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Special Edition

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TIPS Conference on Privatisation, Competition and Regulation in South Africa

Trade and Industrial Policy Strategies (TIPS) recently hosted a conference on the interaction between privatisation, competition and regulation in the electricity, transport, telecommunications and water sectors.

The *Privatisation, Competition and Regulation in South Africa* conference provided perspectives from both developed and developing nations, with policymakers, regulators, local academics and international experts, as well as speakers from the US, Latin America and Egypt, participating. Special attention was paid to distributional issues associated with the reform of state-owned enterprises, infrastructure investment and universal access.

Regulation of network industries, each combining elements of state ownership, liberalisation, privatisation and competition, is a complex task. Regulators are required to fulfil many, often contradictory, policy objectives – sometimes with an ambiguous or insufficient mandate from government. The economic decisions taken by the regulators and policymaking government departments are of critical importance to the long-term growth and development of these sectors, to downstream manufacturing industries and services sectors, and ultimately to the growth of the economy as a whole.

Policymakers in regulated industries are expected to design frameworks whose outcomes will mimic that of a competitive market structure. However, technically optimal solutions often take precedence over those economically the most favourable.

It is expected that the demand for research on utility regulation will increase in South Africa. Several new regulators are being established (gas, transport safety), while the existing regulators are launching the South African Utility Regulators Forum (SAURA) to focus on cross-cutting issues in utility regulation.

Extracts from three of the papers presented at the conference are included in this edition of the *Trade and Industry Monitor.*

The Triumph and Tragedy of Human Capital: Foundation Resource for Building Network Knowledge Economies

This is an extract from a paper presented at the conference by William H. Melody, Vodacom Visiting Professor – LINK Centre, Graduate School of Public and Development Management, University of the Witwatersrand

We enter the 21st century in the early phase of a fundamental transformation of the global economy. The 20th-century industrial economy is being transformed into an information and knowledge economy. This is changing the character of local, national and international economic, social, cultural and political activity. The primary forces driving this transformation are dramatic changes in technologies, markets and government policies, and a combination of the development and increasingly pervasive applications of information and communication technologies and services (ICTS) on one hand, and the worldwide movement to market liberalisation and deregulation on the other. The conversion of telecommunication networks and all forms of communication and information content to digital standards is creating an electronic network foundation that facilitates exchanges and transactions of all kinds. Electronic commerce and the next-generation Internet represent a further step in this process. Together with liberalised markets and reduced barriers to trade, this will ensure the 21st-century knowledge economy becomes primarily an international, even global, economy.

In the knowledge economy, the expectation is that people will be the central resource attracting investment because knowledge is essentially produced, stored and applied by humans. Whereas the industrial economy was an era of physical capital with labour employed to facilitate its needs,

the knowledge economy is expected be an era of human capital with investment in the skills, competencies and capabilities of people being the central activity.

Investigating human capital in network knowledge economies, one should evaluate how efficiently existing human capital is being allocated and used, and the direction of policy changes necessary to improve it. Secondly, one should look at how established knowledge institutions can meet the challenge of building the human capital needed for network knowledge economies. The success of knowledge economies in different countries and regions may depend critically upon the ability of knowledge institutions to adapt to the rapidly changing environment, and produce human capital and knowledge output that generate a high level of economic productivity.

The Allocation of Resources in the Industrial Economy

The Accomplishments

In many respects the economic well-being of people today is better than at any time in human history. Indicators of the number of people employed, average wealth, income, gross national product, real wage rates, life spans, health and unemployment and welfare benefits in most developed countries are greater than they have ever been. Average levels of literacy, education, training and skill development are higher than they have ever been. A significant level of human capital is evident in advanced economies, and large investments in building human capital are made continuously.

Resources and Markets Under Capitalism

Capital refers to valuable endowments that can be applied for a productive purpose over a future time period, what we might more readily recognise as assets. The allocation of capital to its most productive uses is done primarily through the interaction of supply and demand in markets. Traditionally many industries and markets have been regulated by national governments, primarily to protect domestic producers and employment in particular industries.

However, the global trend towards increasing deregulation of markets, at the same time as information and communication technologies and services are facilitating the expansion of markets to global dimensions, is dramatically increasing the role of markets in allocating money capital as well as the production and sale of goods and services on a global basis.

Throughout the history of capitalism, the priority resource for efficient allocation through markets has been money capital. The unemployment rate of money capital is less than 1% and global markets now facilitate the instant transfer of money capital around the world to the point where it can destabilise national currencies and entire national economies, as has been experienced in South Africa (SA) and Argentina.

The second most important resource in industrial capitalism has been physical-capital – the production facilities of industry and other physical assets, such as buildings, cars and personal computers. Although investments in physical capital are always made with expectations of efficient and profitable use, the uncertainties of demand, technological change, unexpected competition and the business cycle create inefficiencies, wasted resources and bankruptcies. But even here the remaining value for future productive use stimulates careful attention to the preservation and enhancement of physical-capital assets. Lost investment from the abandonment of physical capital assets (derelict plants and buildings) as a percentage of the total investment in such assets is relatively small, although in a global market this can be devastating to specific localities and even small countries.

To illustrate, a few years ago the use and profitability of long-distance telecommunication transmission capacity in the US, Europe and across the Atlantic was high, and expectations for explosive growth and continued technological improvement great, so capacity was expanded using the most advanced fibre-optic cable. Today there are a number of bankrupt companies and substantial excess capacity waiting to serve the growth in demand that has been postponed to a more distant future.

The value of these assets is a lot less than anticipated, but they are still valuable physical capital, and serious attention is being paid to preparing these unemployed assets for future productive use. Comparable attention is not being paid to the associated excess capacity created in the human capital employed by the bankrupt companies. These human assets are being abandoned by old and new owners in great numbers, without regard to their capabilities for future production.

Under industrial capitalism, the efficient allocation and use of the labour resource has been a third-tier consideration for several reasons. First, the major demand has been for unskilled and low-skilled labour for which there generally has been an ample supply. Shortages in one country can be met by immigration from another. Secondly, society's rejection of slavery and indentured service has removed the property rights in direct ownership of labour in most parts of the world, so organisations do not consider employees as assets. Employees can leave an employer or be dismissed on short notice – particularly in relation to the long lives of investments in physical capital. Physical capital assets are a fixed cost. Labour costs are variable and flexible. The labour resource bears the primary uncertainty and inefficiency imposed by market instabilities.

This differential treatment of money capital, physical capital and labour or human capital under industrial capitalism has meant that less attention is directed to the efficient use of labour than to the other resources. Demonstrable inefficiencies in labour markets are not only wasting potentially valuable human resources, but also contributing to significant human misery.

The Market for Human Capital

Employment in the EU

Unemployment in Europe has been reduced pretty much to what economists call the "natural rate of unemployment" – the minimum achievable in a dynamic economy – and there are even labour shortages in some areas. So an unemployment rate of about 9% or 17-million people in the EU is about as good as can be expected.

The youth of today represent the backbone of tomorrow's knowledge economy. But the aggregate statistics for particularly youth employment (people under 25) tell a very different story. Across Europe, youth unemployment is two to three times the average unemployment rates, and sometimes higher. (A massive programme launched between 1995 and 2000 in Spain has reduced youth unemployment from 40% to 28%.)

With governments seeking to get employment numbers up and unemployment numbers down over the years, the definition of employment has expanded to include part-time and relatively short-term employment, especially with women becoming more active in the labour force. A third category of people has been created for those not actively seeking work – usually because of a lack of success in previous efforts – but are considered to be employable. In addition, a significant percentage of people are not in positions that use their basic skills and training. So they have jobs but their existing human capital is not being used most productively.

These factors suggest that even under current conditions of relative full employment, there is huge underemployment of human capital capability in the EU, which, if applied to physical capital or money capital, would be considered a massive depression.

The Global Labour Market

The International Labour Organisation (ILO) estimates that 66-million young people are unemployed worldwide – about 41% of total unemployment. Across Latin America, youth unemployment rates range from 36% to 66%. Comparable statistics are reported across Africa, the former Soviet Union countries and Southern Europe. Even with significant economic growth in the world economy between 1995 and 2000, world youth unemployment increased by eight- million. (ILO 2000 a).

Despite the fact that a significant number of the most skilled people in many developing countries have been attracted to developed countries to meet skill shortages, and the existence of large informal and black economies functioning in developing countries, evidence indicates that underemployment of people – unused and under-utilised skills – is also far greater than in developed countries. Today there are more refugees in the world than at any time since the Second World War. Most are economic refugees, people looking for jobs to sustain a better life.

The Global Knowledge Economy

Notwithstanding, employment trends suggest a continuing increase in the numbers of skilled jobs, with the information and communication technology (ICT) and knowledge industries driving economic growth. Is it likely that the ICT revolution and the transformation to a global knowledge economy will change the current trend to inefficiency and waste in the use of labour? Will the continued liberalisation of markets bring about a more efficient allocation of human capital resources? Can the latent potential of human capital be unlocked by exploiting the opportunities made possible by next-generation Internet capabilities, liberalised markets and an expanded role in the economy for the human capital production sector – education, training, research and development?

These developments do make it possible to reverse the global trend of increasing unemployed and underemployed human resources, but by no means guarantee it. This will depend in part on national and international government policy and funding priorities, and also on how effectively telecoms and Internet infrastructure resources can be used by transformed education and training institutions to serve a vastly expanded number of people with an increasing variety of education and training needs.

The Unbalanced Structure of Market Liberalisation

The worldwide deregulation of markets has proceeded at a very uneven pace. The virtually complete deregulation of financial markets, combined with new global information and communication financial networks, has provided for such rapid movements of money capital around the world that it is causing instability. Some analysts think it has gone too far, encouraging financial speculation and 'casino capitalism' rather than investment in productive activity. The liberalisation of production and services markets is proceeding more slowly through negotiations at the World Trade Organisation (WTO) on a sector-by-sector and industry-by-industry basis, but major steps in liberalising markets have been taken over the last 15 years. More industries are subject to global competition, and consumers can buy more products and services in global markets.

Deregulation is having a demonstrable impact on product and services markets and on resource allocation. But the liberalisation of labour markets has yet to get off the ground, primarily because rich countries fear being invaded by an army of surplus unemployed from developing countries. The impeccable logic of the efficiency of markets and the improved productivity from resource allocation on a global scale, which is immediately accepted for money capital and in principle for physical capital in product and services markets, somehow has not been applied to human capital, which remains highly regulated, with even tighter restrictions being adopted by many rich countries today. Neither this inefficiency in the allocation of human capital, nor the accompanying hypocrisy in the rich countries, is sustainable. In the so-called global knowledge economy, policies of liberalisation must be extended to the labour market. A global knowledge market can only function

efficiently if there is a global market for human capital. Clearly there is considerable evidence of market failures in some labour markets, as there is in some capital and product markets. An immediate deregulation of the world's labour markets might create even more instability than deregulation of the capital markets. The challenge is to consider steps to the efficient deregulation of all markets for economic resources in a co-ordinated and balanced approach. This suggests a very clear policy agenda to improve the allocation efficiency of all resources in a global knowledge economy:

- Increased regulation in financial markets to reduce incentives for speculation and market manipulation, to achieve greater stability and efficiency.
- Decreased regulatory protection of economic sectors in the rich countries for which poor countries have an international comparative advantage – especially in agriculture and textiles.
- A gradual liberalisation of international labour markets to improve the efficiency of the market allocation of labour resources.
- Significantly increased levels of investment in building human capital by all sectors of the economy, including governments and corporations.
- Massive increases in access to education, training and skills-development institutions and resources, possible because of the expanding capacity of the telecoms network infrastructure and innovative applications of Internet capabilities.

Building Human Capital for a Global Knowledge Economy

The Investment Environment

As there is widespread acceptance by politicians and governments of the transformation to a knowledge economy, one would expect an associated increased allocation of financial resources to education and training, and the establishment of government commissions to examine how the education and training sector can be restructured to meet the enormous new demands.

Worldwide, national governments have issued information society policy statements; the European Commission has an Information Society Directorate; and the 2002 annual meeting of the G-8 country leaders highlighted information society development issues, with particular emphasis on overcoming the 'digital divide' between rich and poor countries. SA has appointed a Presidential Commission on the Information Society.

But government funding of universities, training institutes and research and development – measured as a percentage of total resource allocation – has been declining steadily for several years across most countries, rich and poor. Although this can be attributed in part to a failure of governments to comprehend the contradictions in their policies and the magnitude of the task ahead, it is primarily due to a lack of confidence that existing education and training institutions can deliver the knowledge and human capital needed for the new economy. Rather it is hoped that in a deregulated market environment, the private sector will contribute largely to building new knowledge and human capital, and provide a competitive stimulus for some fundamental reforms by public-sector educational institutions.

Creating New Network Universities and University Networks

Historically, educational institutions have been highly resistant to change, with the basic organisation and structure remaining largely the same over the last 300 years. Universities, with a few exceptions, have been slow to take advantage of the potential of the Internet. Yet the learning and knowledge business is more suited to benefit from information sharing over communication networks than many others.

North American, Australian and British universities have a head start over other universities. Operating increasingly in a global education and training market, these countries now count education and training exports in the trade accounts.

Almost anyone can be an effective teleworker. The capacity to teach students or undertake research in many areas is not constrained by the physical capacity of buildings, classrooms and offices. Many leading universities are already becoming quasi-virtual organisations. Although seminars and meetings with a physical presence are an essential part of learning, they will no longer be the dominant foundation of university courses or most research projects. Rather each course and research project will be a virtual network of people, with a faculty leader. Student access to courses will become much easier. Professors and most staff will no longer need private offices. The capacity of a university to serve students well and undertake high-quality research need no longer be constrained by the capacity of physical resources, but only by the capacity of the human capital employed by the university. This permits a massive increase in the capability of universities to provide programmes at dramatically reduced costs per student. To render this more concretely: if one-third of the global staff of IBM – primarily a producer of physical products – has no offices, universities as primarily producers of intangible learning and research services can most certainly adopt similar structures.

The next-generation Internet will make the even wider sharing of university resources possible. The productive twinning of universities, university programmes, faculties and students in rich countries with those in poorer countries can help to improve the quality and quantity of education and training in these countries. Electronic access to university libraries and course materials, and even direct participation in virtual courses in the wealthier countries can enhance the productivity of universities in poorer countries at very little additional cost. This kind of quantum leap in the capacity and service of universities and training institutes in both rich and poor countries is not only possible, it is essential if the youth unemployment rate is to decline, and if the global knowledge economy policies are to be converted from rhetoric into reality.

Creating More Relevant University Programmes

But what about the relevance question? If government and corporate leaders do not believe that existing education and training institutions can deliver the knowledge and human capital needed for a knowledge economy, there will be no opportunity for these institutions to make the major structural adjustments necessary to respond to the opportunities available. Direct and productive linkages between the university and a variety of external institutions, including government agencies, corporations and foundations are vital – not simply to cultivate funding for university research – but to provide a basis for specialised training programmes and exchanges of personnel for short and longer periods, with considerable flexibility in how they are implemented. This enables the university to better understand the real needs of external institutions, including funders, and gives the external institutions continuing benefits throughout the university programmes.

Further, the disciplinary foundations of traditional programmes devoted to the study of technologies, the economy, government policy and regulation – primarily engineering, economics, management, political science and law – must be broadened.

Full-fledged multi-disciplinary programmes in ICTs and the network knowledge economy have been established at many universities to connect the relevance of academic teaching and research programmes, and the knowledge and skill sets of the students to the changing needs of the external organisations employing them and the knowledge societies in which these students will live.

Progress requires constructive participation by a diverse array of organisations and people from several industries and disciplines, many of which were previously restricted by inherited policies, regulations and institutional arrangements. The liberalisation policies of the last 30 years have been about broadening the participation of capital, institutional and human resources in the development of network knowledge societies.

Efficiency and Road Privatisation: Bidding, Tolling and the 'User Pays' Principle

The second extract is from a paper presented at the Conference by ***Anthony Leiman*** *– School of Economics, University of Cape Town*

Background

Tolling lies at the centre of the privatisation process and the 'user pays' approach. But it is a funding tool with a number of limitations. First, despite a common view that it 'levels playing-fields' tolling may increase distortions. Next, even if 'optimal tolls' could be determined, they would still engender systemic inefficiency unless imposed universally on all roads. Finally, a build-operate-transfer (BOT) agreement funded by toll payments can be a source of contractual inefficiency. Examples of such principal-agent issues are identified in the design of a current contract between the toll companies and the SA National Roads Agency (Sanra).

In recent years the number of toll-roads in SA and the volume of traffic they carry have increased sharply. Some of these roads were constructed by the private sector on a BOT basis. Others were originally built and maintained by Sanra who subsequently outsourced the operation, maintenance and toll collection to the private sector. Since September 1997 the process has also included unsolicited bids: private consortia obtaining the right to toll traffic on a route by paying Sanra for an existing road and agreeing to maintain it for a fixed period.

Privatisation and the Unsolicited Bidding Process

Although competitive tender procedures remain in use, Sanra allows the option of privatisation through unsolicited private bids. Ideally these would fund the fiscus while retaining the efficiency of private operation – without the wasteful effort replication of the conventional tender process. Typically a consortium of contractors, operators and banks approaches Sanra with an offer to construct a new road or to take over the management and maintenance of an existing one, on a BOT contract. If Sanra accepts the proposal, other consortia may present counter-bids within 60 days. However the high cost of preparing such a bid generally precludes counter-bidders.

SA's domestic civil engineering market is small and dominated by a few large firms, and the bidding to date has been notably free of corruption or inefficiency. However any process that allows oligopolies to form consortia that take over national assets will face public concern about collusion and impropriety. The mere perception that a cartel of engineering firms handles the entire arterial road system may engender political and social costs. Probity and the minimisation of political costs require not only that the bid offer be truly competitive, but that it be seen as such by the affected public.

Currently Sanra maintains SA's roads using funds allocated by parliament. It performs some of the work itself, with the remainder of the upkeep and construction activities put out to tender. Privatisation is seen as an alternative process that contributes present funds to the fiscus and reduces

subsequent demands on it. But operation by a private-sector consortium is not the only option. A common alternative elsewhere has been the formation of independent turnpike or toll authorities. The boards of such authorities include representatives of the major interested parties such as local business and residents, and local and national government. Turnpike authorities identify and prioritise activities on their roads and put them out to competitive tender. The unsolicited private-sector bidding process (in which consortia are profit motivated) must compete with this non-profit administrative structure.

Efficient Tolling

Government's transport policy document, *Moving South Africa*, requires that the tolling system be economically efficient.

Economic efficiency requires that the price paid by a road-user equals the marginal social costs incurred.[1] It requires that each road user pays toll fees equal to the incremental costs which that user is imposing:

- On maintaining the road – marginal operating costs.
- On other road users – marginal external costs.
- For the road itself – amortisation/interest on capital expended.[2]

The document also states that no group of users should cross-subsidise another – the first point of failure. Small car drivers subsidise heavy commercial vehicles, and on some routes users of one section of road tend to subsidise users of another. For example, the proportion of large commercial vehicles in the total traffic flow rises as one moves away from large cities. Background documentation on the proposed N1/N2 toll road near Cape Town gives insight into the problem. Along the N1 (which may be tolled between Sandhills in the Little Karoo and Cape Town), it rises from 8% in urban Cape Town, to 28% at Sandhills in the Karoo beyond Worcester. On the other hand, the total traffic volume on the N1 at Sandhills is only one-twelfth of that carried when it reaches Cape Town. The implications are clear. If passenger car and light delivery-vehicle drivers are not to subsidise heavy commercial vehicles, and if users of one section of the route are not to subsidise another, the ratio between the toll paid by a heavy commercial vehicle and that paid by a light vehicle will have to vary more substantially along sections of the route than is currently the case. The current lower and upper limits of the ratio on SA toll roads are 2.75:1 and 7.63:1 (see *http://www.transport.gov.za*).

If we look at an existing road handed to a toll corporation for a fixed period, treat efficiency in a partial equilibrium sense, and the highway as a single road with no substitute or complementary routes and hence no systemic impacts (since there is no deviation of traffic), there will be five clear components to full-cost tolling[3]:

- A share of maintenance costs unrelated to use.
- Damage to the road done by the user – which increases exponentially (roughly to the fourth power[4]) with axle loading.
- A pro-rata share of the amount the consortium has paid Sanra for the road.
- Other external costs, including environmental externalities such as air and noise pollution associated with highways, and congestion externalities that increase with traffic density and also tend to vary directly with vehicle length and inversely with speed.
- The cost of toll collection and administration.

The first refers to the ongoing expenditures to maintain a road in good condition. The second and third elements cover amortisation of the road and its deterioration with use. The lifetime over which the owners of a road can seek a return on their capital is affected by the type and volume of traffic using it and by details of its construction. Both maintenance and depreciation of roads are linked to the axle loading and axle configuration of the vehicles using it. Optimal pricing therefore requires an axle toll per kilometre that rises exponentially with loading, but first takes into account the number of axles and their configuration. The basic toll would depend on road characteristics such as thickness and structure of the surface, foundations, substrate, and presence and length of bridges.

However, on any stretch of tolled road in SA, the current basis for the charge is simply the number of axles (and the road's characteristics). This method is fundamentally incapable of accurately capturing the damages imposed on a road by heavy vehicles! Its sole advantage is that it can be applied easily without unduly slowing the passage of large commercial vehicles through tollgates.

The fourth component of the toll should be an amount equal to the marginal external cost imposed by the vehicle. Theory insists that those who bear externalities should not be compensated (Baumol and Oates, 1988: p23-25). The moneys raised can, however, be used to ameliorate the problem. So, where a major road runs through a residential area, modern engineering can reduce noise. A Pigouvian approach may not be appropriate for some externalities, such as vehicle exhaust emissions. If vehicles with serious exhaust emissions are a small minority, a tax based on average levels of emissions is both unjust and ineffective. The administrative costs of a tax based on the true marginal external cost of the emissions from a vehicle would be too high for it to be feasible. A better solution would be to specify an acceptable standard of exhaust emission and conduct random checks. The penalty for failing the test would vary geographically – low penalties in rural areas and higher ones in urban areas where the value of the externality is greater (ideally such monitoring would be in conjunction with a trip permit system using compliance weights).

A more important externality is congestion. Once the traffic on a road reaches capacity, each extra car tends to slow the entire stream of vehicles. This marginal impact may be addressed through a congestion tax – a toll that varies with

time of day is a form of peak load pricing. It may also include a specific 'rush-hour' levy on long or slow-moving vehicles that could disproportionately slow traffic down. Such congestion taxes have not been introduced on any of the country's toll roads to date; they do, however, warrant consideration. It is worth commenting that a congestion tax is theoretically more efficient at solving congestion externalities than simple regulations such as allowing even number plates on one day and odd number plates on the next, or precluding cars with no passengers from city centre roads over rush hour, both of which are used abroad.[5]

If a toll company actually builds a road, a further factor enters the analysis. Thickening the surface of a road yields more than proportional increases in its ability to handle heavy traffic. Newberry (1988,1990) suggests that doubling the thickness results in roughly a hundredfold increase in the traffic a road can sustain before needing resurfacing. As regulations have eased, allowing ever-heavier vehicles onto the roads, Sanra has prescribed ever-stronger roads and bridges. The resulting increased capital cost is a consequence of the need imposed by the heavier vehicles in use, and should be reflected in the share of interest repayment borne by them. This is an aspect not recognised in models that address only maintenance expenditures (for example, Newberry, 1988, 1989 and 1990).

One obvious weakness of SA's current tolling formulae is that the tolls levied are not based on actual axle loading, but on potential vehicle capacity (number of axles). A vehicle laden to the legal limit pays no more than one carrying a lesser load. The implicit incentive is to reduce the number of vehicles and to load them more heavily. This reinforces the effects of existing scale-economies in road transport, which already induce overloading.

Even more central, an increase in the number of axles reduces the damage done by a given load, yet the SA tolling system increases the charge as the number of axles rises. A true 'user pays' toll should be based on a combination of loading per axle / number of axles / distance covered. Such tolling systems are already used in such diverse places as Oregon and Iceland, New Zealand and Norway. In SA the transactions costs of establishing and monitoring such a toll are immediate constraints to its introduction.

Efficiency of the Overall Transport System

In a partial equilibrium sense, efficiency on a toll road is achieved when users pay a toll equal to the marginal social cost. Transport, however, is a general equilibrium problem. Tolling one road in a network has impacts on traffic flows elsewhere. It can lead to distortions and unexpected costs that threaten the efficiency of the overall transport network. Currently the bulk freight transport system is already subject to distortions. Thus Spoornet, the rail operator, not only covers the running costs of its own haulage operations, but is also responsible for all track construction and maintenance. In contrast, hauliers do not pay for road damages or clean ups (such as chemical spills) necessitated by accidents involving trucks, while rail operators cover all cost when accidents occur. Road hauliers have no variable tariff to make them liable for either road construction costs or for their share of road maintenance costs. While such distortions are in place, the market mechanism cannot be relied on to allocate resources efficiently.

This pattern of distortions and the advantages enjoyed by road hauliers over rail are especially marked in SA, since the maximum gross vehicle mass allowable on the roads is 56 tonnes – well above the limit of 48 tonnes in the early 1990s, and far above the 38 tonne limit in the US, Mozambique and Angola. Overloading is a further factor. The Council for Scientific and Industrial Research (CSIR) and the Road Freight Association[6] estimate that 15% to 20% of vehicles are overloaded, and that these are responsible for about 60% of road damage (valued at R600-million annually). Legally loaded heavy vehicles are doing the bulk of remaining damage, and light vehicles virtually none.

The tolling process has two weaknesses that tend to increase externalities and reduce the efficiency of the transport system. First, tollbooths slow down traffic flow, increase accident risk and add to noise and air pollution in their vicinity. These problems are easily mitigated with new technologies such as automatic vehicle identification (AVI). Secondly, rather than simply 'levelling the playing fields' between road hauliers and Spoornet, tolling an open highway shifts costs onto the state and local residents as heavy vehicles use secondary roads to avoid tolls. The potential for tolling to divert heavy traffic onto alternative routes less able to sustain it should be seen as a source of systemic inefficiency.

Electronic tolling technology, based on AVI, can be used to ameliorate these problems. Once in place it lowers the costs of monitoring the movements of large vehicles. Systems of either regulation or taxation aimed at keeping such vehicles on the arterial roads designed to support them can then be introduced. Also, electronic tolling reduces the proportion of traffic moving through tollbooths, reducing the problems mentioned earlier. A potential further benefit is better tracking of stolen vehicles. At the moment AVI is only cost effective on high-volume commuter routes.

When toll roads are mooted, job creation and skills generation are sometimes cited as positive externalities of manned tollbooths. From an economic point of view neither is a true externality, though both may be relevant as political considerations.

Alternatives to Tolling

Shadow tolls: The managers of a road (private or state) are funded from a central purse. The payment depends on the volume and type of traffic, and on the nature of the road (the costs of maintaining that road plus necessary expenditures to improve it). The sources of the fund are taxes on fuel and tyres, and additional duties on motor vehicles and spare parts.

Shadow tolling does not guarantee a viable, high-quality

road infrastructure in the same way a simple, privatised toll road system does. Though fuel levies have existed in SA for many years, the county's fiscal system treats all tax revenue as fungible and precludes revenue targeting.[7] Revenues raised through a particular tax cannot be reserved for a single pre-specified use; instead they go into a central fund and are then allocated across all competing uses via the budgetary process.

Despite public belief, fuel levies do not automatically go to the coffers of Sanra. More importantly, even if the fiscal process changed to allow revenue targeting, fuel levies could not be efficient. An individual engine's fuel consumption is not directly linked to road usage or road damage. For example, a tax on diesel fuel would affect drivers of small delivery vehicles, of tractors and users of generators, as well as hauliers using large vehicles on the roads. Scale economies enhance the appeal of large vehicles. Certainly fuel use rises with vehicle mass, but it does so at less than an arithmetic rate, while road damage done rises exponentially So from a theoretical efficiency point of view, a simple fuel levy is not the answer, since it cannot act as an optimal Pigouvian tax to internalise the externalities of heavy vehicles. This does not mean that fuel levies have no place; they might help to internalise externalities related to speed, since both the severity of damage to third parties and fuel consumption rise with vehicle speed.

Annual vehicle levies are widely used internationally and in SA. However, they typically appear as lump-sum annual licence fees. A lump-sum tax is effectively a change in fixed costs that leaves variable (and hence marginal) costs unaffected. It can affect the decision to enter or leave an industry, but should not affect the operating behaviour of those who do stay. Efficiency requires the internalisation of external costs; a fixed charge per vehicle is neither likely to achieve this nor to be consistent with the requirements of *Moving South Africa*. Theory prescribes a tax on variable costs – ideally one that varies with actual road use (deterioration caused). Unfortunately implementing such a tax would be difficult without AVI technology and sealed odometers in all heavy vehicles. Optimality would require that vehicles be weighed at random intervals and locations, and annual mileages monitored. A levy based on the observed mean and peak gross vehicle masses, and the annual mileage covered would then be levied and targeted for road maintenance. Immediately a number of problems appear: revenue targeting would be required, monitoring and revenue collection would be expensive, the potential for evasion and corruption would be substantial, and the actual use of the funds would have to be monitored. To avoid double taxation, rebates would be needed for heavy vehicles using privately constructed toll roads. Only in the absence of transaction and monitoring costs could such a system be regarded as ideal. The alternative is to levy a charge on each trip undertaken by a vehicle – a trip permit sale.

Trip permit sales are suited to the internalisation of external costs and the achievement of system-wide economic efficiency. Certain US states issue permits for each trip undertaken by a heavy vehicle. The prices can be used to capture the road damage costs generated by the vehicles used. For example, Minnesota imposes a permit charge based on the axle configuration, weight carried, number of axles and distance covered (Federal Highway Administration. March 1995. Volume 2, Ch 2. 22/23.). With adequate monitoring, appropriate penalties and a sound bureaucracy, such permit sales could circumvent some of the efficiency problems of toll roads. The permit can be used in conjunction with a weighting factor designed to improve the level of compliance with vehicle regulations. Examples are the recommendations made in New Zealand and the US for a register of vehicle operators in which compliance with such factors as speed limits and load limits would be recorded. Operators with a record of overloading would be penalised by the implementation of a higher weighting.[8] Advocates of this approach state that many vehicle externalities are consequences of operator behaviour rather than the legal operation of heavy road rigs. The combination of trip permit fees and compliance weights can help to address both problems.

Administratively the introduction of a viable trip permit sales system would need an overhaul of the transport administration process in SA. It seems unlikely that trip permit sales will be politically feasible in the near future.

Funding through debt: The efficiency of the transport infrastructure has an interesting alternative dimension – *funding efficiency*. Historically, road construction in SA was primarily funded by the state, either from tax revenues or through state borrowing. Since the state is effectively a zero-risk borrower, it should be able to raise funds more cheaply than the private sector. More arguably, the collection and diversion of tax revenues should be less expensive than the collection of toll revenues. Despite these points, merchant banks and toll consortia increasingly handle the funding of road construction and maintenance.

A further factor is that, though the merchant banking industry is highly competitive in both raising and lending funds, the contract between the state and the toll concessionaire may restrict the fundraising approaches open to the banks. Indeed, substantial proportions of earlier contracts have been devoted to the regulation of funding. This principal-agent problem introduces the issue of contractual efficiency.

Contractual Efficiency

Contractual efficiency is achieved when monitoring costs and opportunities for rent-seeking behaviour are minimised. An additional dimension appears when a contract is not intended to run in perpetuity. This is the case with the BOT format popular in recent years, a key feature of which is a fixed end-date. A fixed-period contract means that the property rights of the agent are incomplete and the incentives accordingly distorted. These have to be corrected if toll consortia are to act as Sanra wishes. Certain features are known to help obviate shirking and self-seeking

behaviours in agents (Lawther. 2000: p160):

- The expectation of repeated future contract opportunities (including re-bidding once the operating period is complete)
- Difficulty in collecting unobserved income flows or other benefits
- Stable corporate hierarchies in both parties and low costs of keeping contact
- Agents who monitor their own staff
- Short hierarchies

At the beginning of the operating period, the interests of the two parties are likely to be congruent. As one would expect, the divergence between the interests of Sanra and the consortium increases as the transfer (end) date approaches. The incentive to spend money on road maintenance declines as the end of the contract approaches. It is in the consortium's interests to look after the road well at first, since it is the source of its future income stream. As the end of the contract approaches, however, the returns on maintenance expenditures decrease. By the final period of the contract, unless the firm is hoping to renew the contract, and reasonably expects to do so, there is virtually no incentive to spend money on road maintenance.

Conclusion

Road privatisation in SA has had a number of dimensions.

- Divestment as the State effectively sold roads to consortia.
- Delegation of responsibility for new construction as the state licensed consortia to build and maintain roads.
- Public transport and carriage of freight: the actual use of the road has been deregulated to some extent, with both public transport and freight increasingly in the hands of private carriers.

If the economic test of regulation is whether or not it improves the allocation of resources, SA's experiences may be illuminating. As the traditional freight carriers – the state railways – were privatised (to form Spoornet), they were confronted by new state regulations that raised the maximum gross vehicle mass to 56 tonnes, an unusually high level by international standards. The greater flexibility of road transport, and the economies of scale present when trucks are heavily loaded, saw increasing proportions of freight diverted from rail to road. The state's failure to recover the costs these vehicles imposed on the road system distorted the system further in their favour and made the current system unsustainable without cross-subsidisation by taxpayers and drivers of small vehicles. One of the issues raised in this paper is whether or not tolling, as currently practiced, helps to rectify this distortion. It is clear that the current tolls are too low to do so and that systemic inefficiencies would follow if they were raised in the absence of appropriate tolls on secondary roads, and efficient vehicle tracking systems.

SA is a country with a high-quality road infrastructure, but a shortfall in the funding needed to maintain it. In the course of public meetings on unsolicited bids for the privatisation of arterial roads it has become clear that 'interested and affected parties' are willing to pay for the certainty that these roads will be maintained in future. What is not clear is how much they are willing and able to pay, how payment should be exacted, and what economic efficiency suggests it should be.

The second of these problems is the easiest to answer. The introduction of AVI, especially if done in conjunction with global positioning technologies, will make trip permit sales for heavy vehicles increasingly viable. The mass, axle configuration and route of each vehicle will determine the tariff paid on an entire trip. This seems the one means of charging for road use that has the potential to internalise the costs imposed by heavy vehicles. Whether road hauliers will remain competitive if required to pay permit prices that do so is not discussed. But it is clear is that the transport system does not yet accord with the ideals of *Moving South Africa* and that Sanra needs to rethink seriously the practice and advised levels of tolling.

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End Notes

[1]This is the standard marginal cost pricing result; see for example Baumol and Oates, 1988: p36-47.

[2]The list can also include conventional externalities such as noise and air pollution, however, the opportunity cost of the land should not be included. Roads and road reserves use up a substantial amount of land, but landowners are paid out. In an efficient market the price paid to say a farmer is the present value of the net revenues the land could have generated. Clearly inclusion of such lost revenues would constitute double counting.

[3]There is clear overlap with the three components of marginal cost pricing mentioned earlier.

[4]For a critical analysis see p13 of Cebon D.

[5]A well-known example of the former is Singapore and of the latter is Jakarta.

[6]Engineering News 2001. Vol. 21 (37): p17

[7]Note, however, the following statement from the Department of Transport. "Grants from Fiscus: This source is an allocation from government to fund the construction and maintenance of non-toll roads. The Agency uses the national petrol levy as a surrogate for direct user charges to finance its work. To this end, the Ministry of Finance has undertaken to allocate to Sanra an amount equal to 5c for every litre of fuel sold during 1998, rising to 6c/*l* in 1999." http://www.transport.gov.za/search/index.html

[8]A weighting of 1.0 would mean the operator paid only the regulation trip permit levy. If his vehicles were monitored speeding or overloaded, this might rise to say 1.1, which would increase subsequent trip permit fees by 10%.

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Economic Regulation of Water

The third extract is from a paper presented at the Conference by Rolfe Eberhard – Palmer Development Group.

A Changing Context

For the regulation of water services to become more effective in SA, greater attention needs to be given to economic regulation, and it should be situated within the broader regulatory framework in SA. At present there is little understanding of economic regulation in the water sector, the appropriate methodologies to be employed, and the practical implications of undertaking economic regulation.

Why Focus on Economic Regulation?

What is Economic Regulation?

The two fundamental arguments for economic regulation in the water sector are:

- Market failure: The bulk water supply and distribution industry is a natural monopoly. Natural monopolies should be regulated to protect the public interest.
- Public interest: Water is a public good with benefits and costs that extend beyond the direct provision of services to individuals. Government must ensure that the interests of the public are protected through the regulation of investment and pricing decisions (two key aspects of economic regulation).

The overall objectives of economic regulation may be defined as protecting the public interest through the promotion of effective, financially viable and sustainable water services, ensuring adequate (but not excessive) investments in infrastructure, appropriate pricing and promoting the efficient use of water.

Why is Economic Regulation Important?

Urban retail water supply is a natural monopoly and the scope for competition is limited to the procurement of services (for example related to construction) and entry into the market (in the case of term-limited franchises). It is necessary to regulate retail water supply services because monopoly enterprises generally have few incentives to invest or operate efficiently and because customers are captive to the water service provider and need protection from monopolistic pricing. Although a legislative framework for the regulation of water supply is set out in the Water Services Act and more generically in the Municipal Systems Act, this framework is limited in its understanding of economic regulation.

In SA, the water distribution sector is dominated by public-sector monopolies that are owned and operated by municipalities. Historically, regulation of the water sector has focussed on the technical and environmental aspects of water services. More recently (post-1994) greater attention has been paid to the regulation of services for public benefit, specifically with respect to the universal provision of basic services.

Although little attention has been given to date to economic regulation, existing legislation contains some of the basic elements required to establish a framework for the practical implementation of economic regulation of water services. The water sector is a significant and important industry in SA. Annual water sales for industrial and urban water use are estimated to be 4,000-million kilolitre (*kl*). If it is assumed that the average sale price is R2.50 per *kl*, the annual turnover of the water industry is about R10-billion. An efficiency gain of just 5% would result in a benefit to the country as a whole of R500-million per year. Given the general absence of any real and significant level of economic regulation of water services at present, such an efficiency gain should not be hard to achieve with the establishment of effective economic regulation. For example, a 5% efficiency gain on the part of water boards in the form of reduced capital investments would result in an annual saving of R50m (in capital investment) and R150m in operating expenses.

Economic Regulation as Part of a Broader Whole

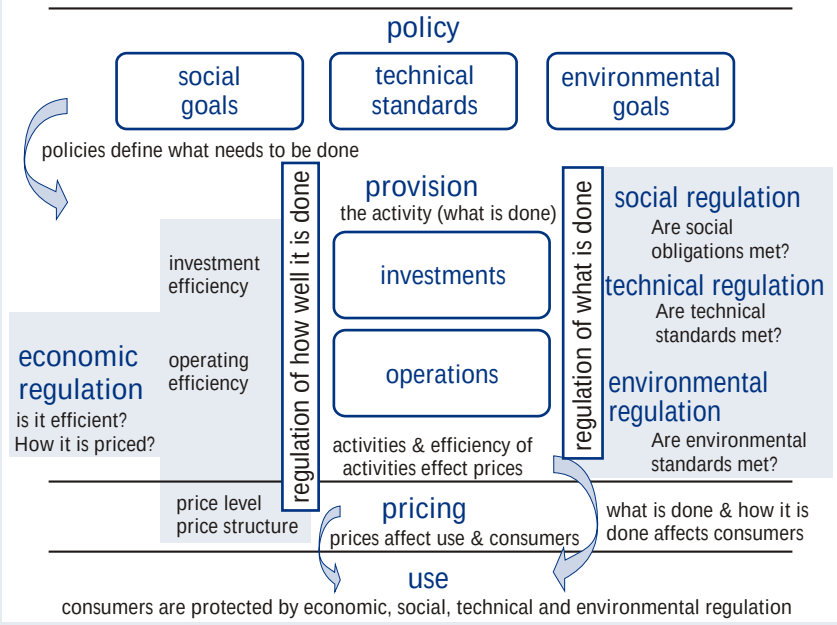
To be effective, economic regulation must take place within a holistic and integrated regulatory framework. The overall objective of regulation is the protection of the public interest. In terms of the National Water Policy White Paper (1997) and the National Water Act, the objectives of regulating water services in SA are threefold:

- Ensuring equity and public benefit – universal access to basic services, the more equitable distribution of resources and safeguarding public health. Two important aspects of this regulation are service coverage targets and minimum standards of service.
- Ensuring sustainability – in terms of financial, institutional and environmental sustainability. Financial

sustainability is promoted through pricing and subsidy policies and by ensuring adequate access to capital finance and operating resources. Environmental sustainability is promoted through environmental regulation (water demand management, pollution/effluent management and control, environmental impact assessment requirements, and strategic environmental assessments). Institutional sustainability is promoted by ensuring organisations are fit-for-purpose, effectively managed, adequately resourced and operate within a sound incentive environment.

- Promoting efficiency and effectiveness – ensuring that resources are used efficiently, the application of resources achieves the desired goal, and wastage is minimised.

Figure 1: Conceptual Framework for Regulation



Internationally, governments typically apply a range of instruments to regulate public-service industries, particularly where they involve natural monopolies. These include:

- Technical regulation to influence service outcomes such as the quality of water supplied to consumers.
- Environmental regulation to influence environmental outcomes such as the protection and conservation of ecosystems.
- Social or public-benefit regulation to influence social outcomes such as the provision of basic services to households.
- Economic regulation to influence economic outcomes such as costs and efficiency of service provision (investments and operations), prices, financial sustainability, the level of return on assets and the extent to which a monopoly profits.

The technical regulation of water services in SA is well developed. The Department of Water Affairs and Forestry (DWAF) has also given attention to environmental regulation, especially on the water resources side, with a pricing strategy for wastewater under development. Key issues to be taken into account are:

- The integration of environmental regulation with economic regulation.
- Trends in international best practice related to the regulation of the environment using economic instruments and incentive regulation (for example tradable permits).
- The relationship between water services authorities (WSAs) and Catchment Management Agency (CMAs) with respect to environmental regulation. Particular attention will have to be given to the relationship between the regulation of the water resource and the regulation of water services.

A framework for social regulation is already fairly well developed and is set out in the Draft Water Services White Paper and in the Water Service Act. WSAs are required to develop and publish Water Services Development Plans, which show how they are meeting defined social objectives such as supplying (or planning to supply) at least a basic minimum level of water service to all residents in their area of jurisdiction.

The Free Basic Water Services policy is a key component of social regulation, with detailed implementation strategies having been developed.

The requirement that WSAs develop (and implement) Water Services Development Plans is clearly a major step towards building the regulatory system. Nevertheless, concerns have been raised as to both the ability of WSAs to carry out these plans and the capacity of DWAF to monitor these plans in an effective way.

How is Water Regulated in South Africa?

National Government is the Sector Regulator

Within the framework of the Constitution, national government is the overall regulator of the sector. This regulatory role takes four primary forms:

- The setting of national norms and standards, including the specification of certain planning requirements and the regulation of tariffs.
- The regulation of WSAs in terms of these norms and standards.
- The regulation of contracts between WSAs and water services providers (WSPs).
- The direct regulation of organs of state (for example government-owned and -controlled water boards).

The key elements of the regulation of WSAs by national government are as follows:

- WSAs must take reasonable steps to realise the right of everyone to have a basic water supply and sanitation service, subject to certain limitations, including the availability of resources and the right to limit or discontinue the provision of water services if there is a failure to comply with reasonable conditions set for the provision of services.
- Water services must be provided in terms of national norms and standards relating to water quality, effective and sustainable use of water, and operational efficiency and viability.
- Tariffs must be set in terms of national norms and standards.
- Water services must be provided in terms of a water services development plan.
- The process of contracting with WSPs and the content of such contracts are regulated by national government.
- The WSA must monitor the performance of any WSPs within its area of jurisdiction to ensure compliance with national norms and standards and the contract.
- The minimum scope of the municipal by-laws related to water services provision is specified by national government.
- There is a duty on WSAs to report to national government on their performance as it relates to the water services development plan.

WSAs Regulate the Provision of Water Services

The key elements of the regulation of water services by WSAs are as follows:

- Democratic local government, as the WSA, is ultimately accountable to its citizens for the effective delivery of services to meet their needs.
- The municipality regulates water services within its area in terms of a set of by-laws that it must promulgate. These by-laws set out the general rights, duties and responsibilities of consumers with respect to the activities related to water services.
- Where a municipality contracts with a WSP, the municipality regulates the WSP by contract (even where the municipality is itself the WSP). Any contract developed must be consistent with national norms and standards. All contracts are subject to national regulatory oversight.
- All WSPs are required to prepare and report against business plans.
- All WSPs must enter into contracts with their consumers setting out the general and specific rights, duties and responsibilities with respect to the provision of water services to each consumer or group of consumers.
- WSPs have a duty to report regularly to WSAs on operating performance vis-à-vis their contracts and business plans.

The Current Regulatory Framework (Economic Regulation)

A brief review of existing legislation and regulations pertaining to the economic regulation of water services are summarised as follows:

- Neither Act, nor the existing draft regulations and guidelines, provide detailed regulations or guidelines as to municipalities' approach to economic regulation. Specifically, the regulations provide no practical guidance on a number of key aspects of economic regulation, how to determine efficient costs, what a reasonable rate of return on assets or profit is, how depreciation should be calculated, how to value assets, and whether prices should be regulated based on rate of return of assets, cost plus regulation, price cap or a cap on profits.
- There is significant overlap between the Water Services Act and the Municipal Systems Act. It is not clear which Act will prevail in the case of conflicts.
- The regulations are contradictory in places. For example, Section 10 of the Water Services Act (tariffs) refers to limitations on surpluses or profit, but the regulations related to Section 10 make no mention of surpluses or profit. The regulation related to Section 19 (contracts) refers to rates of return on investment, but the linkages between these are not made explicit and the regulations could be applied in contradictory ways.

How can Economic Regulation be Applied in SA?

This will depend on the specific governance arrangement for each water services provider. There is scope for a range of governance models (existing and potential) in SA, which is described below.

Table 1: Vertically Integrated Water Services

Market Structure & Governance Model	Description Example Market size (number of contracts, customers and volume of water)	Economic Regulation Status & Scope
WSP = WSA	The WSA provides the full water services function itself, including bulk supply. *Examples:* All areas where there is no water board and no use of external WSPs. Cape Town, Nelson Mandela	Regulation is by the Council (budget process). No real economic regulation of tariffs or investments. Extent of inefficiencies not known.
WSP = water board	Water board provides both bulk and retail services in a WSA area. *Examples:* Harrismith, Emfuleni (proposed). *Size:* Water boards are keen to expand their scope of services to WSAs. Vertical integration and "regionalisation" is being promoted by the South African Association of Water Utilities (SAAWU).	Regulation is by contract between WSA and water board in terms of Section 19(2) regulations. No national review of contracts. No competitive procurement required. No formal economic regulation. Protection of public interest in WSA area not ensured. Protection of water board customers not ensured (water boards could enter into contracts in their own interests but not in interests of other water board consumers). Clear ring-fencing of businesses not practised and not regulated.
WSP = another municipality	Where districts is the WSA, may contract local municipality to be WSP. *Examples:* May be common in some provinces where districts have been authorised and local municipalities are doing water services and manage their own bulk supply.	No competitive procurement required. Regulation in terms of Section 19(2) regulations?
WSP = public entity	Where an integrated water service (bulk and retail) is managed by a public entity which is not a water board.	No competitive procurement required. Regulation in terms of Section 19(2) regulations?
WSP = private entity	Where WSA contracts with an external WSP for full service including bulk. *Examples:* Some mining towns?	Competitive procurement required. Regulation in terms of Section 19(2) regulations.

(Note: The four tables are a preliminary attempt to define the scope for economic regulation in SA, and are still to be refined.)

Table 1: Vertically Integrated Water Services

Cost structures for bulk supply are likely to vary more widely than for retail, making economic regulation more difficult but there are potential benefits of economies of scale which could reduce costs. Rate of return on assets regulation is likely to prove difficult due to uncertainties in asset base for vertically integrated providers.

Table 2: Bulk Water Service Providers

Cost structures for bulk services provision are likely to differ widely, making benchmarking more difficult compared to retail services. Return on asset regulation is easier to implement for bulk services as there is greater certainty in evaluation of assets compared to retail services.

Table 3: Retail Services

The scope of benchmarking is greater for retail water services as cost-structures are likely to be less diverse compared to bulk services. The scope for return on asset-type regulation is more difficult due to greater uncertainty in valuation of assets (historic costs or revalued assets).

Table 3: Retail Services

Market Structure & Governance Model	Description Example Market size (number of contracts, customers and volume of water)	Economic Regulation Status & Scope
WSP = WSA	Water services authority is the retail water services provider. *Examples:* Most municipalities in South Africa. *Size:* Turnover of about R5-billion per annum.	Regulation is by the Council (budget process). No real economic regulation of tariffs or investments. Extent of inefficiencies not known.
WSP = water board	See Table 1 (Vertically integrated services).	See Table 1
WSP = another municipality	Likely to occur where district is WSA and local is the WSP.	Nature of contract could vary from lease to concession (or even just a management contract). Little transparency in contracts, though required to make public in terms of MFMB?
WSP = public entity	Retail service provider is a public entity. *Example:* Johannesburg Water. *Size:* Only Johannesburg Water at this point. But being looked into by a number of municipalities (Cape Town, Mangaung, Umhlatuze?).	Subject to Section 19(2) regulations (even if wholly owned by WSA?). No formal national economic regulation oversight. Nature of "deal" is dependent on capacity by WSA.
WSP = private entity	Retail service provider is a private entity *Examples:* Nelspruit and Dolphin Coast Concessions *Size:* A few contracts. Private sector view legislative and policy context as hostile to involvement. Contradictions in national policy with respect to encouragement and discouragement of private sector involvement in the water sector.	Competitive procurement. Subject to Section 19(2) regulations. DWAF involved in high profile cases, but capacity to exert authority and influence is doubtful. No formal economic regulatory input provided to WSAs by DWAF to assist. Importance and nature of economic regulation will depend on the size, period and nature of contract (risk allocation).

Table 2: Bulk Water Service Providers

Market Structure & Governance Model	Description Example Market size (number of contracts, customers and volume of water)	Economic Regulation Status & Scope
WSP = water board	All areas where there is a water board *Examples:* Water boards *Size:* 16 water boards, annual turnover of approximately R3.5-billion per annum.	Regulated directly by DWAF. Method of economic regulation not transparent. Current capacity of DWAF to regulate is questionable. Many WSAs are unhappy with performance & regulation of water boards. Not clear if Section 19(2) regulations apply to bulk services. If so, not being applied.
WSP = another municipality	Municipalities sometimes provide bulk water supply services to other municipalities. *Example:* Cape Town *Size:* Was more common in the past. No longer common due to wider demarcation of municipal boundaries.	Provision by service agreement. Not clear if part of Section 19(2) regulations. No formal economic regulation. No competitive procurement required. Costs of municipal supplier unlikely to be properly ring-fenced making economic regulation almost impossible.
WSP = public entity	Municipal-owned entity provides bulk service. Entity could be owned wholly by WSA, or my more than one WSA and could have private shareholding. *Example:* ERWAT	Competitive procurement not required. Should be subject to Section 19(2) regulations.
WSP = private entity	Private operator provides bulk services through BOT or operating contracts. *Example:* Durban wastewater treatment, Cape Town wastewater treatment (Zandvliet) *Size:* small at present	Competitive procurement not required. Should be subject to Section 19(2) regulations.

Table 4: A Summary of the Main Forms of Contracting

In addition to these governance models, the nature of economic regulation will also depend on the type of contract entered into. A summary of the main forms of contracting and their implication for economic regulation is given in Table 4.

Conclusions

Regulating vertically integrated regional utilities: Although not significant at present, this institutional form may become more important in future. The regulatory capacity to regulate integrated utilities should be developed in parallel with the reform of the sector if this reform route is pursued. This institutional form will require a strong (and probably independent) regulator.

Regulating water boards: Regulation of the bulk services function of water boards should, in theory, be relatively straightforward. The asset base is well defined and costs should be transparent. However in practice, water boards are not effectively regulated from an economic point of view. There is no transparency in the regulation, the methods used are not clear, and there is not adequate capacity to undertake the effective economic regulation of water boards. The annual turnover of water boards is significant (R3.5bn) and more effective regulation of this business could bring important economic benefits.

Table 4: Implication of Contract Type for Scope of and Need for Economic Regulation

Contract type	Scope for economic regulation	Importance of contract form and improving economic regulation
Internal service agreement (WSA = WSP)	Little scope for economic regulation unless service properly ring-fenced. Social and political pressures likely to dominate over economic regulation.	Most common "contracting" form (the default) in South Africa. Difficult to gauge the scope for efficiency improvements through economic regulation.
Public entity (ownership-control rests with one or more WSAs)	Traditional utility-style regulation through, for example, return on assets regulation, but conflicts of interest as a result of ownership (regulator is also shareholder). Could have a national utility regulator (or national could oversee local utility regulators).	Only one such "contract" in South Africa at present (Johannesburg Water). But likely to grow. Very important that regulation of this contract becomes a role model for others who are thinking of following suit.
Concession (with an external public or private entity)	Public: No competition through entry into market. Cannot assume interests of partnering public entity are benign. No good reason to exclude competitive procurement. Private: Competitive procurement, but danger of adverse outcomes resulting from information asymmetries over long time period (up to 30 years) as for public. Need a strong regulator to manage contracts.	Little transparency in existing public-public contracts (for example, Rand Water – Emfuleni) so hard to assess their true nature. Is it more like a concession or a lease? *Poor enforcement of public-public as in terms of MFMB no fines can be levied on another municipality for poor performance.* Within a policy environment of promoting public-public partnerships, this contracting model likely to become more important. At present, there is not the regulatory capacity nor the tools to manage concession contracts (both public-public and public-private) – urgent need to develop national capacity to assist.
Lease (or enhanced lease or "affermage") – with public or private entity	As above. Less risk due to restriction to operating only (no or limited investments) and shorter timeframes (up to 10 years). Tariff set more firmly in contracting process and less subject to negotiation. Investments remain responsibilty of the WSA. No competitive procurement required in case of public entity. No good reason for this.	As above. Similar regulatory capacity required. Also risks lower, benefits may also be less.
Management contract – with public or private entity	As above. Less risk due to restriction to operating only (no or limited investments) and shorter timeframes (up to 10 years). No competitive procurement required in case of public entity. No good reason for this.	Less regulatory capacity required but benefits may also be less.

Regulation of municipal entities: This follows a more traditional utility regulation model, although the regulator (the WSA) is also the shareholder (which may cause conflicts of interest). For this reason, national oversight may be necessary. The Johannesburg Water Utility is the only example of this mode of regulation in SA, but the model may be followed by other cities and so appropriate precedents must be set. Much still needs to be learned about regulation in this context.

Self-regulation: Much of the sector is self-regulated in the sense that the WSA (the regulator) is also the WSP (the operator). True economic regulation is not possible because costs allocations are not transparent and there is no separate accountability for performance.

Clarity in nature of WSA-WSP contracts (where the WSP is an 'external mechanism'): There is a need for greater clarity in the essential characteristics of different types of WSP contracts (concession, lease, management contract) and the appropriate allocation of responsibilities, risk and reward, especially in the case of public-public contracts. Basic tools for economic regulation are needed to assist in the development and regulation of these contracts.

Regulating public-public contracts: Public-public contracts may be more difficult to regulate effectively due to the absence of competitive procurement to ensure a cost-effective base line, and suitable enforcement mechanisms.

Regulating public-private contracts: Competitive procurement is a requirement and enforcement should, in theory, be more effective than public-public contracts. However, there are likely to be important information asymmetries which could be exacerbated by a strong profit motive. So there could be a need for national assistance to WSAs in the development and regulation of public-private contracts. At present there is a lack of capacity at national level to undertake this task effectively.

Constraints to Economic Regulation

Municipalities face a number of major constraints in implementing effective systems for economic regulation. First there is the problem of defining the asset base and efficient costs of service provision. Municipal water services accounts are typically not ring-fenced and it is often not possible to distinguish between costs and assets associated with water services and those associated with other municipal services with any degree of confidence or accuracy. In this context it is not possible to define target rates of return, or to establish appropriate cost-based benchmarks for the measurement of performance. The recent introduction of Generally Accepted Municipal Accounting Practices (GAMAP), based on generally accepted accounting practices (GAAP) represents a significant step in the right direction. Whilst the full implementation of GAMAP will assist in defining the underlying asset base, it will not in itself provide an adequate methodology for correctly allocating joint costs between services.

Secondly, municipal capacity is generally weak. Economic regulation is a complex process and may require sophisticated technical, accounting, economic and legal skills (depending on the nature and extent of regulation). Even the largest municipalities face significant challenges in adequately establishing the skills base and competencies required to regulate water and other services in the context of a changing municipal service environment. So it is desirable to build regulatory capacity within municipalities and externally to support them.

The Economic Regulation of Water Boards

Water Boards are owned and controlled by the national government. The Minster of Water Affairs has powers to appoint board members and approve business plans. The current method of economic regulation of water boards is not transparent. It is not clear what methodologies are used to assess the business plans and to approve proposed tariff increases. The Draft Water Services White Paper consultation process has revealed a general and widespread unhappiness amongst municipalities with the governance and regulation of water boards. At the same time, water boards are not happy with the current status quo. They feel they are disadvantaged vis-à-vis the private sector as they must conform to stringent public-sector legislation not applicable to private-sector operators. They propose a more level playing field. Water Boards are promoting the idea of regional source-to-tap entities. No definite proposals on governance and ownership of these entities have been proposed.

Private-Operator Perspective

Private operators view the current policy and legislative environment as 'anti' private sector. They believe they are disadvantaged vis-à-vis water boards and other public agencies who are not required to contract through competitive procurement procedures. They believe that Section 78 of the Municipal Systems Act and the public-preference contained in the Water Services Act place undue procedural obstacles in their way and create a negative environment in terms of the perceived benefits of private-sector involvement.

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Focus on Facts

A Review of the Changing Composition of the South African Economy

Structural Changes in the South African Economy

From a broad perspective, there have been noticeable structural changes in the reasonably diversified SA economy since the 1970s (see Table 1). The share of the primary sector (*Agriculture* and *Mining*) in overall gross domestic product (GDP) has decreased over the past three decades, while the secondary (*Manufacturing; Construction; Electricity, Gas* and *Water*) sector's share of GDP has remained more or less constant between 1970 and 2001.

Most striking is that the tertiary sector (including services) that traditionally had the largest GDP share, is increasingly growing at the expense of the primary sector. This is in line with the trend towards less reliance on primary products and more on high value-added services.

Table 1: Components of GDP, 1971-2001 (1995 constant prices)

	Ave share 1971-1980 %	Ave share 1981-1990 %	Ave share 1991-2001 %	Ave share 1991-1996 %	Ave share 1997-2001 %
Primary [1-2]	16.1	13.3	11.4	12.1	10.7
Secondary [3-5]	29.5	29.6	27.6	27.9	27.1
Tertiary [6-9]	54.3	57.0	61.0	60.0	62.2
Total	100.0	100.0	100.0	100.0	100.0

[Source: TIPS SA Standardised Industry Database]
Note: GDP is measured at factor cost

Value-added

Table 2 shows that with 6%, *Business Services* had the highest growth rate in value-added between 1997-2001, followed by *Transport and Communication* with 5.6% and *Wholesale and Retail Trade* (1.8%). This can be compared with an economy-wide average growth in value-added of 2.3%. *Mining* and *Electricity, Gas and Water* recorded the lowest growths in value-added, with -1% and -0.1% respectively. *Manufacturing* is ranked fourth out of nine sectors, with a growth rate of 1.5%.

The performance of the *Transport and Communications* sector in 1997-2001 vis-à-vis 1991-1996 can be attributed to the rollout of telecommunications services by mobile service providers and national fixed-line operator Telkom. *Manufacturing's* growth performance has not improved significantly in 1997-2001 compared to the preceding period, and it is also below the economy-wide average. The low performance of *Community Services – including government services,* can be explained to some degree by the fiscal policies adopted during the middle of the 1990s that negatively affected the government services sector.

In 1991-1996, *Transport and Communication* and *Electricity, Gas and Water* exhibited the highest value-added growth – 5% – with *Business Services* in third place with 3%. At the bottom end of the scale, *Construction* had a value-added

Table 2: Growth in Value-added, 1991-2001 (1995 Constant Prices)

		Ave annual Δ 1997-2001 %	Ave annual Δ 1991-1996 %	1991-1996 Rank	Ave share 1997-2001 %	1997-2001 Rank	Ave share 1991-1996 %	Δ Rank 1991-1996 to 1997-2001
1	Business Services	6.0	2.9	3	18.0	3	15.7	2
2	Transport	5.6	5.2	1	10.5	5	8.5	-1
3	Trade	1.8	2.2	4	13.5	4	14.0	1
4	Manufacturing	1.5	1.6	5	20.3	1	21.2	1
5	Agriculture	1.4	-0.4	8	4.5	7	4.8	3
6	Construction	1.3	-0.7	9	3.1	9	3.3	3
7	Community Services	0.1	1.6	6	20.3	2	21.9	-1
8	Electricity	-0.1	4.5	2	3.7	8	3.5	-6
9	Mining	-1.0	-0.1	7	6.2	9	7.3	-2
	All Industries	2.3	2.0		100.0		100.0	

[Source: TIPS SA Standardised Industry Database]

growth rate of -0.7%, followed by Agriculture with -0.4% and Mining with -0.1%. Economy-wide value-added growth in 1991-1996 was just 2%.

Table 2 further reveals that for the *Agriculture, Mining* and *Construction* sectors, the situation has not changed much when comparing the decade's two halves. Although *Agriculture* and *Construction* have seen positive growth compared to the first half of the 1990s, these sectors seem to be insulated from most of the shocks *and* economic policy action that have taken place during the middle of the decade, *and* remain perennial under-performers. The deterioration of the mining sector is linked to the decline in commodity prices, notably those of *Gold Mining, Coal Mining* and *Iron Ore.*

Regarding the shares in net output during the 1990s, Table 2 shows that *Manufacturing* and *Community Services – including government services,* are the most important contributors to value-added by 9-sector aggregation, both capturing 20.3% of the total, followed by *Business Services* with 18%. The smallest sector in this configuration is *Construction* with 3.1% of value-added, followed by *Electricity, Gas and Water* with 3.7%. This hierarchy is also evident for the 1991-1996 period, where *Community Services – including government services,* accounted for 22% of value-added, *Manufacturing* for 21% and *Business Services* for 16%.

It seems that *Community Services – including government services,* has lost some ground, presumably following the fiscal austerity measures introduced during the middle of the decade. *Business Services* and *Transport and Communication* have increased their share in GDP, while the contribution of *Agriculture, Mining* and *Construction* has declined. *Manufacturing's* share in GDP has remained constant at around 20%.

Exports

Table 3 shows that with 7.3%, *Business Services* recorded the highest growth rate in exports in 1997-2001, followed by *Manufacturing* with 6.9% and *Community Services* –

including government services, both with 6.9%. This can be compared to an economy-wide average growth in exports of 3.7%. *Construction* and *Mining* recorded the lowest export growths -7.6% and -3.6% respectively.

Overall export performance has been lower in 1997-2001 compared to 1991-1996, which is perhaps explained by the suggestion that the 'apartheid dividend' had already been reaped by the mid-1990s. Another conclusion might be that SA's liberalisation policies have not resulted in a more export-oriented economy. Also, we should not ignore the East Asian financial crisis during this period, which dampened global economic growth.

While the export performance of some of the more traditional non-tradable industries are less relevant, it should be noted that *Manufacturing's* export performance, although in positive territory, has lost ground relative to *Business Services. Mining's* export performance suggests that the global financial crises during the latter part of the decade could have had a considerable negative impact on SA's overall export performance.

Table 3: Growth in Exports, 1991-2001(1995 constant prices)

	Sector	Ave annual Δ 1997-2001 %	Ave annual Δ 1991-1996 %	1991-1996 Rank	Ave share 1997-2001 %	1997-2001 Rank	Ave share 1991-1996 %	1991-1996 Rank
1	Business Services	7.3	10.3	7	3.5	6	2.5	6
2	Manufacturing	6.9	15.5	1	53.3	1	41.2	2
3	Transport	5.8	11.7	4	6.1	3	5.2	3
4	Agriculture	5.3	13.6	3	4.3	5	3.9	5
5	Trade	3.5	10.6	6	5.5	4	4.5	4
6	Electricity	-0.1	14.3	2	0.1	8	0.1	8
7	Mining	-3.6	-3.7	9	26.9	2	42.3	1
8	Construction	-7.6	11.1	5	0.0	9	0.0	9
9	All Industries	3.7	6.4		100.0		100.0	

[Source: TIPS SA Standardised Industry Database]

Manufacturing captured 53.3% of the absolute total of exports, followed by *Mining* with 26.9% and *Transport* and *Communication* with 6.1%. The smallest sector in this configuration is *Construction* with no exports, and *Electricity, Gas* and *Water* with 0.1%.

Evidently the large weight of *Mining* combined with its poor showing dragged the total export performance of the SA economy down. Whether this is a blessing in disguise for the other industries' export behaviour remains to be seen. On the other hand, the mining sector is a large employer, and the state will have to provide sufficient resources to allow labour to shift to newly exporting industries.

While export growth rates and shares tell one part of the story, it is also important to examine the extent to which an industry exports its output, to ascertain whether these have been growing faster than total sales. Export-output ratios point to whether an industry has become more export oriented over time.

Table 4 shows that except for *Mining*, all the other economic sectors have increased the proportion of output that is sold at world markets. *Manufacturing's* exports as a proportion of total output has increased from 13% in 1991-1996 to 21% in 1997-2001, while *Agriculture's* proportion has increased from 13% to 18%, suggesting that the most important tradeable sectors have indeed seen an outward-oriented shift. The decline in the export orientation of mining may have been the result of downstream beneficiation.

Table 4: Export-Output Ratios, 1991-2001(1995 constant prices)

	Sector	Ave annual Δ 1997-2001 %	Ave annual Δ 1991-1996 %	1991-1996 Rank	Change 1st – 2nd half %	Change in ratio Rank
1	Mining	66.3	75.8	1	-9.5	9
2	Manufacturing	22.2	14.6	2	7.6	1
3	Agriculture	16.1	12.6	3	3.5	2
4	Transport	9.6	8.8	4	0.8	5
5	Trade	6.3	4.4	5	1.9	3
6	Business Services	3.3	2.4	6	0.9	4
7	Electricity	0.6	0.6	7	0.0	6
8	Community Services	0.3	0.3	8	0.0	7
9	Construction	0.0	0.1	9	0.0	8
	Total	13.9	12.1		1.8	

[Source: TIPS SA Standardised Industry Database]

Imports

While greater export orientation is one side of the trade liberalisation coin, higher import penetration may be the other side. Increases in imports follow trade liberalisation as tariffs are lowered, with several possible effects. Lower tariffs can make export-oriented industries more competitive in terms of imported intermediate inputs, although local suppliers may be pushed out of the market, resulting in job losses. Consumers reap the benefits of lower relative prices of final goods such as clothing, electronics and some food products.

Table 5 shows that with 16.2%, *Mining* sector imports have grown most in 1997-2001, followed by *Transport* and *Communication* with -1.5% and *Manufacturing* with -1.7%. This can be compared to an economy-wide average growth in imports of 0.1%. *Agriculture* and *Community Services – including government services* recorded the lowest growth in imports with -8.4% and -6.8% respectively. In stark contrast, during the 1991-1996 period *Electricity, Gas and Water* topped the import growth table, followed by *Construction* with 20.3% and *Agriculture* with 12.3%. The weakest performance in 1991-1996 was seen in *Community Services – including government services* (1.5%) and *Business Services* (2.7%).

The global economic slowdown during the late 1990s, combined with low domestic economic growth, may be

Table 5: Growth in Imports, 1991 - 2001 (1995 constant prices)

	Sector	Ave annual Δ 1997-2001 %	Ave annual Δ 1991-1996 %	1991-1996 Rank	Ave share 1997-2001 %	1997-2001 Rank	Ave share 1991-1996 %	1991-1996 Rank
1	Mining	16.2	11.7	5	12.7	2	9.3	2
2	Transport	-1.5	5.7	6	4.0	3	5.3	3
3	Manufacturing	-1.7	12.8	3	77.8	1	77.1	1
4	Electricity	-4.1	22.0	1	0.0	9	0.0	9
5	Business Services	-5.8	2.7	8	1.4	5	2.2	5
6	Trade	-6.2	4.3	7	1.1	7	1.6	7
7	Construction	-6.2	20.3	2	0.1	8	0.1	8
8	Community Services	-6.8	1.5	9	1.1	6	2.1	6
9	Agriculture	-8.4	12.3	4	1.7	4	2.3	4
	All Industries	0.1	11.7		100.0		100.0	

[Source: TIPS SA Standardised Industry Database]

responsible for the reduced demand for imported goods and services, in spite of the significant lowering of tariffs. In terms of absolute share of total imports in 1997-2001, the table further shows that the lion's share of imports were by products of the *Manufacturing* sector, with an average of 77.8% of imports between 1997-2001, with *Mining* coming a distant second with 9.3%, and *Transport and Communication* at 5.3%. The lowest share of imports was seen in the *Electricity, Gas and Water* sector (0%), followed by *Construction* (0.1%) and *Wholesale and Retail Trade* and *Community Services – including government services* (1.1%). This hierarchy was also seen in 1991-1996.

Import Penetration Ratios

Import penetration ratios – derived by dividing imports by the sum of total output and imports less exports – compare imports with the size of the domestic market. The results shown in Table 6 are rather deceptive with regards to *Mining*, due to the high level of exports. However, the increase in the import penetration ratio of *Manufacturing* can be explained by trade liberalisation after 1995.

In both *Mining* and *Manufacturing* the change in import penetration between the two periods has been positive, but negative or insignificant for all other sectors. This again mirrors the global economic slowdown and SA's generally low economic growth.

Table 6: Import Penetration Ratios, 1991-2001 (1995 constant prices)

	Sector	Period Ave 1997-2001 %	Period Ave 1991-1996 %	Ave Annual Rank	Δ in ratio 1st - 2nd half %	Δ in ratio Rank
1	Mining	44.3	37.3	1	7.0	1
2	Manufacturing	27.1	21.7	2	5.4	2
3	Agriculture	6.4	7.0	4	-0.7	8
4	Transport	5.8	7.5	3	-1.7	9
5	Business Services	1.3	1.8	5	-0.5	7
6	Trade	1.2	1.3	7	-0.1	5
7	Community Services	1.0	1.3	6	-0.3	6
	Construction	0.3	0.2	8	0.1	3
9	Electricity	0.0	0.0	9	0.0	4
	Total	12.6	10.6		2.0	

[Source: TIPS SA Standardised Industry Database]

GDFI and Capital Stock

Most of the macroeconomic policies adopted in SA during the mid-1990s were aimed at boosting the levels and rates of investment. In an attempt to evaluate the success or failure of these policies, and to identify which industries have had robust growth in capital stock, Table 7 details the growth in Gross Domestic Fixed Investment (GDFI) and capital stock.

Negative GDFI in *Electricity, Gas and Water* can be explained by the nature of the investment process in the sector the last major investments in generating capacity were undertaken during the 1980s. *Manufacturing* investment has started to lag all other industries except *Agriculture, Construction* and *Electricity, Gas and Water*. A similar pattern appears with regard to growth in capital stock, except that because of its initial size (owing to large investments undertaken in earlier periods), the growth rate of *Mining's* capital stock is much lower than, for example, that of *Manufacturing* or *Business Services*. Similar to GDFI, the growth rates in capital stock are low but slightly up during the latter part of the decade, with the exception of *Manufacturing* and *Community Services – including government services*.

Table 7: Growth in GDFI and Capital Stock, 1991- 2001 (1995 constant prices)

	Sector	GDFI Ave annual Δ 1997 -2001 %	GDFI Ave annual Δ 1991 -1996 %	GDFI 1997 -2001 Rank		Sector	Cap Stock Ave annual Δ 1997 -2001 %	Cap Stock Ave annual Δ 1991 -1996 %	Cap Stock 1991 -1996 Rank
1	Transport	9.2	7.6	2	1	Transport	3.1	0.7	5
2	Trade	4.9	2.6	6	2	Trade	2.4	1.1	3
3	Mining	4.8	-6.6	9	3	Manufacturing	2.2	3.0	1
4	Manufacturing	0.4	6.5	3	4	Business Services	1.7	1.0	4
5	Community Services	0.4	0.1	7	5	Community Services	1.3	1.2	2
6	Construction	0.0	-5.3	8	6	Mining	0.6	-0.8	6
7	Business Services	-1.1	4.0	5	7	Construction	0.4	-2.1	8
8	Agriculture	-9.6	8.0	1	8	Agriculture	-0.8	-1.1	7
9	Electricity	-19.1	5.1	4	9	Electricity	-2.6	-2.6	9
	All Industries	0.2	3.2			All Industries	1.5	0.7	

[Source: TIPS SA Standardised Industry Data Base]

Investment Rates

The investment rate is defined as GDFI divided by value-added of an industry. Table 8 shows that in 1997-2001, *Mining* and *Transport* and *Communication* had the highest average investment rate (27%), followed by *Electricity, Gas and Water* with 24.3%. At the bottom-end of the scale were *Construction, Wholesale and Retail Trade, Agriculture* and *Community Services – including government services*, with 5.9%, 9% and 12.4% respectively. In contrast, in 1991-1996, *Electricity, Gas and Water* had the highest investment rate (37.1%), followed by *Mining* (22%) and *Transport* and *Communication* (20.8%). The lowest investment rates were seen in *Construction* (6%), *Wholesale and Retail Trade* (7.7%) and *Community Services – including government services* (7%).

In terms of change in investment rate between the periods under review, the highest increase in investment rate was recorded for *Transport* and *Communication* (6.2%), followed by *Mining* (5%), and in third position *Manufacturing* (3.2%).

Shifting trends in the growth of capital stock and investment suggest that the move towards reallocating capital from highly capital-intensive state-owned enterprises in the 1970s and 1980s towards smaller industries in the aftermath of capital market liberalisation in the 1990s may have continued only to a degree in recent times.

Employment

The crisis in the employment creation capacity of the SA economy since the middle of the 1990s has been well documented elsewhere. This section merely highlights the

Table 8: Investment Rates, 1991-2001 (1995 constant prices)

	Sector	Period ave 1997-2001 %	Period ave 1991-1996 %	1991-1996 Rank	Δ in ratio 1st – 2nd half %	Δ in ratio Rank
1	Mining	27.0	22.0	3	5.0	2
2	Transport	27.0	20.8	4	6.2	1
3	Electricity	24.3	37.1	1	-12.8	9
4	Business Services	23.2	24.7	2	-1.5	8
5	Manufacturing	21.6	18.4	5	3.2	3
6	Community Services	12.4	11.2	7	1.2	5
7	Agriculture	12.4	13.1	6	-0.8	7
8	Trade	9.0	7.7	8	1.4	4
9	Construction	5.9	6.0	9	-0.1	6
	Total	18.4	16.8		1.6	

[Source: TIPS SA Standardised Industry Database]

industries that have been most responsible for the downward trend in the demand for labour that characterised the latter part of the 1990s. At the 9-sector aggregation level, Table 9 depicts the trends in employment in the SA economy during the 1990s, and it is immediately apparent that with the exception of *Wholesale and Retail Trade*, all sectors have been shedding jobs during this period.

Between 1997 and 2001, *Wholesale and Retail Trade* reported an average annual employment growth rate of 1.7%, followed by *Electricity, Gas and Water* (-0.6) and *Business Services* (-0.9%). *Construction* had the poorest growth rate (-8.9%), followed by *Mining* (-6.6%) and *Transport and Communication* (-5.5%). In the 1991-1996 period, employment in *Community Services – including government services*, grew 2.1%, followed by *Business Services* with 1.8% and *Agriculture* (-0.9%).

Table 9: Growth in Labour Demand, 1991-2001(1995 constant prices)

	Sector	Ave annual Δ 1997-2001 %	Ave annual Δ 1991-1996 %	Ave annual Δ Rank	Ave share 1997-2001 %	1997-2001 Rank	Ave share 1991 -1996 %	1991-1996 Rank
1	Trade	1.7	-1.2	5	13.2	3	12.2	3
2	Electricity	-0.6	-3.5	8	1.0	9	1.0	9
3	Business Services	-0.9	1.8	2	6.7	5	6.0	6
4	Community Services	-1.0	2.1	1	37.6	1	34.5	1
5	Agriculture	-2.0	-0.9	4	10.6	4	11.0	4
6	Manufacturing	-2.4	-0.9	3	17.6	2	18.6	2
7	Transport	-5.5	-4.1	9	3.8	7	4.7	7
8	Mining	-6.6	-1.6	6	6.0	6	7.6	5
9	Construction	-8.9	-3.0	7	3.4	8	4.6	8
	All Industries	-1.8	-0.1		100.0		100.0	

[Source: TIPS SA Standardised Industry Database]

In terms of absolute share of employment, *Community Services – including government services* – occupied first position in 1997-2001 with 37.6%, followed by *Manufacturing* with 17.6% and *Wholesale and Retail Trade* (13.2%). *Construction* (3.4%) performed poorest, followed by *Transport and Communication* (3.8%) and *Mining* (6%). This hierarchy was also seen in the preceding period, where *Community Services, including government services*, *Manufacturing* and *Wholesale and Retail Trade* captured 34.5%, 18.6% and 12.2% of labour demand respectively. *Construction* and *Mining* recorded 4.6% and 4.7% respectively.

Conclusions

While the structure of the SA economy has adopted global trends in the direction of the 'New Economy' and has seen a shift in production towards tertiary industries, the employment crisis is still not being addressed adequately. At a more general level, a serious evaluation of the impact of government policy on different economic sectors requires scrutiny of a range of policies across various government departments, not just the Department of Trade and Industry. The degrees to which they have stimulated or impeded the growth of various sectors are important areas for future research.

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TRADE AND INDUSTRIAL POLICY STRATEGIES

UPCOMING EVENTS http://www.tips.org.za/events/calendar.asp

TIPS

An Introductory Course to Computable General Equilibrium Modelling

30 June - 11 July 2003

University of Cape Town (UCT)

The use of economic modelling techniques that capture economy-wide impacts of policy changes is growing in South Africa's academic, consulting and research circles. With this course, the UCT School of Economics and the International Food Policy Research Institute aim to cater for the increased demand.

Contact: *ledwards@commerce.uct.ac.za*

TIPS AND DPRU FORUM 2003

The Challenge of Growth and Poverty: The South African Economy Since Democracy

8 - 10 September 2003

Indaba Hotel Johannesburg

TIPS is hosting its seventh annual forum together with the Development Policy Research Unit (DPRU) at the School of Economics at UCT.

The annual forum serves as a platform for researchers and policymakers to discuss ongoing research and enter into dialogue on policy-relevant issues.

This year's forum focuses on SA's progress in addressing growth and poverty since democracy and the challenges it still faces.

Contact: *forum2003@tips.org.za* or
Sally Probert +27 11 645 6404

SATRN

Pre-Cancun Preparatory Meeting

3 - 4 July 2003

Maseru, Lesotho

This workshop aims to assist policymakers to prepare for the Cancun WTO Ministerial Meeting. Senior policymakers, SADC Secretariat officials, Geneva- and Brussels-based ambassadors, and SATRN researchers will attend.

Annual Symposium: Trade Policy and Economic Development in Southern Africa

16 - 19 November 2003

Port Louis, Mauritius

The Annual SATRN Symposium will be attended by senior policymakers, SADC Secretariat officials, Geneva- and Brussels-based ambassadors, and SATRN researchers

About SATRN

The Southern Africa Trade Reseach Network is designed to assist the SADC member countries to participate more effectively in the WTO process.

It aims to mobilise the capacity for research and policy analysis across the region, and to strengthen the links between SADC researchers and the SADC policy community.

http://www.tips.org. za/satrn
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UPCOMING TIPS PUBLICATIONS

Working Papers

WP12-2003: Armington Elasticities for South Africa: Long- and Short-run Industry Level Estimates, by *Katherine Lee Gibson – TIPS*

WP13-2003: The Export 'Success' of the Motor Industry Development Programme and the Implications for Trade and Industrial Policy, by Anthony Black – *University of Cape Town*

WP14-2003: Policy in the South African Motor Industry: Goals, Incentives and Outcomes, by *Anthony Black – University of Cape Town* and *Shannon Mitchell – Virginia Commonwealth University*

WP15-2003: Intra- versus Inter-Industry Specialisation, Labour Market Adjustment and Poverty: Implications for Regional Integration in Southern Africa, by *Nicolette Cattaneo* and *David Fryer – Rhodes University*

WP16-2003: The South African Business Cycle Over the 1990s: What Can We Learn? by *Pieter Laubscher – University of Stellenbosch*