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Industrial Participation, Investment and Growth: The Case of South Africa's Defence Related Industry[1]

Peter Batchelor and Paul Dunne

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Centre for Conflict Resolution, Cape Town
Middlesex University Business School, United Kingdom

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1. Introduction

In November 1998 the cabinet announced the list of preferred suppliers for the South African National Defence Force's (SANDF) R30 billion arms acquisition programme. This included Britain (maritime helicopters, jet trainers and light fighters), Sweden (light fighters), Germany (corvettes and submarines) and Italy (light utility helicopters). To spend so much money on arms procurement from abroad is a major blow to the local defence industry. In attempting to win public support for the R30 billion arms deal government has continually stressed the potential positive effects of the proposed industrial participation offers on investment, job creation and growth in the local-defence related industry and the national economy.

At the time of the announcement government stated that the European suppliers had made industrial participation offers (otherwise known as offsets) worth R110 billion which would result in the creation of more than 60 000 jobs over a period of 7 years.[2]

The aim of this paper is to examine the economic issues surrounding the industrial participation aspects of the R30 billion arms deal, and its likely impact on investment and growth in South Africa's defence-related industry and more generally in the national economy.

Section 2 considers the present state of the defence-related industry. Section 3 surveys the existing literature on the economics of offsets and the international experience of defence offsets. Section 4 provides details of the arms acquisition programme, followed by a description of government policies on industrial participation in section 5. Information on the arms acquisition programme and its expected industrial participation activities are presented in Section 6. Section 7 considers the value of the defence-related industry to the South African economy. Section 8 outlines the local procurement that it is likely to result from the

[1] This paper is based on research currently being undertaken as part of a project on Defence Industrial Restructuring, Conversion and Economic Growth in South Africa, funded by the Leverhulme Trust, whose support is gratefully acknowledged. The support and assistance of the Department of Trade and Industry and the Aerospace, Maritime and Defence Industry Association of South Africa (AMD) in providing information is also gratefully acknowledged.

[2] Department of Defence: Statement of Defence Acquisition Package, 18 November 1998.

arms deal. This is followed in Section 9 by a discussion of the existing, and planned, inward investment, joint ventures, technology transfer and export benefits that are attached to the arms deal. Section 10 considers the job creation aspects of the arms deal and the industrial participation activities. Section 11 considers the non-defence industrial participation activities that are expected to flow from the arms acquisition programme and finally Section 12 presents some tentative conclusions.

2. South Africa's Defence-Related Industry

The cuts in South Africa's defence budget since the late 1980s have had a dramatic effect on the country's defence-related industry, which has undergone a process of downsizing and restructuring as outlined briefly in ***Appendix 1***. The restructuring and commercialisation of the public sector defence industry, including the formation of Denel in 1992, has had a dramatic effect on the private sector defence industry. The changes in Armscor's procurement policies, including more transparent and competitive procurement from both local and foreign suppliers, have fundamentally altered the 'cosy' relationship that was evident between the public and private sector industry during the apartheid era.

The new ANC-led government's commitment to black empowerment has resulted in a number of empowerment deals and equity partnerships between (largely white) private sector defence companies and black companies. In 1997 a black empowerment group, Kunene Technology Limited acquired a 47% share in Grintek Electronics. In June 1999 Reunert formed a new joint venture radar company with empowerment group Kgorong Investment Holdings and DaimlerChysler Aerospace (Dasa). The equity of the new company, Reutech Radar Systems is distributed between Reunert (37%), Dasa (33%) and Kgorong (30%) (Business Day, 9 June 1999). These empowerment deals have also fundamentally changed the structure of the local defence market.

In response to the decline in demand, local defence firms have pursued a number of supply-side adjustment strategies. The outcome of these adjustment strategies has included a changed local defence market in terms of size and structure; the increasing concentration and monopolisation of the domestic defence market; a dramatic increase in defence export sales; the increasing internationalisation of the domestic industry through international joint ventures and equity partnerships; and a significant increase in diversification initiatives.

The downsizing and restructuring that has taken place in the local defence industry has been reflected in the poor and deteriorating financial performance of most local defence firms. In terms of profitability, a recent study (Batchelor, Dunne and Parsa, 1999) showed that defence companies had lower average net profit margins (net profit/turnover) than non-defence companies for the period 1988-1997. Denel's turnover has declined in real terms by an average of 5% per annum since 1992, and in the last few years the company has posted massive losses.

The 3 largest private sector defence groups (Reunert, Grintek and Altech) have also witnessed some financial problems since the early 1990s as a result of the significant declines in the value and share of their defence work. However, all of these firms have reduced their dependence on their defence business to less than 20% of turnover and have been able to offset the declines in domestic defence with significant increases in non-defence work and export orders.

The downsizing and restructuring of the local defence industry has taken place in a policy vacuum, and the government has adopted a 'hands-off' approach to defence industrial adjustment. The announcement of a large procurement order with foreign suppliers in November 1998 constitutes a major threat to the long-term survival of the local defence industrial base. This has led government to continually emphasis the offset arrangements which are attached to the arms deal, and which will in all likelihood benefit the local defence industry. While it seems that local industry will benefit from the offsets, there are a number of issues associated with the decision to import with offsets that are questionable. The next section considers some of the conceptual issues involved in offsets and the international experience of defence offsets.

3. The Economics of Defence Offsets

When countries procure defence equipment they have a number of options ranging from indigenous production to off the shelf purchase from a foreign supplier. In between there are various forms of involvement in production and the development of the product, each of which will have different implications for costs, programme risks, control over specifications and wider industrial and economic benefits (Hartley, 1991). In addition to direct involvement of the purchasing country, joint production, licensed production, sub-contractor production, foreign direct investment and technology transfer there are various other methods of compensation such as countertrade, which may be civilian rather than military. All of these are lumped together under the concept of "offsets". Countries often have different criteria for whether offset obligations are required for a particular transaction and what types of offsets are acceptable. The United States Government defines offsets as 'industrial compensation practices required as a condition of purchase in either government-to-government or commercial sales of defence articles and/or defence services' [3]. The UK is more restrictive (Martin, 1996)

It is useful to distinguish between direct offsets, which includes goods and services for the equipment the purchaser is buying (parts of the weapon system is sourced from the purchaser) and indirect offsets, which includes goods and services unrelated to the specific equipment, and can include foreign investment and countertrade (barter counter purchase and buy back). It is also possible to agree to inward investment unrelated to the purchase of the goods. Such offset deals are an increasingly important part of the international trade in military equipment, especially in the aerospace industry (Martin, 1996, Udis and Maskus, 1991).

The nature of offset agreements will depend upon the type of buyer. In the case of a country with a defence industry, the emphasis of the offsets will often be on limiting the impact on the domestic industry by a relocation of economic activity from the supplier country to the purchasing country, including technology transfers. This relocation of economic activity may also be linked with offsets that focus on non-military products.

While official publications often herald offset agreements as beneficial to the purchasing country, the issue is much more complex and the costs and benefits of such programmes have been the subject of some debate. Offset agreements are likely to be more of an attempt to

[3] This definition is taken from "Offsets in Military Exports" (U.S. Department of Export Administration, Washington D.C., December 1998).

justify foreign procurement, rather than an economic argument in support of the benefits of import replacement.

If a country with a local defence industry decides to procure new weapons systems, then it has to decide whether to produce the weapons locally or to purchase from a foreign supplier. Local production is likely to be the most expensive option and the technology may not be available. If the decision is made to import then there is usually a search for a foreign supplier with the weapon system and a decent offset deal. If there is a local defence industry then it is bound to be effected by the procurement orders going abroad, but evidence suggests that maintaining a local defence industry is expensive and uneconomic for a small country (Dunne, 1996). This means importing arms may be more sensible, especially as there is usually a premium attached to offsets, with the result that the purchase price is normally higher. A study by Cooper (1999) argued that

'the costs incurred by arms companies as a result of offset deals are simply passed on to the recipient…the level of job creation and technology transfer over and above that which would have occurred without offsets is generally minimal' (quoted in Business Times, 25 July 1999).

The welfare issues are unclear. Offsets relocate production to the purchasing nation, which represents a trade diversion, which can be welfare reducing. Imports can create wealth by allowing labour to be moved to more productive (competitive) areas of the economy. On the other hand international markets are not competitive and offsets may improve efficiency if they remove non-tariff barriers and lead to a search for more efficient subcontractors. Offsets may be considered as a subset of the myriad price-quality-quantity trade-offs, which characterise negotiations for large transactions (Martin and Hartley, 1995). They may lead to reduced transaction costs (reducing the number of contracts per trade) but they may also inhibit the flexibility of negotiating advantageous deals and result in inefficient procurement (Hall and Markowski, 1994)[4]

Competitive bidding leads companies to compete on offsets and to come up with some ingenious ways to deal with them. This sometimes leads to unrealistic offset agreements. The complexity of some agreements has led to the establishment of specialist agencies (e.g. Australia, Spain) within government to deal with offset programmes. This has helped both purchases and suppliers to overcome the problems of the past, but there still remain problems. It is possible that the supplier may plan to renege, building into the purchase price the cost of reneging (moral hazard). It is often unclear how much of the offsets is genuinely new work; what is the technical content; and which companies and regions will benefit from the offsets. In addition, defence offsets have often been linked with development aid (e.g. Pergau Dam).

Over 130 countries have some form of offset policy. In a recent international survey Martin (1996) concludes that, although problems of getting data make comparisons difficult there are some general conclusions that can be drawn:

1. Typically the value of direct/indirect offset is measured in financial terms and success or failure tends to depend on whether the vendor meets the obligation within the specified

[4] The impact on the supplying firm can be negative if, for example, they end up with lower quality components as part of countertrade. Countertrade can destroy local industry, tending to hit smaller contractors. This has been recognised in the US with workers from a subcontractor demonstrating against countertrade negotiations, which could have replaced their input.

time period. It is also often unclear whether the work actually occurred because of the offset (was it new) and whether the difference between the off-the-shelf price compared well with the offset value.
2. Offsets have involved a learning experience on both sides. Suppliers often underestimate the costs of meeting offset commitments. Originally there was no cost to failing to meet offset obligations but now financial penalties for non-fulfilment have been brought into offset agreements. There has been a move away from promises of orders to determining a package of work for domestic industry in advance.
3. There has been a move away from rather general offset programmes towards more focussed offset programmes.
4. Time horizons have lengthened especially for countries with domestic defence industries. Buyers provide incentives for foreign firms to continue placing work with local firms and often try to encourage foreign firms to establish more formal links with local firms.
5. There has been a move towards more focussed longer-term investment strategies, joint ventures, technology transfers etc.
6. It is unlikely that offsets will disappear in the foreseeable future.

Clearly the benefits of offsets to the procuring country are open to question and the only way of determining the true value of an offset arrangement to a country is to make a detailed analysis. When this has been done the impact on the economy has been much smaller than expected or promised (Matthews, 1996, Martin, 1996). For a small country the issue may be to maintain an intelligent customer capability (intelligent buyer) and to be able to maintain and upgrade systems rather than to retain a domestic production capability. This might be achieved through maintaining technological capabilities in research establishments and requiring technology transfers, rather than retaining a local defence industrial base. If there are to be defence offsets then they could be used for developing civil products and/or to assist with the conversion of defence companies rather than attempts to maintain local defence capabilities. Any other solution could be considered second best.

In the case of South Africa the decision has been made to procure the weapons, and the emphasis has been placed on offsets rather than price. While there are clear opportunity costs, particularly with respect to the local defence industry, considerable efforts have been made to implement offset policies that reflect the experience of other countries, such as the UK. There is also a reasonable amount of information available, which allows us to consider the likely economic impact of the defence offset deals. Before doing so we need to consider the nature of the arms acquisition programme and the government's policy on offsets.

4. The Defence Review and the SANDF’s R30 billion arms acquisition programme

The cuts in South Africa’s defence budget since the late 1980s have been funded through cuts in the SANDF’s capital budget, the Special Defence Account. In the 1999/2000 budget the Special Defence Account was allocated 17% of the total defence budget, down from nearly 60% in the late 1980s (National Expenditure Survey, 1999). As a result of the cuts in procurement spending the SANDF has had to cancel or postpone most of its major procurement projects since the early 1990s (Batchelor and Dunne, 1998).

The Defence Review, which was approved by parliament in April 1998, provided details of a new force design and force structure for the SANDF. It proposed reversing the trend of increasing personnel and operating expenditure to allow for increased capital expenditure by cutting personnel levels in the SANDF from 100 000 to around 70 000 by 2000/01. The

proposed rationalisation process in the SANDF would reduce the share of personnel expenditure to 40% and operating expenditure to 30% of the total defence budget, thereby allowing capital expenditure to increase to 30% of the budget, a level last achieved in 1993/94. The Defence Review also approved new equipment requirements for the SANDF in line with the proposed new force design and force structure (Defence Review, 1998).

As a result of the Defence Review, Armscor, the DoD's acquisition organisation, issued requests for tenders to foreign suppliers to meet the SANDF's new equipment requirements, including main battle tanks, jet trainers, light fighter aircraft, light utility helicopters, corvettes, submarines and maritime helicopters. All potential foreign suppliers were notified of the government's policy on offsets, and requested to submit proposals with their tenders. The next section provides some detail on these policies and their proposed implementation

5. Industrial Participation in South Africa

Offsets or 'Industrial Participation' (IP) as it is officially referred to in South Africa, became mandatory for all government purchases in September 1996. In April 1997 Cabinet approved National Industrial Participation (NIP) policy and operating guidelines for all government departments and parastatals to be administered by the Department of Trade and Industry (DTI) (see Appendix 2). NIP effects all government and parastatal purchases or lease contracts (goods, equipment and services) with an imported content equal to or exceeding US$ 10 million (or the equivalent thereof) are subject to an Industrial Participation Obligation. The IP obligation must equal or exceed 30% of the value of the imported content of the purchase or lease and must be fulfilled within 7 years from the effective date of the IP agreement. The prospective foreign seller/supplier has to submit and implement business projects, which would generate IP credits equalling or exceeding the 30% IP obligation. A 5% performance guarantee is required prior to the IP contract being awarded.

The mission of the NIP policy is *'to leverage economic benefits and support the development of South African industry by effectively utilising the instrument of government procurement'.* The stated objectives of NIP policy are: sustainable economic growth; the establishment of new trading partners; the generation of inward foreign investment; increasing exports of 'value added' goods and services; R&D collaboration; job creation; human resource development; technology transfer; and the creation of economic advantages for previously disadvantaged communities.

The Defence Industrial Participation (DIP) policy for purchases by the Department of Defence (DoD) has further objectives more focussed on the defence-related industry. It aims to retain and create jobs, abilities and capabilities; allow a sustainable defence industrial capacity, with strategic logistic support capabilities; to promote value-added arms exports; to promote like-for-like technology transfer and joint ventures; to maintain skilled indigenous manufacturing capabilities

To deal with some of the problems discussed above the SA Government has set out some principles for all IP contracts. These include a requirement that there should be no increase in price as a result of IP (this is very difficult to police as there is no fixed price!); must represent new business; must be economically and operationally sustainable; must result

directly from the purchase contract[5]; and the fulfilment of any IP obligation lies solely with the seller.

IP projects and activities can be investments; joint ventures; sub-contracting; licensed production; R&D collaboration; export promotion and supply partnerships. They are dealt with by an IP Secretariat in the DTI to evaluate IP proposals, negotiate IP contracts and monitor all IP projects and activities and an IP Control Committee, which is made up of representatives from the Departments of Finance, Trade and Industry, Foreign Affairs, Defence In evaluating IP proposals a credit system is used which also allows the accumulation of credits (Appendix 2).

For NIP policy related to DoD purchases, the value threshold is US$10 million (or equivalent). Unlike with other government departments the DIP obligation is 100% split 50:50 between national (i.e. non-defence) and defence priorities and managed separately by DTI and Armscor.

The assessment of DIP proposals is based on the extent to which it supports the capabilities required in the defence industry to provide for a strategic, logistical support and upgrade capacity for a technologically advanced and modern defence force, its doctrine and posture (Defence Review, 1998). All DIP proposals, contracts and projects/activities are managed and administered by Armscor on behalf of the DoD. All non-military portions of IP projects linked to DoD purchases are managed and administered by the DTI in accordance with the provisions of NIP policy. Direct DIP involves activities directly linked to the specific DoD purchase or Main Agreement, while indirect DIP involves IP activities that may be unrelated but have relevance for the defence industry as a whole. Unlike other government departments, the DoD also has an in-house DIP programme, fully managed by Armscor, on all purchases between US$2 million – US$10 million. The DIP obligation for these purchases is 50% of the value of the contract.

The discharge period for all DIP obligations is 7 years. A penalty of 10% is levied by Armscor, with the approval of the DoD, on the unfulfilled portion of DIP obligations for contracts worth US$10 million or more. Armscor levies a penalty up to 30% on the unfulfilled portion of DIP obligations for contracts worth between US$2 million and US$10 million.

Many of the features of this approach follow the policies of European economies. Given the concerns of the previous section it is clear that the government has tried to deal with some of the issues and problems with offsets, but while statements of intent are valuable, it is what happens which is important and there are reasons for scepticism. Certainly, the government aims and policies seem to reflect some of the lessons learned by countries such as the UK, but any evaluation of their impact on the economy or value to it will need a more detailed understanding and analysis. The next section outlines the details of the arms acquisition package and the proposed IP activities.

6. Arms Acquisition and Industrial Participation

[5] The exception is the Strategic Partnership Agreement (SPA), which involves a long-term agreement between government and supplier and is not linked to a single tender.

In November 1998 the cabinet approved the list of preferred suppliers for jet trainers (Britain); light fighter aircraft (Britain/Sweden), light utility helicopters (Italy); corvettes (Germany); submarines (Germany) and maritime helicopters (Britain). The decision around the SANDF's requirement for main battle tanks was postponed. Cabinet also provided some details of the costs and IP components of each of the 6 arms acquisition programmes (see Table 1).

Table 1. SANDF Acquisition Programmes, 1998

Programme (no of units)	Supplier	Cost	Investment	Exports	Local Sales	Total Value of IP (%) *	No of Jobs
Corvettes (4)	Germany	R6001m	R2112m	R2109m	R11 786m	R16 007m (267%)	10153
Submarines (3)	Germany	R5212m	R6262m	R22 950m	R1062m	R30 274m (581%)	16251
Maritime Helicopters (4)	Britain	R787m	R268m	R227m	R2225m	R2720m (346%)	2536
Light Utility Helicopters (40)	Italy	R2168m	R431m	R2847m	R1407m	R4685m (216%)	4558
Jet Trainer (24)	Britain	R4728m	R2552m	R4566m	R1462m	R8580m (181%)	7472
Light Fighter (28)	Britain/ Sweden	R10 875m	R14 387m	R26 481m	R7445m	R48 313m (444%)	23 195
Total		R29 773m	R26 012m	R59 180m	R25 387m	R110 579m (371%)	64 165

Source: Department of Defence, Defence Acquisition Package, 18 November 1998
Note: * Total value of IP activities as a percentage of purchase cost

The total direct cost of the 6 acquisition programmes is estimated at R29,7 billion (in current prices and exchange rates) to be paid out over a period of at least 10 years. The equipment is expected to be delivered between 2000 and 2007.

The promises of IP are valued at R110 billion and are divided into 3 categories: investment (direct investment by European suppliers in South African industry); export sales (by South African companies in partnership with European suppliers); and local sales (purchases from South African companies by European suppliers).

In each of these 3 categories there is a split between NIP and DIP. It is estimated that at least R15 billion of the total IP offers of R110 billion will be spent directly in the local defence-related industry with the balance of R95 billion to be spent on non-defence activities (The Star, 29 July 1999). Each of the 6 arms acquisition programmes carries a 5% penalty clause for non-delivery on NIP and DIP projects and activities.

At the time of writing the final contracts between the European suppliers and Armscor had not been finalised and information on the proposed NIP and DIP activities of each of the 6 arms acquisition programmes remains sketchy. It is therefore difficult to undertake a comprehensive assessment of the economic impact of the IP activities on South Africa's defence-related industry and the national economy.

It is clear from the general discussion, however, that the overall economic and welfare effects of the packages are far from obvious. The benefits espoused by those involved are questionable. Fundamentally, the policy aims at maintaining the domestic defence production capability, arguing that this is important for the economy. The next section considers this issue.

7. The Value of South Africa's Defence-Related Industry

As mentioned earlier the procurement of arms from foreign suppliers rather than from the domestic industry casts a shadow over its future. This need not be a concern as there is a body of literature that suggests that military spending is unproductive and can either have no significant effect, or a negative effect on economic growth in developing countries (Grobar and Porter, 1989; Dunne, 1996). The negative economic effects of military spending can be exacerbated by investment in domestic arms production (Brauer, 1991; Dunne, 1995). According to a study by Vayrynen (1992) 'in purely economic terms arms production is inefficient and expensive …it distorts the structure of the national economy in the long run and has only a limited export potential.'

A recent study of the South African defence industry (Batchelor and Willett, 1998) concluded that 'the expansion of the domestic arms industry (during the 1970s and 1980s) distorted the trajectory of the country's industrial development (and) imposed a number of long-term economic costs on the economy. The absorption of scarce resources (capital, labour and foreign exchange) and the crowding out of non-military public and private investment and of non-military R&D contributed to the underdevelopment, declining productivity and poor international competitiveness of the civilian economy.'

If this were to be taken seriously the emphasis in procurement decision making might then be on cost, giving the option of using the saved expenditure for converting the domestic defence industry. Instead the role of offsets has been designed to maintain the local industry through the DIP.

The direct DIP activities will result in the preferred European suppliers purchasing certain locally manufactured inputs (e.g. sub-systems, components) from the domestic defence industry, which will then be integrated into the new weapons systems. In some of the programmes significant parts or sub-systems of the new weapons systems will be manufactured locally, either under license or in collaboration with the European suppliers. The European suppliers will contract directly with the local industry and will take final responsibility for the weapons systems before they are delivered to the SANDF.

This is likely to have a positive impact on the fortunes of the local defence-related industry. However, the costs of these direct DIP activities will probably be higher, given the incentive for the foreign suppliers to raise their prices to include the price of the offsets and the penalty clause, and given the fact that there is no market price for military equipment. There has been some debate recently about whether South Africa is paying higher prices for some of the new weapons systems (e.g. Gripen Fighters, Agusta light utility helicopters) it has decided to procure (Business Times, 25 July 1999).

The indirect DIP activities will result in some of the European suppliers investing (through equity purchases) in certain local defence companies and/or setting up new production/assembly facilities for other defence products and services. A number of the European suppliers may also help South African defence firms to win export contracts, and/or integrate South African inputs (e.g. technology, sub-systems) into their weapons systems for sale in foreign markets.

These examples of indirect DIP could provide much-needed finance and technology for the local defence-related industry and assist it to become more internationally competitive. Again, however, they are at the cost of higher procurement prices and the cost of maintaining a local defence industry and they are subject to the risk of broken promises.

8. Local Purchases from the Defence-Related Industry

All of the 6 arms acquisition programmes will require purchases of inputs (e.g. components, sub-systems) from the local defence industry. Since the announcement of the list of preferred suppliers in November 1998, a number of local defence companies have entered into agreements, or are busy concluding agreements, with the European suppliers to supply inputs (e.g. sub-systems) for the new weapons systems for the Navy and Air Force. The value of purchases from the local defence industry will depend on the competitiveness (in terms of price, quantity and delivery) and capabilities of the local industry, and whether the European suppliers are confident that local inputs can be successfully integrated into their weapons systems.

The programme involves purchases of significant quantities of new weapons systems for the Navy and the Air Force. These purchases will have a significant impact on the maritime, naval shipbuilding and aerospace sectors and sub-sectors of the local defence-related industry. However, the local industry is considerably smaller, more concentrated and financially weaker than it was in the late 1980s as a result of the defence cuts and increased foreign competition. The market-driven processes of downsizing and restructuring have also led to a loss of capabilities, including skilled human resources, in many sectors and sub-sectors of the local industry. Many of the European suppliers have expressed concern at the lack of capabilities in the local defence industry, and have struggled to identify worthwhile direct and indirect DIP activities in the sectors and sub-sectors of the local industry. (The Star, 22 July 1999).

South Africa's maritime and naval shipbuilding industry, which is concentrated in Durban and Cape Town, has downsized quite dramatically in recent years with the attendant loss of valuable capabilities and skills. The country's only naval shipyard, Dorbyl Marine, closed down in the early 1990s because of poor trading conditions. The industry thus lacks the capacity to design and manufacture major naval ships including submarines, although a few companies have the capacity to design and manufacture small harbour patrol boats. The local maritime industry does, however, have a limited capacity in naval electronics (including shipborne radar systems), systems integration (combat suites), ammunition (including naval bombs and mines), research and development and ship repair and maintenance.

Notwithstanding the local industry's reduced capabilities, local defence companies such as LIW (Denel) and ESD (Reunert) have emerged as likely suppliers of the 35mm and 76mm naval guns for the corvettes (Engineering News, 5 March 1999). In early 1999 it was reported that 7 local defence companies including African Defence Systems, Grintek, Reunert and Denel had formed a consortium to bid for the manufacture of the combat-suites for the corvettes, which could result in up to R2 billion worth of contracts for local industry (Sunday Times, 10 January 1999). The marine engineering division of Siemens in Pinetown, Kwazulu-Natal is hoping to supply locally manufactured electrical and electronic systems for the submarines and corvettes (Business Day, 2 December 1998).

In June 1999 the South African government and the German submarine consortium initialled a draft agreement for the purchase of 3 submarines at a cost of R4,5 billion, which is 15% lower than the initial quote of R5,2 billion announced in November 1998. The total IP agreement amounts to over R20 billion and the NIP component of the agreement is valued at R19 billion. The DIP component of the deal, which includes local purchases of equipment and sub-systems for the submarines, is valued at R1,1 billion, which amounts to 25% of the total purchase price of the submarines (Business Day, 14 June 1999). No details on the South African companies that will benefit from these local purchases are available.

Overall, this sector is not particularly well placed to benefit from the Navy's acquisition programmes without significant investments to upgrade and expand its existing capabilities.

South Africa's aerospace industry, which is concentrated in a few companies in Gauteng, has a relatively well-developed capacity to design and manufacture missiles, aerospace engines and fixed and rotary wing military aircraft. The industry also has significant capabilities in electronics (including radar), avionics, systems integration, weapons systems, and ammunition. Likely beneficiaries of the European suppliers' local purchases for the Air Force's acquisition programmes (jet trainers, light fighters, light utility helicopters) include companies such as Denel Aviation, Grintek, ATE, AMS and Aerosud. AMS is expected to supply health and usage monitoring systems for the Agusta 109 helicopters, the Westland Lynx maritime helicopters and some of the electronic equipment on the Gripen fighters (Engineering News, 5 March 1999).

Denel Aviation had been awarded a R282 million contract to design, develop and manufacture weapons-carrying pylons for the local (i.e. for the South African Air Force) and export versions of the Gripen fighter aircraft (Business Report, 31 May 1999). In addition, Agusta offered Denel Aviation licence rights to manufacture the A109 helicopter in South Africa, the right to source components for the helicopter from local industry, and to perform complete maintenance and overhaul of the A109 in South Africa (Engineering News, 16 July 1999).

This sector of the defence-related industry is therefore potentially well placed to benefit from the Air Force's acquisition programmes.

9. Investment, Joint Ventures, Technology Transfer and Exports

As a result of the proposed arms purchases, a number of European defence companies, including the preferred suppliers, have made investments in local defence companies, particularly aerospace and IT companies. Most of this investment has involved equity purchases, rather than fixed investment in plant and capital.

British Aerospace is the majority shareholder in Paradigm Systems Technology, a Gauteng-based software company. In 1997 it acquired a 20% equity share in Advanced Technologies and Engineering (ATE), a Gauteng-based aerospace company (Business Day, 9 December 1998). In February 1999 Altech sold the remaining 50% of its defence business (African Defence Systems) to the French company Thomson CSF, which had purchased an initial 50% equity in the company in March 1998 (Business Times, 28 February 1999). In March 1999 Swedish company Celsius purchased 49% of Grintek Avitronics for R30 million (Business Day, 1 March 1999).

British Aerospace is also currently in negotiations to purchase a 20% equity share in Denel Aviation, which will form the basis for a new Aerospace company with ATE and Aerosud (Business Day, 22 April 1999). Vickers, the UK engineering firm, is likely to purchase Reumech OMC, the armoured vehicle division of Reunert (Business Report, 19 August 1999).

These equity investments are linked to the proposed arms purchases from countries such as Germany, Sweden and Britain, but are also part of larger initiatives by European governments to promote increased trade between South Africa and themselves.

Another form of inward investment has been the growing number of joint ventures between European and South African defence firms, sparked off by the arms deal. These joint ventures are significant in that they involve technology transfers, and should allow South African defence firms to become part of these European companies' global supply chains. In May 1998 Grintek and GEC-Marconi (UK) entered into a joint venture, in which Grintek will produce sub-system components for telecommunications productions which GEC-Marconi sells globally (Business Day, 7 May 1998). In June 1999 Reunert and Daimler-Chrysler Aerospace (Germany) together with a black empowerment group Kgorong Investment Holdings formed a new joint venture company, Reutech Radar Systems (Business Day, 9 June 1999). In August 1999 Grintek and DaimlerChrysler Aerospace (Dasa) entered into a joint venture to develop high frequency radio systems (Business Day, 13 August 1999).

The proposed arms deals have already had a significant impact on South Africa's defence exports. Some European governments have been 'prompted' to purchase South African defence products in favour of their own products, despite criticism from their domestic defence industries. For example, in January 1999, Denel's Somchem division was awarded a R1 billion contract to supply fuses for the AS90 155mm howitzer guns used by the British peacekeeping forces in Bosnia (Business Day, 6 January 1999).

Some of the preferred European suppliers have also helped South African defence firms to bid for, and win, foreign defence contracts. In late 1998 Grintek was awarded a R56 million contract to supply audio-management systems for the British Aerospace-Saab Gripen fighter aircraft (Business Day, 16 November 1998). This was followed by an export contract in March 1999 from Ericsson Saab Avionics worth R6,2 billion to develop and produce electronic sub-systems for the Swedish Air Force's next batch of 64 Gripen fighter aircraft for delivery in 2003, in March (Business Report, 26 March 1999). Then in May 1999 Grintek was awarded an R8,4 million contract to design and develop the communications control and display unit (CCDU) for the Saab-British Aerospace Gripen fighter aircraft (Business Report, 28 May 1999).

During early 1999 British Aerospace (Australia) and Denel Aviation entered into a joint sales effort to sell the Rooivalk Attack Helicopter to Australia. However, the bid was unsuccessful (Pretoria News, 22 April 1999). Analysis, Management and Systems (AMS) were awarded a R10 million contract to supply onboard computers for the sale of British Aerospace Hawk jet trainers to Canada. This contract was a follow up to a contract to supply flight computers for Hawk jet trainers bought by the Australian Air Force in 1998 (Business Report, 27 August 1999).

10. Job Creation

The European suppliers' proposed defence purchases from the local defence-related industry, together with the prospect of increased defence exports, is likely to have a positive impact on job creation in local defence firms. Currently direct employment in the defence-related industry is estimated at 25 000 jobs (15 000 in the public sector and the rest in the private sector). Indirect employment (e.g. suppliers, sub-contractors) accounts for a further 35 000 jobs.[6] To put this into perspective more than 60 000 jobs in the defence industry have been lost since the late 1980s (Batchelor and Dunne, 1998).

Any such estimates are questionable, as the impact of the arms acquisition programmes, including the DIP activities, on job creation in the local defence-related industry is difficult to quantify. Certainly local purchases by the European suppliers, equity investments, joint ventures and export contracts will help to maintain jobs in the local defence-related industry, and prevent further retrenchments.

The job creation estimates which were presented in November 1998 suggest that R110 billion worth of DIP and NIP will create a total of 64 165 jobs – this amounts to R1,7 million per job. This figure is extremely high and more than 20 times higher than the average cost per job in the local defence industry. In 1997 the cost per job (remuneration costs per employee) in the public sector defence industry (Denel) was R93 722, while in the private sector (e.g. Reunert) it was slightly lower at R82 838. However, this is not an accurate reflection of the real costs associated with maintaining or creating jobs in the defence industry. In 1997 turnover per employee in the public sector defence industry (Denel) was R231 898 while in the private sector (e.g. Reunert) it was more than double - R464 633. Based on these figures, the estimated R15 billion worth of potential direct and indirect DIP activities could create, or sustain, approximately 40 000 jobs (based on R350 000 per job) in the local defence-related industry[7]. This is still considerably fewer jobs than could be created if the money were used for other purposes than buying arms.[8]

11. Non-Defence Industrial Participation

Government, through its NIP policy, has attempted to use the defence purchases to leverage substantial investment in the non-defence sectors of the South African economy. It has attempted to 'direct' this investment to particular sectors (minerals and energy) of the industrial economy and to specific parts of South Africa such as Kwazulu-Natal, the Western Cape and the Eastern Cape (The Star, 29 July 1999). It has also attempted to link it with other national economic and industrial policy initiatives (e.g. the DTI's Spatial Development Initiatives and Industrial Development Zones).

While details of the companies' NIP offers are still confidential, there is an increasing amount of information becoming available. A number of UK companies are reported to be considering non-defence investments as part of the NIP component of the arms purchases from British Aerospace (jet trainers, light fighters) and GKN-Westland (maritime

[6] This is an estimate based on information obtained from the Aerospace, Maritime and Defence Industry Association of South Africa (AMD).

[7] It has been reported that Denel's R1 billion contract to supply artillery charges for the British Army's 155mm howitzers will sustain 100 jobs and create 30 new jobs (Business Report, 25 June 1999). Another report suggests that the combination of the UK export contract, together with the Agusta helicopter deal and the local purchases associated with the arms acquisition programmes will secure or create about 1400 jobs in Denel and about 6000 jobs at its affiliates (Business Times, 22 November 1998)

[8] Reallocations of defence spending to other forms of government spending have been shown to increase employment and output. See discussion in Dunne (1996)

helicopters). Rolls Royce has proposed setting up an industrial park in East London to produce aircraft components, creating 200 jobs. National Power has promised to source components for its generating stations from South Africa, creating 200 jobs; and GKN has stated that it intends to expand its Cape Town operations by setting up a plastic moulding plant (Business Report, 11/1/99). According to newspaper reports Agusta's NIP offer includes the establishment of a US$10 million jewellery manufacturing plant in Cape Town by Filk, the world's largest manufacturer of gold chains; the establishment of a textile factory and the local assembly and manufacture of parts and components for Agusta's K119 Koala civilian helicopter (Business Report, 25 January 1999).

The draft agreement to purchase 3 submarines from the German submarine consortium for R4,5 billion incorporates an offer of nearly R19 billion in NIP activities, including the construction of a stainless steel plant by German company Ferrostaal at Coega near Port Elizabeth, and the establishment of a US$10 million venture capital fund to help SMMEs in the stainless steel industry (Business Day, 14 June 1999). The steel plant will form the anchor tenant for the planned deep water port at Coega and is expected to generate 3000 jobs during the construction phase and 1000 permanent jobs once production begins (Business Day, 14 June 1999). The construction of the plant is expected to cost R6 billion, while exports and local sales are expected to generate revenues of nearly R13 billion, which is 50% lower than the initial IP estimates of R24 billion announced in November 1998 (Business Day, 14 June 1999).

South Africa already has a well-developed stainless steel manufacturing capacity. The loss-making Columbus project, which is the largest single site stainless-steel plant in the world, will have a planned output of 600 000 tonnes at full production by the end of the century; and Iscor is currently expanding its stainless steel capacity by 480 000 tonnes (Fine, 1997). In the light of these developments, and the uncertainties around export markets and the limited number of jobs (including in downstream industries) that have been created in these mega-projects, does the stainless steel plant at Coega make any economic sense? Some studies have pointed out that the world market for stainless steel already suffers from excess production capacity, that the world price of steel is too low and therefore does not make the plant viable, and that running such a plant will be highly capital intensive, and skill intensive, requiring imports of skilled people (Finance Week, 6 August 1998). It is also worth noting that the proposed job creation effects of the submarine deal, including the stainless steel plant at Coega, are significantly less than the 16 000 jobs which were originally estimated in November 1998.

Notwithstanding such projects, the European suppliers seem to be struggling to find feasible NIP investment opportunities in the non-defence sector. Saab/British Aerospace have promised R48 billion worth of IP activities, including a potential investment in Coega, as part of the SANDF's planned purchase of 28 Gripen light fighters. However, the two companies have recently admitted that they are finding it difficult to convince government of the value of their proposed NIP activities and projects (Sowetan, 10 June 1999).

Ferrostaal recently stated that 'the submarine deal swayed the investment decision' (quoted in Business Day, 14 June 1999). This suggests that Ferrostaal's decision to invest in South Africa is not based on any rational investment criteria. It is also possible that many of the other European suppliers' NIP offers will also be based on 'irrational' investment criteria. This does not bode well for the future of these projects or inspire confidence in their ability to contribute to future economic growth in the SA economy.

12. Conclusions

South Africa faces a number of economic challenges, including attracting foreign direct investment and creating jobs. In this context the government has decided to spend R30 billion on imported arms for the SANDF. Rather than simply purchasing the weapons off the shelf the government has put considerable efforts into negotiating industrial participation agreements to benefit the local defence related industry and the national economy.

Leaving aside the issue of whether the expenditure on arms was necessary at all on security grounds, this paper has shown that the choice of imports with offsets seems a risky one. The purported benefits of offset agreements are questionable and what little empirical evidence is available suggests that they tend to have a much smaller impact on the local economy than expected. It is very difficult to judge whether prices are reasonable and whether the work attached to the offsets is actually new work at the same level of technology etc.

The South African government have made attempts to develop IP policies that reflect the lessons learned by other countries. However, there are still potential problems, which leave the benefits of the programme open to doubt. There is still the problem of firms reneging on agreements and simply paying the agreed penalties and whether the promised inward investment will take place and generate the numbers of jobs that have been promised.

Certainly the local defence industry will benefit from the deal and while it might struggle to retain the capabilities to produce a range of advanced weapons systems it could become a part of the global industry as sub contractor to some of the major players. There are capacity and capability problems in the areas relevant to the navy orders, which suggest that the sector will benefit little, but the local aerospace industry has the capacity and capability to benefit significantly from the Air Force orders.

Whether South Africa should be maintaining a defence industrial base at all is an important question, given the evidence that it can be a drain on the economy. Off the shelf purchases would have been cheaper and would have allowed the government to allocate the savings to encourage conversion in defence related industries and to develop those areas of the economy with the highest potential for economic growth and job creation. They could certainly have made more of an inroad into unemployment by using the expenditure differently.

The non-defence industrial participation proposals are certainly questionable. It is not clear whether SA will be getting state of the art technology in an area of growth, or old technology in areas of overcapacity (e.g. stainless steel) The dangers are clear. After the economic damage the misallocation of resources to strategic industries and capital-intensive mega-projects caused under apartheid, it is important not to make the same mistakes. It is not clear from our survey that the implications for industrial policy that are implicit in some of the offset offers have been fully thought out. It is certainly the case that the alternatives have not been given adequate consideration.

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Appendix 1: The Restructuring of South Africa's Defence-Related Industry

This appendix provides a brief overview of the changes that have been taking place in South Africa's defence-related industry.

South Africa's domestic defence-related industry has undergone a process of downsizing and restructuring in the last 10 years as a result of the dramatic cuts in the country's defence budget. Between 1989 and 1998 the defence budget was cut by more than 50% in real terms. The procurement budget, which is used to fund purchases of armaments from local and foreign suppliers, declined by more than 80% during the same period, while its share of the total defence budget declined from 58% to 15%.

The defence cuts have been accompanied by a variety of disarmament measures (including the dismantling of the country's nuclear weapons programme) and a restructuring of the public sector defence industry (Batchelor and Willett, 1998). As part of a policy of 'commercialising' public enterprises, Armscor was split into two separate organisations in April 1992. A new state-owned industrial company called Denel was formed under the Ministry of Public Enterprises, and it inherited most of Armscor's research and development and production facilities. Armscor remained part of the Ministry of Defence and retained responsibility for the procurement of armaments for the SADF (Cilliers, 1994).

The decline in demand for armaments has had a dramatic impact on the size and structure of the local defence industry. The size of the domestic defence market, as measured by total Armscor Acquisition Spending, declined by 81 per cent in real terms between 1989/90 and 1998/99 (an average decline of nearly 17% per annum).

Table 1. South African Domestic Defence Market, 1989/90 – 1998/99
Figures in italics are in percentages.

Year	Armscor Total Acquisition Spending (1990 Rm)	*% change*
1989/90	6236	
1990/91	5126	*-17.8*
1991/92	3931	*-23.3*
1992/93	3242	*-17.5*
1993/94	3162	*-2.5*
1994/95	2427	*-23.2*
1995/96	2167	*-10.7*
1996/97	1984	*-8.4*
1997/98	1386	*-30.2*
1998/99	1140	*-17.7*
Avg		*-16.8*

Source: Armscor Annual Report

Total employment in the defence industry declined by nearly 60 000 between 1989 and 1997, which represented a drop of over 40%. Employment in the defence industry during this period fell more quickly than in the overall economy as reflected by the decline in its share of manufacturing and total employment. The share of defence employment in manufacturing employment declined from over 8% in 1989 to 5% in 1997. The share of defence employment in total employment declined from over 2% to 1.4% during the same period.

Table 2. Defence Industry Employment, 1989-1997
Figures in italics are in percentages.

Year	Defence Industry*	*Defence/ Manf. Employment (%)*	*Defence/ Total Employment (%)*
1989	131750	*8.3*	*2.3*
1990	118150	*7.5*	*2.1*
1991	106935	*6.8*	*1.9*
1992	82900	*5.4*	*1.5*
1993	74570	*5.0*	*1.4*
1994	74235	*4.9*	*1.4*
1995	76270	*5.0*	*1.4*
1996	76700	*5.3*	*1.5*
1997	73995	*5.3*	*1.4*
Avg.		*6.0*	*1.7*

Sources: Armscor Annual Report, Denel Annual Report, *Quarterly Bulletin* (South African Reserve Bank).
Note: * Estimate including Armscor, Denel and Private Sector Defence Industry

The structure of the local market has also changed since the late 1980s. Many small and medium-sized private sector defence firms have gone out of business or exited the defence market because of the cuts in defence spending. This has made the local defence market increasingly concentrated. Denel is still the single largest domestic player (over 50% of domestic acquisition spending). The 3 largest private sector defence companies (Reunert, Grintek and Altech) together with Denel totally dominate the domestic defence market, accounting for over 90% of total domestic acquisition spending (Batchelor and Dunne). Surprisingly, the lifting of the UN arms embargoes in May 1994 has not resulted in significant increases in the value or share of arms imports. In fact the share of imports in the overall market has declined since the late 1980s and has averaged around 20% during the 1990s. The value and share of arms imports in total acquisition spending is likely to increase in the light of the recently announced arms purchases, which will have a very high import content.

Denel continues to dominate most of the 7 major sectors of the domestic defence market, particularly ***aerospace***, ***ammunition*** (small, medium and large calibre), ***weapons systems*** (including infantry weapons, cannons, artillery systems and missiles) and ***military vehicles*** and many sub-sectors, such as information technology, and testing. The other major sectors of the domestic defence market, namely ***electronics, maritime*** and ***support equipment*** are dominated by the three largest private sector defence firms, namely Reunert, Altech and Grintek (Batchelor and Dunne, 1998).

With such large cuts in demand in the defence industry the performance of the manufacturing industry was bound to be effected, through the impact on defence contractors, sub contractors and intermediate product suppliers. The downsizing of the defence industry exacerbated the impact of the domestic recession, which occurred between 1990 and 1993, and is reflected in the declines in the value and volume of manufacturing production after 1990.

During the period 1990-1998 when the domestic defence market contracted an average of 16% per annum, the manufacturing sector as a whole experienced a period of slow and declining growth in production and sales. During this period the volume of physical production grew by an average of 0.5% per annum, while the value of total sales grew by an

average of 0.2%. During this period the manufacturing sector actually shed jobs, despite marginal growth in volume and sales and total employment declined by an average of 2% per annum.

In some sub-sectors such as transport equipment and electrical machinery, which have a significant dependence on defence business (see Batchelor, Dunne and Saal, 1999) the picture is even more depressing. The volume of production in the transport equipment sub-sector declined by an average of 5% per annum between 1990 and 1998, while the value of sales declined by nearly 2% per annum during the same period. Although the volume of production in the electrical machinery sector witnessed positive average growth per annum between 1990 and 1998, the value of sales declined by an average of over 2% per annum during the same period. These trends in both the transport equipment and electrical machinery sub-sectors highlight the impact of the declining defence market on the manufacturing sector.

Table 3. Manufacturing Performance, 1990-1998
Figures are in percentages.

	Average Annual Growth (1990-1998)*
Total Manufacturing: Volume of Production	0.5
Total Manufacturing: Value of Sales	0.2
Total Manufacturing: Employment	-2.0
Transport Equipment: Volume of Production	-5.3
Transport Equipment: Value of Sales	-1.7
Electrical Machinery: Volume of Production	1.1
Electrical Machinery: Value of Sales	-2.5

Source: Statistics South Africa, Bulletin of Statistics, various issues
Note: based on 1995=100

Adjustment Strategies

In the face of declining demand for their products South Africa's defence firms have responded in a number of ways. They have pursued *offensive* adjustment strategies to maintain or increase their defence business. The most common offensive strategies have included increasing arms exports, mergers and acquisitions, and joint ventures with local and/or foreign defence firms. They have also pursued *defensive* strategies, to reduce their dependency on defence. This normally involves some form of conversion and or diversification. This section examines the adjustment strategies of South Africa's public and private sector defence firms since the late 1980s.

Vertical Integration, Mergers and Acquisitions

In the last few years all of South Africa's private and public sector defence firms have had to re-evaluate their corporate strategies. Denel and the major private sector defence contractors, such as Reunert, Grintek and Altech have all attempted to vertically integrate, by outsourcing far less of their defence business than in the past. This has reduced the demand for the output of hundreds of smaller defence firms, particularly those that act as suppliers and sub-contractors for the larger firms. Many small and medium-sized private defence firms have merged with, or been acquired by, larger defence firms in the last few years (e.g. Reunert acquired the armoured car division of TFM in January 1997), while others have exited the market. This has meant that the domestic defence market, and the various sectors of the

domestic market (e.g. aerospace, ammunition, military vehicles) have become increasingly concentrated (Batchelor and Dunne, 1998).

Exports and International Joint Ventures

Almost all South Africa's defence firms, without exception, have pursued export markets quite aggressively since the late 1980s, and particularly since the lifting of the UN arms embargoes in May 1994. Armscor's international marketing efforts, the presence of South African defence firms at international defence exhibitions, South Africa's re-integration into the international economy, together with the support of the ANC-led government have contributed to increases in the value of arms exports since the early 1990s.

Table 4. South Africa Arms Exports, 1989-1998
Figures are in Rand million in constant 1990 prices. Figures in italics are in percentages.

Year	Arms Exports	*% change*	Merchandise Exports	*% change*	*Arms/ Merchandise*
1989	236		44170		*0.5*
1990	163	*-30.9*	42735	*-3.2*	*0.4*
1991	686	*320.7*	46147	*8.0*	*1.7*
1992	411	*-40.0*	42516	*-7.9*	*1.0*
1993	712	*73.2*	46974	*10.5*	*1.5*
1994	659	*-7.6*	53873	*14.7*	*1.2*
1995	721	*9.5*	60419	*12.2*	*1.2*
1996	330	*-54.2*	66401	*9.9*	*0.5*
1997	802	*142.8*	71487	*7.7*	*1.1*
1998	380	*-52.6*	80005	*11.9*	*0.5*
Avg		*40.1*		*7.1*	*1.0*

Sources: Armscor, National Conventional Arms Control Committee, Quarterly Bulletin (South African Reserve Bank).

The value of South Africa's arms exports has fluctuated quite widely since the late 1980s, largely as a result of the lumpiness of export contracts. However, the value of arms exports has witnessed average growth of 40% per annum between 1989-1998, compared to only 7% average growth for merchandise exports. The share of arms exports in merchandise exports has fluctuated around 1% since the late 1980s, largely as a result of the sustained real growth in merchandise exports. South Africa's arms exports are dominated by Denel, which has averaged 80% of total arms exports in the period 1992-1998 (Batchelor and Dunne, 1998).

In addition to finding new export markets, most defence firms have also actively pursued international joint ventures with foreign defence firms, to strengthen their chances of bidding for, and winning, new defence contracts in South Africa and in foreign markets. Most of these are with European defence firms, and are concentrated in a number of key niche markets (e.g. electronics, armoured vehicles) in which South Africa has a 'proven' international competitive advantage.

Diversification and Conversion

Both public and private sector defence firms have actively pursued strategies of diversification and conversion since the late 1980s. These strategies have included joint ventures, acquisitions and/or mergers with civilian firms, the purchase of existing non-

military product lines or licensing agreements, and the development of civilian products using existing defence technology and production facilities (i.e. spin-off) (Batchelor,1996). These diversification strategies have been accompanied by significant investments in R&D and new product development as well as by marketing strategies to identify new (local and foreign) civilian markets.

In the public sector the outcome of Denel's diversification efforts since 1992 are reflected in the trends in the company's turnover and profitability and in the changing composition of the company's business. Denel's turnover declined by an average of over 5% per annum in real terms between 1992 and 1997 largely as a result of the dramatic declines in the value of its domestic defence business. The company's poor level of profitability over this period was related to the commercially unviable nature of many of the company's assets and facilities that it inherited from Armscor and the cancellation of a number of large export orders. The declining contribution of Denel's domestic defence business was offset to some extent by increases in exports (mainly arms exports) and civilian sales. The increasing value and share of the latter is directly related to the company's diversification efforts in some of its groups, such as Denel Informatics.

Table 5. Denel Composition of Turnover, 1992-97
Figures are in Rand million in constant 1995 prices. Figures in italics are in percentages.

Year	Turnover	*% change*	*Domestic Defence*	*Defence Exports*	*Domestic Civilian*	*Civilian Exports*	*Defence/ Total*
1992	3660		*63*	*16*	*20*	*1*	*79*
1993	3382	*-7.6*	*53*	*20*	*24*	*3*	*73*
1994	3274	*-3.2*	*48*	*23*	*25*	*4*	*71*
1995	3401	*3.9*	*45*	*24*	*25*	*6*	*69*
1996	2805	*-17.5*	*50*	*14*	*30*	*6*	*64*
1997	2725	*-2.9*	*41*	*20*	*30*	*9*	*61*
Avg:		*-5.5*	*50*	*20*	*26*	*5*	*70*

Source: Denel Annual Report

Only one of Denel's divisions has pursued an explicit strategy of conversion. Houwteq, which was formerly involved in military satellites, converted all its facilities to civilian purposes in 1992, and became involved in the development and marketing of low-earth orbit (LEO) satellites. However, the initiative was not commercially viable, largely because of political pressure from the USA, and was terminated in October 1994.

The results of diversification efforts in the private sector have been mixed given the presence of a number of barriers to exit from the defence market. These barriers have included: expensive plant and equipment; highly-paid and highly-skilled defence workers, the presence of a severe domestic recession; highly competitive and overtraded civilian markets; and a lack of direction from government with respect to the future of the defence industry. Some firms (e.g. Grinaker Avitronics) have been relatively successful in developing civilian products (e.g. microwave products, voice technology products) from their existing military technologies. However, most small and medium-sized firms have found it more difficult to develop spin-offs because of the resources needed to fund R&D to develop new civilian products. Most of the large defence firms (e.g. Reunert) have been successful in acquiring civilian firms, or civilian product lines through licensing agreements with civilian firms. Conversion has not been popular amongst private sector firms, as it is perceived as expensive and difficult. By 1998 less than 20% of Reunert's turnover was derived from its defence

business, while Grintek's defence business accounted for 12% of turnover. Altech's defence business in 1999 accounted for less than 10% of turnover.

Appendix 2: National Industrial Participation Policy

The evaluation of IP proposals and the awarding of IP credits are based on the following methodology:

Table 6. South Africa's Industrial Participation Methodology

Objective	Methodology	Factor
Sustainable Economic Growth	Revenues accumulated over the fulfilment period	$1 = 1 Credit
Export Promotion	Export Revenues = Additional Credits	$1 = 1 Credit +LC*
Job Creation	Salaries and Wage costs accumulated over the fulfilment period	$1 = 1 Credit
Training and Development	Training and Development Costs accumulated over the fulfilment period	$1 = 1 Credit
SMME Promotion	Outsourcing to SMMEs	$1 = 1 Credit
Previously Disadvantaged Individuals	Outsourcing to PDI SMMEs PDI Ownership % x Revenues	$1 = 2 Credits $ x % = Credits
Investment	Capital outlay or capital injections	$1 = 2 Credits
R&D Expenses	All costs	$1 = 2 Credits
Technology Transfer	On a case by case basis linked to revenues	$1 = 1 Credit

Source: National Industrial Participation Policy for South Africa, Department of Trade and Industry, Pretoria, April 1997
* LC = Local Content

Since 1996 the DTI has signed a number of IP contracts with foreign companies, including:
Ericsson (Sweden) for a Telkom contract for microwave equipment;
Alcatel (France) for digital enhanced cordless telephones (Dect) supplied to Telkom;
Lucent Technologies (USA) for digital enhanced cordless telephones (Dect) supplied to Telkom; and
Thomson CSF (France) for radar equipment supplied to the Air Traffic and Navigational Services company (Business Day, 28 November 1997).

Appendix 3: A Discussion of the Macroeconomic Effects of Arms Acquisition and Industrial Participation in South Africa

While it is possible that the R30 billion arms acquisition programme will have potentially positive direct and indirect benefits for South Africa's defence-related industry, it is important to consider the macroeconomic implications of the proposed arms purchases and IP activities on the national economy.

Government Finances

Spending R30 billion on arms purchases over the next 7 years will certainly have an adverse effect on the government's finances, particularly the budget deficit and the size of total government debt. It has been reported that only R22 billion of the proposed expenditure of R30 billion can be financed through the existing capital budget of the Department of Defence, and thus additional borrowing of R8 billion will have to be financed from other sources (Business Day, 17 November 1998). In order to finance this additional R8 billion (in current prices and at current exchange rates) government will have to consider the following options: 1) resources will have to be diverted from other categories of government spending; 2) taxes will have to be raised; 3) the budget deficit will have to be increased, thereby increasing the size of government debt and putting upward pressure on interest rates.

The first option is not viable, given the country's pressing socio-economic priorities. The second and third options are plausible. Studies of the South African economy have showed that the tax system has the capacity to mobilise between R15-R25 billion in additional tax revenue each year (Harber, 1995; Samson, 1997). The fact that almost R3 billion has been mobilised from business, labour and government as a result of the 1998 Presidential Job Summit provides evidence of the economy's ability to mobilise significant resources for job creation (Business Day, 18 February 1999). Statistical studies and cross-country comparisons also indicate that South Africa could incur additional public debt of approximately R60 billion without unduly burdening the economy (Samson, 1997). Given the fact that macroeconomic factors do not rule out increased spending on armaments purchases, why are they currently used to rule out increased spending on social priorities such as housing, health and education?

Balance of Payments

The R30 billion arms acquisition programme will involve substantial increases in imports over the next 10 years. In the absence of compensating exports, South Africa's balance of payments could be negatively effected. Over 10 years the arms purchases will cost approximately R3 billion per year (in current prices), less adjustments for offsets, which represents around 2% of the value of current merchandise imports. If the gap between imports and exports widens, this will place downward pressure on the exchange rate, which may force the Reserve Bank to increase interest rates to defend the external value of the Rand. Higher domestic interest rates will have a negative impact on investment and growth in the national economy, particularly the performance of SMMEs which are being targeted by government as one of the major job creation sectors of the national economy.

Investment

In recent years most of South Africa's foreign investment has been linked to short-term speculative investment in bonds and equities (Budget Review, 1999). Despite large inflows of short-term capital there has been very little long-term fixed direct investment, which is the kind of investment that is needed to compensate for South Africa's low level of domestic saving (15% of GDP in 1998) and to create jobs.

On the face of it, it seems as if government is trying to use the R30 billion arms purchases to leverage fixed direct investment into certain parts of the country such as the Western Cape, Kwazulu-Natal and the Eastern Cape. In addition to Ferrostaal's decision to build a R6 billion stainless steel plant at Coega it has also been reported that Coega has been selected as a possible site for an industrial complex, harbour and power station as part of the Saab/British Aerospace NIP offer which is linked to the purchase of Gripen fighter aircraft (Eastern Province Herald, 27 July 1999). Saab/British Aerospace's initial IP offer is reported to have included promises of investment in South Africa by companies such as Volvo, ABB, Electrolux and Ikea (Business Day, 27/7/99). It has also been reported that the Western Cape, and particularly Simon's Town, stand to benefit significantly from the contracts associated with the corvettes and submarines (Cape Argus, 29 July 1999).

Job Creation

Total formal employment in the non-agricultural sectors of the economy has continued to decline since 1994, despite a 10 per cent expansion in real output, thereby creating a situation of 'jobless growth' (Budget Review, 1999). Thus economic growth has been achieved through improvements in productivity (including labour productivity) rather than through employment creation. Unemployment in South Africa is currently estimated at 37.6 % of the work force and the need for 'labour-demanding growth' has thus become South Africa's most formidable economic challenge (Budget Review, 1999).

In the absence of more detailed information about the DIP and NIP offers it is unclear whether the proposed investments, export sales and local sales will be able to generate the amount of jobs (65 000) that were originally estimated at the time of the announcement of the preferred supplies in November 1998. It is also unclear whether the jobs that are being created in local industries are sustainable in the long run.

The record of employment creation associated with investment in strategic industries (e.g. Armscor, Sasol, Mossgas) and massive capital-intensive mega-projects (e.g. Columbus and Alusaf) is not particularly impressive (Fine, 1997). In many of these mega-projects the potential foreign exchange earnings are never repatriated, vertical integration does not take place and the job creation effects in downstream industries are never fully realised (Fine, 1997). This suggests that government should be cautious of sanctioning investment in capital-intensive mega projects such as the proposed stainless steel plant at Coega to generate jobs. Government should rather be trying to leverage investment into those sectors (e.g. housing, transport, tourism, energy, communication) which have a high capacity for mass employment creation and which can make a positive contribution to South Africa's infrastructure capacity and towards meeting basic needs in public utilities.

Appendix 4: Comparative Assessment Taxonomy

IP Alternative	**Import Only**
Potential Costs	**Potential Costs**
Economic effects of a local defence industry	Reduction in size of local defence industry
Higher Prices	Cost to maintain capability
Risk of Broken Promises	
Potential Benefits	**Potential Benefits**
Cheaper than domestic procurement	Lower costs
Increase domestic production	Conversion possible
Help with exports	Reduction in size of local defence industry