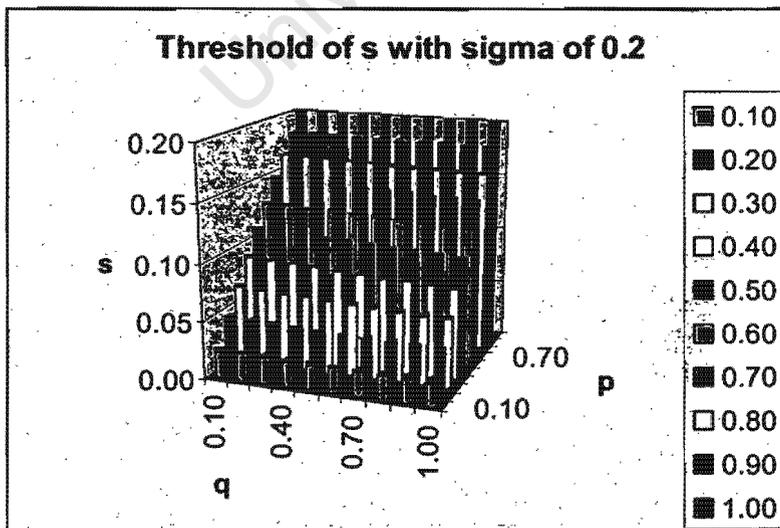
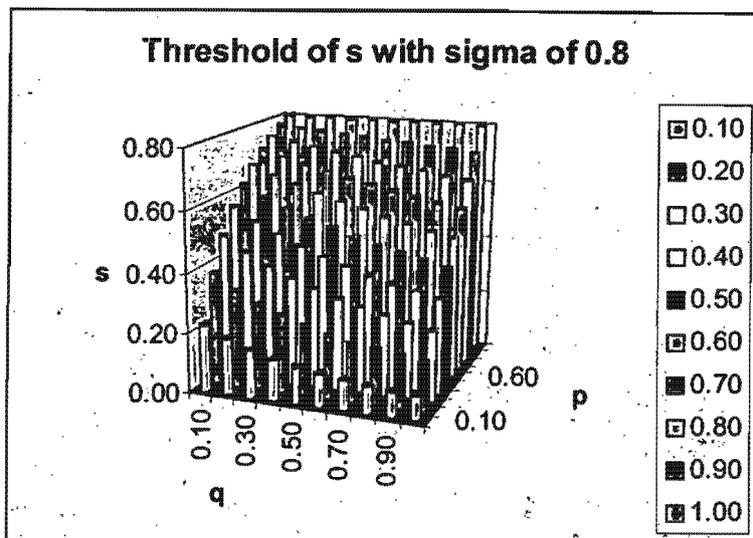


Figure 6:



What would be the threshold value of s under reasonable assumptions of the levels of p , q and δ ? If:

$$p = 0.4$$

$$q = 0.3$$

$$\delta = 0.3$$

then:

$$s = 0.14$$

This means that s must be greater than 14% of x for PMA to accept this settlement.

This is certainly true, because in settling, the PMA loses only parallel importation.

The gain in compulsory licensing would be valued at greater than 14% of x .

Therefore, Accept dominates Reject for PMA under reasonable assumptions.

If SAG were to reach its node, what would it do? It is easy to see that for SAG, settle strictly dominates pursue, given that the PMA will accept this settlement under realistic assumptions. The expected value of the payoffs to the SAG is q multiplied by the broad payoffs, added to $(1 - q)$ multiplied by the narrow payoffs. The lottery payoffs for SAG are as follows:

$$E[v]_{SAG} = qz(p-1)\beta^2 + (1-q)y(p-1)\beta^2$$

$$E[v]_{SAG} = \beta^2(zqp - qz - y - yqp) < 0$$

The settling payoffs for SAG are as follows:

$$E[v]_{SAG} = q\beta^2(1-s)x + (1-q)\beta^2(1-s)x$$

$$E[v]_{SAG} = \beta^2x(1-s) > 0$$

Clearly Pursue is strictly dominated by Settle for SAG. Therefore, if SAG gets a turn to play, it will offer to settle and the PMA will accept this settlement.

But, this means that when the PMA gets to its first information set, it will offer to settle. Settling earlier lowers the impact of δ on the PMA's payoffs. To avoid unnecessary clutter in the game tree, for the SAG, the option of rejecting the settlement is not shown. If they were to reject, I assume that the game moves directly into the lottery, which is the worst of the outcomes for SAG.

4. Equilibrium

In equilibrium, the PMA offers to settle at their first information set, and SAG accepts this settlement. This is a sequential equilibrium. Neither player can improve their payoffs given the actions of the other player. In settlement, SAG avoids a broad interpretation of the law, and chalks up some moral capital. In settling, the PMA avoids weakening of intellectual property rights in South Africa, and minimises their loss of moral capital.

Chapter Six

Conclusion

When I started this thesis, the motivation was to add to the body of research on HIV/AIDS and the access to antiretrovirals. I hoped to provide an accurate description of a country's obligations with respect to Intellectual Property Rights for medicines. If one feels confident to use the flexibility in TRIPS, this may increase the access to antiretrovirals. In addition, I was interested to see how the interaction between firms (the pharmaceutical companies) and governments (the United States and South Africa) could affect South Africa's access to antiretrovirals. As expected, it was found that access to antiretrovirals was not a simple domestic matter, but was very much part of the broader world trade agenda.

Since then, there have been shifts in the WTO, which should make developing countries confident to compulsory license or parallel import antiretrovirals. This has diminished the need to modify TRIPS itself to enhance access to antiretrovirals, although there is definitely room for a re-examination of the patent system for medicines. Using methodology acceptable to the industry, it was shown that R&D costs, including the opportunity cost of capital and the risk of failures, do not justify the profits made on these drugs.

For South Africa, the first move should be to work some of TRIPS' flexibility into domestic law. South Africa's Patents Act does not provide as much leeway as TRIPS for compulsory licensing, and as has been shown, the Medicines Act will only be helpful for parallel importation. If South Africa wants to compulsory license medicines, this is possible as the law stands, but extra flexibility in the law as regards pharmaceutical patents would not go amiss.

Unfortunately, increasing access to antiretrovirals in the public sector is not high on the government's to-do list. They are prioritising other trade and economic growth goals above HIV/AIDS treatment. This leads to the anomaly of the court case, which was analysed in detail in the chapter on Game Theory.

This paper has found that the government needs to put more emphasis on HIV/AIDS treatment. Future work, perhaps, could be directed towards remedying this situation.

University of Cape Town

References

- Achmat, Z. 2001, Speech, Cape Town, 10 Aug.
- Achmat Z. 2000, *Article Submitted to the Sowetan, South Africa's biggest daily, by Zackie Achmat, chairperson of the Treatment Action Campaign* 18 May. [Online], Available: www.tac.org.za [2001, Feb. 20].
- Additional notes on government role in the development of HIV/AIDS drugs* 2000, [Online], Available: <http://www.cptech.org/ip/health/aids/gov-role.html> [2001, Aug. 17].
- "A Healthy Diagnosis" 2001, *World Link*, July/August, pp. 20-24.
- "ANC Message on HIV/AIDS: Prevention is our best defence" 2001, *ANC Today*, vol. 1 no. 3, 9 – 15 Feb. 2001. [Online], Available: <http://www.anc.org.za/ancdocs/anctoday/2001/at03.htm#art1> [2001, July 01].
- "A war over drugs and patents" 2001. *Economist*, 10 Mar. pp. 43-44.
- Ayogu, M., Hodge, J. 2001, *The socio-economic context and institutional foundations of privatization and regulatory reform in South Africa (draft)*, University of Cape Town, Cape Town.
- Balasubramaniam, T. 2000, *Background Information on Fourteen FDA Approved HIV/AIDS Drugs*, [Online], Available: <http://www.cptech.org/ip/health/aids/druginfo.html> [2001, Aug. 17]
- Barber, S. 2000a, "Trade benefits under fire in US" *Business Day* 14 July [Online], Available: <http://www.bday.co.za/bday/content/direct/0,3523,657499-6078-0,00.html> [2001, Aug. 24]
- Barber, S. 2000b, "Petitions flood trade representative" *Business Day* 18 July [Online], Available: <http://www.bday.co.za/bday/content/direct/0,3523,659690-6078-0,00.html> [2001, Aug. 24]
- Barber, S. 2001a, "SA should call for drug tenders, says US lobby" *Business Day*, 20 Feb. [Online], Available: <http://www.businessday.co.za/bday/content/direct/1,3523,795378-6078-0,00.html> [2001, Sep. 21]
- Barber, S. 2001b, "US Will not Keep South Africa from Licensing Local AIDS drugs" *Business Day*, 23 Feb. p. 1.
- Barber, S. 2001c, "Firm's drug scheme is not the way for Africa to fight AIDS", *Business Day*, 28 Feb. p.2.

- Barber, S. 2001d, "David and Goliath confront a red herring in the high court" *Business Day* 7 Mar. [Online], Available: <http://www.businessday.co.za/bday/content/direct/1,3523,806042-6078-0,00.html> [2001, Sep. 21]
- Bayne, N. 2000, "Why did Seattle Fail? Globalization and the Politics of Trade" *Government and Opposition*, vol. 35, no. 2, pp.131-151.
- Beresford, B. 2001a "Drug giants back down" *Mail & Guardian*, 20 to 25 April, p. 2.
- Beresford, B. 2001b "State stands firm on anti-retrovirals" *Mail & Guardian* June 08 2001 [Online], Available: <http://www.sn.apc.org/wmail/issues/010608/OTHER34.html> [24 July 2001]
- Beresford, B. 2001c, "Aids suit: State's reply", *Mail & Guardian*, 14 to 20 Sep., p. 12.
- Blair, T., Mbeki, T., 2001, *Dare to hope for Africa's children* [Online], Available: http://www.gov.za/search97cgi/s97_cgi?action=View&VdkVgwKey=%2E%2E%2Fdata%2Fspeech01%2F010614945a1002%2Etxt&DocOffset=184&DocsFound=1733&Collection=speech01&SortField=TDDate&SortOrder=desc&ViewTemplate=gov%2Fdocview%2Ehts&SearchUrl=http%3A%2F%2Fwww%2Egov%2Eza%2Fsearch97cgi%2Fs97%5Fcgi%3Faction%3DSearch%26ResultTemplate%3Dgov%252Fdefault%252Ehts%26Collection%3Dspeech01%26SortField%3DTDDate%26SortOrder%3Ddesc%26ViewTemplate%3Dgov%252Fdocview%252Ehts%26ResultStart%3D176%26ResultCount%3D25& [2001, July 01]
- Boseley, S, 2001 "At the mercy of the giants" *Mail & Guardian*, 16 to 22 Feb., p. 9.
- CBO, 1998, *How increased competition from generic drugs has affected prices and returns in the pharmaceutical industry*, [Online], Available: <http://www.cbo.gov/shodoc.cfm?index=655&sequence=0&from=1> [2001, Aug. 8].
- Church, J., Ware, R. 2000 *Industrial Organisation A Strategic Approach*. Irwin McGraw-Hill.
- Crotty, J. 2000 (draft) *Slow Growth, Destructive Competition, and Low Road Labor Relations: A Keynes-Marx-Schumpeter Analysis of Neoliberal Globalization*; University of Massachusetts, Amherst.
- Davidson, D. 1984, *Inquiries into Truth and Interpretation*, Oxford University Press.
- Department of Finance 1996, *Growth, Employment and Redistribution: a Macroeconomic Strategy*, Republic of South Africa. [Online], Available: <http://www.finance.gov.za/> [2001, Sep. 21].
- Department of Finance, 2001, *Overview of the 2001 Budget*, [Online] Available: <http://www.finance.gov.za/> [2001, Sep. 21].

- Department of Health, 1997 “Amendments to the South African Medicines and Related Substances Control Act No. 101 of 1965, section 15C” [Online], Available: <http://lists.essential.org/pipermail/pharm-policy/2001-January/000607.html> [2001, Jun. 08].
- Department of Health, 2001a, *Briefing document: Defending the Medicines Control Amendment Act* [Online], Available: http://www.gov.za/search97cgi/s97_cgi?action=View&VdkVgwKey=%2E%2E%2Fdata%2Fspeech01%2F010305945a1003%2Etxt&DocOffset=1&DocsFound=1&QueryZip=Medicines+Control+Amendment+Act&Collection=empty&Collection=speech01&SortField=TDDate&SortOrder=desc&ViewTemplate=gov%2Fdocview%2Ehts&SearchUrl=http%3A%2F%2Fwww%2Egov%2Eza%2Fsearch97cgi%2Fs97%5Fcgi%3Faction%3DSearch%26QueryZip%3DMedicines%2BControl%2BAmendment%2BAct%26ResultTemplate%3Dgov%252Fdefault%252Ehts%26QueryText%3DMedicines%2BControl%2BAmentment%2BAct%26Collection%3Dempty%26Collection%3Dspeech01%26SortField%3DTDDate%26SortOrder%3Ddesc%26ViewTemplate%3Dgov%252Fdocview%252Ehts%26ResultStart%3D1%26ResultCount%3D25& [2001, Jun. 08].
- Department of Health, 2001b. *Draft for Comment: General regulations in terms of the Medicines and Related Substances Control Act, 1965, as amended* <http://www.hst.org.za/doh/default.asp> [2001, Jun. 08].
- Department of Trade and Industry, 1999. *Joint understanding between the governments of South Africa and the United States of America* [Online], Available: <http://www.polity.org.za/govdocs/pr/1999/pr0917b.html> [2001, Jun. 08].
- DiMasi, J.A., Hansen, R.W., Grabowski, H.G., Lasagna, L. 1991 “Cost of innovation in the pharmaceutical industry” *Journal of Health Economics*, vol. 10 pp. 107-142, Elsevier Science Publishers [Online], Available: <http://www.citizen.org/congress/drugs/DiMasi.html> [2001, Aug. 08].
- European Union 2001, *TRIPS Council on Discussion on Access to Medicines, EU’s Paper*, [Online], Available: http://www.wto.org/english/tratop_e/trips_e/paper_eu_w280_e.htm [2001, July 01].
- Geffen, N. 2001 *TAC Electronic Newsletter*, E-mail to S. Cleary (cleary_susanmay@hotmail.com), 7 Mar. [2001, Mar. 08]
- Gellman, B. 2000 “Gore in Conflict of Health and Profit” *Washington Post* May 21 [Online], Available: www.tac.org.za [2001, Mar. 01].
- Gintis, H. 2000 *Game Theory Evolving*, Princeton University Press, New Jersey
- Harvey, E., 2000. “A dictatorship growing inside a multiparty democracy” *Mail & Guardian* July 7 [Online], Available: <http://www.sn.apc.org/wmail/issues/000707/NEWS137.html> [2001, Sep. 21]

- Harris, G. 2001 "Adverse Reaction: AIDS Gaffes in Africa Come Back to Haunt Drug Industry at Home" *Wall Street Journal* April 23 [Online], Available: <http://lists.essential.org/pipermail/pharm-policy/2001-April/000960.html> [2001, Aug. 8]
- "HIV/AIDS Barometer" 2001 *Mail & Guardian* Feb. 23. [Online], Available: <http://www.sn.apc.org/wmail/issues/010223/OTHER34.html> [2001, Sep. 21]
- HIV 2000: Major and Emerging Markets*, 2000. Decision Resources, Inc.
- "Historic agreement lays the basis for co-operation towards health for all", 2001, *ANC Today* vol. 1 no. 13 20-26 April, [Online], Available: www.anc.org.za/ancdocs/anctoday/2001/at13.htm [2001, Jun. 08].
- Health Care and Intellectual Property: Parallel Imports*, [Online], Available <http://www.cptech.org/ip/health/pi/> [2001, Sep. 2001].
- Holiday, A. 2001 "Mbeki must find some way to slay his demon" *Mail & Guardian*, June 8. [Online], Available: <http://www.sn.apc.org/wmail/issues/010608/OTHER31.html> [2001, Sep. 21]
- Kaitin, K.I., Healey, E.M. 2000 "The New Drug Approvals of 1996, 1997 and 1998: Drug Development Trends in the User Fee Era", *Drug Information Journal* vol. 34, pp. 1-14
- Love, J. 1999 *Five Common Mistakes by Reporters covering US/South Africa disputes over compulsory licensing and parallel imports* [Online], Available: www.tac.org.za [2001, Mar 13]
- Love, J. 2001a, *Access To Medicine And Use Of Patents Without The Permission Of The Patent Owner: Models For State Practice In Developing Countries (draft)* [Online], Available: <http://www.cptech.org/ip/health/cl/recommendedstatepractice.html> [2001, Jun. 08].
- Love, J. 2001b *Report on the court case* [Online], Available: <http://lists.essential.org/pipermail/pharm-policy/2001-March/000740.html> [2001, Jun. 08].
- Love, J. 2001c *Affidavit of James Packard Love in the matter between: Pharmaceutical Manufacturers' Association of South Africa and others and the President of the Republic of South Africa and others and the Treatment Action Campaign amicus curiae* [Online], Available: <http://www.cptech.org/ip/health/sa/loveaffidavit> [2001, Aug. 23].
- Mbeki, T. 2000, *Opening Address at the 13th International AIDS Conference* 9 Jul. [Online], Available: www.woza.co.za [2001, Mar. 03].

McCalman, P. 1999, "Reaping What You Sow: An Empirical Analysis of International Patent Harmonization" Department of Economics, University of California, Santa Cruz.

Offers of Price Reductions for HIV/AIDS Drugs 2001 [Online], Available: <http://www.cptech.org/ip/health/pcuts.html> [2001, Aug. 2]

National Institute for Health Care Management (NIHCM). 2000. *Prescription Drugs and Intellectual Property Protection* [Online], Available: www.cptech.org/ip/health/econ/nihcm-drug&ipp.pdf [2001, Aug. 17].

Patents Act, No. 57 1978 (Republic of South Africa), s. 56

Pharmaceutical company lawsuit (forty-two applicants) against the Government of South Africa (ten respondents) 1998, [Online] Available: <http://www.cptech.org/ip/health/sa/pharmasuit.html> [2001, Aug. 1].

Pharmaceutical patents and the TRIPS Agreement 2000, [Online], Available: http://www.wto.org/english/tratop_e/trips_e/pharma_ato186_e.htm [2001 Aug. 1].

Public Citizen, 2001 *Rx R&D Myths: The Case Against The Drug Industry's R&D "Scare Card"* [Online], Available: <http://www.citizen.org/congress/drugs/R&Dscarecard.html> [2001, Aug. 8].

Report of the Workshop on Differential Pricing and Financing of Essential Drugs 2001 [Online], Available: http://www.wto.org/english/tratop_e/trips_e/tn_hosbjor_e.htm#finalreports [2001, Aug. 01].

Sidley, P. 2000, "Government seems ready to accept HIV/AIDS drug donations", *Business Day*, 20 Oct., p. 2.

Sidley, P. 2001a, "Doubt cast on cost-efficiency of AIDS drugs", *Business Day*, 01 Mar., p. 6.

Sidley, P. 2001b, "High stakes poker in drug battle", *Business Day*, 9 Mar. [Online], Available: <http://www.businessday.co.za/bday/content/direct/1,3523,808068-6078-0,00.html> [2001, Sep. 21].

Sidley, P. 2001c, "Govt clears cloud over AIDS drugs", *Business Day*, 30 Mar. p. 3.

Sidley, P. 2001d, "Government AIDS drugs still a way off", *Business Day*, 20 Apr. [Online], Available: <http://www.businessday.co.za/bday/content/direct/1,3523,834256-6078-0,00.html> [2001, Sep. 21].

Smith, C. 2001, "Free treatment for HIV+ mums", *Mail & Guardian*, 26 Jan. to 1 Feb., p.3.

- South Africa Comments to WHA Executive Board on Revised Drug Strategy*, 1999 [Online], Available: www.tac.org.za [2001, Mar. 8]
- Swarns, R. 2000a "Loans to Buy AIDS Drugs Are Rejected by Africans" *New York Times*, 22 Aug. [Online], Available: www.tac.org.za [2001, Mar. 8]
- Swarns, R. 2000b "South Africa to Distribute \$50 Million in Donated AIDS Drugs" *New York Times*, 2 Dec. [Online], Available: www.tac.org.za [2001, Mar. 8]
- Tandon, Y. 1999 "The World Trade Organisation and Africa's Marginalisation" *Australian Journal of International Affairs* vol. 53, issue 1, p. 83.
- Time-line of Disputes over Compulsory Licensing and Parallel Importation in South Africa* 1999. [Online], Available: <http://www.cptech.org/ip/health/sa/sa-timeline.txt> [2001, Jun. 08].
- Treatment Action Campaign Fact Sheet: Brazil's HIV/AIDS Treatment Programme*, [Online], Available: www.tac.org.za [2001, Jul 13]
- TRIPS Council Meeting on Access to Medicines* 2001. [Online], Available: http://www.wto.org/english/news_e/pres01_e/pr233_e.htm [2001, Jun. 08].
- TRIPS and pharmaceutical patents: fact sheet*, 2001. [Online], Available: http://www.wto.org/english/tratop_e/trips_e/factsheet_pharm00_e.htm [2001, Jun. 08].
- Unicef, UNAIDS Secretariat, WHO/HTP, MSF. 2001 *Sources and prices of selected drugs and diagnostics for people living with HIV/AIDS*, [Online], Available: <http://www.accessmed-msf.org/msf/accessmed/accessmed.nsf/html/4DTSR2?OpenDocument> [2001, Aug. 5]
- US Government efforts to negotiate the repeal, termination or withdrawal of Article 15(c) of the South African Medicines and Related Substances Act of 1965* 1999. in *Time-line of Disputes over Compulsory Licensing and Parallel Importation in South Africa* 1999. [Online], Available: <http://www.cptech.org/ip/health/sa/sa-timeline.txt> [2001, Jun. 08].
- Wolson, R.A. 1997. "Intellectual Property Rights and Their Rise to Prominence in the International Trade Arena" *Trade & Industry Monitor* July 1997, vol. 2.
- Wolson, R.A. 1998. "South Africa" in *Intellectual Property Rights in Agricultural Biotechnology*, eds F.H. Erbisch & K.M. Maredia, CAB International, United Kingdom, pp. 73-90.
- World Trade Organisation 1994, *The Results of the Uruguay Round of Multilateral Trade Negotiations. The Legal Texts*. GATT Secretariat, Geneva Switzerland.
- "World Trade Rules and Cheaper Drugs" 2001, *The Lancet*, vol. 357, p. 243.

Appendix

Appendix A - Timeline of events

1996: Brazil Creates a Generics Market:

Brazil instituted universal access to HIV/AIDS treatment in 1996. Partially sponsored by a World Bank loan of US\$325 million. Brazil had no pharmaceutical patents prior to 1995, when it joined the WTO, therefore able to produce generic drugs. Passed a law allowing pharmaceutical patent protection in 1997. The law still allows Brazil to issue compulsory licenses. Brazil has recently issued a compulsory license for Roche's nelfinavir, because negotiations over price cuts were unsuccessful. In Brazil, the price of antiretroviral medication has dropped by 72.5% since 1996. (*TAC Fact Sheet: Brazil's HIV/AIDS Treatment Programme*).

Events leading up to the passing of the Medicines Act

Medicines Act: conceived of to allow government to obtain cheaper essential medicines. These are as defined by WHO. In 1999, nevirapine and AZT were included as essential medicines. Other antiretroviral drugs are not essential medicines.

May 1997: First pressures against the proposed Medicines Act

Drug industry heavyweights Aldridge Cooper of Johnson & Johnson and Harvey Bale of the PhRMA (the industry lobby) begin writing to Charlene Barshefsky's office at the USTR and to Commerce Secretary William Daley to denounce the proposed amendments to the Medicines Act (Gellman, 2000).

22 September 1997:

At a working dinner with Vice President Gore, Mbeki complains that drug companies often charged SA prices many times greater than those elsewhere, a legacy of the apartheid economy (Gellman, 2001).

Concerns are voiced in letters to then Deputy President Mbeki, to Minister of Trade and Industry Alec Erwin and to Minister of Health Nkosasana Zuma. Objections are mainly from US Department of Commerce, the Office of the USTR.

12 December 1997:

Despite oppositions, the amendments are signed into law.

February 1998:

PMA files its lawsuit. This means the government cannot implement the law.

PhRMA is not prepared to accept even parallel imports. Although the practice is permitted under world trade rules, it is vigorously denounced by drug companies who enjoy the ability to profit from price discrimination. PhRMA is expecting the US government to push for TRIPS-plus protection for pharmaceuticals. When asked what conditions would allow them to accept parallel imports in South Africa, "They said no, we really just want you [the US government] to hold the line and continue to pressure South Africa to terminate this law altogether" (Gellman, 2000: p. 2).

Mbeki's stance, according to Frank Chikane (Mbeki's notetaker in Bilateral Commission meetings with Gore) was:

"You sell medicines to us here, the same product, labelled by the same company, but it's two time more here than in Botswana. Why should we not go in and pluck up the cheapest medicines we can? The pharmaceuticals really wanted to strangle us on this, but we maintained our position." (in Gellman, 2001: 2)

It is argued that, although Section 15C was initially conceived for parallel importation, the South African government began to appreciate the greater usage of 15C for compulsory licensing in 1998.

27 January 1998:

Executive Board of the World Health Assembly recommends the adoption of the Revised Drug Strategy. This advocates putting public health before commercial interests in pharmaceutical and health policies. Countries are advised to review their options under TRIPS. The Revised Drug Strategy is attacked by the US, EU and Big Pharma.

21-23 April 1998

"Questions from the US" are submitted to the WTO Trade Policy Review. Questions about South Africa include Section 15C.

1 May 1998

SA put on Special 301 Watch List (of countries risking trade sanctions). The announcement focuses on the Medicines Act.

11 May 1998:

At WHO meetings, an executive board resolution on WHA's Revised Drug Strategy draws heated opposition from EU, US and Japan. Dr Olive Shisana from SA Ministry of Health is the leading proponent of the resolution from African countries. The US government threatens diplomatic pressure to remove Dr Shisana from the negotiations (*Timeline of Disputes*, 1999).

30 June 1998:

The White House announces that it will not give South Africa its requested preferential tariff treatment until progress is made on intellectual property rights.

12-16 October 1998:

WHO hosts a meeting of the "Ad Hoc Working Group" to discuss the WHA's Revised Drug Strategy. South Africa is the leading country in favour of a strong public health statement, and the US is the leading country representing the industry point of view.

21 October 1998:

A law is passed in the US, which threatens to cut off aid from South Africa pending a Department of State report.

November 1998:

A new Medicines Act is passed in South Africa with provisions identical to section 15C.

9 December 1998:

TAC founded

26 January 1999:

WHA Executive Board meets about the Revised Drug Strategy resolution proposed at the WHO meeting. Peter Goosen, South African spokes person, speaks about the South African Medicines Act at this meeting. He says that “we have passed legislation to enable South Africa to parallel import pharmaceuticals and the allow for the issuing of non-exclusive compulsory licenses” (*South Africa Comments to WHA Executive Board on Revised Drug Strategy*, 1999: 1)

16 February 1999:

PhRMA’s 301 submission asks that SA be listed as a Priority Foreign Country under Special 301. The reasons include the issues of compulsory licensing and parallel importation, and the government’s public statements at the World Health Assembly promoting the Revised Drug Strategy. They write:

“From the recent remarks and actions, the apparent intent of the Government of South Africa is to not only defend its diminishment of the effectiveness of patent protection in South Africa, but to urge other countries to similarly weaken patent protection for pharmaceutical products. Such a posture is plainly antagonistic to the concept of effective patent protection for pharmaceuticals, and is likely to give rise to a substantial diminishment of the effectiveness in protection not only in South Africa but elsewhere.”

(*Timeline of Disputes*, 1999)

Part of their worry was that South Africa’s actions would be copied by other developing countries.

21 March 1999:

First TAC activity – a fast on human rights day to “pressure the government and the pharmaceutical sector to seriously address the need for equitable and affordable access to treatment and care for all people with HIV/AIDS (Geffen, 2001).

March 1999:

Inside US government, senior policymakers begin to focus in earnest on the stunning growth of AIDS in the developing world, where more than one in five people are infected and infection rates have yet to peaked. For the first time, the moral implication of pricing anti-retroviral drugs out of the reach of poor countries is considered. African American political leaders and AIDS activists converge on the issue.

11 April 1999:

Reuters writes the first major US wire story about the South African trade dispute.

28 April 1999:

TAC pickets the offices of Glaxo Wellcome in Midrand (Geffen, 2001)

The first major US newspaper story is written on the issue in the Chicago Tribune, and is titled: "Third World Battles for AIDS Drugs" (*Timeline of Disputes*, 1999)

30 April 1999:

MOH Nkosazana Zuma meets with TAC and asks for TAC's active support of the government's measures to lower the prices of "essential medicines" (Geffen, 2001).

30 April 1999:

USTR, backed by the Commerce and State departments, proposes to escalate South Africa to the "priority watch list" - a step closer to formal sanctions. The designation is punitive in itself as it sends a signal of no confidence to foreign investors.

24 May 1999:

WHA approves the Revised Drug Strategy

By late May:

Vice President Gore's office begins to try to reach a compromise. A settlement deal is presented to the office of the USTR wherein SA would reaffirm its commitment to its international patent laws, and the US government would withdraw its objections to the Medicines Act. This remains unsigned.

16 June 1999:

Gore announces his campaign to run for presidency. AIDS activists infiltrate the crowd with banners and noisemakers concealed in their clothing, threw showers of "blood money" and wave banners saying "Gore's Greed Kills" (Gellman, 2000)

Charlene Barshefsky of the USTR signs the settlement agreement.

She says:

"Largely it was the activities of ACT-UP and the AIDS activist that galvanized our attention [to the fact] that there was an absolute crisis....I was certainly not aware of this at all...In years past, this [pharmaceutical] issue was treated purely as a trade issue and an intellectual property rights issue." (Gellman, 2000: p.1)

21 June 1999:

A settlement deal is finalised where SA will "reaffirm" its commitment to international patent laws and the US government will withdraw its objections to the Medicines Act.

The South African government issues a number of statements saying it will proceed with both parallel imports and compulsory licensing, as long as these efforts are in line with TRIPS (Love, 1999)

September 1999:

PMA announces that it will suspend the legal action in order to negotiate, but South Africa is still blocked from using the law.

TAC calls this a public relations exercise (Geffen, 2001).

22 September 1999:

TAC pickets outside PMA offices

November 1999:

Seattle Round of WTO. First World countries have the backing of activists for their measures on environmental standards and labour standards. "The NGOs, in the great majority, were based in rich countries. The environmental protection and labour standards which they sought would, in effect, limit the market access for the products of developing countries" (Bayne, 2000). The US government especially, and other first world countries to a lesser extent seemed concerned to justify the NGOs and conciliate them. The Third World (SAG) realised at this point that it was of the utmost importance to get the moral arguments on their side. If the First World were to benefit from economic power and have the backing of the NGOs, there would be little hope for the Third World to benefit from trade. At this point, the SAG would have honed its strategy of being WTO compliant, being pro free trade, but arguing that the First World is not living up to the spirit of the agreements (not fair trade) through technical barriers which are already in place, and through the threats of other barriers such as labour and environmental standards.

December 1999:

USTR removes South Africa from its "Special 301" Watch List

Up until this point, the South African government appears to be genuinely backing the Medicines Act to gain access to cheaper medication through compulsory licensing, if necessary, and definitely through parallel importation. However, from 2000, the strategy changes, which is the point at which the game begins.

Mbeki becomes interested in dissident theories of HIV/AIDS. For most of 2000, there is no movement on the litigation. Nevertheless, it is the common belief that, if the government were to win the case, the legislation would be used for parallel importation and compulsory licensing of drugs.

3 April 2000:

TAC pickets Pfizer over Fluconazole (Geffen, 2001).

6 April 2000:

TAC members meet with Manto Tshabalala-Msimang to discuss the affordability of "essential medicines" (Geffen, 2001: 4)

May 2000:

Clinton Executive Order broadens and formalises the agreement to include any country in sub-Saharan Africa that attempts to regulate AIDS drugs as long as the TRIPS minimum requirements are met.

11 May 2000:

UNAIDS Accelerating Access Initiative: a deal is made with the Big Five to cut prices in poor countries by up to 80%. But, industry imposed a series of caveats and very few countries make deals with the Big Five.

9 July 2000:

TAC organizes a Global March for Access to HIV/AIDS treatments. Over 6000 participants. A Memorandum was written, calling for an end to the litigation. This was handed over by the Vice-President of Cosatu, Ms Joyce Phekane, to the Minister of Health, the Executive Director of UNAIDS and the President-elect of the International AIDS Society. The memorandum was addressed to the South African government and to the International Federation of Pharmaceutical Manufacturers Association (IFPMA) (Geffen, 2001).

14 October 2000:

Zackie Achmat brings a generic version of fluconazole into the country (Geffen, 2001).

16 November 2000:

TAC deputy chairperson, Mark Heywood, meets with senior representatives of Glaxo Wellcome in London to discuss the need to resolve the court case. By this time, the PMA had caused the matter to be set down for hearing, although they did not admit to this (Geffen, 2001).

1 December 2000:

TAC demonstrates outside PMA offices, led by the General Secretary of Cosatu. PMA does not admit to having set the suit down for a hearing.

7 February 2001:

Cipla offers to let MSF have its three-drug AIDS cocktail for \$350 per patient per year. Developing country governments can have it for \$600. (Barber, 2001c)

12 February 2001:

1500 people march on parliament to condemn drug company profiteering and to call on the government to produce generic antiretrovirals (Geffen, 2001).

5 March 2001:

Court case

TAC International Day of Action with protests held in South Africa, Brazil, Philippines, US, UK, Kenya, Thailand, France, Italy, Denmark, Australia, Germany and elsewhere (Geffen, 7 Mar 2001).

6 March 2001:

TAC is admitted as amicus curiae, and the case is delayed until 18 April. TAC as amicus curiae will force the argument to focus more on the issue of HIV/AIDS. The TAC has a long history of action against the PMA's law suit, starting from its founding on 9 December 1998. This includes all forms of activism. The TAC is supported by numerous national and international NGOs and by trade unions in South Africa, most notably Cosatu. The importance of activism in this matter cannot be overstated. Without activism, media attention may not have been enough to put the type of public relations pressure on the pharmaceutical companies necessary to change their actions. TAC, as amicus curiae will submit affidavits, most notably, the affidavit of James Love, which will testify to drug company profiteering through the

patent system. In order to continue, it would be necessary for the companies to divulge their pricing data and practices.

Merck announces cut prices on antiretrovirals. They offer Crixivan for \$600 per year and Stocrin for \$500 per year. This is available in the private sector.

7 March 2001:

Cipla uses the court case, and TACs testimony to support their application for compulsory licenses. Cipla's prices are 40% lower than the offers in the Accelerating Access Initiative, which shows that even then profits were being made (Harris, 2001).

13 March 2001:

South African government refuses to declare a State of Emergency.

15 March 2001:

Bristol Myers-Squibb offers cut prices of US\$0.15 for ddi and US\$0.85 for d4t. These are offered to the private sector.

18 April 2001:

PMA offers to settle out of court.

23 April 2001:

Gardiner Harris reports in the *Wall Street Journal* that the pharmaceutical industry has become a "pariah du jour". For the first time, some in the US Congress are talking about new Medicare (US public health) benefits that may contain pricing restrictions. This is the drug companies' biggest fear, and shows that the patent system is coming under its greatest pressure since the TRIPS coup d'etat. Harris reports that people both inside and outside the industry agree that the reason for the turn in public favour is the African AIDS crisis. "The industry responded to international calls for lower AIDS-drug prices in poor nations with a series of gaffes that have tarnished its reputation, weakened its political positions and emboldened its adversaries in a host of battles in the U.S. and abroad" (Harris, 2001: p.3)

Appendix B - Threshold values of s , given p , q and δ

σ	0.1										
	q										
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
p	0.10	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	0.20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	0.30	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
	0.40	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	0.50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	0.60	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
	0.70	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
	0.80	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
	0.90	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
	1.00	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
σ	0.20										
	q										
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
p	0.10	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	0.20	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
	0.30	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06
	0.40	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08
	0.50	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10
	0.60	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12
	0.70	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.14	0.14
	0.80	0.17	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
	0.90	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
	1.00	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
σ	0.30										
	q										
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
p	0.10	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03
	0.20	0.08	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06
	0.30	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.09	0.09	0.09
	0.40	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.12
	0.50	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.15	0.15	0.15
	0.60	0.20	0.20	0.20	0.19	0.19	0.19	0.19	0.18	0.18	0.18
	0.70	0.23	0.23	0.22	0.22	0.22	0.22	0.22	0.21	0.21	0.21
	0.80	0.25	0.25	0.25	0.25	0.25	0.25	0.24	0.24	0.24	0.24
	0.90	0.28	0.28	0.28	0.27	0.27	0.27	0.27	0.27	0.27	0.27
	1.00	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30

σ	0.40											
		q										
			0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
ρ	0.10	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04
	0.20	0.11	0.11	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.08	0.08
	0.30	0.16	0.15	0.15	0.14	0.14	0.14	0.13	0.13	0.13	0.12	0.12
	0.40	0.20	0.20	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.16	0.16
	0.50	0.24	0.24	0.23	0.23	0.22	0.22	0.21	0.21	0.21	0.20	0.20
	0.60	0.28	0.28	0.27	0.27	0.26	0.26	0.25	0.25	0.25	0.24	0.24
	0.70	0.31	0.31	0.31	0.30	0.30	0.29	0.29	0.29	0.29	0.28	0.28
	0.80	0.34	0.34	0.34	0.34	0.33	0.33	0.33	0.33	0.33	0.32	0.32
	0.90	0.37	0.37	0.37	0.37	0.37	0.37	0.36	0.36	0.36	0.36	0.36
	1.00	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
σ	0.50											
		q										
			0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
ρ	0.10	0.08	0.08	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05
	0.20	0.16	0.15	0.14	0.13	0.13	0.12	0.11	0.11	0.10	0.10	0.10
	0.30	0.22	0.21	0.20	0.19	0.18	0.17	0.17	0.16	0.16	0.15	0.15
	0.40	0.27	0.26	0.25	0.24	0.24	0.23	0.22	0.21	0.21	0.20	0.20
	0.50	0.32	0.31	0.30	0.29	0.29	0.28	0.27	0.26	0.26	0.25	0.25
	0.60	0.37	0.36	0.35	0.34	0.33	0.33	0.32	0.31	0.31	0.30	0.30
	0.70	0.40	0.40	0.39	0.38	0.38	0.37	0.37	0.36	0.36	0.35	0.35
	0.80	0.44	0.43	0.43	0.43	0.42	0.42	0.41	0.41	0.40	0.40	0.40
	0.90	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.45	0.45	0.45	0.45
	1.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
σ	0.60											
		q										
			0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
ρ	0.10	0.12	0.11	0.10	0.09	0.08	0.08	0.07	0.07	0.06	0.06	0.06
	0.20	0.21	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.12
	0.30	0.29	0.27	0.25	0.24	0.23	0.22	0.21	0.20	0.20	0.19	0.18
	0.40	0.36	0.34	0.32	0.31	0.29	0.28	0.27	0.26	0.25	0.24	0.24
	0.50	0.41	0.39	0.38	0.37	0.35	0.34	0.33	0.32	0.31	0.30	0.30
	0.60	0.46	0.45	0.43	0.42	0.41	0.40	0.39	0.38	0.37	0.36	0.36
	0.70	0.50	0.49	0.48	0.47	0.46	0.45	0.44	0.44	0.43	0.42	0.42
	0.80	0.54	0.53	0.52	0.52	0.51	0.50	0.50	0.49	0.49	0.48	0.48
	0.90	0.57	0.57	0.56	0.56	0.56	0.55	0.55	0.55	0.54	0.54	0.54
	1.00	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60

σ	0.70										
	q										
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
ρ	0.10	0.16	0.14	0.13	0.11	0.10	0.09	0.09	0.08	0.07	0.07
	0.20	0.28	0.25	0.23	0.21	0.19	0.18	0.17	0.16	0.15	0.14
	0.30	0.38	0.35	0.32	0.30	0.28	0.26	0.25	0.23	0.22	0.21
	0.40	0.45	0.42	0.40	0.37	0.35	0.34	0.32	0.31	0.29	0.28
	0.50	0.51	0.49	0.46	0.44	0.42	0.41	0.39	0.38	0.36	0.35
	0.60	0.56	0.54	0.52	0.50	0.49	0.47	0.46	0.44	0.43	0.42
	0.70	0.60	0.59	0.57	0.56	0.55	0.53	0.52	0.51	0.50	0.49
	0.80	0.64	0.63	0.62	0.61	0.60	0.59	0.58	0.58	0.57	0.56
	0.90	0.67	0.67	0.66	0.66	0.65	0.65	0.64	0.64	0.63	0.63
	1.00	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
σ	0.80										
	q										
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
ρ	0.10	0.23	0.19	0.16	0.14	0.13	0.11	0.10	0.09	0.09	0.08
	0.20	0.38	0.33	0.29	0.26	0.24	0.22	0.20	0.18	0.17	0.16
	0.30	0.48	0.43	0.39	0.36	0.33	0.31	0.29	0.27	0.25	0.24
	0.40	0.56	0.52	0.48	0.45	0.42	0.40	0.37	0.35	0.34	0.32
	0.50	0.63	0.59	0.56	0.53	0.50	0.48	0.45	0.43	0.42	0.40
	0.60	0.67	0.65	0.62	0.59	0.57	0.55	0.53	0.51	0.50	0.48
	0.70	0.71	0.69	0.67	0.65	0.64	0.62	0.60	0.59	0.57	0.56
	0.80	0.75	0.73	0.72	0.71	0.70	0.68	0.67	0.66	0.65	0.64
	0.90	0.78	0.77	0.76	0.76	0.75	0.74	0.74	0.73	0.73	0.72
	1.00	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
σ	0.90										
	q										
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
ρ	0.10	0.33	0.26	0.21	0.18	0.15	0.13	0.12	0.11	0.10	0.09
	0.20	0.51	0.42	0.36	0.32	0.28	0.25	0.23	0.21	0.19	0.18
	0.30	0.62	0.54	0.48	0.43	0.39	0.36	0.33	0.31	0.29	0.27
	0.40	0.70	0.63	0.58	0.53	0.49	0.46	0.43	0.40	0.38	0.36
	0.50	0.76	0.70	0.66	0.62	0.58	0.55	0.52	0.49	0.47	0.45
	0.60	0.80	0.76	0.72	0.69	0.66	0.63	0.61	0.58	0.56	0.54
	0.70	0.83	0.80	0.78	0.75	0.73	0.71	0.69	0.67	0.65	0.63
	0.80	0.86	0.84	0.82	0.81	0.79	0.78	0.76	0.75	0.73	0.72
	0.90	0.88	0.87	0.86	0.86	0.85	0.84	0.83	0.82	0.82	0.81
	1.00	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
σ	1.00										
	q										
		0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
ρ	0.10	0.53	0.36	0.27	0.22	0.18	0.16	0.14	0.12	0.11	0.10
	0.20	0.71	0.56	0.45	0.38	0.33	0.29	0.26	0.24	0.22	0.20
	0.30	0.81	0.68	0.59	0.52	0.46	0.42	0.38	0.35	0.32	0.30
	0.40	0.87	0.77	0.69	0.63	0.57	0.53	0.49	0.45	0.43	0.40
	0.50	0.91	0.83	0.77	0.71	0.67	0.63	0.59	0.56	0.53	0.50
	0.60	0.94	0.88	0.83	0.79	0.75	0.71	0.68	0.65	0.63	0.60
	0.70	0.96	0.92	0.89	0.85	0.82	0.80	0.77	0.74	0.72	0.70
	0.80	0.98	0.95	0.93	0.91	0.89	0.87	0.85	0.83	0.82	0.80
	0.90	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.90
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00