TELKOM AND THE SOUTH AFRICAN ECONOMY: ACHIEVING THE OPTIMAL RELATIONSHIP

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I. INTRODUCTION AND BACKGROUND

1.0 Purpose

South Africa needs a modern, sophisticated telecommunications network to ensure economic development and political stability. The same network must also provide affordable and reliable service to a great percentage of the population. The telecommunications industry is currently monopolised by Telkom, a state-owned business enterprise (SBE), and does not appear capable of meeting these basic requirements. The purpose of this paper is to present a case for restructuring Telkom and liberalising the telecommunications industry to best serve the needs of the South African economy.[1]

The objective for restructuring the telecommunications industry must be to maximise long-term consumer welfare for all South Africans. This paper argues that consumer welfare will be maximised only by dismantling the statutory monopoly structure and moving toward a highly competitive, privately owned telecommunications industry. The economic issues, of course, can not be discussed realistically without reference to political, social and historical variables, all of which are also considered. By focusing primarily on economic issues, however, this paper strives to avoid the ideological disputes which usually surround discussions of state ownership.

This paper focuses on the telecommunications industry because it represents the single most important infrastructural component in a modern economy. It also presents a unique opportunity if managed well, and a grave danger if allowed to continue in its current structure.

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[1]Although the South African government operates parastatals in many industries, this paper focuses almost solely on the telecomms monopoly. The primary objective of this paper is to determine an optimal structure for Telkom, but an important secondary objective is to create a framework for analysing the structure of other SBEs. Much of the analysis of telecommunications is applicable to other industries, and may provide a useful basis for discussing the optimal structures for other South African SBEs.

The relatively modern and broad-based existing telecomms network is one of South Africa's principal competitive advantages in the regional economy: its maintenance and extension is vital for future economic prosperity. Moreover, because the network will deteriorate and/or become obsolete very quickly – relative to other components of infrastructure– its optimisation must take place on a timely basis. The danger of obsolescence is heightened by an ongoing "technological transformation which entails the increasing convergence of telecommunications and information technologies." (Kaplan 1990, p. 14) In other words, rapid action is required to maintain competitive advantage. Ironically, the same technological transformation which heightens the risk of obsolescence also provides unique opportunity for creative restructuring.

Restructuring the telecomms industry presents an opportunity to expedite South Africa's economic development, and to help ensure the country's transition to peaceful, productive democracy. Continuing with the status quo presents a dire threat to economic development, and can only impede the socio-political transition.[2]

1.1 Structure of Paper

This paper is structured to illustrate key economic issues in the general discussion of competition, state ownership, and privatisation, while simultaneously examining the issues which relate specifically to Telkom and its future. Some parts of the analysis are, therefore, relatively theoretical and general, while others focus specifically on the facts of Telkom, the telecommunications industry, and South Africa's political economy.

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[2] A second reason for focusing this analysis on the telecomms industry is the relative difficulty of arguing for Telkom's privatisation. The case for privatisation is difficult because Telkom is profitable in accounting terms and operates in an industry which has historically had a pronounced risk of sub-optimal societal outcome in an environment of unrestrained competition. Privatisation of any money-losing SBE could be justified simply as a means to reducing government's borrowing needs. Without financial losses (as in the case of Telkom) this paper foregoes an easy argument for recommending privatisation. The risk of sub-optimal outcome from unrestrained competition has traditionally created a broad consensus that government has some legitimate role in the regulation and/or ownership of the telecommunications industry. This risk of "market failure" has been used as a compelling argument for state monopolisation (i.e., eliminate market failure by eliminating the

Following the introduction and description of structure, Chapter I presents a brief history of telecommunications in South Africa and a description of Telkom's commercialised structure. Chapter I also presents a description of Telkom's physical network and some of the Company's operating statistics. Finally, Chapter I discusses the circumstances which heighten the economic and political attractions of a fundamental restructuring in the telecomms industry.

Chapter II outlines the economic reasons (fears of market failure) which originally justified structuring the telecommunications industry as a statutory monopoly. Chapter II also examines the current applicability of the original reasoning, and concludes that the fears of market failure have been largely alleviated by technology. Finally, Chapter II outlines the negative economic consequences which are created by the existing state monopoly structure, and concludes that the status quo has resulted in a sub-optimal outcome.

Chapter III begins by outlining some broad goals for an optimal telecomms industry in South Africa, providing a benchmark for evaluating the competition-enhanced, private-ownership structure which is presented in later chapters. Chapter III presents a number of specific steps which can be taken to increase competition in telecomms at the industry level. These steps can be undertaken prior to any restructuring of Telkom itself.

Chapter IV presents steps for operational restructuring which Telkom must undergo before privatisation. Primarily this restructuring entails the division of Telkom into stand-alone telecomms companies, each focusing on a particular service or geographic region. Chapter IV also examines a variety of ownership structures for the separate Telkom units and presents the general economic and non-economic issues surrounding the transfer of Telkom ownership to private investors.

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role of the market). The combination of accounting profitability and market-failure risk create a greater burden of proof to establish that privatisation will actually improve aggregate consumer welfare.

Chapter V presents a series of specific steps for effecting the privatisation of Telkom. Legislative and organisational issues are discussed, and a three-stage plan for actual share divestment is proposed. The proposal includes an ownership structure, rudimentary regulatory parameters and guidelines for the use of proceeds from the privatisation. Specific terms and conditions for the privatisation of Telkom would, of course, have to be negotiated in a broad-based forum for stakeholders.

Chapter VI is a brief summary and conclusion.

1.2 History of South African Telecommunications

Telkom's predecessor company was created in the late 19th century as a subsidiary of the government's postal service. Although the original telephone and telegraph lines were installed by private entrepreneurs, "these fledgling telecommunications services ... were bought by government before the turn of the century." In its infancy, telecommunications was seen as "an extension of the postal carrier's primary objective," and was considered too important to be left in the hands of the private sector. (Telkom 1993B, p. 4)

Originally the postal and telecommunications services were operated directly by the Treasury and Commission for Administration. The Department of Posts and Telecommunications (DPT) was created in the 1960s to encourage a more businesslike approach to the provision of these services. Until 1990 the telecomms monopoly was operated by the DPT, which was administered in turn by the Minister of Transport and Communications. DPT was a "classic post, telephone and telegraph monopoly, legally monopolising postal and telecommunications services." (Horwitz 1993, p. 6)

In aggregate, the DPT was forbidden by statute from posting a net profit or loss at the end of each year. To prevent this, operating profits from the relatively lucrative telecomms service were generally used to cross-subsidise the losses generated by the postal segment. Even if profit maximisation had not been legally

prohibited as a goal, it would have almost certainly been superseded by the political objectives of DPT's elected and appointed masters. The primary non-market objectives were:

- job creation
- industrial policy promotion
- provision of service to rural Afrikaners.

Non-market Objectives

A primary goal of South African SBEs was to provide jobs for "hundreds of thousands of landless, poor Afrikaners who had left farming," (Horwitz 1992, p. 299) and were unable to find work in the industrial sector. Although DPT was not the primary source of jobs and patronage for Afrikaner voters, this function was undoubtedly important for the Department's overseers in Parliament. (Horwitz 1993 , p. 8)

DPT was also an important tool of the government's industrial policy, as it "played a major role in the development and support of the local electronics industry." (Telkom 1993, p. 9) The support of local industry was effected primarily through a series of long-term agreements (called Manufacture and Supply Agreements, or MSAs) to purchase equipment from a small number of domestic suppliers. These MSAs, which were first introduced in 1958 and did not expire until 1995, guarantee comfortable profit margins to the favoured suppliers and have greatly subsidised the development of the South African electronics industry.[3]

In addition to the job-creation and industrial-policy goals, DPT also pursued politically important operational goals. These goals included: maintenance of low prices for plain old telephone service (POTS) and extension of that service to as many white-owned households as possible. In fact, service to rural areas was "virtually limited to white-owned farms," and was "heavily subsidised ... because of political influences." (Telkom 1993B, p. 36)

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[3]A thorough analysis of MSAs and their role in the development of the South African electronics industry is presented in David Kaplan's The Crossed Line: South African Telecommunications Industry in Transition.

DPT's success in keeping basic service prices low was evidenced in a 1985 study, which calculated South African phone service as the 8th-least expensive of 34 countries surveyed. The drive for universal service for whites was also highly successful: in 1987 there were 83.9 telephones in service for every 100 white-owned residences (Horwitz 1993, p. 16), a penetration ratio comparable "to that of the populations of many industrialised countries." (Kaplan 1990, p. 52) Penetration amongst black population groups was, and continues to be, substantially lower.

Adherence to these non-market objectives has created major distortions in the natural development of Telkom's network. These distortions persist to this day, and are likely to present a major challenge for Telkom (or its privatised successors) and competitors in future years.

1.3 Commercialisation

Under the old South African political order, and in the context of early telecomms technology, the monopoly structure of DPT was considered adequate for meeting the government's goals. For many years DPT provided inexpensive telecomms and postal services for voters (i.e., whites) and relatively modern and efficient telecomms infrastructure for formal-sector (i.e., white-owned) businesses.

In the late 1980s a variety of political, economic and technological changes pressured government to re-evaluate the DPT organisational structure. Subsequent to that evaluation the decision was taken to divide the DPT into three separate entities:

- a residual Department of Posts and Telecommunications, which is responsible for regulating the communications industries;
- the postal service;
- and the telecommunications monopoly, which was "commercialised" and renamed Telkom SA Limited.

The commercialised telephone company was established to free it "from the constraints of being tied to the national postal carrier" and to reduce the impact of

"financial and political goals imposed by government." (Telkom 1994, p. 1) Telkom's mission statement reads:

> "We are dedicated to being South Africa's leading and most respected provider of excellent telecommunications services and products that satisfy the needs of our clients whilst fulfilling our social responsibility and maintaining a sound financial structure." (Telkom 1994, p. 1)

Although Telkom cites the goal of its commercialisation as an attempt to make it "more efficient and productive," commercialisation is generally seen as an intermediate step before privatising any given SBE. If privatisation were the ultimate goal, the purpose of commercialisation is "to separate enterprise activities and decision making from the traditional bureaucratic hierarchy of political administration." (OECD 1993A, p. 14) Commercialisation also creates distinct financial results for an enterprise, which are meant to become the basis for investor valuations at a later date.

Despite occasional proclamations to the contrary (see Ryan 1993), it was not politically feasible for the minority South African government to carry out the privatisation of Telkom unilaterally. Prior to entering government, the ANC announced that

> "although it was no longer wed to nationalisation as a matter of general policy, public sector corporations and parastatals that were privatised prior to political accommodation would be prime candidates for (re)nationalisation. " (Horwitz 1992B, p. 302)

This announcement was intended specifically to forestall the planned privatisation of Telkom, and was a response to the widely held belief that the purpose of privatisation was "to take the parastatals out of the hands of the black majority come a democratic dispensation." (Horwitz 1993, p. 12)

In the first thirteen months of the Mandela presidency, there have been no official pronouncements regarding the resumption of the privatisation programme.

Recently, however, the President and certain cabinet members have begun discussing privatisation as a means to reduce the government's borrowing requirements. (Keller 1994, page A10)

1.4 Description of Telkom and its Operations

With annual turnover of R8.4 billion, and total assets of R15.4 billion, Telkom is a very large organisation by any standard. The Company employs 60,172 people, having reduced head count by almost 8,000 since commercialisation. (Telkom 1994, pp. 8-12)

Company Structure [4]:

Telkom is an omnibus provider of telecommunications services in South Africa, with a statutory monopoly in virtually all sectors of the industry. The Company's businesses include:

- long-distance dialing services (LDDS)
- local telephone service
- value-added voice services
- telematics (Saponet, Diginet)
- value-added networks (Beltel, Easy Access)
- telex and teletex
- cellular communications
- marine radio
- research & development (through the Telecommunications Development Institute)

Telkom's organisational structure is a semi-matrix form, with responsibilities allocated primarily by function. Within the operations division, however, management responsibility is divided on geographic lines. Figure 1 is a simplified diagram of Telkom's organisational structure.

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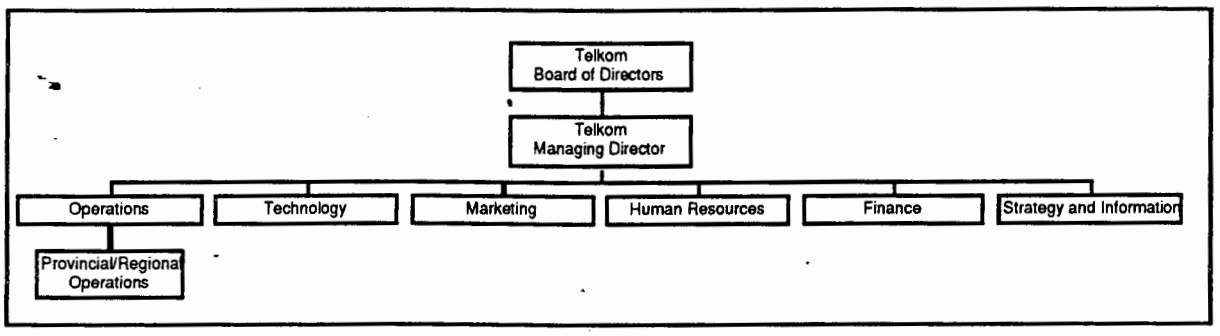
[4] Description of Telkom's corporate structure is summarised from Telkom Annual Reports (1993A) and (1994) and Telkom Company Profile (1993B).

Figure 1: ORGANISATIONAL CHART



Source: Telkom 1993B

Operating control

In recent years, Telkom has devolved considerable decision-making power in operations to its six regional divisions. The divisions provide the bulk of the network's services, and regional line managers "have the responsibility of running and being accountable for their own operations." (Telkom 1993B, p. 10) At the regional level, the units are organised along functional lines, including network control, long-distance and international services, and telematics.

Telkom's head office provides centralised support functions (finance, human resources, technology, marketing), and retains control over all strategic decisions. The major centralised divisions are:

- Technology: plans and implements technological improvements to the network, and executes Telkom's research and development function.
- Marketing: caters to the interests of commercial and residential customers, and develops public phones and other services.
- Human Resources (HR): hires and trains Telkom employees, and assigns them to tasks within the divisions and sub-divisions of the Company. HR also handles labour relations and contract negotiations.
- Finance: maintains the accounts and manages Telkom's Treasury and procurement functions.
- Strategy & Information: plans the future strategic direction of the Company, and manages communications with the government and other stakeholders.

Statistical Measures

The telecommunications system currently managed by Telkom is impressive in many ways. It is by far the largest and most sophisticated network on the African

continent, measuring approximately 100 million circuit kilometres, 80% of which are digital. (Telkom 1993A) The network provides 3.5 million access lines, which makes it the 25th largest in the world. (Horwitz 1993, p. 16) The South African network is connected to the rest of the world via analogue and digital submarine cables and satellite link, and is sophisticated enough to allow for 98.5% of the 35 million annual overseas calls to be dialed directly. (Telkom 1993A)

Quality of Service

By most statistical measures, the quality of Telkom's service is considered reasonably good. The percentage of calls answered averages just over 60%, which "compares favourably with the service quality of other major international telecommunications companies." (Telkom 1993A, p. 29) The speed of fault clearance, 77% within one working day, is also considered "near to the level of industrialised countries." (Horwitz 1993, p. 19)

Service Complaints

Despite the quality of service as quantified above, there is broad customer dissatisfaction with Telkom's current service level. Telkom management acknowledges this problem: "The single biggest perception of Telkom among the public is that service is abysmal." (Telkom 1993B) This dissatisfaction is very broad-based, exhibited by existing commercial and residential customers as well as by the vast numbers of South Africans who have been unable to even subscribe to the network.

Business users are particularly dissatisfied with the very slow introduction of value-added network services (VANS), such as call-waiting and call-forwarding, data transmission and voice mail. Customers are also frustrated by the unavailability of itemised billing and a perceived lack of responsiveness to complaints. Non-subscribers are highly dissatisfied with the long waiting periods for connection and the complete lack of service availability in many areas. Telkom claims to be making great progress in these areas, but still only 50% of the orders for service connection are filled within one month, and only 90% within three months. (Telkom 1994, p. 4)

Subjective perceptions of low productivity and inefficiency at Telkom are borne out by the low number of access lines in service per employee, a standard measure of telecommunications productivity. As Table 1 indicates, Telkom's lines per employee compares poorly to countries such as South Korea, the United States, and even Mexico

Table 1: TELECOMMS PRODUCTIVITY BY COUNTRY

Country/Company	Lines per Employee
Japan (NTT)	236
United States (RBOCs)	231
South Korea	226
France (Telecom)	199
British Telecom	171
Deutsche Telekom	160
Mexico (Telmex)	96
South Africa (Telkom)	**57**
Ecuador	56
Tanzania	14

Sources: Telkom (1993),Horwitz (1993), p, 8
Durchslag & Puri (1993)

Additional Difficulties

More important than the current complaints about Telkom's service and low penetration, it appears that the Company is not equipped to rectify its fundamental problems in the foreseeable future. Telkom has been starved of investment capital for many years, both under its old DPT structure and under the post-1990 commercialised structure. Between 1988 and 1991, capital expenditure on telecommunications decreased 42% in nominal terms, with no plan to increase spending until 1995 at the earliest. (Telkom 1993B, p. 32)

Telkom's capital expenditure budget is limited by its statutory obligation to continue subsidising postal service until 1996, and by its requirements to return profits to government. In 1994, government took R483 million in taxes and dividends on Telkom's pre-tax profit of only R1,206 million, leaving only R700

million gross capital expenditure in 1995. (Telkom 1994, p. 40) By way of illustration, it has been estimated that it would cost at least R11.5 billion to install an additional 10 million phone lines in South Africa. (Li and Li 1995, p. 11) At current investment rates (ignoring depreciation), capital expenditures totaling R11.5 billion will not be invested until the year 2010.

Compounding the lack-of-capital problem, Telkom has stated the objective of reducing its debt/equity ratio to 1.1x by 1998 (from 1.8x in 1994). (Telkom 1994, p. 33) This planned deleveraging prevents Telkom from financing its necessary capital expenditures with new debt.

A number of Telkom-specific factors further compound the problem of low capital expenditure. Specifically, the productivity of capital investment has been reduced by the following [5]:

- prohibitive tariff and non-tariff barriers on imported telecommunications equipment, which drives up the prices of domestic equipment;
- long-term domestic supplier relationships which helped build the local electronics industry but did not provide lowest-cost inputs;
- extremely restrictive agreements with labour, which prohibit management from retrenching employees as part of the post-commercialisation restructuring;
- continuing politicisation of the Company's goals and objectives;
- uncertainty about future ownership and structure.

1.5 Need and Opportunity for Restructuring

If Telkom were organised efficiently and capitalised adequately, the maintenance and extension of the network would help to lead South Africa into sustainable economic prosperity and development. Moreover, telecommunications plays:

> "an indispensable role in promoting openness, accessibility, democracy, decentralisation --all of the "soft" qualities essential to effective social, economic and political development." (Pitroda 1993)

Conversely, if the infrastructure controlled by Telkom is not extended and improved, or is allowed to deteriorate significantly, hopes for sustainable real

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[5] Summarised from Telkom 1993A, Telkom 1993B, and Telkom 1994.

economic growth in South Africa become less probable. As Telkom management describes it:

> "Countries that fail to keep pace with advances in telecommunications could quickly become technologically obsolete and, isolated from lucrative world markets, destined to poverty." (Telkom 1993B, p. 36)

Under normal circumstances, a proposal to radically change the structure and ownership of a major infrastructural asset would be strictly an academic exercise, with little hope of policy effect. Current circumstances in South Africa, however, are far from normal. Two simultaneous, but independent, transformations indicate that a privatisation of Telkom could be effected in the near future. These two transformations are:

- South Africa's political transition
- the global trend toward reduced government interference in markets, as manifested by deregulation of industry and privatisation of state-owned companies.

Political Transition

The first source of opportunity is South Africa's tumultuous grand transition from rulership by a white minority to full democracy. A fortunate byproduct of this change is that the fundamental structures of the South African political economy are being questioned, and that the merits of various organisational principles are being debated seriously by new and old policy makers. To some, the greater transition period presents an opportunity to evaluate and optimise the economic role of the government, and to create an efficient system of political and economic organisation for South Africa's future.

In the latter half of the 1980s, the South African minority government began unilaterally reducing its presence in the economy. "Retrenchment of state intervention" included the commercialisation and privatisation of some SBEs, and included plans for privatising many more. After negotiations toward a fully democratic political system were begun in 1990, the privatisation process was largely suspended. (Horwitz 1993) Because the parastatals are a highly visible

legacy of the apartheid system, however, it seems virtually inevitable that they will be restructured in some way during the greater political transition.

Adding to the great pressure for restructuring is government's need to obtain and invest capital to improve the living standards of South Africa's poorest citizens. Privatisation of state-owned assets is frequently discussed as a potential source for this capital.

Specifically relating to Telkom, reform of the telecomms industry is seen by many as a crucial building block of a new democracy.

> "Telecommunications was as critical to nation building as water, agriculture, health and housing, and without it ... democracy could founder." (Pitroda 1993, p. 68)

Global Privatisation Boom

Quite separate from the political and economic transition in South Africa, a global re-evaluation of the relationship between governments and markets has been in progress for the last 15 years. A wide variety of economic, social and political factors have caused nations in all geographic regions and at all stages of economic development to examine the structures of their economies. Based on internal re-assessments, many governments have embarked upon programmes to reduce the level of their own intervention in their economies. These programmes are usually characterised by deregulation of industries, liberalisation of international trade, and the privatisation of state-owned business enterprises.

Globally, between 1985 and 1994, SBEs worth a total of $328 billion were sold to investors, using a wide variety of privatisation techniques. In 1992 alone, SBEs worth $69 billion were privatised in 50 different countries. (Economist 1993) Although privatisation was originally considered appropriate only for advanced industrialised economies, privatisation programmes have been implemented successfully in nations at all stages of economic development. Privatisations have ranged in size from the $12.4 billion equity flotation of Nippon Telephone and

Telegraph to nominal (or negative) prices paid for companies in Eastern Europe and Africa.

The sweeping political change in South Africa and the global re-consideration of the appropriate role for government in the economy combine to present a unique opportunity in South Africa. The new South African government has the power to determine the optimal structure of South African parastatals in general. Specifically, the government can unlock the political and economic power of a deregulated, technologically sophisticated telecomms network.

1.6 Conclusion

Both in the national and global contexts, South Africa's SBEs are due for a comprehensive re-consideration of their organisational structures. Telkom represents a unique opportunity for the new South African government to optimise its relationship with an industry which provides a crucial component of infrastructure.

By restructuring the telecomms industry for maximum competition, and by privatising Telkom to improve its efficiency and its beneficial reach, the government can materially improve the lives of its citizens. Also, the government can send a strong signal to its constituents, and to the world, that it is pursuing economically rational, creative strategies to encourage economic development.

II. STATE MONOPOLY IN TELECOMMUNICATIONS

2.0 Introduction

Chapter II examines the economics of Telkom's state-monopoly structure, and draws conclusions about its effects on the efficiency and sophistication of telecomms in South Africa.

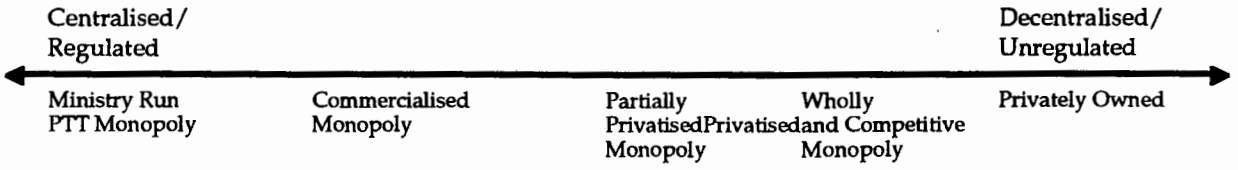
State ownership can be justified economically by its ability to ameliorate market failures –in this case natural monopoly and demand economies of scale. Section 2.1 examines these market failures in the context of a telecommunications company, particularly at the time when the state-monopoly structure was created and developed.

Section 2.2 evaluates the applicability of these market-failure fears in the current technological environment. Specifically, Section 2.2 examines the technological means to ameliorate market failures, and determines that the state-monopolisation of the telecomms industry is unnecessary at best.

Section 2.3 examines the negative economic consequences engendered by the state monopoly of telecomms services. Specifically, Section 2.3 discusses the allocative and "x-" inefficiencies and lack of technological innovation which characterise the existing SBE structure. Section 2.4 concludes the chapter.

2.1 Economic Arguments for State Monopoly Structure

Figure 2: SPECTRUM OF STATE INVOLVEMENT IN TELECOMMS



Government intervention in any industry takes a variety of forms, ranging from complete laisser-faire to government ownership of a monopoly supplier of goods or services. Any degree of government intervention can be legitimised by

economic arguments in two broad areas: amelioration of product-market failure, particularly natural monopoly and externalities; and alleviation of income inequality. Political arguments for government intervention are also frequently expressed by policy makers, but an analysis of these is beyond the scope of this paper.

Although income inequality was, and continues to be, a serious problem in South Africa, government involvement in telecomms was explicitly not initiated to alleviate that condition. Beginning in the late 19th century, South African policy makers were motivated by the fear that a competitive market would fail to result in an optimal output of telecomms services. Specifically, the government recognised the "inability of telecommunications pioneers to fund the capital expenditures needed." (Telkom 1993B, p. 5) The private sector's perceived inability to fund the large fixed costs of a telecomms network was compounded by the high risk of embarking on such a project.

More important than lack of capital, government recognised the "strategic importance" of telecomms, and could not depend on the market to establish the type of network it saw as necessary. This was an implicit recognition of the risks of market failure in the telecomms industry. On the basis of these arguments, government officials chose to structure the industry as a state monopoly.

The remainder of Section 2.1 examines the economic arguments which have been used to legitimise state monopolisation of the telecomms industry. Sections 2.2 to 2.4 focus on the applicability of the legitimising arguments in today's world, and the negative economic consequences of continuing state ownership.

Market Failures [6]

The parastatal structure in telecomms is designed to prevent two general categories of market failure: the consequences of natural monopoly and the inability of private suppliers to capture the societal benefits (positive externalities) which are derived from operating the telecommunications network. In an unregulated market environment, both of these market failures could result in a systematic undersupply of telecommunications services and a distorted allocation of resources for society as a whole.

To prevent a socially sub-optimal result, the government determines price and supply by fiat, rather than allowing market forces to reign. In the early days of telecommunications, the decision of the South African government to structure the industry this way is quite defensible. [7]

Section 2.1a - Market Failure #1: Natural Monopoly

Telecommunications has traditionally been considered a natural monopoly industry for two reasons:

1. The physical nature of the network creates economies of scale for incumbent firms and presents barriers to entry (including high exit costs) for potential competitors; and
2. telecommunications does not have any close substitutes in other industries.

Fixed Costs and Economies of Scale

The act of telecommunication (except cellular and radio) requires that users be physically connected to each other by a system of cables and exchanges. This network requires substantial investment in switching equipment (exchanges), transmission facilities (wire or optical fibre lines) and terminals (subscriber

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[6] It must be noted that market failures in telecomms do not extend to the manufacture of telecomms equipment, particularly the mass-market production of end-user equipment. There are no legitimate economic arguments based on market failure which can be used to justify statutory monopoly or state ownership of these manufacturing functions. In Telkom's case, the Company has frequently granted sole rights to manufacture specific equipment for the network. Aside from industrial policy (discussed in Section 2.1(c), there is no economic defense for these exclusive arrangements.

[7] An alternative to state ownership was the creation of a highly regulated, privately owned telecomms network. This was the model adopted by the U.S. and Mexican governments, among others, but was

equipment). The need for up-front investment creates sharply decreasing average costs: marginal costs per call are practically zero, and the fixed costs of the network are allocated to an increasing number of calls. In an unregulated market the competitive advantage in cost for an incumbent telecomms service provider is a sustainable and effective barrier to entry.

Exit Costs

Telecommunications assets are highly site-specific and task-specific, and would be of little value to businesses which were not directly competing in the telecomms market in which the equipment is installed. These high exit costs, which increase the risk of investment in a competing telecomms venture, heighten the barriers to entry.

Lack of Substitutes

Even in an industry which has a single competitor and high barriers to entry, contestability could possibly be maintained by the presence of close substitutes from other industries. High cross-elasticity of demand acts as an effective check on monopoly power, since consumers will simply purchase substitutes for the monopolised good or service.

In the case of telecommunications, no close substitutes have been readily available until recently, and cross-elasticity of demand remains low. Consumers have long judged telegraph and telex services to be inferior, and wireless communication technologies have only become widely available in the last ten years. Wireless communication continues to be relatively expensive, and continues to be reliant upon the traditional telecomms network for completion of calls.

Consequences of Natural Monopoly

The barriers to entry and the lack of close substitutes from other industries support an industry structure of natural monopoly. (Oster, 1994, pp. 55-59) The allocative inefficiency of monopolisation (without first-degree discriminatory

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premised on the continuing existence of incumbent firms in some type of electronic-based communications business.

pricing) has been well documented, but is primarily characterised by prices which are higher, and output which is lower, than those observed in a competitive structure.

> "The achievement of allocative efficiency requires that the prices paid by consumers ... should cover, at the margin, the opportunity costs to society of resources used as inputs to production." (Floyd 1984, p. 17)

In telecomms, the government expected an unregulated market to result in equilibrium pricing well above marginal cost, and a sub-optimal level of production. [8]

State Ownership as Remedy [9]

Many governments have attempted to ameliorate the social inefficiencies of natural monopolies in telecomms by creating state-owned companies. State ownership was thought to "ensure economically or politically desired prices [and output] and at the same time guarantee the reliability of supply." (Bös 1991, p. 8) Rather than relying on market forces to allocate the supply of telecommunications services, it was believed that the government could determine an optimal output level and price using positive analysis. By fiat, state-owned company could then be "given explicit assignments to follow a behaviour that should lead to a Pareto optimum." (Bös 1981, p. 19)

In telecommunications this societal optimum was generally interpreted as "a mandate to expand service universally and generally to keep basic prices low." (Horwitz 1992, p. 5) In other words, the state monopoly could dictate pricing which approximated marginal cost, and could increase service levels to a perceived societal optimum.[10] This is in contrast to a private-sector monopoly,

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[8] Monopolisation of a major industry also has significant distributive consequences. Regardless of the size of the deadweight loss from monopoly, excess profits will accrue to the owners of the monopoly rights.

[9] State ownership has failed abjectly in the modern era to reduce the adverse effects of natural monopoly. This failure is discussed at length in Section 2.3.

[10] A very clever (and well-informed) government could approximate a second-best solution by taxing the sale of non-monopolised goods and services in the economy. If the tax-induced premium to marginal cost in competitive goods were roughly equal in percentage terms to the rents earned by the natural monopolist, distortion would be minimised. A second-best solution based on equivalent taxation would be extremely difficult to administer.

which would be expected to set higher prices for lower output levels. In the event, for white South Africans this is exactly what the DPT was able to do under the original state monopoly structure.

In addition to determining optimal prices and output levels, the monopoly structure could be used to "solve the problem of standards, interconnection, and easy access to capital." (Horwitz, 1992, p. 5)

Particularly with regard to standards, the need for technological compatibility in telecomms creates the potential for wasted resources.

> "When preferences differ ... each party will promote as the standard the technology that maximises its own private benefits, not the technology that maximises benefits for society at large." (Besen & Saloner 1988, p. 180)

Agreement on technological standards reduces the likelihood that infrastructure will be duplicated by non-compatible networks. [11] As a monopsonistic purchaser of telecomms hardware, the state has the market power to insist on consistent standards and complete compatibility of equipment from all of its suppliers.

Section 2.1b - Market Failure #2: Demand Economies of Scale

The nature of a telecommunications network dictates that demand economies of scale will arise as additional consumers subscribe to telephone service. By attaching to the network, a new subscriber increases his or her own utility (presumably by more utility units than any similarly priced consumption opportunity). In addition, the expansion of the network by one subscriber increases marginally the utility of all incumbent subscribers, since their opportunities for telecommunication have been increased. On a decentralised (i.e., individual decision making) basis, in an environment with non-zero transaction costs, the positive externality generated by an additional subscriber goes unpriced and uncompensated.

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[11] In some circumstances competing suppliers will collaborate and set industry standards, but this solution is by no means guaranteed in a competitive environment.

Public Good Qualities

Although telecommunications have some of the characteristics of private goods, particularly the power to exclude non-payers from most services, the network itself creates a public good. At its simplest level, the public good aspect is explained by observing the smallest possible number of subscribers which would constitute a network, (i.e., one telephone).

A single-telephone network is of no use, since the lone subscriber would have no one to call. Extending the network to a marginal subscriber inherently increases the value received by the incumbent subscriber. Each additional subscriber receives the individual-level (or household-level or firm-level) benefits of being connected, but also creates an incremental benefit for each of the existing subscribers. This incremental value of a marginal subscriber decreases in importance as the network reaches high levels of penetration, but at the inception of telecomms service (when industry-structure decisions were taken) it had material economic importance.

A straightforward example of the public-goods quality of telecomms network is the contribution of such a network to national security, the archetypal public good. By serving as a vital link between state and citizenry, and between citizens, the network is of great value in responding to natural disasters and the threat of military conflict from without or within. This "national security" argument was considered especially relevant for extending service to geographically isolated white farmers during the minority rule of white South Africans.

Creamskimming

The supply-side manifestation of this market failure is the risk that service providers in a competitive environment will engage in "creamskimming," or serving only the most lucrative markets. Areas which do not offer much profit potential (either due to low population density or low income) may not receive telecomms service, although society as a whole would benefit from higher penetration. "In other words, the likelihood of market failure ... is high." (Horwitz 1992, p. 3)

State Ownership as Remedy

Assuming that a democratic government is strictly meant to represent the interests of society as a whole, a government-owned telecommunications company could capture the benefits of demand economies of scale. By calculating the social benefits of the network, a service-penetration level would be determined by government and would justify the provision of services above and beyond what subscribers would be willing to buy on a disaggregated basis. In other words, "Direct state control ... entailed a mandate to expand service universally and generally to keep basic prices low." (Horwitz 1992, p. 5) State ownership also removed the risk of creamskimming, since the government would dictate service levels based on perceived societal benefit, rather than on profitability from serving particular districts.

If it is accepted that a high-penetration network is a socially beneficial goal, the state can easily be seen as the logical creator of that network. The state's ability to capture societal benefit, its low cost of capital, and its ability to withstand investment risk, make the state monopoly of telecomms services even more defensible. The unsophisticated telecomms technology which existed at the time DPT was created heightened the risk of these market failures, and therefore increased the justification for state monopoly.

Section 2.1c - Market Failure #3: Industrial Policy

A possible sub-set of the positive externalities created by a telecomms network includes economic development through industrial policy. Government-led industrial policy is clearly facilitated by state ownership of infrastructural assets. Unlike other examples of market failure, however, there is no consensus amongst economists as to the effectiveness of such industrial policies. In other words, the actual broad developmental impact (positive or negative) of industrial policy is indeterminate.

In the absence of tariffs, quotas or other government intervention, profit-maximising telecomms companies would source their equipment globally from

the least expensive suppliers. Unregulated telecomms companies would make decisions with little regard for developing local industry. A government which is seeking to develop its domestic electronics industry employs the monopsony powers of centralised purchasing, and can dictate the pace and direction of technological development by fiat. DPT used the Manufacture and Supply Agreements discussed in Chapter II as a "purposeful state policies to encourage the development of a local telecommunications industry." (Kaplan 1990, p. 27)

If the infant domestic electronics industry is able to mature and compete internationally due to the policy of local sourcing by the state-owned telecomms monopoly, society may derive considerable long-term benefits.[12] Clearly the shareholders in the chosen electronics companies derive substantial economic profits, both from subsidised research and development and from non-competitive pricing.

Summary of Market Failures

At the time DPT (then the Treasury and Commission for Administration) entered the telecommunications industry, the fears of market failure from natural monopoly and unpriced positive externalities were quite legitimate from at least four perspectives:

- Early telecomms technology (dedicated and wire-based) dictated the inevitability of a single dominant network (natural monopoly) as the long-run industry structure.
- Billing methods were not sufficiently sophisticated to allow for discriminatory pricing, which would have mitigated some of the negative effects of monopoly.
- The effect of demand economies of scale was relatively important, creating systematic undersupply in a competitive industry structure.
- Very high capital investment costs and extreme uncertainty created by product/technology risk and market risk (no market existed at the time) made it likely that no private-sector companies would undertake the construction of a broad-based network.

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[12] Regardless of the success or failure of an industrial policy, society bears heavy costs for its implementation. These costs generally take the form of higher-than-competitive prices, relatively poor quality, and/or retarded speed of product innovation.

Therefore, under the existing circumstances, a state-monopoly structure appeared to be both reasonable and efficient. With the exception of the United States (which created a highly regulated, private-sector-led industry structure), virtually all countries developed their telecomms industries within the confines of a state monopoly structure.

2.2 Applicability of Current Technology to Market Failures [13]

More than nine decades have intervened since the decision was made to structure South Africa's telecomms industry as a state monopoly. In that period, telecomms technology has advanced so much as to make those early fears largely irrelevant. In the last fifteen years, particularly, the advent of digitisation and computerisation, and the widespread use of optical fibre have alleviated the market failures which were previously inherent in the telecommunications industry. Technology has wrought changes in at last the following areas:

- open-access networks
- ability to discriminate in price
- substitutes for traditional network telecommunications

The judicious application of technology to South Africa's telecomms infrastructure will make significant competition possible in the near term.

Open-Access Networks

The most important technological change in terms of market failure has been the development of open-access networks. This means that it has become economically feasible for many service providers to share access to long-distance

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[13] The following technology-based argument is undeniably made from a developed-economy perspective. In South Africa, which does not even have a fully digitized phone network and continues to use copper cabling, some of the technological progress will not be available for many years. Nevertheless, the technologies are economically feasible in many developed and developing countries, and can be expected to fall further in price as they are replicated and improved upon.

phone lines while maintaining their switching equipment separately.[14] This creates competition where none was previously possible.

> "The idea of open-access networks was developed by American economists during the 1970s. Under this approach the physical infrastructures of the networks remain regulated monopolies. Access to these networks is opened such that the remaining elements can be submitted to competition." (Horwitz, 1992, p. 3)

Although open-access network technology was developed to facilitate the sharing of long-distance lines, it is being extended to create competitive possibilities in local phone service as well. According to a vice-president at Pacific Bell, a major U.S. telecommunications company, "There is no technological reason that complete competition can not exist in local telephone service." (Sherman 1993) In fact, as of 1 January 1995 Pacific Bell reduced its local tariffs by 40% in response to price competition by new entrants, including MCI. Telephone subscribers in the U.S., the U.K., New Zealand, and (in the near future) in Germany, are able to choose their telecommunications providers. (Economist 1993b, p.62)

Price Discrimination

Metering and billing technology has afforded service providers with the ability to engage in substantial price discrimination among consumers. As noted briefly in Section 2.1(a), first-degree price discrimination by a monopoly supplier creates a price and output equilibrium identical to that of a competitive industry structure, although the distributive consequences are acute. Although it provides an economically efficient solution, price discrimination results in the transfer of all consumers' welfare gains to the monopolist. The distributive consequences of this transfer continue to make the natural monopoly highly detrimental to South Africa's economy. Therefore an improved ability to discriminate in price reduces some of the efficiency risk of vestigial natural monopoly, but will exacerbate the income inequality problems already facing South Africa.

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[14] Under this structure, the need for technological standards as described in Section 2.1(a) is a crucial element. The computer hardware industry has demonstrated, however, that competing private companies can and are

Second- and third-degree price discrimination are greatly facilitated by technological innovation and by the nature of telecomms services. First, it is very difficult to resell the perishable and specific services provided by telecommunication, and there is little scope for arbitrage between different user groups. Second, telecomms providers are generally able to distinguish between user types (and their willingness to pay) With digital switching and billing, consumers can be differentiated by the time of their usage, total service volume purchased, geography, household income, and many other factors. Effective price discrimination in telecomms usually takes the form of peak and off-peak pricing (multi-part tariffs), which increase capacity utilisation and more closely approximate a competitive equilibrium.

Technology-based price discrimination mitigates some of the efficiency consequences from monopoly power which remains present in telecomms markets. As noted above, however, price discrimination is not a solution to all of the problems of natural monopoly. The distributive consequences (transfer of gain to the monopolist) are acute, and are not likely to be tolerated indefinitely in a democratic society.

Substitutes for Traditional Telecommunications

In addition to the changes within the telecomms industry as it has been traditionally defined, technological improvements have created a number of close substitutes (and complements) from outside the industry.

The advent of cellular telephony and other wireless data communications technologies (pagers, personal digital assistants, personal computers) have reduced dependence on network-based telecommunication. Moreover, the imminent merger of digital telecomms systems and cable television systems provides scope for additional competition in both industries.[15] Finally, continuing

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frequently able to agree on industry standards when such standards are to general benefit. This phenomenon is most evident in the emergence of open-standards computing. (McKinsey, 1991, p. 10).

[15] McKinsey & Co., the management consultancy, describes this competitive environment in telecomms/cable television as "total war over two wires."

improvements in computer hardware and user-interface software are increasing the ease with which consumers can choose the most attractive means of receiving and transmitting information.

As noted in Section 2.1(a), increased cross-elasticity of demand reduces the risk of monopolists taking excess profits. The ever-increasing availability of these substitutes further reduce the remaining monopoly power of telecomms service providers.

Summary of technology

Due to technological advancement, the traditional concerns about natural monopoly and unpriced externalities in telecomms are no longer warranted. In fact, the entire economic paradigm of telecommunications as a discrete and unique industry is rapidly becoming obsolete. The trends toward greater competition and greater ability to capture total benefit to society are likely to continue as technology continues to improve and is dissipated across the globe.

Since technology has largely obviated the fears of market failure, it can be argued that the state-ownership structure is, <u>at best</u>, unnecessary. The harms which the state monopoly was designed to protect against are no longer relevant, and no new dangers of the free market have emerged to replace them. Moreover, to the extent that dangers of market failure persist, examples from other countries (including the U.K. and U.S.) have demonstrated that regulation of a private telecomms industry is at least as effective in promoting social goals as is direct ownership by the state.

Section 2.3 goes further to illustrate that the consequences of the SBE structure are much worse than simply utility-neutral. In fact, the SBE structure causes significant harm to the telecomms industry, to the South African economy, and to the people of South Africa.

2.3 Economic Consequences of State Monopoly

Despite the economic good intentions of DPT/Telkom's founders, a persuasive body of literature exists which catalogues the economic harm caused by the state-monopoly structure.

> "For lack of a better term, we might call them bureaucratic failures, ... because of the lack of market-based information and incentives. [State monopolisation] had engendered many unwanted outcomes, including sheltered inefficiency, the suppression of innovation, and misallocation of resources." (Horwitz 1992, p. 6)

The economic problems fall into three main categories: economic inefficiency (including both allocative inefficiency and "X" inefficiency) the stifled of technological innovation, and a broad variety of problems caused by mis-alignment of the goals of principals (citizens) and agents (Telkom management).

2.3 (a) - Allocative Inefficiency

In economics it is widely accepted that resources are allocated efficiently only when no one could be made better off without making at least one person worse off. This condition of Pareto efficiency can only be achieved by setting prices equal to marginal costs across the economy. (Bös, 1991, p. 143; Black, 1992, p.6) In an economy of perfectly competitive industries and factor markets, marginal cost pricing would be the equilibrium outcome, and would represent a societally efficient allocation of resources.

Under the existing monopoly structure, Telkom makes no systematic attempt to equate marginal costs with prices. Therefore, allocative inefficiency is inherently exacerbated. The allocative inefficiency is manifested as a deadweight loss to the economy, meaning that total consumer welfare could be increased if resources were allocated to telecomms on a basis which approximated marginal cost.

Note that the problem of allocative inefficiency is inherent to monopoly, but is not necessarily related to state ownership. As noted in Section 2.1(a), under natural monopoly conditions, a profit-maximising corporation would produce telecomms services at a societally sub-optimal, deadweight-loss-producing level as well. In

fact, the ability to expand output by fiat (and thereby diminish deadweight loss) is a crucial argument for the legitimacy of state ownership. It is ironic, then, that although the allocative inefficiency of monopoly is crucial to the justification of state ownership, it is not being solved by state monopoly in telecomms. As discussed in Section 3.2, the best solution is to enhance competition, which allows the market to drive prices toward a marginal-cost-basis equilibrium. [16]

2.3 (b) - X-inefficiency

X-efficiency (also known as technical efficiency) is achieved when a given level of output is produced using the absolute minimum level of inputs. (Leibenstein 1966, p. 406) Firms which have achieved technical efficiency are therefore producing on the edge of their production possibility frontier (PPF). Many firms, however, produce in an x-inefficient manner, well within their PPFs: "The simple fact is that neither individuals nor firms work as hard, nor do they search for information as effectively, as they could." (Leibenstein 1966, p. 407)

A firm's degree of x-inefficiency is a function of three interrelated elements, in descending order of importance:

- external motivation efficiency; created by the threat of competition;
- intra-plant motivational efficiency; created by alignment of incentives, appropriate training, and good communication;
- non-market input efficiency; measuring a firm's ability to attract and retain top-quality human resources. (Leibenstein 1966, p. 413)

External Motivation

X-inefficiency is a negative function of competition, so it is greatest in firms which have the smallest threat of external competition. Large, monopolistic corporations in the private sector frequently fall prey to some degree of x-inefficiency. State-owned monopolies, however, are generally considered to be much more x-

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[16] An alternative approach to understanding the loss of allocative efficiency without marginal cost pricing is in terms of net willingness to pay (NWTP). NWTP (or consumer surplus) is equal to the area under the demand curve from the origin to the quantity demanded in equilibrium, less the total cost of producing that output. NWTP is maximised (the Pareto efficient condition) by setting price equal to the marginal cost of producing a unit of output. See Black 1992), in Black and Dollery Leading Issues in South African Microeconomics.

inefficient than any private companies because even the remote threat of external competition is eliminated by statute. The statutory prohibitions on competition of any kind with Telkom have contributed to high levels of x-inefficiency.

Intra-plant motivation

Intra-plant motivation is also low at Telkom, because workers have been traditionally protected by political interests and strong unions. Without the threat of competition in the labour markets, Telkom has become characterised by, "overly complex networks of dysfunctional bureaucratic controls." (Commander and Killick 1988, p. 19) Even in the post-commercialisation era, Telkom workers have been protected by highly restrictive agreements which limit the number of employees who can be retrenched due to restructuring and rationalisation.

Based both on the theory of x-inefficiency and on the empirical evidence provided by other countries, Telkom's x-inefficiency can be expected to decrease simply through industry restructuring. McKinsey & Co. estimates generally that productivity increases of 20% or more are achievable by exposing SBEs to competition. (see Niels 1990 and Durchslag & Rao 1993)

In the case of Telkom, aligning management's interests with those of profit-seeking shareholders (see Section 2.3(d)), and promoting external competition in all markets would combine to motivate management highly. Moreover, by dividing Telkom into smaller, competing units, some of the x-inefficiency which appears to be inherent to large organisations will be eliminated.

2.3 (c) - Stifled Technological Innovation

A further consequence of statutory monopoly is its chilling effect on technological innovation. Under normal circumstances technological improvements will continually push outward the production possibility frontier. Under statutory monopoly, these outward shifts do not take place with the same frequency and or magnitude as they would under a competitive industry structure. Technological innovation in South African telecomms is reduced by the state monopoly structure

in at least two ways: lack of internal incentives and impossibility of entry by innovative entrepreneurs

Internal incentives

Similar to the forces causing x-inefficiency, technological innovation is greatly reduced within Telkom by the absence of external competition. (Leibenstein 1966, p. 407) There is no managerial incentive to innovate, nor to transfer technology from other sources. Since managers do not participate in the potential economic profits to be gained from technological innovation, they have no rational motivation to expose themselves to the career risks and additional work which technological improvements imply.

Impossibility of Entry

In a competitive market, previously important barriers to entry are surmounted by the adaptation of new technologies. The natural process of innovation facilitated by entrepreneurial companies ensures continual technological advancement. In South Africa, however, no company can legally take advantage of technological breakthroughs in telecomms (either developed internally or imported from overseas) by competing with Telkom. These internal and external factors combine to explain why Telkom has neither created internally nor acquired many of the technological improvements described in Section 2.2.

2.3 (d) - Principal-agent Problems

In a conceptual sense, the current owners of Telkom are the citizens of South Africa, with their property rights exercised by a representative sovereign government.[17] The goals of these citizens as principals (as outlined in Section 3.1) are likely to conflict with the goals of Telkom's managers, who are meant to act as agents in pursuing the goals of the principals. The broad parameters of this principal-agent problem are summarised by the possibility that Telkom managers may succumb to:

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[17] Prior to democratic elections in April 1994, the notion of Telkom's ultimate principals was substantially more complicated.

> "(a) moral hazard, where the agent may expend less than optimal effort, and (b) adverse selection, where the agent may expend an inappropriate type of effort." (Nilakant and Rao 1994, p. 653)

Manifestations of the principal-agent problem may be apparent in the x-inefficiency condition described in Section 2.3(a), but also may result in agents' "diverting resources to their personal use." (Nilakant and Rao 1994, p. 651)

In private-sector organisations, principals also frequently entrust tasks to agents. Under that ownership structure, however, principals exercise greater monitoring and discipline power through "incentive schemes, external labour markets, and capital markets." (Nilakant and Rao 1994, p. 651) In the case of Telkom, none of those disciplinary tools are available, and the agents' accountability to the principals is negligible.

Compensation schemes are limited by the inability to sell ownership shares to employees, which would create an incentive to produce more efficiently, and by the fact that profit-maximisation has not been a Telkom objective, making measurement of success more difficult. Labour markets are heavily distorted by previous governmental policy (job reservation and Bantu education). The supply of workers with the necessary education and experience to work in telecommunications is severely restricted, which reduces the ability to replace shirkers. Discipline from the capital markets is impossible, since principals are not legal owners, and do not have the ability to sell their positions in response to poor management results.

Not subject to these disciplinary tools, the agents have little accountability to their principals, and, as expected in positivist agency theory, use this freedom to pursue their own objectives.

2.4 Conclusion on Economics of State Monopoly

The DPT/Telkom structure was designed to ameliorate market failures, particularly natural monopoly and undersupply of services. Although fears of these market failures were legitimate when Telkom was founded, technological

improvements in the industry have largely removed the need for state ownership on this basis. Therefore, no societal benefits appear to result directly from the state monopoly structure.

Rather than being utility neutral (i.e., simply creating no societal benefit), the state monopoly structure actually harms the South African economy by perpetuating allocative inefficiencies, by creating x-inefficiencies by restraining technological improvement, and exacerbating the principal-agent problem. By removing statutory barriers to competition and by changing the ownership structure of Telkom it is possible that these problems will be ameliorated.

III. OPTIONS AND OPTIMISATION - INDUSTRY CHANGES

3.0 Introduction

Based on the evidence presented in Chapter II, the current state-monopoly structure of South Africa's telecomms industry is both sub-optimal and untenable for a globally competitive economy. Improving the situation will require a two-pronged approach:

- systematic increase in industrywide competition and
- restructuring and privatisation of Telkom.

Chapter III deals primarily with the means for increasing competition in the South African telecomms industry. Section 3.1 presents the broad societal goals which a restructuring is intended to accomplish: it is essentially a description of the ideal telecomms industry, as restructured through privatisation and enhanced competition.

Section 3.2 presents specific steps for enhancing competition in South African telecommunications. These steps include primarily the removal of barriers to entry and other liberalising policies. Section 3.3 presents an array of possible ownership structures for a re-organised Telkom, and assesses the viability of each system in helping to approach the ideal of Section 3.1.

3.1 Parameters of the Optimal Telecomms Industry

The broad parameters of an ideal system create a benchmark against which any industry structure can be measured. Although some of the goals outlined in describing the optimal telecomms structure are inconsistent with each other, it is important to acknowledge explicitly the tradeoffs which will have to be made in structuring the industry for South Africa. Broadly speaking, the goals of an ideal system are likely to include: extension of service to underserviced communities; efficient allocation of resources; expedited introduction of value-added telecomms

services; improved customer service and responsiveness; low prices for basic services.[18]

Extension of Service

It is crucial to make affordable, reliable telecomms service available to all South Africans, regardless of income level and geographic location.

> "... telecommunications lies at the very heart of progress. This is true in the political and social sense ... and it is true in the more practical sense that development depends on communications for logistical efficiency." (Pitroda 1993, p. 76)

Progress toward universal service creates the positive externalities which are described in Section 2.1(b), and will promote the redistribution of wealth and income to disadvantaged South Africans. Although the extension of service is an explicit goal of the current Telkom management team (Telkom 1993, p. 11), a credible plan for increasing telephone penetration levels amongst previously underserviced groups must be agreed upon by all stakeholders.[19]

Much of the funding for increased network penetration could legitimately come from existing telecomms subscribers. As noted in Section 2.1(b), the value of the network to existing subscribers is a positive function of the number of subscribers included. Therefore, an appropriate temporary subsidy could be calculated to expand service, with the benefits of higher penetration equalling the price increases to existing subscribers.

Community phone banks

Although universal service is a desirable goal, unless considerable creativity is exercised it is difficult to achieve within the parameters of marginal-cost pricing. An obvious solution to extending availability of phone service to rural and low-

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[18] It is important to note that these are broad goals for a telecommunications system, as described in Pitroda (1993); Durchslag and Rao (1993); McKinsey & Co. (1993); Jones, Tandon and Vogelsang (1990); Munston (1988); and Durchslag, Puri and Rao (1994). The specific goals of a restructured Telkom would have to be determined by management, customers and the regulating authority.

[19] Telkom has announced a R6 billion plan to install one million phone lines in the former TVBC states, contracting out much of the work to a strategic partner from overseas. This initiative will need to be repeated in many other impoverished regions in order to increase penetration on a national basis.

income areas is to establish community phone banks and voice-mail systems which allow service providers to allocate fixed costs of installation across groups of low-use subscribers. Centralisation of community phones also allows for better physical security of assets and easier billing, both of which will reduce the costs of providing service. Once installed, community phones become: "as critical as water, food, shelter and health services. " (Pitroda 1993) Moreover, community phones:

> "... become an instrument of social change, fundamental to the process of democratisation." (Pitroda 1993)

One possible means for installing community phones on a broad basis is to sell ordinary subscriber equipment equipped with small meters to rural entrepreneurs. Telephone owners set up their machines in village centers, and charge customers to make or receive calls, based on meter readings. Although local competition must be safeguarded in each village, the spread of telecommunications penetration can be increased rapidly.

Availability of Value-Added Network Services (VANS)

Global improvements in telecommunications and computing technology have spawned an incredible array of new value-added services. Although Telkom has made the introduction of VANS a management priority, including a "rewriting of the rule book to allow previously forbidden VANS," (Telkom 1993B, p. 30) the development of these services in South Africa has been inexplicably slow. By way of comparison, in the U.S., for example, local telephone companies generally offer at least the following services to their residential and commercial customers:

- Call waiting* - functionally equivalent to having two incoming phone lines on a single subscriber number
- Call forwarding* - transfers incoming calls to a chosen number at another location

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* Indicates a service which is either "in development," is available on a trial basis in selected areas, or is expected to be available by year-end 1995.

- Voice mail* - allows callers to leave voice messages when a subscriber's line is engaged or goes unanswered. The subscriber can retrieve messages from the home phone or from remote locations.
- Caller identification - flashes the telephone number from which an incoming call originates
- Three-way or conference calling
- Automated third-party and collect billing services - reduces the cost of making calls from pay phones or from other remote locations
- Automated repeat dialing - attempts to make a connection on a repeated basis if a line is engaged or goes unanswered
- Speed dialing and voice-activated speed dialing - allows a subscriber to specify a group of frequently called numbers, and accesses them by pushing a single key or by speaking an identifying word into the receiver at the specified time.

These value-added services are in addition to standard features such as itemised billing, all-digital exchanges, calling-card services and modular connections for data, voice and facsimile communication.

Clearly these services are not appropriate for all South African telephone subscribers, but their value for commercial and home-business customers, as well as some residences, is readily apparent.

Improved Customer Service

A logical complement to universal access and availability of value-added services is an improvement in customer service. Customer satisfaction with Telkom's service is very low, and does not appear to be improving. More important, as new subscribers come onto the network, and as existing subscribers have their service options expanded, the role of consumer education will be of heightened importance.

Improved customer service would include decreased waiting times for new installation, improved responsiveness to equipment and connection problems, itemised billing for services, development of large-account service teams, and a general re-focus on customer satisfaction.

Low prices

Although cross-subsidisation is not economically efficient, low prices are essential for extending the network. It is important, therefore, for marginal costs to be kept as low as possible, so as to maximise the affordability of phone service for poor South Africans. Specifically, this requires maximum technical efficiency on the parts of service providers, an assurance (preferably through competition) that monopoly profits are not being taken, and continual outward shifts of the PPF through technological improvement.

3.2 Increasing Competition Industrywide

To approach the ideals of the system described in Section 3.1, two processes need to take place:

- a series of inter-related policy decisions designed to heighten the competitiveness of various segments of the telecommunications industry;
- an operational and financial division of Telkom into independent units, and the sale or distribution of these operating units.

The division and privatisation of Telkom is discussed in detail in Chapter IV. The remainder of Chapter III is devoted to making the industry as a whole more competitive, independent of privatisation and restructuring for the state monopoly.

In the area of competitiveness, most of the technological barriers to competition have long been surmounted in other parts of the world. Part of making South African telecomms more competitive will require the incorporation of expensive new technology. Immediate improvements can also be made, however, and most of these will be easy and inexpensive to implement. Some of these steps require Parliamentary action, others require initiative by managements of private companies and non-Telkom SBEs. To create a competitive industry, the following immediate steps are available:

Remove Legal Barriers

The easiest first step is to rewrite the regulatory statutes to permit free competition in all areas of telecommunications which are not reasonably subject to monopoly abuses. Specifically, the manufacture and import of telecommunications equipment (particularly subscriber equipment) should be liberalised entirely. Any company which desires to compete in the telecomms hardware business in South Africa should be allowed to do so immediately.

Ownership and installation of pay telephones should also be liberalised entirely, ending Telkor's monopoly on this service. Telkom can immediately implement a programme of privately leased "community pay phones" as described in Section 3.1. In addition, private-sector providers should be permitted to compete in the provision of value-added services such as facsimile transmission, voice mail and other services.

In removing legal barriers to competition, Parliament's assumption should be that all aspects of the telecomms industry will be deregulated, and that the burden of proof is on incumbent providers to establish reasons that continuing state monopoly is necessary. Fulfilling this burden of proof will require incumbent providers to engage in systematic (and public) argument to persuade regulators that consumers' welfare would be enhanced by continued monopoly.

Empower the Department of Posts & Telecommunications

In order for deregulation to be accepted by the South African populace, and to ensure that monopoly abuses are detected and dealt with swiftly, Parliament must create and empower a regulatory body. Presumably the vestigial Department of Posts and Telecommunications (DPT) will be restructured into an effective vehicle for promulgating regulations and for enforcing the competitive nature of the telecomms industry. [20]

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[20] It appears likely that the DPT will be replaced by a new, broadly empowered regulatory agency called the Independent Telecommunications Authority (ITA).

To make the DPT (or ITA) an effective regulatory body, Parliament will have to define its mandate broadly (e.g., to increase competition) and provide it with the resources and authority necessary to do an adequate job.[21]

Licence additional service providers

Because Telkom will continue to own the poles-and-wires of the telecomms network, simple deregulation will not be enough to introduce competition into various segments of the telecomms market. Competition should be encouraged by granting licences to any company which satisfies basic competitive requirements. These requirements are likely to include:

- adequate financial capital
- experience in telecommunications
- ability to guarantee the integrity of the network [22]

Mandatory open access to Telkom's existing network must be one aspect of competition. Telkom must provide access on a compensated basis to the network to all licenced long-distance service providers. [23] Mandated rights of access must include the cable and satellite connections for overseas calls as well. These competitive service providers will provide their own switching equipment and will allow subscribers to choose a long-distance and short-distance carriers for themselves. Eventually, competing providers can be expected to construct their own long-distance networks, providing optical fibre of their own and piggybacking on the existing poles and pipes systems.

In addition to mandatory open access, a protocol must be devised which compensates local-service providers for providing call-completion access to long-distance companies.

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[21] Regulation is discussed further in Section 5.1.

[22] These will be the criteria to receive a licence to compete in the German telecommunications market after Deutsche Telekom is privatised. The German government will not award a fixed number of licences, but will allow any companies or consortia meeting the criteria to enter the market. (Financial Times 1995, p.1)

[23] The pricing for access to the Telkom network must be somewhat complicated in order to compensate Telkom fairly and to reduce allocative inefficiency. The access pricing should be based on "efficient component pricing (ECR)". ECR requires that the price equal the marginal cost to the network (primarily wear and tear) plus the opportunity cost of allowing in the competitor's call at that time. The ECR structure is described in Baumol & Sidak **"Toward Competition in Local Telephony"** 1993).

Encourage telecomms convergence

Nearly 900,000 South African households are currently connected to the cable television network. (New York Times 1994, p. A4) Assuming that all of these homes also have telephone service, the cable hookup provides an opportunity for unfettered competition in digital communication (i.e., reception of digital data for both television and telephone services). Although the technology for this type of competition is still in development, cable television companies will soon compete on a house-by-house basis for telephone subscribers with minimal additional investment (primarily switching equipment).

Expand the use of existing telecomms alternatives

Although Telkom has monopolised commercial and residential telecomms services in South Africa, reasonably sophisticated alternative networks have also been developed for other users. Specifically, Transnet operates a country-wide telecommunication network called Transtel for its internal purposes. By upgrading the switching capability of the Transtel network and piggybacking on Telkom wires where necessary, South Africa could have a viable alternative to the Telkom network in place very quickly and at minimal expense.

Expansion of Transtel's use will increase existing telecomms capacity and provide a ready physical capability for new competition. The fact that Transtel is already owned by the government, and could be quickly sold or leased to the private sector, means that competitive service providers could be brought on line almost immediately.

Auction electromagnetic spectrum

Although wireless telecommunication is currently structured to promote modest competition (i.e., duopoly), all future use of precious electromagnetic spectrum should be allocated according to market principles. As soon as the existing period of wireless-communication duopoly expires, the spectrum which is to be reserved for cellular telephones, for satellite communication, and for other broad- and narrow-band usage must be auctioned off in multi-year contracts.

The spectrum auction should be open to all participants (without regard to nationality), and should be designed to maximise revenues to the state. Although some efforts should be made to avoid monopolisation by a single bidder group, in a completely global auction this should not be a problem.

3.3 Conclusion

Regardless of the ownership structure of Telkom, a number of steps can be taken immediately to increase competition in the telecomms industry. Most of these steps simply involve the removal of legal barriers to entry. Others require positive action on the part of government to provide opportunities for potential entrants.

If competition is substantially increased, much of the struggle to improve telecomms in South Africa will be complete. The invisible hand of the market will drive out much of the x-inefficiency in existing service providers, and will enforce a pricing regime which more closely approximates allocative efficiency. Moreover, the creative-destruction dynamic of technological innovation will be spurred by new entrants and finally allowed to flourish.

Table 2: SUMMARY OF COMPETITIVE INDUSTRY RESTRUCTURING

Competivising Action	Description
Remove legal barriers	Enact legislation which allows competition to prevail in all areas of the telecomms industry.
Empower the DPT (or ITA)	Charge a federal regulatory agency explicitly with promoting competition in the telecomms industry, and fund it adequately to do the job. Shift the burden of legitimisation for any non-competitive behavior onto the incumbent producer.
Licence additional providers	Allow and encourage entrepreneurs to provide telecomms services as long as the integrity of the network is protected
Encourage convergence	Minimise regulatory interference in the digital convergence between telecomms and broadcast communication
Expand use of alternatives	Encourage alternative telecomms providers (e.g., Transnet's Transtel system) to begin providing telecomms services to the public
Auction electromagnetic spectrum	As existing commitments expire, auction off all use of electromagnetic spectrum, without preference for national origin of purchasers. If existing contracts are perpetual, force a renegotiation under the principle of eminent domain.

IV. THE FUTURE OF TELKOM

4.0 Introduction

Although increased competition will go a long way toward achieving the optimizing improvements in South African telecomms, a major question remains about the optimal structure of the Telkom monopoly. Particularly in the decade following liberalisation, if left in its current form, Telkom will continue to be a significant force in the market.

The success or failure of the overall industry restructuring depends on the societal value which can be created from Telkom's restructuring. Evidence suggests that revenue from the sale of parastatals can be increased (all other things remaining equal) by undertaking operational improvements and restructuring prior to the sale. A study of privatised companies in Southeast Asia finds that higher profit margins (a proxy for operational efficiency) increase the market/book value at date of initial public offering. (Hermer 1993, p. 2). Moreover, privatisation experts conclude that basic restructuring adds to the sale value and increases the number of likely buyers.

> "Governments are not particularly good at fixing broken companies, but when they are properly assisted, and get it right, the economic benefit can be enormous." (Robson 1995)

Chapter IV discusses the optimal structure for Telkom in a post-liberalised industry structure. Section 4.1 describes the operational restructuring which Parliament and Telkom management need to undertake. This restructuring is necessary to further enhance industrywide competitiveness and to improve efficiency at the operating level.

Section 4.2 outlines a variety of ownership structures which might apply to the new Telkom sub-units. These ownership structures are summarised in a table found at the end of Section 4.2. Section 4.3 concludes the chapter.

4.1 Operational Restructuring

In its current form, Telkom is an omnibus provider of telecomms services to South African businesses and residences. The Company is essentially a conglomerate of vertically integrated service providers, sharing common senior management and a common owner. The crucial first step in optimising Telkom should be to "re-organise the firm around economically rational business units." (Durchslag, Puri & Rao 1994, p. 9)

As described in Section 1.4, Telkom is currently organised in a matrix form, with responsibilities allocated along functional and geographic bases. The internal divisions would become the framework for creating an array of independent new companies. Specifically, the decentralisation of operational authority would be accelerated and formalised, with most functions absorbed by regional operating companies.

In re-organising Telkom, the assumption should be that the centralised functions of the Company would be absolutely minimised, and that lines of business would either be devolved to the regions or sold. The long-distance services division can continue to exist as a national operation, and would represent corporate continuity for Telkom. Essentially all other corporate-level functions of Telkom would be devolved, separated or would cease to exist. In summary, Telkom's monolithic structure would be broken up into regional operating companies and specialised functions. Specifically the independent divisions would include at least the following [24]:

- Long-distance Services (Telkom LD)
- Six geographically specific regional operating companies (TROCs)
- Cellular communications
- Other services and miscellaneous businesses

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[24] Many of the proposed operational restructuring concepts are inspired by the Modified Final Judgment (MFJ) which settled the anti-trust lawsuit between the U.S. Department of Justice and AT&T.

Telkom LD

Telkom's long-distance operating unit (hereafter referred to as "Telkom LD") would represent the continuity of Telkom's corporate identity. After all unrelated lines of business are cleaved from it, the residual business would be the long-distance service provider. Telkom LD would retain ownership rights to Telkom's inter-regional telecomms assets, including transmission lines, and switching equipment. As discussed in Section 3.2, Telkom LD would be required to provide access to all local-service providers (TROCs and others) on an equal basis. Telkom LD would pay local-service providers a fee for access to their local networks, which would allow the long-distance providers to complete their calls.

In addition to line access, new entrants to the long-distance market can be expected to eventually string their own optical-fibre. In that event, they would be guaranteed access to certain physical assets (e.g. utility poles and subterranean pipes) as they construct their own networks of lines and switches. Of course, Telkom LD would be compensated by its new competitors for the rental of existing infrastructural assets.

TROCs (Regional service providers)

At present, Telkom's Operations Division is divided into six regions: Witwatersrand, Transvaal, Western Cape, Eastern Cape, Orange Free State, Northern Cape and KwaZulu/Natal. [25] As part of Telkom's restructuring, each of these regional units would be transformed into an independent provider of local and regional telecomms services. These independent units would be known as Telkom Regional Operating Companies, or TROCs. The six TROCs would eventually be transferred into the private sector, but should be regulated to the extent that they are able to exercise monopoly power in their geographic regions.[26]

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[25] It is not known whether Telkom has restructured its geographical coverage to reflect the new political boundaries within South Africa. The description of regional coverage areas, the genesis of the TROC structure, is from Telkom's 1993 profile. Telkom's regional operating structure may have changed since the April 1994 election.

[26] Presumably the higher-density TROCs would face competition from cable television and wireless communication much earlier than their rural counterparts. Therefore, the urban TROCs would likely require relatively less regulation.

The organisation, scope of service and capitalisation of the TROCs needs to be negotiated as part of the restructuring process. Originally it is envisioned that the TROCs would be limited to providing communication services (including telephone, data and cable), within their geographic region, and would be prohibited from operating in the market for long-distance or international communications services. This restriction can be relaxed in the medium term, to further heighten the level of competition nationwide.

Assuming that cross-subsidisation from regulated operations can be prevented, the TROCs would be free immediately to compete nationwide in additional markets, including:

- cellular and other wireless services
- ownership of foreign telecomms networks
- manufacturing and marketing of telecomms equipment.

A close regulatory watch must be kept, however, to prevent anti-competitive behavior (e.g., cross-subsidisation from regulated monopoly businesses).

The establishment of the TROCs is a critical element of the overall restructuring of telecomms in SA. Although they would retain a certain degree of local monopoly power, their decentralisation and their freedom to compete in other businesses will greatly increase the base-line level of competition.[27] The TROCs' ability to own (or invest in) telecomms companies outside SA would speed the transfer of technology to other African countries.

Cellular Communications

Telkom owns 50% of a joint venture called Vodacom, which shares the duopoly rights to cellular services in South Africa. Under a general industry restructuring, this duopoly should eventually be broken up into multi-local competitive structures, and the rights re-allocated on the basis of an auction for rights to the electromagnetic spectrum. Telkom's interest in Vodacom should either be sold to

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[27] The TROCs' monopoly power in local telephony, as traditionally defined, would be mitigated by the emergence of non-traditional communications alternatives, including cellular, Personal Communications Services, and Internet-based voice communication.

the joint-venture partners (Vodaphone and Rembrandt), or put into a newly formed independent company.

It should be permissible for Telkom LD and the TROCs to compete for local cellular rights, but great care must be taken to prevent cross-subsidisation from regulated services to the cellular segment.

Similar to the mandated open relationship between the TROCs and long-distance service providers (Telkom LD and other anticipated entrants), network-based services should be required to make their networks accessible for cellular connections. Operational division between the TROCs and cellular operations should help to ensure fairness.

Manufacturing and other services

Despite the need for maintenance of technological standards, there is no reason for a Telkom unit to be engaged in the manufacture of telecommunications hardware. Direct manufacture of hardware by Telkom subsidiaries appears to be minimal. These operations would be packaged into a small, independent unit and prepared for sale. All exclusive long-term contracting (like the MSAs) should be discontinued (for the reasons cited in Section 2.3), and all statutory competitive barriers in manufacturing should be eliminated.

Other services provided by Telkom should also be discontinued, sold or spun off into private companies. For example, the recently formed radio-trunking network joint venture (Q-Trunk), the maritime radio service, the Innobel electronic dictionary service, telephone directory services, and pay telephone services (Telkor) should not be included in the core Telkom LD nor in any of the TROCs. Instead they should be restructured and operated as independent companies, consolidating any of the subsidiaries which have material operating synergies. Any transactions conducted with former Telkom subsidiaries must be negotiated and priced strictly on an arm's-length basis as soon as the operational restructuring has commenced. Later these independent units may be sold to private bidders, or if possible, floated on the equity markets.

The Telkom Development Institute (TDI) should also be privatised, or should be transformed into an independent research unit, funded by Telkom LD and the TROCs, but operationally independent of them.

Section 4.2 -Ownership Structures

Having divided Telkom into its component parts, the ownership of each part becomes a critical issue. Change in ownership structure is most important for alleviating the x-inefficiency and principal-agent problems described in Section 2.3. Strategic and financial investors, motivated by desire for profits, are likely to monitor the actions of their agents more closely than incumbent government overseers. Subjecting Telkom management to greater monitoring and disciplinary control through the capital markets is likely to improve performance in many dimensions.

Ownership structure can be evaluated along two primary vectors: percentage of government ownership (0% to 100%, with a crucial break at 51%) and the composition and representation of non-government owners (general public, strategic buyers, financial institutions, foreign telecommunications companies, foreign individuals and existing Telkom management). An infinite number of ownership combinations can be conceived of for each operational unit, many of which serve complementary goals. The structures to examine for comparative purposes are:

- 100% government ownership (status quo)
- 51% - 99% government ownership (partial privatisation)
- 51% - 100% ownership by individual South African citizens (popular privatisation)
- 51% - 100% ownership by foreign telecomms operator (strategic sale)

If the issue of ownership is stated differently, the optimal ownership structure for each Telkom unit can be determined by answering a series of questions [28]:

- Should government continue to own any part of the unit?
- Are there any reasons that foreign companies should not own a controlling stake in the unit?
- Will ownership by a foreign telecomms partner provide material benefits in the form of technology transfer or foreign direct investment?
- Are the transaction costs of a per-capita distribution of shares very high relative to the unit's economic value?

Because the technological, financial, and managerial needs of each separated business will be different, there can not be a single privatisation method which will be most appropriate for all of them. By examining each of the highlighted structures in light of these questions, some determinations can be made about the optimal post-privatisation structure of each unit.

It is extremely important to note that all of the methods described have significant advantages and disadvantages if used as the sole means for privatisation. One goal of examining each of the methods separately is to consider means by which they can be combined. Combinations of privatisation methods may enable South Africa to reap the benefits from each method while avoiding the disadvantages.

Regardless of each unit's circumstances, the process must remain focused on the overriding goals which will be described in Section 5.3. Most important, the decisions must be made on a transparent basis, with full accountability .

Status Quo (100% Government Ownership)

For all of the reasons described in Section 2.3, it is clear that 100% government ownership is a sub-optimal structure for Telkom and for the economy. Given the competition-enabling advancements in technology, and the government's continuing ability to regulate private providers of telecomms services, there are no economically sound reasons for continued government ownership of any restructured Telkom units.

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[28] Many of the normative criteria used to evaluate these ownership structures are explained more fully in

The difficulty faced by existing principals (citizens) in monitoring the actions of Telkom management strengthens the rationale for changing the ownership structure. Privatisation "brings to bear monitoring by debt and equity holders, which," along with well-defined property rights, can be expected to improve performance. (Evans 1993, p. 59).

Arguments potentially could be made for the government to continue operating units which serve an undeniably public goal (e.g., maritime radio), but would not be profitable in private hands. In that case, government might contract out and pay directly for the administration of those services. There appears to be no inherent benefit in having government employees themselves managing the operation of these businesses.

Partial Privatisation (1%-99% government ownership)

Unless there are clearly identifiable economic rationale for continued government ownership, the government's equity stake should be eventually reduced to zero in all parts of the restructured Telkom. The purpose of representative government is to govern, and there are no readily apparent societal benefits to having government officials act as equity investors. Over time, therefore, the assumption must be that the government will divest itself, of ownership in all Telkom assets. Based on empirical evidence (see Niels 1990), this step of divestment alone should improve the technical efficiency of the operating units.

Of course, the government does have a legitimate ongoing role in preventing market failure in the telecomms industry. To the extent that market failure continues to be a risk, operating control which the government previously achieved through direct ownership can be replicated through effective regulation.

For political reasons it might make sense for the government to retain a so-called "golden share" in some Telkom units The golden share allows the government to exercise operational control over the telecomms industry in times of national

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Section 5.3, in discussing the objectives for the privatisation.

crisis. After the national crisis ended, ownership (and reparations) would, of course, return to the rightful owner. The golden share can also be used block strategic decisions which are seen to contradict the national interest directly.

Strategic Sale (51% - 100% ownership by operating company)[29]
Telecommunications companies headquartered in North America, East Asia and Europe have purchased controlling shares in the privatised telecomms networks in many developing countries.

The economic advantages of selling a controlling stake to foreign operators (through a tender auction) are indisputable. (Durchslag, Puri & Rao 1994, p. 16) First, auction to a foreign partner is maximally transparent and creates a significant inflow of stable foreign direct investment. It is also likely to present the likeliest method for maximising revenue from the sale. The chief advantage of selling control to foreign strategic investors, however, is the "rapid migration of skills" and the technology transfer which the new proprietors provide. (McKinsey & Co. 1993, p. 24)

The primary disadvantage in selling to a foreign multinational is the perceived loss of control, and the political difficulty which results. For many reasons, some countries object to having elements of their infrastructure controlled by foreign institutions. Telkom's corporate communications office (not a disinterested source) offers the dire prediction that, "relinquishing control of such a highly strategic resource ... could well be a recipe for disaster." (Telkom 1993B, p. 36) These fears can be allayed through maximum transparency in the process, prominent and trustworthy regulatory agencies, and effective public relations. If necessary the golden share can be granted to reduce security concerns, although this is likely to reduce the value of bids.

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[29] Presumably a strategic investor would be a foreign telecommunications company or a consortium of foreign and domestic firms. Although foreign domicile is not an absolute requirement for the strategic investor in a successful privatisation, in order for technology transfer and foreign investment to occur it appears to be a very strong likelihood.

Sale to foreign strategic investors is most appropriate for those Telkom businesses which are in greatest need of technological improvement, and for those which are in already competitive markets. Of the specific units described in Section 4.1, Telkom LD is the most likely to be sold successfully and at a high price. The TROCs are also likely to be attractive on a stand-alone basis, particularly those located in densely populated geographic regions. Based on experiences in other countries, it is unlikely that foreign telecomms companies and consortia will bid heavily for Telkom assets unless they are offered controlling interests.

If the political disadvantages of foreign ownership can be minimised through good public relations and (if necessary) through deployment of a golden share, private sale of the majority interest in the largest Telkom units may be the best means of furthering the goals of the restructuring.

IPO method -(Sale of shares to investors)

In developed countries, the most common method of privatising large SBEs has been to sell their equity onto the shares market in an initial public offering (IPO). Assuming that the shares are auctioned off, rather than subscribed to at a pre-determined price, the IPO method has many advantages:

- it creates a highly liquid market for domestic and foreign investors to participate in ownership of the newly privatised entity;
- it raises large amounts of cash for the government;
- it is highly transparent in valuation and execution.

The drawbacks to the IPO method are considered two-fold. First, it tends to dilute ownership control very thoroughly, which entrenches existing management. A broad distribution of shares also increases the costs (and decreases the likelihood of success) for any acquiror to purchase a controlling stake in the privatised company. In the absence of concentrated ownership, management power remains dominant after the privatisation. [30]

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[30] The dispersion of ownership, and concomitant dilution of pressure by owners creates a principal-agent problem. Regardless of whether shares are sold or distributed gratis to individuals and institutions,

A second drawback, more important in the case of many Telkom units, is that an IPO is unlikely to result in acquisition by a strategic investor. If technology transfer and an influx of foreign capital are deemed desirable goals of the privatisation process, they are less likely to be achieved unless a strategic investor acquires a controlling stake in major units. This is unlikely to happen if privatisation is effected solely through an IPO.

A partial IPO is of considerable interest, since the benefits of the transaction are still realised (specifically the public float and market valuation), while large blocs of equity can still be held by a single shareholder.

Public Share Ownership (per-capita distribution of shares)

Although there are clear benefits to foreign strategic investment in Telkom, a major appeal of privatisation is the opportunity to distribute equity ownership (and/or cash) to South African citizens. The "progressive privatisation" or "populist capitalism" strategy reduces wealth-distribution inequality, binds society together through common ownership interest, and is politically popular. The crucial goal in progressive privatisation is to distribute a valuable equity instrument broadly. As long as it is effective, the specific method for distributing value broadly (e.g., coupon bidding) is not terribly important.

Similar to the case with an IPO, the single great disadvantage of progressive privatisation by itself is that ownership and control inherently become dispersed. In this case, ownership control would be held collectively by a very large group of relatively unsophisticated (and presumably inactive) investors nationwide. In the ownership-power vacuum, existing Telkom management is again likely to retain complete operating control. Under those circumstances management will be insulated from pressure to improve company results and to perform more efficiently.

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dispersion of ownership control tends to insulate management. The prohibitive organisational costs faced by citizen-owners ensures that they have little influence over management's decision making.

To achieve the benefits of populist capitalism it makes sense for Telkom LD and the TROCs, in particular, to include a public equity component in their post-privatisation ownership structure. To alleviate the dangers of control dispersion, it also makes sense to ensure that a controlling bloc of shareholders is formed. This is why combining a public distribution of shares with direct sale of majority stake to a strategic investor may be the optimal strategy. At the very least, there should be no legal limits on the size of equity ownership stakes (as was the case with Iscor) [31] and there should be no long-term restrictions on the pooling, sale or transfer of shares.

As noted above, assuming that value is distributed on a per-capita basis, the specific means of distribution is not terribly important. The choice of distribution method should be made on the basis of effective reach, cost, and transparency. Transaction costs may vary between methods (i.e., share distribution is complicated and costly), and the benefits may also diverge (i.e., there may be significant positive social externalities and educational benefits to distributing equity in a publicly traded company).

Management buy-out

Under other circumstances, many of the Telkom operating units would be attractive candidates for management-led leveraged buyouts (MBOs). Although Telkom LD and most of the TROCs would probably be too large to be disposed of in this fashion (particularly given the non-existence of a public corporate debt market in South Africa), some units might benefit from private ownership and continuity of management.

In South Africa, however, MBOs of parastatal corporations are likely to be politically unacceptable. MBOs appear to reward entrenched (white) managers

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[31] In the privatisation of Iscor, for example, equity ownership concentration was limited to 10% by any single entity. This limitation has allowed management to entrench itself and to operate with little performance pressure from its shareholders.

financially, at the expense of the public weal.[32] Moreover, the specialised capital markets for financing and promoting transactions of this type do not yet exist in South Africa. Therefore, MBOs are unlikely to play a major role in the organisational restructuring of Telkom.

4.3 Conclusion

After steps are taken to make the telecommunications industry more competitive as a whole, further steps must be taken to restructure and privatise Telkom. The first, crucial step is to divide the monolithic Telkom into legally independent operating entities. The independent companies will be created by stripping off regional operations into six TROCs, and separating off ancillary services into an array of small companies, leaving only the long-distance services to continue operating under the Telkom name.

After the business units are divided, re-organised and adequately capitalised, each must be prepared for sale or public flotation. The optimal strategy for divesting government's ownership in each Telkom subsidiary will depend on that particular unit's needs for technology, capital and management expertise. In no cases does it appear likely that government's continuing ownership of equity makes economic sense. The salient question is to whom, and how, each unit's shares will be divested.

Of the various ownership structures examined, partial sale to foreign strategic investors appears to make the most sense for Telkom LD and for the larger TROCs. This strategy will provide maximum transfer of technology and increase in capital expenditure. The benefits of public distribution of shares are also strong, and indicate that the distribution of some equity on a per-capita basis would complement the goals of the privatisation. For the smaller Telkom units,

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[32] A distribution of shares to rank-and-file employees would be less politically unpopular, but given the long standing policies of job reservation, transfer of public wealth to selected (primarily white) employees, might still be seen as inequitable. Moreover, special distributions to employees would be less effective than pro-rata distribution in reducing wealth inequality.

direct private sale to financial investors or to operating companies appears to make the most sense.

Table 3: SUMMARY OF POSSIBLE OWNERSHIP STRUCTURES

Ownership Structure	Advantages in Isolation	Disadvantages in Isolation
Status quo	Minimises uncertainty and volatility	See Section 2.3
Partial privatisation	Allows government to retain strategic control	Does not eliminate the problems outlined in Section 2.3
Strategic sale of majority stake	Allows for maximum technology transfer; provides foreign direct investment; is fast and relatively simple	May be politically unpopular, may raise sovereignty issues
Public flotation	Raises cash; provides valuation benchmarks; politically popular	Does not encourage foreign direct investment nor technology transfer; leaves incumbent management in control
Per-capita distribution	Politically very popular; efficient means for distributing value and enabling citizens economically	Leaves incumbent management in control; does not raise cash; does not lead to FDI or technology transfer
Management buy-out	Provides continuity of management; increases efficiency through alignment of incentives	Politically very unpopular; may not raise the maximum cash revenues

CHAPTER V - SPECIFIC STEPS TO PRIVATISATION

5.0 Introduction

South Africa is fortunate because many of the steps which can lead to optimisation of the telecomms industry structure have already been taken. Specifically, commercialisation has made it much easier to envision the structure of a post-privatisation telecomms company, and to forecast the steps needed to achieve that structure. Moreover, many of the changes which will increase general competition in the industry are easy and inexpensive to implement (as discussed in Section 3.2). To complete the optimisation process, the following specific steps could be undertaken:

- legislation by national and provincial Parliaments (Section 5.1)
- organisational and financial restructuring (Section 5.2)
- setting objectives for privatisation (Section 5.3)
- three stages of ownership transfer (Sections 5.4, 5.5, 5.6)
- implementation of new regulatory control (Section 5.7)

5.1 Legislative Action

The first order of business is for the national Parliament to pass five steps of legislation. These changes in legislation would include:

1. allow for ownership and operating-structure changes in all Telkom companies and affiliates;
2. remove all legal barriers to competition in telecommunications;
3. reduce (then eliminate) all tariff and non-tariff barriers on the import of foreign telecomms equipment and services;[33]
4. eliminate all restrictions on foreign investment in and foreign ownership of telecommunications concerns;
5. empower the Department of Posts and Telecommunications and regional regulatory agencies to set regulatory goals, and to encourage industrywide competition.

Specifically these legislative changes would involve enacting amendments to the Post Office Amendment Act (Number 85) of 1991 ("the Act"). Among others,

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[33] South Africa's inclusion in the World Trade Organisation will require that these barriers be reduced in the medium term regardless of other restructuring.

Section 5(7) of the Act, which restricts share ownership solely to the South African government, will require alteration by Parliament.

Privatisation Enablement

Step 1 of the legislative changes outlines the process for privatising Telkom, and announces the intended goals of the process. This legislation should allow for great flexibility in accomplishing goals, but should set a reasonably strict time line for completion of the restructurings and ownership transfers. One critical component of the legislation is the appointment of a senior government official (of absolutely unimpeachable integrity and credibility) who will act as the "privatisation czar" for Telkom's restructuring.

Privatisation Czar

The role of the privatisation czar is absolutely pivotal to the success of the efforts to restructure and optimise Telkom In fact, based on privatisation experiences in other countries, the choice of a privatisation czar is frequently the single most important factor in determining the success of the privatisation process. (Durchslag, Puri & Rao 1994, p. 16)

The privatisation czar should be fully accountable to Parliament (and to the people) for the success of the privatisation, and will act as the liaison amongst Telkom and: Parliament, the public, prospective investors, and advisors and merchant bankers working on the project. The privatisation czar and his or her staff will also supervise the re-organisation and capitalisation of the divided Telkom units prior to their sale.

The person chosen as privatisation czar must be "widely respected in both the public and private sectors, of high integrity, and having effective communications skills." (Durchslag, Puri & Rao 1994, p. 16) He or she should also have considerable executive authority, an adequate staff and operating budget, and direct access to decision makers at the highest levels of government. It is critical that the privatisation czar have executive control over changes within Telkom, and

be protected as much as possible from pressure to favor any particular economic or political group during the proceedings.

Enhanced Competition

Steps 2, 3 and 4 of the legislative changes will spur competitive behavior, as entrepreneurs and foreign competitors are allowed to enter manufacturing and service provision markets. These steps should also spur competitive reaction from Telkom and from its suppliers, as they respond to a newly competitive market.

Steps 2, 3 and 4 are also likely to be the most politically contentious ones. Policies of maximum transparency, broad consultation and full disclosure are likely to return their greatest benefits in this stage of the process. Moreover, in order for these steps to pass Parliament, substantial popular support will already have to have been generated through good public relations.

Regulatory Construct

Step 5 requires action at regional and national levels. Ideally, regulatory oversight of TROCs will occur at local/regional levels, and will be highly adaptive to the competitive environment and technological sophistication prevailing in local markets. In establishing the new regulatory regime, the emphasis should be placed on increasing the intensity of competition in all aspects of the telecomms industry. Aggressive regulatory agencies (such as OFTEL in the U.K.) are "essential to ensure that improvement through competition develops cumulatively over time." (Beauman 1989, p. 223)

It must be emphasised that the regulatory agency's primary function will be to promote competition, rather than to exercise direct control over the telecomms industry. Incumbent producers would be required to justify their strategic decisions on the basis of their effect on competition, and, the agency must be eternally vigilant for evidence of anti-competitive behavior. Moreover, the agency should create actively an environment in which competition can flourish, by continually eliminating anti-competitive regulation and supporting the efforts of entrepreneurs with logistical and regulatory help.

Federal oversight should largely be limited to inter-regional and international services, as well as cellular services. Federal regulation can be enforced by an expanded and empowered Department of Posts and Telecommunications (or the newly formed ITA) [34]

Most of the TROCs, can be expected to retain significant market power in the medium term, so their regulation is particularly important. [35] Other Telkom units which are not likely to enjoy significant market power should be left largely unregulated except for normal corporate and securities oversight.

5.2 Intra-unit Organisational and Financial Restructuring [36]

Under the direction of the privatisation czar, the organisational restructuring described in Section 4.1 must be undertaken with due haste. Ideally, Telkom would be divided into its long-distance (Telkom LD), TROCs, cellular, research (TDI) and other operating units. As noted above, the TROCs are likely to be divided on the same regional bases currently used for internal management by Telkom.

Organisational Restructuring

Each of the separate operating units would be separately incorporated, and should constitute separate (independent) boards of directors and senior management structures. At the time of division, the South African government would continue to own 100% of the equity in each unit.

The division (or unbundling) process should include clear delineation of the rights and responsibilities incumbent upon each business unit and their relationships with respect to other industry participants. These rights and responsibilities are

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[34] A major problem with the existing Telkom structure is that the vestigial DPT has been left with a highly ambiguous regulatory role. Parliament must clarify this role and fund its professional execution.

[35] Regulation of local telecomms service is likely to be based on some formula which limits Return on Assets. A system similar to the (RPI-x) formula which is used in the U.K. for regulating price increases in regulated services is probably most appropriate.

[36] The following discussion of restructuring summarises, in part, the lessons of telecomms privatisations in Sri Lanka, Malaysia, Chile, and the U.K. Sources for these lessons include: Nankani 1988, Jones, Tandon and Vogelsang 1990, and Marshall and Montt 1988.

particularly important in the areas of line access and pricing. The units must also set up structures to ensure continuing cooperation on technological standards and resolution of disputes.

Financial Restructuring

After Telkom is divided into business units, historical income statements, balance sheets and cash flow statements will be prepared for each of the newly independent operations. Inevitably this will be a messy process, but the goal should be to prepare historical records which best represent the expected future condition of the business. These statements need to be reconstructed from pre-division (i.e., consolidated) results, and should be fully audited by independent accountancy firms. Inherent in this process will be the (perhaps painful) necessity of marking all assets to their market values, and assessing their profit-making potential going forward.

Under the direction of the privatisation czar, each of the Telkom units should be adequately capitalised prior to their sale or flotation on the equity markets. Levels of capitalisation adequacy can be determined through internal analysis and by comparison with similar entities in foreign countries. For units which are substantially undercapitalised, financial support from government may be required, or an equalisation between over- and under-funded units may occur at the discretion of the privatisation czar.

Strategic Planning

Prior to privatisation, each unit must be prepared for sale. This process will include, at least the following steps:

- comprehensive strategic planning
- rationalisation of management, labour and physical capital resources;
- development of marketing and sales plans;
- negotiation of long-term contracts
- selection of corporate and capitalisation structures

Within an organisation which has been run as conservatively as Telkom, fundamental changes of this type will inevitably create internal dissension. The

political clout of the privatisation czar, and his or her backing at the highest levels of government, may be sorely tested. It is crucial that these changes are well-planned, and executed quickly. If divisional managers are newly enabled to act on the behalf of their own business units, and if bureaucratic oversight is kept to a bare minimum (except by the privatisation czar and staff), the inherent difficulties of this process should be reduced.

5.3 Setting Objectives for Privatisation

After dividing Telkom into its operating components and restructuring the finances of each unit, separate decisions on the disposal of government's interest in each unit should be taken. Under the supervision of the privatisation champion, the objectives described in Section 3.2 can be operationalised and applied to each sale/distribution decision. The main operational objectives to be considered include [37]:

OVERRIDING MANDATES

- enhancement of competition
- public acceptance and support
- transparency

PRIMARY OBJECTIVES

- broad-based share ownership
- technology transfer
- increased capital investment

SECONDARY OBJECTIVES

- revenue maximisation
- speed of transfer

SPECIAL MANDATE

- redistribution of wealth

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[37] As in Section 3.1, some of these objectives contradict each other, or are even mutually exclusive. In choosing the specific operational goals for each Telkom unit, the tradeoffs between conflicting goals must be made explicit.

Overriding mandates

For all aspects of the privatisation process, maximum transparency, general public acceptance and the enhancement of competition are crucial objectives, *sine qua non*. The credibility and feasibility of all future privatisation depends on adherence to plans which maximise on these three variables. Therefore the negotiations and transfers which lead to privatisation must be always open to public scrutiny and input. Moreover, all decisions should be "as objective as possible, with the criteria and their weighting clearly delineated." (Durchslag, Puri & Rao 1994, p. 15)

Transparency and public acceptance do not require that the process should be delayed indefinitely in order to carry out consultations with all affected parties individually, nor to gain complete consensus on all issues. Forward momentum and a fast-track agenda for completing the privatisation should dictate an

aggressively paced series of deadlines.[38] The methodologies and results, particularly of valuation, should be fully disclosed. This need for complete disclosure extends to all regulatory decisions as well.

Primary Objectives

For Telkom LD, and for the TROCs, the most-important objectives include the transfer of technology and increased levels of capital investment. Therefore the emphasis should be on locating and obtaining bids from appropriate foreign investors. Social welfare would be best served in the long-term by finding appropriate strategic investors who are willing to lock up their investment capital for extended periods.

In many cases the privatisation czar might make certain concessions to potential buyers, but these concessions should never be designed to result in decreased competition. The government should resist strenuously the urge to guarantee monopoly power of any kind to potential bidders, although these guarantees might increase their bidding prices. Government should also resist granting guarantees of profitability or growth:

> "Investors should bear the risk of the project's failure. The absence of risk removes the private sector's incentive to prevent failure." (Durchslag, Puri & Rao 1994, p. 16)

For the smaller pieces of Telkom, technology transfer and investment objectives are not as important. For these units, the privatisation czar should attempt to maximise revenue and to complete the transactions as quickly and neatly as possible. Again, negotiations must be transparent, and must be undertaken strictly in the context of enhancing competition.

Secondary (negotiable) Objectives

For most of the Telkom units, consideration should not be dominated by the maximisation of revenue nor speed of ownership transfer. The South African

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[38] A strict time table would be included in the privatisation legislation, and should be adhered to under all but the direst circumstances.

government is not rigidly constrained by the need for cash inflow nor rapid action, and focusing on these short-term objectives is likely to be to the detriment of long-run development goals. To ensure that the necessary improvements in telecomms infrastructure occur, and that competition is generally enhanced, government should be willing to trade off some zero-period revenue to gain long-term benefits of the privatisation process.

Special Mandate Part 1 - Redistribution of Wealth

What should be done with the money? Privatisation of SBEs presents a special opportunity for governments to effect change in their societies. The windfall revenues which are generated by monetising (or securitising) state-owned assets can be used to promote any social goal which would benefit from an infusion of cash. In a developing country, it is expected that a legitimate government will use the proceeds from privatisation to further the process of economic development. In the case of South Africa, a strong case can also be made that privatisation proceeds should be used to redistribute wealth.

Case for popular capitalism

All in, the privatisation of Telkom can be expected to generate between R31 billion and R35 billion. (Fleming Martin, 1995). These funds should be used to increase social welfare for South Africans as much as possible, either by promoting long-term economic development goals, reducing income inequality, or both.

When Iscor was privatised, the funds were used to retire government debt, to fund the formation of small business, and to create the Independent Development Trust. It was implicitly believed that the goals of society could best be met by pooling the financial capital from the Iscor privatisation, and applying it to development problems on a top-down, centrally planned basis.

If the developmental needs of South African society were concentrated in areas in which there is a substantial risk of market failure (e.g., transportation or communication infrastructure), the Iscor model makes sense. In the presence of

market failure (in those cases a public-goods problem), it is sensible for government to undertake projects itself for the greater good of all of the people. When pools of capital are accumulated for any public purpose, however, the likelihood for conflict between the desires of principals and the actions of agents is high. There appears to be a tradeoff in efficiency when developmental projects are undertaken on a massive scale, with a salaried cadre of implementors who control access to the capital. Some portion of the funds are almost inevitably lost to inefficiency and influence behavior.

In the current environment in South Africa, the most pressing developmental needs will not be met by massive infrastructural projects. The greatest needs of poor South Africans are for houses and jobs, both of which (it can be argued) are created most efficiently on a decentralised, laisser-faire basis. By distributing the proceeds from Telkom's privatisation directly to the citizens of South Africa, the efficiencies of the market can best be put to work. There may be scope for pooling some small amounts of capital for infrastructural purposes (particularly residential site & service and access roads), but generally speaking the impetus should be to distribute wealth.

If individual households are entrusted to do what is in their own best interests, it is likely that the number of new dwellings built and the number of new jobs created from start-up ventures will be much greater than would occur if the money were administered by bureaucratic, centralised government structures.

More important, in a society which has been long characterised by excessive government interference in the workings of the economy, many individual South Africans would welcome the opportunity to make their own investment and consumption decisions. Funding from other sources (including international aid) can be applied to the centralised development projects. The cash and ownership equity from the privatisation of Telkom would flow directly to those who will best be able to use it.

Political popularity

In addition to the economic arguments outlined above, popular capitalism has the benefit of political popularity. In gaining public acceptance of a privatisation plan, the prospect of immediate, and tangible, economic reward can be very persuasive. Citizens are more likely to support a privatisation plan which increases their economic well-being directly and immediately than a plan which promises to improve their lives at some date in the future, and requires them to beleive in government's ability to choose appropriate means to make those improvements.

5.4 Ownership Transfer - Stage One

As discussed in Section 4.2, the optimal ownership structures of the various Telkom units depends on political and economic factors specific to each. In addition to factors affecting optimal outcome, the analysis which will determine the optimal privatisation technique should include:

- expected size and complexity of transaction
- expected sub-industry structure (e.g., oligopoly, monopolistic competition)
- need for technology transfer
- need for financial capital
- need for management expertise

Prior to Stage One, Telkom will have been thoroughly restructured, with its operating units divided into independent companies. Merchant bankers and specialist management consultants will have been hired to assist in drawing up a master plan for the privatisations. During Stage One it is envisioned that the government's stake in all major units of the former Telkom will be reduced to below 50%. The net cash which is received from the sale of these majority stakes would be deposited into a special trust account, and under no circumstances made available for general-fund government purposes.

Telkom LD

The majority stake in Telkom LD is likely to be auctioned off to strategic investors, presumably from overseas. This sale will be conducted through a transparent, negotiated bidding process. The privatisation czar will be empowered to

negotiate for some concessions from the purchaser, where those concessions are congruent with the overriding goals of the privatisation. For example, in exchange for an agreement by the purchaser not to sell shares for five years, the privatisation czar might be willing to accept a lower bid.

TROCs

The ownership of the TROCs is the most problematic aspect of Stage One. The TROCs are most likely to require ongoing regulation and the rigid enforcement of structures which enhance competition. The TROCs will also require great amounts of capital investment and technology transfer. Sale of controlling interest in the TROCs to foreign strategic investors is likely to make economic sense, but may be politically unpopular. This unpopularity will be heightened if the same foreign company or consortium ends up buying Telkom LD and one or more TROC. Adequate, credible and equitable regulation, (with particular emphasis on the prevention of anti-competitive behavior) is of paramount importance in making the sale of the TROCs successful.

Cellular and Other Investments

For businesses which are not 100% owned by Telkom, some arrangement will have to be negotiated with the other owners. Pending the long-term re-organisation of the national cellular duopoly, the privatisation czar may simply agree to sell Telkom's share in Vodacom to the remaining partners (Vodaphone and Rembrandt Group). Otherwise, a dedicated holding company may be created to own the assets of the former Telkom's investment, and that holding company could be sold to financial or strategic investors, or could be floated on the equity markets in Stage Two of the privatisation process.

Non-cellular joint ventures and investments (e.g., Q-Trunk) could be disposed of in a fashion similar to that used for the cellular properties. If a complete separation is not economically feasible, Telkom's stakes in a number of small ventures could be consolidated under the authority of a single holding company, which could then be sold or floated.

Other Units

Manufacturing and other highly competitive smaller units will be sold outright on a private-sale basis, to domestic or foreign investors. The cash raised from these sales will also be escrowed in the special trust account, and will not be available for general government purposes.

Conclusion of Stage One

At the conclusion of Stage One, the majority of Telkom LD will be owned by a strategic investor, with the minority continuing to be held by government. The individual TROCs will also be majority-owned by strategic investors, again with government retaining minority stakes. Cellular, manufacturing and other smaller subsidiaries will have been auctioned off to the highest bidders. All cash revenues from all transactions will be escrowed into a special trust account.

5.5 Ownership Transfer - Stage Two

As noted in Section 4.1, in the long term there is no reason for the South African government to own equity shares in any of the Telkom pieces. Stages Two and Three provide the means for government to complete its divestment and to distribute the value of these shares to its citizens.

Stage Two creates a market for the shares in Telkom LD and in the TROCs by selling 50% of the government's remaining minority stakes in these enterprises to

equity investors. [39] The easiest means for accomplishing this is to float the shares on the Johannesburg Stock Exchange (JSE). For Telkom LD and the larger TROCs, the value of government's shares may be high enough to warrant equity offerings on overseas markets (presumably London and New York) as well as on the JSE.

In all cases the shares should be auctioned off in a competitive bidding process, rather than being sold at a fixed price (below market value) and subscribed to by lottery. A competitive auction ensures that maximum revenues will be generated from the sales, and that the distribution process is maximally transparent. As with the bloc sales of equity to strategic investors, and the private sales of smaller units, the cash proceeds from public equity offerings will be escrowed into a trust account.

Completion of Stage Two

At the completion of Stage Two, Telkom LD and the TROCs would continue to be majority-owned by strategic investors. Half of each of the minority stakes will be publicly traded on the JSE and/or foreign exchanges, and the remaining halves will continue to be owned by the South African government.

5.6 Ownership Transfer - Stage Three

Stages One and Two will have divested most of the government's holdings in Telkom entities, and will have created a substantial trust account. A liquid market for shares in the Telkom units would exist on the JSE and foreign stock exchanges. In Stage Three, the remaining government-owned shares and the trust-account cash are distributed in a bundle to all resident citizens of South Africa on a per-capita basis.

Similar to the voucher privatisation schemes employed in the Czech Republic, each man, woman and child citizen of South Africa will be eligible to register for is or her distribution of shares and cash. [40] After establishing identity and residency,

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[39] The strategic investors which bought control in Stage One will be able, of course, to increase their equity holdings in Stage Two, but must bid for their shares on a non-preferential basis.
[40] As described by Sidorchuk, *et al.*

each citizen would receive a bundled distribution of trust-account cash and equity in the publicly traded Telkom LD and TROCs.

The rationale for distributing cash and some owners' equity to the populace is grounded largely in the argument presented at the end of Section 5.3. For the specific developmental needs of South Africa in 1995, there does not appear to be a high risk of market failure, but the risk of non-market failure is significant. By distributing the value of Telkom very broadly, the decentralised allocation processes of the market appear likely to provide more social welfare than a top-down imposition of large-scale projects.

Per-capita rationale

The rationale for making the distribution on a per-capita basis (as opposed to a targeted wealth transfer on a means-tested basis) is not as straightforward. If the sole objective of the distribution is to decrease inequality in the distribution of wealth, a means-tested distribution will clearly be more effective. Moreover, from a social welfare perspective, it can be argued that the money should be transferred to those citizens who will derive the greatest marginal utility from the additional income. presumably these people would be amongst the poorer citizens of South Africa.

The primary reason for distributing on a per-capita basis instead of a means-tested basis is simplicity. Cash transaction costs will increase dramatically if it becomes necessary to determine the net worth of applicants as they register to receive their shares. Moreover, the additional complications and waiting period would be likely to deter many people from registering at all. The ability to gather census-type information from virtually all members of society would also be lost if only some citizens were deemed eligible for distribution of shares and cash. An intangible sense of "fairness" would also be engendered by the per-capita distribution: no preferences on the basis of race, income, gender, age, or tribal affiliation. Means testing would destroy this sense. Finally, the opportunity to engage in some common experience (not unlike voting), and to hold partial

ownership collectively, as a nation, may have some unexpected benefits in building a prosperous and unified nation.

The benefits of simplicity, quality of information, perceived fairness, and (perhaps) nation building are compelling. A means-tested system of distribution would accomplish marginally more wealth redistribution, but it is not clear that the economic and social costs are worth bearing.

Cash Component of the Distribution Bundle

To prevent an overstimulation of the economy, the cash should be distributed to citizens in three equal tranches over the course of a twelve-month period. Clearly there will be a number of logistical and security issues to be worked out (see the discussion of transaction costs below), but these must not deter government from spreading the wealth.

Equity Component of the Distribution Bundle

To prevent chaotic volatility in share prices, the equity shares should also be distributed in three tranches over a twelve-month period. Effectively the shares will be semi-transferable at issue, and will vest into full salability over the course of their first year in existence. Relaxation of some JSE rules on brokerage accounts will be appropriate to facilitate the sale and/or pooling of shares.

Transaction Costs

Registering nearly 40 million people, and distributing equity certificates and large sums of cash will clearly involve significant transaction costs. [41] The expenses of the distribution (as well as the fees of merchant bankers and management consultants) can be paid legitimately from the trust account, although these expenditures need to be closely monitored.

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[41] Despite the daunting logistical problems, popular privatisations of this type have been executed successfully in many Eastern European countries, particularly Poland, the Czech Republic, and the former Soviet Union.

An attractive benefit of the Stage Three distribution process will be that accurate data on South Africa's population, residency and other rudimentary facts can be gathered as part of the per-capita distribution. [42] Also, having undertaken the expenses of registering the entire population once, if subsequent privatisations of SBEs employ a popular distribution, the repeat process will be considerably less expensive

Conclusion of Stage Three

At the end of Stage Three, the government's ownership of Telkom entities will be completely divested. Telkom LD and the TROCs will continue to be controlled by strategic investors, with the market value of those stakes established by the publicly traded shares. The remaining equity and trust-account cash will have been distributed on a per-capita basis, providing further stimulus to a consumption-driven macroeconomic recovery.

5.7 Regulatory Control

After the ownership transfer is complete, the ongoing role of the government will be to provide a regulatory environment which is conducive to maximum competition and allocative efficiency. The primary means for achieving this goal will be:

- mandatory (but compensated) equal access to monopolisable assets;
- continuous encouragement to developers of competing telecomms networks and services;
- explicit encouragement of discriminatory (marginal-cost) pricing in all markets with presence of monopoly power;
- steadfast enforcement of the regulations against anti-competitive behavior of any kind.

In long-distance services, it can be expected that Transtel (the Transnet network) will quickly provide a viable competitive option to Telkom LD. Investment in upgrading Transtel should be explicitly encouraged through tax incentives or

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[42] This information will be extremely valuable to private-sector marketers. Much of the basic information should be made freely available, but certain specific demographic data can be packaged and sold in discrete pieces.

other means. Additional competitors can be expected to enter the industry over time, particularly as technology provides the opportunity to leapfrog some of Telkom LD's antiquated network assets.

At the TROC and cellular levels, the regulating bodies must be highly vigilant in the short and medium terms. Scope for monopoly abuses can be expected to persist for the foreseeable future, so the primary role of the regulators must be to heighten competition wherever possible. The regulators must also continue to focus on furthering the goals of the optimal telecomms system as described in Section 3.1. These goals, including universal access, marginal-cost pricing and technological improvement, can be explicitly encouraged through targeted tax relief or tax burden, and through targeted regulatory provisions.

One critical element of the regulatory regime and of South African industrial policy as a whole must be to maximise the free flow of technology, investment and capital goods into the country. Rapid technological improvements, and the economic benefits which are certain to result, can best be accomplished through unimpeded trade and ownership relationships across national boundaries.

5.8 Conclusion

The privatisation plan outlined in this chapter is both practicable and equitable, focused on the goals set out in Section 3.1. A transparent, democratic process within these broad parameters can be certain to win maximum popular approval. This popular approval will remove many of the political difficulties which might otherwise slow the process.

Widespread acceptance of this privatisation proposal by the financial community and the populace at large is predicated on the appointment of a privatisation czar and the employment of effective public-relations techniques. As long as honesty, integrity and the flow of information abound, the economic benefits of the restructuring should take care of themselves.

VI. CONCLUSION AND ADVOCACY

South Africa has a unique opportunity to further its economic development by optimising its telecommunications industry. The current industry structure of state monopoly has outlived its usefulness, and the potential gains from competition and privatisation are substantial.

The value of these changes in other countries at comparable levels of development is evidenced by the summary results in Table 4.

Table 4: EMPIRICAL RESULTS OF TELECOMMS PRIVATISATIONS

Country	Description	Value ($mm)	Result
Argentina (Entel)	Majority stakes sold to foreign strategic investors; remaining 45% sold to employees and local investors	$1,244	Improved performance and efficiency, increased network penetration
Chile (CTC)	Majority sold to foreign investor, remainder floated and sold to employees	$170	Access lines increased 72%, full demand will be met in 1996, fully automated network, >66% digitised
Malaysia (STM)	Sold to investors in IPO	$861	Productivity increased 50% in 3 years; backlog for new installations eliminated
Mexico (Telmex)	Majority stake sold to consortium of foreign investors; remainder floated in Mexico, New York and Europe	$1,760	Market valuation increased 5x; backlog cut; penetration increased substantially; service improved

Sources: Durchslag & Puri (1993); Kikeri, Nellis & Shirley (1992)

The optimisation of South African telecommunications requires a two-pronged approach: maximisation of industrywide competition and rewstructuring and ownership transfer of Telkom. Making the industry more competitive would be relatively easy. Technological advancements have removed most of the economic factors which used to result in natural monopoly. Simply by clearing the regulations out of the way, the government can do a lot to enhance competition very quickly.

The restructuring and sale of Telkom would be substantially more complicated. In order to maximise the benefits from sale (broadly defined to include technology transfer and extension of service, as well as zero-period revenues), it makes sense to break Telkom into smaller strategic components, based on geography or function. The specific circumstances and developmental needs of each individual Telkom unit would determine the optimal means for its disposition.

South Africa has a unique opportunity to improve its economy, redistribute wealth, and send a powerful signal of fiscal sophistication to the world. Through the restructuring of its telecommunications industry South Africa can herald the ongoing development of a great, free nation.

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