

Debating “Privatisation” of Network Utilities in South Africa: Theories, Fables, Facts, Other

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TABLE OF CONTENTS

1. INTRODUCTION	3
2. COUNSEL FOR THE OPPOSITION ADDRESSES THE JURY	4
2.1 <i>Amicus Curiae</i> : Adding a Voice	4
2.2 COSATU's View	5
3. JURY DELIBERATIONS.....	6
3.1 Reform of network utilities: the issues	7
3.1.1 <i>Appropriable rents and redistributive struggles</i>	7
3.1.2 <i>Special problems of network utilities</i>	8
3.1.3 <i>A network liberalisation bubble?</i>	9
3.2 Brief casing the sectors.....	10
3.2.1 <i>The transportation sector: railroads</i>	10
3.2.2 <i>The telecommunications sector: fixed telephony</i>	12
3.2.3 <i>The energy sector: electricity</i>	17
3.2.4 <i>Testing profit-maximisation hypothesis: Eskom</i>	21
4. CONCLUDING REMARKS: JURY STILL OUT	24
REFERENCES	26

LIST OF TABLES

Table 1: Estimates of the Partial Elasticities of Factor Prices	23
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1. INTRODUCTION

The government of South Africa comes across clear in enunciating its goals for the reform of public enterprises. According to the Minister of Public Enterprises, “restructuring” is the generic term taken to represent the set of strategies employed by the state to ensure that public enterprises in South Africa are “efficient, effective, and powerful engines of socio-economic development... Restructuring aims to maximise the contribution that these state assets can make to development through the integration of public, private and social capital and expertise.” (RSA 2001a, 1) In its vision for restructuring, the government declares:

Development cannot be measured only by financial criteria, and restructuring is not a means of improving government finances and enterprise efficiency at the expense of the poor. Rather, the success of restructuring will be measured by its contribution to improving the standard of living of the majority of the population. The goal of restructuring should therefore be sustainable economic and social benefits. (RSA 2000a, 14)

The post-apartheid government of South Africa inherited over 300 state-owned enterprises (SOEs), with four of the firms accounting for 86% of aggregate turnover, 94% of total income, 77% of all employment, and 91% of the total assets of these enterprises. These “key enterprises,” as they are collectively described in the government's Policy Framework Paper, are in telecommunications (Telkom), energy (Eskom), transportation (Transnet), and defence (Denel). None of these firms are slated for outright privatisation in the near future. The debate is joined around the wisdom of the government's model of reform, its so-called “matrix of options.”

In recent times, judging from the diversity of views in the multimedia, there seems to be much confusion and mixed feelings about the nature and pace of the reforms, about who will bear the burden of the perceived costs, as well AS about the distribution of the expected benefits.¹ Despite the diversity of opinions, the government is clear about what it wants to do. In fact, THE government recently issued a press statement (Sunday Times, 26 August 2001, 27) challenging what it perceives as misinformation by the Congress of South African Trade Unions (COSATU). The statement begins by noting that COSATU has called for a strike against what it calls “privatization.” a move that is obviously unnecessary since “restructuring is not necessarily ‘privatisation’.” The press statement highlights that restructuring is a key platform of the Redistribution and Development Programme (RDP), and that far from being ideological, it is a practical programme built up case-by-case to contribute to the following:

- Bring down the cost of electricity, telephones and other services;
- Reduce costs of production and thus improve job creation;
- Bring more productive investment into the economy; and
- Open up the economy to those shut out by apartheid.

¹ See, for instance, Sunday Times, 26 August 2001, pp.15, 20, 24, 27; Mail and Guardian, 24 August 2001; The Star, 27 August 2001, and www.iafrica.com.

In view of the ongoing controversy and the diversity of opinions on this issue, we wish here to further animate the debate by highlighting important elements of network utilities that should be taken into consideration in resolving the restructuring controversy. Also, we marshal views and some of the available evidence from both sides that can be brought to bear on the substantive content of the debate, namely the distribution of the costs and benefits of reforms. We will draw evidence from Eskom, Telkom and Transnet.

These three enterprises share an important characteristic that is central to the reform debate: they are network utilities. Network industries are characterised by investments that are large, lumpy, and sunk. The components that make up the system must work together in order to deliver their services to the end-user. Generally, they include gas, water, electricity, rail, and fixed line telephony. As can be deduced from the examples, these network utilities provide goods that are now generally part of infrastructure services in an economy.

Infrastructure investments provide services that are part of the consumption bundle of residents and serve as inputs into production. Infrastructure may be usefully classified as public capital goods (even though some components are club goods). Public capital goods include highways and roads, mass-transit and airport facilities, educational facilities, electricity, gas and water supply systems, waste treatment facilities, correctional institutions, police, fire services and the judiciary. Core infrastructures include highways, water, electricity, and telecommunications. These components are expected to contribute most directly to private sector output.²

Individuals living in squatter and slum settlements that lack basic infrastructure can be classified as (socially) poor cohorts, regardless of movements in their indicators of income and food consumption. As a basic consumption good, infrastructure has become a central issue in poverty. We claim that understanding the role of infrastructure in the economy can lead to a better appreciation of the privatisation debate which has now crystallised along a battle line that finds government on one side and organised labour on the other (even though labour is by no means the only cautionary voice).

2. COUNSEL FOR THE OPPOSITION ADDRESSES THE JURY

2.1 *Amicus Curiae*: Adding a Voice

To add perspective to the debate, we begin by summarising another opinion on the position of organised labour. According to this view (Sunday Times editorial of 26 August 2001, 20), the decision by COSATU to protest the government's privatisation plans is based on COSATU's belief that privatisation will make some people worse off and will lead to poor service delivery, lead to loss of jobs, and increases in the price of basic services. While labour argues that the provision and extension of basic services to poor communities cannot be entrusted to the market, the government argues that it is

² The Government of South Africa expects that SOEs will play a critical role in our endeavour to enhance our manufacturing competitiveness. They dominate the energy, transport and telecommunications sectors, sectors that are responsible for a significant percentage of input costs to potential high growth industries... By ensuring that our input sectors are efficient and offer high quality services, we can lower the costs and improve the services that they offer....” (RSA 2001a, 1)

reforming the enterprises to deliver services more effectively, and to be able to raise the necessary capital to finance needed infrastructure investment.

The editorial notes that in the post-Cold War era, it has become fashionable to side with proponents of free markets, and to dismiss arguments for active state interventions as “relics of a bygone era.” Those who subscribe to this view would readily dismiss COSATU as being out of touch with the present, preferring instead to remain in the socialist past. However, COSATU's concerns are deserving of serious consideration – a point that the editorial claims to have argued before. Contrary to the way in which COSATU has been portrayed by the government as “blindly opposed to privatisation,” the article deems COSATU's approach as pragmatic in conveying repeatedly its opposition to the privatisation of assets that help the state deliver social services, as well as in suggesting that in other areas the decision to dispose of assets should be “nuanced.”

2.2 COSATU's View

“COSATU supports the restructuring of state-owned enterprises and local government to improve their capacity to deliver basic services.... But privatisation will **NOT** help achieve these ends.” (COSATU 2001a, 3) Therefore, COSATU has demanded that privatisation of basic services and national infrastructure be halted at once, and furthermore, that any restructuring of the SOEs “must improve services for our communities and especially for the poor” (Ibid.). Basic services are listed as “water, sewerage, rubbish disposal, electricity, welfare, and basic housing, health, transport, education, telecommunications and cultural services (such as stadiums, parks and libraries).” The Union's basic argument regarding privatisation is that “it is inherently difficult, if not impossible, to compel private interests to serve the poor or intervene strategically to restructure the economy.” (COSATU 2001b, 1) It demands that the government re-examine the desirability of relying on market forces to govern the delivery of basic services.

COSATU defines privatisation in terms of the extension of the control and wealth of the private sector at the expense of the state, and regards as euphemisms terms such “restructuring” or “public-private partnerships” that are used by the government to characterise its own perception of the reforms. Here are some of the specific issues that the Union finds troubling (COSATU 2001b):

- The government's failure to back up its faith in the market with a proposal for consistent, strong regulatory structures or with a systematic analysis of the costs and benefits of proposals for privatisation.
- The Department of Public Enterprises (DPE) lack of analysis of its own proposals for the biggest parastatals: the DPE has not yet published an analysis that addresses the benefits to society, the costs of the immediate impact on pricing or employment, the social impact from non-delivery of certain essential services, or the impact of unemployment on specific communities.

- The DPE's argument that privatisation is the best way to achieve efficiency, and that government regulation, shareholder compacts or subsidies will ensure adequate services for the poor. The government has never evaluated whether or not it possessed the requisite administrative capabilities to deliver on the regulatory component.
- The Department of Trade and Industry's contention that technological advances have eroded the natural monopoly characteristics in electricity and local telephony, and hence these utilities should be privatised and regulated.

COSATU summarises its objections by noting that "state control is necessary to ensure adequate, quality provision of services to the poor, and to initiate strategic investments to restructure the economy." (COSATU 2001b, 9) Furthermore, the Union argues that almost all government policies on privatisation admit the need for regulation even though the government lacks capacity and commitment to ensure effective regulation.

3. JURY DELIBERATIONS

The informational, as opposed to the participatory role, of the economist-jury is to give better information to political negotiators on economic issues (assuming the negotiators know where their interests lie), where concessions can be sought or given, and where changing the constraints can increase benefits. The question then becomes: To what extent should we relegate the political process in our calculations of the consequences of altering any policies or rules? Should we present the economic results as they would appear if implemented in an apolitical environment, or should we condition them to the political process as we understand it?

Dixit (1998) argues that economic and political aspects of the reform process are not additively separable in their effects, and so one aspect cannot be inserted after the other to get a complete and accurate picture.

Either the economist must include politics in the analysis from the outset, or the political analyst must redo the economics. If neither party is qualified to assess the pertinent aspects of the other's domain of specialisation, the two should collaborate from the outset. A purely economic calculation followed by a purely political one does not appear to be a useful compromise. (Ibid, 50)

Furthermore, he cautions that the purely informational or benchmark nature of economists' technical calculations must be admitted and recognized, as they should not pretend to forecast the effects policies will have in the form in which they are likely to emerge from the political process.

Before we engage in the discussion of issues related to reforming network utilities, two cautionary notes are made in order to temper the ever-present optimism over the potential benefits of reforms, as well as the tendency to over-focus on technological and demand factors in evaluating the nature of reforms. The first is from Schumpeter (1954, 981) who cautioned that, "as we leave the case of pure monopoly, factors assert

themselves that are absent in this case [the monopoly case] and vanish again as we approach pure competition, so that the unbroken line from monopoly to competition is a treacherous guide.”

The other voice emphasized that specialists in business history have long been aware that organisational innovations have had profound efficiency (productivity) consequences, and that technology is important, but not decisive, in shaping the organisation of industry (Williamson 1994, 183). It sometimes appears that in discussing reforms, the influence of organisational factors is not adequately taken into consideration. Yet, as we later restate in our concluding remarks, human skills are emerging as one, if not the most, valuable attribute of modern corporations.

3.1 Reform of network utilities: the issues

3.1.1 Appropriate rents and redistributive struggles

The nature of network utilities is such that they invariably contain a segment in which investments are large, lumpy, and sunk. Furthermore, the ability of new firms to enter such a segment on a compressed time-scale is in general not realistic, particularly when there is an active incumbent. The forcing mechanism here is that costs of production are often subadditive within the relevant range – meaning that for the market being served, it is more cost-effective to have one provider of the service. The highly-specialised nature of the assets, the level of uncertainty in the economic environment, and the durability of the assets all combine with the aforementioned cost-advantage to generate enduring economic rents to an incumbent.

There are other issues. One is that *ex ante* (i.e. before entry occurs), a potential entrant is in a multilateral relationship with respect to its investment horizon. However, post-entry, the entrant is stranded because the bargaining advantage now shifts from investor to consumers. Therefore, “*ex post* guarantees” – credible commitments – are necessary to ensure an *ex ante* optimal amount of investment in the required highly- specialised assets. The other issue is that once services are on stream, there is a “lock-in” effect in that service delivery via networks of water, electricity, telecommunications, and railroads are in a direct link to the consumer who is then captive. For this reason, there is a requirement for an *ex post* guarantee of an efficient volume of trade. Since the market is unable to supply such a guarantee, the usual policy response is to prohibit the exercise of market power by the incumbent utility.

Additionally, given that many of the services delivered over networks are considered basic consumption goods, they inevitably invite consumer activism with respect to the pricing of such services. As aptly described in Newbery (2000, 1), these “consumers are numerous, are politically important, and have no choice of network...they cannot exit and so will use their voice.” The public policy problem, therefore, is to devise a mechanism that balances the interests of investors and the political powers of consumers.

One such device, capable of satisfying the requirement of *ex post* guarantee, is public ownership. Provided that it can finance the required investments, state ownership can be

the solution.³ Regulation is another solution, particularly when the network is in private hands. Overall, it is clear that regardless of the chosen solution, a network utility will inevitably be subject to regulation, often through a line Ministry. Therefore, network utilities operate under terms set by the state.

3.1.2 Special problems of network utilities

The conventional “visible hands” approach to the natural monopoly (market failure) problem is for regulatory institutions to be created, and entrusted with the task of designing price-setting rules and ensuring that the monopolist meets the demand for services. However, as has been argued elsewhere (Newberry 2000, for instance), designing price-setting rules is only a part of the policy agenda for these industries. Network utilities pose special problems of ownership and regulation whose solution is constrained by the institutional endowment of the country, the balance of political power, and changing national objectives. So, property (ownership) rights may not matter as much as control rights, whether exercised by the state directly through ownership or indirectly through regulation.

Regardless of the nature of ownership, societies have to evolve effective regulatory institutions to address the special problems of network utilities, chief among them being the capacity to meet demand and finance investment. Next to these two are the problems of ensuring technical efficiency and the deployment of optimal technology. Here competition is said to be more effective than regulation in encouraging innovation. We would argue, therefore, that the issue is not so much about privatisation (ownership) as it is of liberalisation (multiplicity of services), where feasible.

The inherent tension over distributional issues of “fair” pricing of network services to consumers, and the need to earn a “fair” return on assets deployed so as to encourage future investment, is at the core of the special problems of network utilities. Economic theory predicts that in a competitive industry, excess profits or losses (economic rents) induce firms to enter or exit an industry. Unfortunately, this prediction cannot be reliably used as to guide fair pricing in network utilities because significant entry and exit barriers exist in these sectors.

So far, the presumption in the literature (Batten 1996; Humplick 1996; Culy, Read and Wright 1996) is that performance is affected if competition is introduced into services supplied over the network, either through vertical separation, liberalising access to network, or both. In short, competition matters more than ownership for efficiency.⁴ The literature argues that vertical disintegration has the advantage of confining regulation to the network, provided there is adequate competition in services. Liberalisation, on the other hand, makes more demands on regulatory capacity. Also, it is argued that competition is difficult to sustain in state-owned utilities and so there may be a complementarity between privatisation and competition. In this context, privatisation seems to be a necessary, but not sufficient, step to achieving the benefits of competition.

³ Vertical integration as a solution to the “hold up” problem is the well-known prediction of the Williamsonian Theory of the Hazards of Idiosyncratic Exchange in a Long-term Relationship.

⁴ Further evidence on the importance of multiplicity over ownership can be found in Primeaux (1977, 1978) who compared performance by public monopoly electric utilities with a matched set of public duopolies, most of which competed with a private utility.

In an insightful analysis of “privatisation as insulation,” Willig (1994) claims that it is widely accepted that government enterprises are managed to achieve a variety of objectives that relate to the complexities of politics, while private enterprises are largely managed to earn profits. Survival instincts compel firms in more competitive markets to be relatively more efficient.

This response does not answer two fundamental questions. First, why do the authorities not make public enterprises equally efficient by offering managers the same financial incentives as their private sector counterparts? Second, since all private enterprises are subject to a variety of regulation, how is it that the authorities are able to devise efficient regulations for the private sector while those that apply to public enterprises are so poorly constructed? To quote Bos (1993): “*A priori*, it is not clear why the state, failing to run the firms as well as owner, should now suddenly have become an efficient regulator.” (Ibid, 157)

Willig argues that the empirical answer to the first question seems to be that such public sector reform does not work. He draws an example from Robinson (1992) on the electricity supply industry in UK: “Despite good intentions it proved impossible to have ‘arm’s length’ relationships between the nationalised corporations and government. Instead, governments of both major parties found irresistible the temptation to interfere with the decisions of state owned enterprises so that, in practice, the corporations had little control over pricing and investment decisions.” (Ibid, 158) Willig also cites another instance from Brazil that, in the interest of eliminating operational inefficiency, adopted a system whereby state-owned enterprises had to compete with private corporations under the same conditions. The government, however, proved incapable of abiding by its own rules and instead provided the enterprises with financial support.

To the second question regarding the difference in the quality of regulations applicable to public and private firms, he answers that “political reality is inevitably injected into regulation.... More directly, regulators are often political actors themselves or serve at the pleasure of those in political office” (Ibid, 158)

3.1.3 A network liberalisation bubble?

Can regulatory institutions be designed and sustained to deliver the promised benefits of access, interconnection, and intelligent price setting? Button (1996) examined ownership, investment and pricing of infrastructure services and found both market failure and government failure in pricing. So, are we thus in a liberalisation bubble, or is the current wave an adjustment towards an equilibrium network-industry configuration that internalises both technical and organisational economies?

Even where it does not duplicate facilities, competition may still fail to secure the benefits of coordination, interconnection, and system standardisation. Moreover, transaction costs could be significant in some markets. These and other concerns raise many questions about the socio-economic and political conditions necessary to sustain private ownership, and when might they be lacking, with public ownership the default mode. What if a government becomes time-inconsistent? This says that later on, it can become reluctant to fully enforce the rights of investors because it upsets the balance

between the claims of workers, consumers, and the rest of the voters. If public utilities are to be successfully privately financed, then regulation must credibly resolve the tension between consumers and investors. If consumers are unhappy, they cannot meaningfully “exit” or choose an alternative supplier (even under conditions of vertical disintegration) but must use their “voice” through the political process to secure their demands. If investors are fearful for the security of their future returns, they will not finance the needed investment.

For networks whose facilities are coming due for refurbishment in the near future, and faced with sudden uncertainty over the future regulatory regime, suspending investment is a rational response.⁵ Governments can attempt to legislate away the uncertainty. However, Goldstein (2001) cautions that using formal law to introduce swift changes that do not reflect the political and socio-economic situation of a country will not alter behavior. So, embedding commitments in a constitution when the political equilibrium is not supportive of such an arrangement invites social crisis. Such a commitment device in any case lacks credibility. If regulatory institutions are not sufficiently strong to provide adequate credibility, then private ownership may be infeasible or too costly. The costs may take the form of a high rate of return required to reward investors for the perceived high regulatory risk. This cost can also manifest in other ways such as a high discount on the fair asset value when the utilities are privatised or attempt to enter into a strategic equity partnership.

3.2 Brief casing the sectors

This section briefly reviews sector-specific cases from railroads, telecommunications, and electricity. In particular, we provide a brief profile of each dominant network utility, present government's plans for its restructuring, describe the objections and concerns being raised, and then based on the broad principles outlined previously, offer some comments on the issues.

3.2.1 The transportation sector: railroads

Spoornet profile: Spoornet is the largest division of Transnet; Transnet is the largest state-owned enterprise in South Africa by annual turnover and the number of employees. Incorporated in 1990, it dominates South Africa's transportation sector, and controls 13 companies involved in multimodal transport and allied services. Major challenges to the restructuring plans for Transnet include under-funded pension liabilities, outstanding debentures of R8.471 billion, and an additional liability of R3.442 billion in respect of medical aid costs for pensioners. (RSA 2000a)

Spoornet enterprises comprise: a general freight business (GFB); a heavy-haul coal line (Coallink); a dedicated heavy-haul iron ore line (Orex); an intercity passenger service (MLPS); the Blue Train luxury service (LuxRail); LinkRail, which handles branch lines; and Rail and Terminal Services (R&TS), which maintains and operates the network.

Sector policy: The 1996 White Paper on National Transport Policy was followed in 1998 by the release of a strategy paper on transportation in South Africa for the next 20

⁵ Such a rational response from Telkom was viewed as an absurdity by the Union (see COSATU (2001e, 10). The specific context is given later in the section on the telecommunications sector.

years. One of the major goals underlying the policy and the strategy is “to improve South Africa's competitiveness and that of its transport infrastructure and operations...” (RSA 2000a, 135) The government has also indicated that it will encourage integration, intermodalism, and partnerships between the transportation modes, where such a practice does not create monopolies. (Ibid, 136)

Action by the government: Spoornet will be corporatised, with its different units becoming autonomous corporate entities. Coallink, Orex, LuxRail and LinkRail will be operated as concessions, while the general freight business and R&TS will be corporatised as one entity and subsequently sold through an Initial Public Offering (IPO) or transformed into a joint venture with a strategic equity partner. The concessioning of Coallink, Orex, LuxRail, and LinkRail is expected to attract private capital and expertise into the industry. On the other hand, commercialisation of the general freight business is expected to result in non-negative profits, and thus render it feasible to make explicit subsidies to the poor, when necessary. Because of the obvious excess employment in Spoornet, a significant retrenchment is inevitable.

The government also claims progress in restructuring Transnet through resolving the pension fund problem. The passing of the Transnet Pension Fund Amendment Act in November 2000 enabled Transnet to retire R7.4 billion of bonds that freed government to pursue its restructuring programme without the constraints imposed by the bond covenant. As at June 2001, Spoornet is said to be undergoing internal restructuring, under the supervision of external management consultants. (RSA 2001a)

Organised labour's submission: Labour's position is that rail services should remain in the public sector so that “it can have the required socio-economic impact.” (COSATU 2001c, 3). At face value, this would seem to be an argument for continued cross-subsidisation of uneconomical components. However, labour demands a three-year “turnaround period to demonstrate that an efficient state-owned Spoornet is viable and necessary.” (Ibid, 4) They argue that strategies toward an increased sales volume, regulation of road transport (to account for externalities), and an integrated transport solution are core to the revival of the enterprise. A further argument put forward is that labour is now being made to pay for the ineptitude of management:

Our observation is that Spoornet management has, both as a result of mismanagement and intentionally, adopted a narrow focus.... The result is poor client management in the regions and the complete absence of strategies for developing new clients there. There also appears to be no effort to market space on empty return freight trains at a discount.

This is unacceptable business strategy, which concentrates all resources on the massive clients and high-density lines, which are easily profitable, and runs down the rest of the network and ignores regional lines and small customers. It then becomes all too easy for management to motivate closing down “unprofitable lines” which have been run down by its own strategies. (Ibid, 4)

The Federation (COSATU 2001c, 6) also notes that “Spoornet has sometimes made unnecessary investments, or invested in inappropriate or impractical technology (such as two different radio systems that cannot ‘speak’ to each other).”

Comment: COSATU’s assessment seems to make a compelling case for a “hard budget” constraint on the management of Spoornet, very similar to the government’s present restructuring strategy for that company. Accordingly, the questions left to be asked in this regard should be whether pitfalls exist in the restructuring plan that ought to be given further careful consideration, and how best to address the social dimensions of the reform.

One concern that comes to mind immediately is that it is not very obvious how the restructuring will engender competition. Although the various segments of the rail services are being restructured to operate on hard budget constraints through concessioning, commercialisation, and corporatisation, those features do not in themselves guarantee efficiency if there is no rivalry. As each of the components is non-competing, the potential rivalry is through substitute services from other transportation modes outside rail services. As well, the planned merger of R&TS and GFB into a single corporation needs to be explained.

There is another possible restructuring model, such as one that allows R&TS to own the infrastructure, signalling, and stations, while the train-operating companies bid for franchise to operate services on specific network routes. Whether R&TS out-sources services or provides infrastructure and other ancillary services in-house also requires careful consideration. Another point of concern is that of how potential competition, as the source of “market discipline,” is expected to arise.

Regardless of the number and size distribution of the train-operating companies, the existence of a single platform provider calls for an industry arbiter to referee standards and pricing. Furthermore, if multiplicity of services is not feasible on the routes, we should expect consumers to exercise their “voice” by calling for regulatory oversight over price and quality. Lastly, entry and exit conditions in a market are the key determinants of the level of rivalry. Costly exit is as much an entry-deterrent as is the high cost of entry itself. The lack of readily available alternative uses for rolling stocks (locomotives) is a costly problem affecting the ability to exit the market (and therefore the decision to enter in response to the existence of economic rents). The ability to finance rolling stocks at competitive rates of return affects entry decisions as well.

To summarise, huge set-up costs, combined with a high degree of irreversibility of investments, render implausible any threat of potential competition. Hence, a viable market for the leasing of rolling stock is also necessary for the ultimate realisation of the expected (price-quality) gains from “privatised” railroad services. Either the gains arrive through competition, or one must place considerable faith in the capability of the regulator and the goodwill of the operator.

3.2.2 The telecommunications sector: fixed telephony

Telkom profile: Telkom is an incorporated public enterprise with 67% ownership by the government of South Africa, and 30% ownership by two strategic equity partners through an investment holding company (RSA 2000a). An empowerment group, Ucingo Investments, holds the remaining 3% share.

Telkom holds a monopoly over local and long distance telecommunications services, exchanges, and public payphone services until May 2002. Telkom is also licensed to operate the public switched telephone network (PSTN) and the public switched data network (PSDN) for the period of exclusivity. It holds a 50% stake in Vodacom. Vodacom is the larger of the two cellular phone companies currently operating in South Africa, with a 57% market share in cellular services, and the second largest Internet Service Provider (ISP) in the country. Telkom has a further Internet presence through Intekom, the third largest ISP in the country. Moreover, Telkom's operating license provides that it can obtain an additional year of exclusivity if by the end of the fifth year it achieves 90% of the set target. (RSA 2000a, 144)

Sector policy: The 1996 White Paper on Telecommunications Policy sets a clear, although apparently in some cases conflicting, goals for the sector (RSA 1996):

- Promote universal and affordable provision of telecommunications services;
- Encourage ownership and control of telecommunications services by persons from historically disadvantaged groups;
- Encourage investment and innovation in the telecommunications industry;
- Encourage the development of competitive and effective telecommunications manufacturing and supply sectors; and
- Ensure fair competition within the telecommunications industry.

The outcome of this policy process was the Telecommunications Act (Act 103 of 1996), setting out the telecommunications policy for the next six years. The most important structural elements of the Act comprise:

1. A five-year exclusivity for the incumbent operator Telkom, against an obligation to roll out 2.81 million new lines over this period.
2. Two-thirds of the connections to occur in under-serviced areas and for priority customers. In addition, at least one more operator will be licenced before 2003.
3. The establishment of an independent regulatory body – the South African Telecommunications Regulatory Authority (SATRA).
4. Exploration of the possible licensing of a third mobile operator.

According to the current legal and regulatory framework, the Department of Telecommunications retains responsibility for advising the Minister on policy matters, including issues of competition. ICASA (Independent Communications Authority of South Africa), as the “regulatory watchdog,” gets the power to issue licenses and monitor compliance with the terms of the licensing. Although lacking credible enforcement mechanisms, ICASA nonetheless is responsible for rectifying non-compliance.

In 2000, SATRA was merged with the IBA (Independent Broadcasting Authority) to form ICASA. The ostensible reason was to capture any potential regulatory synergy in digital convergence that would arise from the fusion of broadcasting, computing, and telecommunication (RSA 2000b).

Action by the government: In March 2001, the Ministry of Communications proposed a policy for the post-exclusivity period. The most important structural aspects of the draft policy are:

- License only one additional national network operator that includes an empowerment (affirmative action) partner and the telecommunication subsidiaries of both Transnet and Eskom. Inclusion of these state enterprises is not only consistent with the White Paper thrust, but is held out as a means of deploying a Second National Operator on a compressed time scale than would otherwise be possible. In April 2001, 3% of Telkom was sold to the Black Economic Empowerment grouping, Ucingo.
- Granting an international carrier licence to another state enterprise, Sentech.

In response to mounting pressures from the international telecommunication community, the Department of Trade and Industry and the Competition Commission to “install a pro-competitive market structure,” the post-exclusivity draft policy was revised to include a third national operator, the issuing of broadband licences, and the rapid introduction of number portability. A combination of events forced government to re-revise the draft policy and very recently to issue a final policy that accommodates only one additional national operator for a total of two incumbents, instead of three. Furthermore, the matter of broadband licenses is off the agenda for now, while number portability is delayed until 2005.

The combination of events includes the counter-pressure mounted concurrently by both Telkom and M-Cell, and market reaction to the announcement of a third national operator. That reaction translated into a drop in the market value of M-Cell by R6 billion, or 15% of its market capitalisation within 24 hours. (Sunday Times, 2001) M-Cell is the holding company of MTN (South Africa's second largest cellular network operator) and of Orbicom (a satellite communications company operating in 13 African countries), which is part of a black empowerment grouping and is widely expected to become the licensee for the second national network operator. Orbicom is partly owned by the government (24.1%) through Transnet's stake in M-Cell.⁶

Organised labour's submission: COSATU's position on telecommunications can be summarised in its “Vision for Telecommunications” (COSATU 2001e), which includes universal service, affordability, ownership by the state, job retention and job creation. They argue that roll-out of obligations and meeting of those obligations become “window dressing” if lines are subsequently disconnected due to high rental costs that render them unaffordable – a now widespread phenomenon known as *churn*. COSATU also argues that because of spillover benefits from telecommunications as an infrastructure bundle and as a basic consumption good, too little will be provided if left to the private sector. This divergence of marginal valuation from social valuation can be corrected through government intervention by ownership. Other specific, and perhaps controversial issues, raised by COSATU include the following (COSATU 2001e, 5, et. passim):

⁶ Source: www.M-Cell.co.za.

- Productivity is not a function of employment levels: It may be increased by raising output rather than reducing employment.
- Telkom's pricing policy is being informed not by costs but by the level of competition in particular market segments. Where there is competition, especially in international and long-distance national calls, there have been price reductions, whereas in the monopoly segments (local calls), there have been major price hikes.
- Local telecommunications prices should be falling faster than is currently the case, and so a stronger, more targeted price capping is required to ensure that prices on services that are valued more by low-income consumers fall the fastest.
- Telkom does not yet provide details of stand-alone costs for unbundled services, thus making it difficult to ensure proper cost allocation and pricing of services.
- Long distance and international calls should cross-subsidise local calls, and if necessary, the cost of trunk calls should rise.
- There is no necessary relation between competition and efficiency or quality of service delivery, for while competition may enhance product choice or even service quality for the upscale market, it may well lead to deteriorating or no services for the less profitable section of consumers.⁷
- Profitability should obviously not be a central consideration for an enterprise such as Telkom, which is responsible for addressing backlogs, and meeting basic needs in the telecommunications sector.
- COSATU supports measures to strongly cap price increases for residential customers as an important component of the ongoing regulation of this sector.
- COSATU finds absurd Telkom's claim that because of uncertainties around the future competitive and regulatory regime, its business plan does not currently extend beyond the end of the exclusivity period.

Comment: It is clear that subsidies and job retention are of major concern to organised labour. COSATU advocates subsidised services to all residential customers, with the burden falling on business customers. The problem with this view is that such a tax on business can make them uncompetitive and the environment unattractive for investments. That would impact on growth and employment.

Five years after the Telecom Act was signed into law, the biggest disappointment is that most consumers still have only one option for local phone services. According to the FCC, the Bells still control 96% of the local residential phone lines. The reason is simple: The economics of the business as it's currently structured can't support competition.

Historically, as COSATU (and other unions) are quick to point out, subsidies (bailouts) were commonplace. They have been used in South Africa to extend infrastructure

⁷ It is efficient that less-profitable market segments are not serviced or get low priority in the queue. This is far from saying that less affluent consumers should be exploited because they lack countervailing power. We suspect COSATU meant the “less affluent” consumers who may not necessarily be the “least profitable.” In fact, margins from the lower end of the market can be made higher through either charging them more or by charging the same fees as upscale customers, but delivering lower quality services. Another means is to charge the less affluent less and provide even worse services.

services to the farmers (see COSATU 2001e, 6). In the US, continuing subsidisation of local phone services is a source of discomfort to business and industry, except for the local phone companies who engage in it (Business Times, 2001).

The reason for lack of competition in the US is twofold. It is more profitable to serve dense office premises than widely-spread residential homes. The other is the 60-year anachronistic subsidy system, instituted in the 1940s to boost teledensity (then at 40%). To fund this universal service goal, it is said that AT&T cross-subsidised from long-distance business lines and other custom features, but that the pricing system has “stuck” since then. A suggested solution is to eliminate all but the essential subsidies, and to let the price for services reflect their cost, thus extending to the residential telecommunications market the benefits of competition.

Subsidies could be kept for the 10 million homes in high-cost regions, the 7 million people considered low-income by state governments, and a few other customers. All told, that's less than 20% of the U.S. population. Limiting subsidies to 20% of consumers would cut the total subsidy amount in half or more from the current \$25 billion to \$30 billion a year.

In the same story, Massachusetts is given as a success story of where residential rates have been rationalised and the benefits have come by way of vigorous entry of rivals, and through more capital investment in local phone competition. The result was the price of basic service increased threefold but competition has helped reduce the price of local toll calls and custom caller services by as much as 75%.

The American experience highlights the fact that COSATU did not, in their intervention (COSATU 2001e, 9), give adequate consideration to the critical issue of financing of advanced infrastructure, namely the deployment of advanced digital technology that includes investment in local access networks, in backbone networks, and in the choice of wired access systems.⁸ Investments in advanced technology are the drivers of future growth – the engine of the business segment of telecommunications – to which COSATU looks to cross-subsidise residential consumers and to enable telecommunications fund other social obligations.

Regulatory capacity is another important issue flagged by the opposition. Technical constraints on the production and delivery of telecommunications services make clear that the way in which competition evolves, post-liberalisation, will depend on the nature of regulation. For instance, some segments of the telecommunications industry are, technologically, natural monopolies. Within such segments, production is either by one operator or by a limited number of operators (such as dominant national carriers). These segments can be subject to traffic congestion. Potential bottlenecks mean that interconnection policies – the set of legal, technical and economic arrangements between network operators – are a key factor in the development of competition, as well as in the long-run growth and maintenance of installed capacity.

⁸ Network operators can choose from a wide range of wired access systems including digital loop carrier (DLC) with incrementally added digital subscriber loop (xDSL) modems, fibre-to-the-curb (FTTC), fibre-to-the-home (FTTH), and hybrid fibre coax (HFC) systems. For more on this, see Farrell and Katz (1998).

The obviously important role of a robust regulatory agency elevates to priority the budgetary position as well as the competency of the agency. ICASA has expressed concern about its strength and preparedness. The government's view is that the regulator has all the power and independence it needs to meet its goal. In laying out its perspective on ways of improving corporate governance in SOEs, the government notes that (RSA 2000a, 89-91):

In practice, the government's relationship with the SOE sector was less than optimal over the past five years. The government's previous advisers...report that a number of overlapping problems arose with the restructuring process between 1994 and 1999. Two of the key problems they raised concerned *relationships between various departments* responsible for achieving different objectives of Government, and the problematic *relationships between Government and the management* and/or boards of these enterprises.... Similarly the potential conflict between *Government and regulators* was clarified by restating that regulators need to operate within the framework of government policy rather than seeking to influence policy themselves. [emphasis added]

The point to note is that in spite of the centrality of regulatory capacity to outcomes in this sector, much concern remains about the quality and capacity of the institution.

3.2.3 The energy sector: electricity

Eskom profile: The dominant utility in the energy sector is Eskom, whose operations are structured into three major groups: generation, transmission, and distribution. It supplies 95% of the country's electricity from a fuel base of 90% fossil, 7% nuclear, 1% hydro, and a small proportion of imported energy.⁹ Currently, the power generation segment of the energy sector is comprised of a few players, with Eskom being the largest. In the transmission segment, Eskom is the “natural” monopolist, whereas distribution is fragmented. 40% of Eskom's sales are to local authorities that then redistribute to their captive customers. Sales to Botswana, Lesotho, Mozambique, Namibia, Swaziland, and Zimbabwe account for 2.4% of aggregate turnover. Eskom's total revenue is distributed 39% from resale, 28% from industrial customers, 18% from mining, and 7% from both residential and commercial consumers.

Sector policy: The legislative and regulatory framework for the sector is embodied in the 1998 White Paper on Energy Policy, and in the establishment of a National Electricity Regulator (NER) in 1995. The NER controls the pricing, national services, and technical standards. The White Paper sets out both the broad policy objectives of the state and the national priorities in the energy sector. Among the priorities are “increasing access to affordable energy services, improving energy governance, stimulating economic development, managing energy-related environmental impacts, and securing supply through diversity.”¹⁰ Furthermore, the Paper supports a gradual step towards a competitive electricity market, the restructuring of Eskom into separate generation and transmission entities, and the development of the Southern African Power Pool. Specifically, the Paper states that the electricity distribution industry should be urgently restructured, competition should be introduced into the generation segment, and the

⁹ RSA (2000a).

¹⁰ RSA 2000a, 130.

transmission segment should be required to provide an open and non-discriminatory access to the system.

Action by the government: In order to give effect to the policy objectives in the energy sector, the government plans to “corporatise” Eskom. The Conversion Bill has already been approved, so the date of incorporation is now left to the determination of the Minister of Public Enterprises. The government is also to carry out a full evaluation of different models for restructuring of the energy sector, based on a review of the industry by the Department of Minerals and Energy. The formation of different generating companies to promote internal competition prior to the introduction of private-sector participation in the generation market is also envisaged.

The government claims that a number of developments will take place. Firstly, “vertical disintegration” of Eskom, and therefore the industry, will lead to greater transparency and accountability. Secondly, they contend that creation of regional electricity distributors will lead to better services and ultimately competitive prices for customers. Thirdly, restructuring plans will be such that rollout of electricity to poor in both urban and rural areas is unhampered.

As of June 2001, the government was maintaining its commitment to a competitive model of electricity generation, but with Eskom as the dominant producer (RSA 2001). Given the current growth trajectory of the country, however, it estimates that additional capacity will be required in 2007 and that this creates an opportunity for the entry of new producers around 2003. Also, it is expected that Eskom's investment in generation outside of South Africa will be traded off against a reduction in domestic capacity. The government views this as a strategy that can stimulate competition without undermining Eskom's strength. It therefore addresses the concern expressed during the hearings on Eskom Conversion Bill as to whether restructuring will impair Eskom's capability to continue its ancillary role in economic development. The government's current strategic plan for Eskom does not entail unbundling and privatisation. The Eskom Conversion Bill is designed to make it a corporation with government as the sole equity holder.

Eskom is confident that the restructuring of the energy sector is being carried out in a manner that preserves and enhances its existing strength and does not weaken its ability to contribute to the economy (Eskom 2001). It claims among its achievements the meeting of the electrification targets for schools and clinics, a cumulative reduction in real terms of over 15% in the price of electricity, or a 14.1% reduction when the electrification discount is excluded. It also boasts a strong record of financial performance involving no drain on the treasury of the state or of financing from official development flows, a strong record of skills training and development, Black Economic Empowerment, and employment equity (Eskom 2000).

Organised labour's submission: Organised labour views the current proposals for restructuring the electricity sector as stemming from an ideological persuasion on the part of state agencies, of the merits of the “neoliberal model” of development (see World Bank, 1998 for an elaboration). This is in spite of the fact that the same agencies would readily identify with improving living standards for all, as well as with setting a

course for development that is egalitarian, democratic, and sustainable.¹¹ COSATU and other unions argue that the restructuring proposals meddle with parts of the sector that work well by international standards, while leaving fundamental problems unsolved. The proposals therefore portend rising costs to consumers, a decline in the momentum of the electrification programme that undermines developmental programmes and possibly will deter investment in the sector (COSATU 2001d).

COSATU is also concerned about the redistributive consequences of the proposed reforms and the alternative transfer mechanism proposed by the government. They point to the legacy of apartheid in shaping regional inequalities in access to electricity. Under a regime of independent electricity distributors, cross-subsidisation is difficult, and this difficulty is compounded by the wide regional disparities in wealth across the municipalities. Furthermore, if wealthier municipalities do not cross-subsidise the poorer regions, such savings are nonetheless used to subsidise other services in the wealthier areas. It is well known that “cheap” electricity has been instrumental in developing South Africa's extractive and refining industries (benefits that accrue to a concentrated group), while the externalities (the costs by way of environmental degradation) are widely shared.¹²

In COSATU's parlance, the question boils down to who gets subsidised using which mechanism. The government argues that placing subsidies online in the budget makes for transparency and for the determination of the “real cost” to society. This reason is a subterfuge. Placing items online in the budget is not the only means of determining the real cost to society. The key issue here, as COSATU makes clear, is sustainability. It seeks to institutionalise the subsidy in the same way it has worked for big business. Unless institutionalised, subsidies (transparent or not) will get snared in the budgetary politics of governments under pressure to maneuver tight fiscal corners.

Citing international experiences – New Zealand and California, to name two – that can be described as disastrous (COSATU 2001d, 7), COSATU warns of the impact of the proposed restructuring on the reliability of electricity supply over time.

Comment: To provide quality services at competitive rates to consumers, the state must have a restructuring plan that delivers efficiency in generation, transmission, distribution, trading, and consumption. The plans must minimise barriers to entry and exit, maintain system integrity, minimise transaction costs, and reduce commercial and regulatory risk. In other words, the overall design and implementation of any restructuring plan must recognise that a firm is not only a *production automaton* (the

¹¹ According to Stiglitz, the “neoliberal model” of development accords the government a minimal role in order to enable invisible hands to get prices right. He agrees that many of these policies are necessary for economic success, but far from sufficient – and that some may not even be necessary. (World Bank 1998, 1)

¹² Such incentives (subsidies are not popular expressions in this context) have been instrumental in seeding investments in the country. The Alusaf ferrochrome venture is one example. Various studies on the role of “cheap” power from Eskom are summarised in Hansen (1999). His paper contains discussions on the value of electrical power as a service, and as a key industrial input. Another instance of off-budget subsidies is “commodity-linked” deals that basically allow beneficiary (mining) corporations to partially off-load on Eskom some of the risk from input-costs without this insurance underwriting being explicitly priced. Management nonetheless separately documents the impact of this scheme on the firm's “bottom line.”

traditional but limited view of determining the boundaries of the firm), but is also a nexus of contracts (an efficient transacting mechanism). There is therefore a risk in viewing every vertical arrangement as anti-competitive without counterbalancing the issues.

Beginning with the generation segment, we ask: What are the necessary conditions for sustainable competition, and are those conditions compatible with system integrity? What happens when there are negative rents (some producers are not covering their long-run costs) that induce producers to exit from the market? What happens when there are positive economic rents? Two extant studies on competition in the South African industry (Hansen 1999 and Eberhard 2000) do not address these questions, while Newberry (2000, 251) reports that in the case of Chile, which has been reforming its electricity supply industry (ESI) since 1982, concerns still exist over the degree of competition in the system. “New generation plant has been small scale, built when needed rather than reaping economies of larger scale, suggesting that ENDESA may not be subject to much competitive pressure.”¹³ Estache, Gomez-Lobo, and Leipziger (2001) report that in Argentina, wholesale price of electricity dropped by 50% in the five-year period after privatisation due to the intense competition in the generation sector after the entry of 21 new generators. On the other hand, Newberry (2000, 243) finds that experiences with three ESI privatisations in Britain (England, Scotland, and Wales) and Northern Ireland reveal that “the price-cost margin widened, to the advantage of producers but harming (or failing to adequately benefit) consumers.”

In the transmission segment, which may be a natural monopoly, the question is whether separating generation from transmission will result in significant loss of coordination benefits. According to Newberry (2000, 265), “countries with sparse grids, or distant hydro resources, or those with rapid electricity demand growth, need to think more carefully how to preserve these coordination benefits...” Eberhard (2000, 26) suggests “integrated resource planning” as a way to mitigate any possible loss in coordination benefits from vertical separation. Furthermore, he suggests resting responsibility for the resource planning on the system operator, to be performed as a public service. Presumably, the details of such a scheme in markets subject to systems competition and network standardisation will need to be carefully studied, with the possible strategic behavior of rivals explicitly taken into consideration (modelled). These matters are somewhat academic since the model approved by the government does not require the vertical disintegration of Eskom. It simply scales down Eskom's presence in the generation segment. This is similar to the Chilean plan mentioned above. Whether a similar outcome will occur depends to some extent on whether a stable power pool can be put in place.

By far the thorniest segment of ESI, and one on which the least has been written, is the distribution segment. The current technology for supplying electricity is such that switching of suppliers by consumers (while remaining within the same location) is still not possible. Therefore, customers remain captive while private suppliers remain apprehensive of consumers expressing their voice through political pressure. This creates challenges for the electricity regulator who must then act as an umpire, in

¹³ After restructuring, ENDESA still emerged as the largest generating company with over 50% of national capacity, and with ownership of the interconnected transmission system. Thus, it retained vertical integration even as the market for generation opened to entry (Newberry 2000).

balancing the needs of the consumer to realise the downstream benefits of efficient upstream production, with the needs to *ex post* guarantee adequate returns to the retailer. Without such a guarantee, the optimal amount of asset-specific investment may not be forthcoming *ex ante*. Furthermore, retailers may trade off costs at the margin by reducing service quality, including maintenance and response time. In a network, this can impair system integrity and/or raise the cost of the management of ancillary services (reactive power, voltage control, and so forth).

The number of distributors is not critical to the single consumer because each retailer is a local monopolist. What matters are the skill of the regulator in establishing an intelligent pricing regime, and the nature of the political equilibrium, which not only determines partially the quality of the regulator, but also whether public ownership will be the default ownership structure of the distribution companies.¹⁴

It will be refreshing to offer some empirical evidence bearing on some of the issues under discussion. Unfortunately, the current problem of obtaining firm-level data of a reasonable duration limits extensive empirical analysis. Of the three network utilities, Eskom is the only one that has available an historical data set that is of sufficient duration to be useful. Furthermore, given how crucial to the entire reform debate the quality of regulators has become, we take this unique opportunity offered by Eskom’s data set to make an empirical contribution to the debate by testing implicitly the pricing regime of the electricity regulator. This regime test is achieved through directly testing Eskom for profit maximising price-setting. The outcome of the test can be viewed as a practical manifestation of the long-run outcome of the game between the NER and Eskom.

The test is based on properties of reduced-form econometric equations, with data requirements (revenues and factor prices) that are relatively modest. The model (Panzar and Rosse 1986, 1987) is appealing because measuring the response of the equilibrium values of revenues to changes in the prices of the productive factors relies on the most unambiguous and readily available firm-specific data.

3.2.4 Testing profit-maximisation hypothesis: Eskom

Specification and testing: The following derivation from Panzar and Rosse (1986) is based on the assumption that the firm’s choices are not affected by either strategic interactions or the threat of entry, and that the analyst has a sample of long-run equilibrium observations on the revenues of the firm, R , and on the vectors of exogenous demand, technological, and factor-price variables, z, g, w . The resulting hypothesis are testable restrictions on the parameters of the reduced form equation $R(w, z, g)$. Under the assumption of *profit-maximising* (i.e. efficient) monopoly behavior, equilibrium requires:

$$(1) R_y(y, z) - C_y(y, w, g) = 0$$

¹⁴ As argued previously, if governments or their agencies are not credible, investors may require a very high rate of return for the perceived regulatory risk, or costs of renegotiating the regulatory agreements or license.

$$(2) R_{yy} - C_{yy} = 0,$$

where $R(y)$ and $C(y,w)$ are the firm's revenue and cost functions.¹⁵ Equation (1) defines equilibrium output y^* as an implicit function of the exogenous variables $y^*=y^*(w,z,g)$, where y is the firm's output, and w,z,g are as previously defined. Totally differentiating (1) with respect to w_j , using Shephard's lemma, yields

$$(3) \frac{\partial y^*}{\partial w_j} = \frac{x_j^d}{y} (R_{yy} - C_{yy})^{-1},$$

where $x_j^d(y,w,t)$ is the Samuelsonian constant output-input demand function. $\partial y^* / \partial w_j$ may be negative if j is a normal or superior input and positive otherwise. Multiplying (3) by w_j and summing over all inputs yields a more definitive result:

$$(4) \sum_{j=1}^m \frac{\partial y^*}{\partial w_j} w_j = \frac{x_j^d}{\sum_{j=1}^m w_j} (R_{yy} - C_{yy})^{-1} C_y (R_{yy} - C_{yy})^{-1} < 0$$

Since $R^*(w,z,g)$, $R(y^*,z)$, we have, using Chain rule, $\partial R^* / \partial w_j = R_y (\partial y^* / \partial w_j)$. Substituting this into (4), dividing by R^* and using (1) yields:

$$(5) \frac{\sum_{j=1}^m \frac{\partial R^*}{\partial w_j} w_j}{R^*} = \frac{C_y}{R^* (R_{yy} - C_{yy})} < 0,$$

where $\hat{\alpha}$ denotes elasticity.

Implicit in equation (5) is a test hypothesis from the monopoly behavioral model above. It says that in monopoly equilibrium, the sum of the elasticities of reduced form revenues with respect to factor prices is negative. To test this proposition, we specify the following empirical model:

$$(6) y_t = \hat{\alpha} + \sum_{j=1}^m \hat{\alpha}_j x_{jt} + \hat{\alpha}_z z_t + \hat{\alpha}_g g + e_t,$$

where y_t is the value of the dependent variable (revenue) in period t , x_{jt} is the value of the j^{th} non-stochastic explanatory variable (a factor price), z_t is the value an exogenous demand factor, and g is disembodied technical change. The random error term is assumed to have a mean of zero, and a constant variance. $\hat{\alpha}$'s are the unknown partial elasticities to be estimated. All variables except the technology proxy are in logs. An efficient estimation method is the ordinary least squares (OLS). The null hypothesis asserts that the sum of the (partial) elasticities is zero, and can be tested as a standard F -test of the linear restrictions.

¹⁵ They assume a regular interior maximum so that the inequalities in equation (2) are strict.

Data and empirical estimates: Data are annual observations for the period 1985 to 2000.¹⁶ The firm-specific variables are gross revenue, cost of primary energy, operating expenses, net interest and financing costs, and depreciation. Eskom changed from *fund accounting* to *depreciation accounting*, effective 1 January 1987. This change in accounting practice has been adjusted for previous years. Real GDP is our proxy for exogenous demand, and a time trend variable represents disembodied technical change. The results are reported in Table 1.

Table 1: Estimates of the Partial Elasticities of Factor Prices

Variable	Estimated value	HCSE	P-value
Primary energy cost	0.3306	0.2705	[.253]
Operating expenses	0.5242	0.2525	[.068]
Interest and financing costs	0.1719	0.0855	[.075]
Depreciation charges	-0.0072	0.1158	[.952]
National income	0.2258	0.3847	[.572]
Technology	-0.0112	0.0154	[.832]
F (zero slopes)	1433.94		**[.000]
Adjusted R ²	0.998		
Durbin-Watson	1.544		

Notes: HCSE means heteroscedastic-consistent standard errors. National income is at constant purchasing power. The equation estimated is $y_t = \hat{a} + \sum_{j=1}^m \hat{a}_j x_{jt} + \hat{O}z_t + \hat{e}g + e_t$. The estimated Durbin-Watson test statistic falls within the indeterminate range of 0.74 and 1.93.

The data strongly reject, with 99.99% confidence, the hypothesis of profit-maximisation by Eskom. The elasticities of the factor costs with respect to the revenue are significant but non-negative. Rejection of profit-maximising price formation is hardly surprising given the centrality of energy costs, particularly electricity pricing, in the political economy of the country. Furthermore, given the multiple objectives specified for Eskom, only one of which is perhaps to breakeven, it would have been odd to find profit-maximising price-formation.¹⁷ Without inquiring into the reasons for such conduct, our result says that the electricity regulator does not set price efficiently. We can conclude, however, that despite this apparent (economic) inefficiency in price

¹⁶ I thank the Management of Eskom for providing the data, and for responding to the many clarifying inquiries. Also, I thank Philip Armstrong of the PanAfrican Consultative Forum on Corporate Governance for assistance in obtaining the data.

¹⁷ While the Department of Mineral and Energy is desirous of keeping energy costs low, the Ministry of Public Enterprises wants a viable enterprise, the Ministry of Finance wants a “cash cow to milk” and is concerned about the impact of energy prices on inflation targeting, as well as about “Washington” and investors’ perception of the macroeconomic environment.

setting, Eskom has managed to remain financially viable, with an excellent record of meeting its multiple objectives.¹⁸

We have not sought to attribute Eskom’s success at meeting multiple objectives to Eskom, the regulator, or the nature of the interaction between both parties. In addition, we are unable to predict whether a restructured Eskom can continue to meet or exceed this standard, and we have not been privileged to any report that speaks to this concern. Nonetheless, this uncertainty over the impairment of Eskom’s roles underscores some of the issues raised by organised labour regarding the consequences of restructuring Eskom, and the need for a very careful deliberation of the issues.

4. CONCLUDING REMARKS: JURY STILL OUT

We summarise around three overarching themes – the boundaries of the firm, the difficulty of regulatory commitment, and subsidies/hold up problem – that emerge from the ongoing debate. Incidentally, these themes also emerge as central features in discussions of restructuring in other countries. According to Newbery (2000, 17), public policy toward network utilities must address three levels of question:

The first and most fundamental is how to ensure that the large amounts of specific sunk capital are financed..., how property rights in this capital are to be defined, allocated, and protected. This question underlies the issue of ownership and therefore privatisation, ...depends critically on the form of the regulatory contract between the owner and society’s agent. The second question is what is the right structure of the utility, both vertically and horizontally. ...How should the industry be structured to take best advantage of network economies?

The author notes that the first two questions are dynamic issues while the third is on the efficient use of an existing network, with its main focus, the classic questions of public utility regulation and pricing. He cautions that although important, the third question is the least critical even though failure at this level may induce significant adjustments at the levels of ownership, regulatory regime, and industry structure. He concludes by suggesting that:

Until recently, economists tended to assume that the first two questions had already been answered, or could not be re-opened, so that the theory of regulation concentrated on how best to achieve efficient outcomes for each utility. The British experience, increasingly replicated elsewhere, is that questions of ownership, regulatory regime, and industrial structure need to be examined afresh, and they offer prospects of larger benefits than minor adjustments to the pricing of utility output. (Ibid, 18)

There is also a strong argument to suggest that improper unbundling can impair the resulting firm’s ability to govern or to finance investments (Zingales 2000, 1624, for

¹⁸ Beginning 1993, Eskom spends approximately R700 million annually on the Electrification Programme. Each fiscal year, the entire annual sum expended is charged to operating expenses for that year. There are also other extraordinary costs relating to the mothballing of power stations, impairment loss, provision for doubtful debts, and transfer to insurance reserves, that were excluded from the input costs used in the analysis.

example). In their paper, Holmström and Roberts (1998) review the two strains of work that have dominated the research on the boundaries of the firm: transaction cost economics (bounded rationality) and property rights theory (“hold-up problem”). The authors note that while both theories are quite different in their empirical implications, they nonetheless focus on the “role of ownership in supporting relationship-specific investments in a world of incomplete contracting and potential hold-ups.” They argue for a much broader view of the firm and the determination of its boundaries. Boundary choices must be driven by other considerations such as “agency problems, concerns for common assets, difficulties in transferring knowledge, and the benefits of market monitoring.” (Holmström and Roberts 1998, 75)

Regulation is often invoked to deal with market failures, and the market is invoked as a solution to government failures. Newberry (2000) expounds the regulatory dimension. He notes that any regulation of network utilities has to deal with the hazards of asset-specificity confronting the investor, and the added risk (to the investor) of bounded rationality on the part of the regulator (who necessarily has incomplete and costly information about the options available to the investor).¹⁹ It must also resolve the potential threat of opportunism from either of the parties – on the one hand from the network service provider exploiting a captive market, and on the other hand from the regulator renegeing on the promise to allow a fair return on sunk investments.

Newberry notes one more requirement; namely the need to protect the regulatory compact from third-party intrusions. The critical nature of regulatory commitment for ownership type lies in the fact that for a privately-owned network to dominate public ownership, society has to resolve in a cost-effective manner this inherent tension over distributional preferences.

That ability to resolve these problems (i.e., have a credible regulator) depends on institutional endowments and the degree of social cohesion within the society. This is a potentially fruitful area for further analysis. Meanwhile, a great deal of caution is in order while regulatory capacity develops and the best organisational form and its institutional requirements are hammered out. If I were to stake a position, I will find the government guilty of cautious optimism, but then rule that, *ex ante*, they appear justified in adopting such an attitude. I also find the ongoing debate and tension to be useful – organised labour more than any other part of civil society has been key in calling attention to the many unresolved issues that is deserving of further scrutiny, notwithstanding that some of their positions are arguably partisan.

¹⁹ Contrary to the orthodox assumption that all agents know the true model of the world and costlessly calculate their optimal plans, bounded rationality considers all contracts necessarily incomplete. Therefore, *ex post* institutions – dispute settlement mechanisms – are very important.

REFERENCES

- Batten, D. (1996)** "Infrastructure and the Complexity of Economic Development: An Exploratory Introduction." In *Infrastructure and the Complexity of Economic Development: Advances in Spatial Science*. Ed. D.F. Batten and C. Karlsson. New York: Springer-Verlag.
- Besley, T., and S. Coate (1995)** "Efficient Policy Change in a Representative Democracy: A Dynamic Analysis." Working Paper, Princeton University, May.
- Bos, D. (1993)** "Privatisation in Europe: A Comparison of Approaches." *Oxford Review of Economic Policy* 9: 95-111.
- Button, K. (1996)** "Ownership, Investment and Pricing of Transport and Communications Infrastructure." In *Infrastructure and the Complexity of Economic Development: Advances in Spatial Science*. Ed. D.F. Batten and C. Karlsson. New York: Springer-Verlag.
- COSATU. (2001a)** "Mobilise for the National Strike against Privatisation!" <http://www.COSATU.org.za/campaigns/privpatm.htm>
- . (2001b)** "COSATU Position Paper on Privatisation, Tabled at NEDLAC, 30 July 2001." <http://www.COSATU.org.za/docs/2001/privatpp.htm>
- . (2001c)** "Reconstructing Spoomet." Joint labour proposals from its Operational Efficiency Committee members: Submitted to Spoomet Human Resources & Turnaround Management, 14 September 2000.
- . (2001d)** "COSATU Submission on the Electricity Restructuring." Submitted to the Minerals and Energy Portfolio committees, 19 September 2001.
- . (2001e)** "COSATU Submission on the Consultation Document: Review of Rate Regime for Public Switched Telecommunications Services." Submitted to ICASA, 31 January 2001.
- Estache, A., A. Gomez-Lobo, and D. Leipziger. (2001)** "Utilities Privatisation and the Poor: Lessons and Evidence from Latin America." *World Development* 29(7): 1179-98.
- Culy, J., G. Read, and B. Wright. (1996)** "The Evolution of New Zealand's Electricity Supply Structure." In *International Comparisons of Electricity Regulation*. Ed. R. Gilbert, and E. Kahn. New York: Cambridge University Press, 312-365.
- Dixit, A. (1998)** *The Making of Economic Policy: A Transaction-Cost Politics Perspective*. Cambridge, MA: MIT Press.
- Eskom. (2000)** "African and Globally Competitive." *Eskom Annual Report 2000*.
- . (2001)** "Eskom Restructuring Update." *Eskom Release*, 31 August 2001.

Goldstein, A. (2001) "Comments on 'Corporate Governance and Privatisation: Lessons from Transition Economies' by Saul Estrin." December AERC Plenary Papers on Privatisation in Sub-Saharan Africa, forthcoming *Journal of African Economies, Special Supplement*.

Gramlich, E. (1994) "Infrastructure Investment: A Review Essay." *Journal of Economic Literature*. 32: 1176-96.

Hansen, C. (1999) "Regulatory Change and Competition in the South African Electricity Supply Industry." Paper Presented at the Trade and Industrial Policy Strategies (TIPS) Annual Forum, 19-22 September, 1999.

Humplick, F. (1996) "Does Multiplicity Matter more than Ownership in the Efficiency of Infrastructure Services?" In *Infrastructure and the Complexity of Economic Development: Advances in Spatial Science*. Ed. D.F. Batten and C. Karlsson. New York: Springer-Verlag

Laffont, J., and J. Tirole. (1993) *A Theory of Incentives in Procurement and Regulation*. Cambridge, MA: MIT Press.

Madisha, W. (2001) "My Word." Opinion, *Sunday Times*, Sunday, 26 August 2001, 15.

M-Cell. www.M-Cell.co.za.

Moe, T. (1990) "The Politics of Structural Choice: Toward a Theory of Public Bureaucracy." In *Organisation Theory*. Ed. O. Williamson. New York: Oxford University Press, 116-153.

Newberry, D. (2000) *Privatisation, Restructuring, and Regulation of Network Utilities*. Cambridge, Massachusetts: MIT Press.

Panzar, J., and J. Rosse. (1986) "Structure, Conduct, and Comparative Statics." Bell Labs Economic Discussion Paper # 248.

---. (1987) "Testing for 'monopoly' equilibrium." *Journal of Industrial Economics*. 35: 443-56.

Primeaux, W. (1977) "An Assessment of X-Efficiency Gained Through Competition." *Review of Economics and Statistics*. 59: 105-8.

---. (1998) "The Effect of Competition on Capacity Utilisation in the Electric Industry." *Economic Inquiry* 16:237-48

Republic of South Africa (1996). *White Paper on Telecommunications Policy*. Pretoria, South Africa: Government Printer, for the Ministry of Telecommunications.

---. (2000a) "Vision for Restructuring." *An Accelerated Agenda Towards the Restructuring of State Owned Enterprises: Policy Framework*. Republic of South Africa, Pretoria: Ministry of Public Enterprises, August.

- . (2000b) "ICASA Act 2000." *Government Gazette No. 21154*. Notice No: 462,5 May 2000.
- . (2001a) "Budget Speech By the Minister of Public Enterprises, Jeff Radebe." 1 June 2001, 1-4. <http://www.dpe.org.za>.
- . (2001b) "'Privatisation' Strike - The Facts." *Sunday Times*, Sunday, 26 August 2001, 27.
- Robinson, C. (1992)** "The Results of UK Electricity Privatisation." Working Paper, University of Surrey, Guildford, UK.
- Schumpeter, J. (1954)** *History of Economic Analysis*. New York: Oxford University Press.
- Sunday Times.** "Don't Blame COSATU for the Strike." Comment. Sunday, 26 August 2001, 20.
- Tirole, J. (1994)** "The Internal Organisation of Government." *Oxford Economic Papers*. 46(1): 1-29.
- Williamson, O. (1975)** *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.
- . (1985) *The Economic Institutions of Capitalism*. New York: Free Press.
- . (1994) "Emergence of the Visible Hand: Implications for Industrial Organisation." In *Managerial Hierarchies: Comparative Perspectives on the Rise of the Modern Industrial Enterprise*. Harvard Studies in Business History XXXII. Ed. A. Chandler, Jr., and H. Daems. Cambridge, Mass.: Harvard University Press.
- Willig, R. (1994)** "Public versus Regulated Private Enterprise." *Proceedings of the World Bank Annual Conference on Development Economics 1993: Supplement to the World Bank Economic Review and The World Bank Research Observer*. 155-178.
- World Bank. (1994)** "Infrastructure for Development." *World Development Report*. New York: Oxford University Press.
- . (1998) "Opening the door to new ideas." *World Bank Policy and Research Bulletin* 9(2).