



Conference 2006



An Evaluation of the Developing Economic Relationships between China and South Africa in the Context of Negotiations on a Trade Agreement

Nepeti Nicanor, Simon Roberts and Marian Walker

**Accelerated and Shared Growth in South Africa:
Determinants, Constraints and Opportunities**

18 - 20 October 2006

**The Birchwood Hotel and Conference Centre
Johannesburg, South Africa**



Conference organised with
support from the EU



**An Evaluation of the Developing Economic Relationships between China
and South Africa in the Context of Negotiations on a Trade Agreement**

10 October 2006

Nepeti Nicanor

Simon Roberts

Marian Walker

Corporate Strategy and Industrial Development research programme

University of the Witwatersrand

csid@sebs.wits.ac.za

Tel: 011 717 8126

TABLE OF CONTENTS

1	Introduction	3
2	Overview of Chinese industrial development and policies	9
3	Analysis of South Africa-China trade flows	13
3.1	Profile of South African Exports to China	13
3.2	Profile of South Africa's imports from China.....	15
3.3	Sectors in which China and South Africa complement, and compete, with each other.....	16
4	Sector Focus 1: The Mineral Sector	18
4.1	Overview of the minerals sector.....	18
4.2	Mineral Sector Trade Flows	22
4.3	Analysis of Mineral Sector	23
4.4	Implications for Mineral Sector.....	24
5	Sector Focus 2: The Base Metal Sector.....	25
5.1	Overview of the Base Metal Sector.....	25
5.2	Base Metal Sector Trade Flows.....	27
5.3	Analysis of the Sector.....	28
5.4	Implications for Base Metal Sector	30
6	Sector Focus 3: Machinery & Equipment Sector	31
6.1	Overview of the Machinery & Equipment Sector	31
6.2	Machinery & Equipment Sector Trade Flows.....	32
6.3	Analysis of the Machinery & Equipment sector	35
6.4	Implications for Machinery & Equipment Sector	38
7	Sector Focus 4: The Agro-Processing Sector.....	39
7.1	Overview of the Agro-Processing Sector	39
7.2	Agro-Processing Sector Trade Flows.....	40
7.3	Analysis of the Agro-Processing Sector.....	43
7.4	Implications for Agro-Processing Sector	44
8	Sector Focus 5: The automotive sector	45
8.1	Overview of the Automotive Sector.....	46
8.2	Automotive Sector Trade Flows.....	50
8.3	Analysis of the Automotive Sector.....	52
8.4	Implications for Automotive Sector	53
9	Conclusions and Implications for SA-China Economic Relations	53

1 Introduction

The rapid economic growth of China in the past two decades, averaging over 8 per cent per annum, has major implications for the growth of the world economy, and for growth and development in South Africa. At the same time, South Africa (and the Southern African Customs Union) is engaged in negotiations with China on a Trade Agreement. A detailed analysis of trade flows and the opportunities and threats that a trade agreement poses has been undertaken elsewhere (see Wilcox and Van Seventer, 2005; Draper and Le Pere, 2005; Jensen and Sandrey, 2006). We question the gains that are typically highlighted from complementary patterns of comparative advantage. Our objective is to consider the evolving economic relationships between China and South Africa, including trade, and to situate them within the broader implications of China's growth. These implications include the likelihood of sustained higher demand growth for minerals and other commodities, of major importance for South Africa's development trajectory.

China's impact on the global economy is due to its size and rate of growth, however, even after two decades of high growth GDP per capita in China is still just one third of that in South Africa (Table 1). Despite this, China's pattern of export specialisation has rapidly evolved to encompass diversified, relatively high-technology, products. This is part of the strong leading role that industry, and manufacturing in particular, has played in China's growth. It is a key feature which we explore in more detail below.

Table 1. South Africa and China comparative indicators, 1993-2003

	South Africa	China
GDP, 2003 (current US\$ bn)	160	1 417
Real GDP, annual gr, %	2.8	8.9
GDP per capita, 2003 (constant 2000 US\$)	3 026	1 067
GDP per capita, ann gr, %	0.7	8.0
FDI as % of GDP, avge 93-02	1.5	4.6
Manufacturing, ann gr, %	2.0	13.7
Manufacturing, % of GDP, 2003	17.2	37.0
Industry ann gr, %	1.6	14.0
Industry as % of GDP, 2003	28.2	52.1

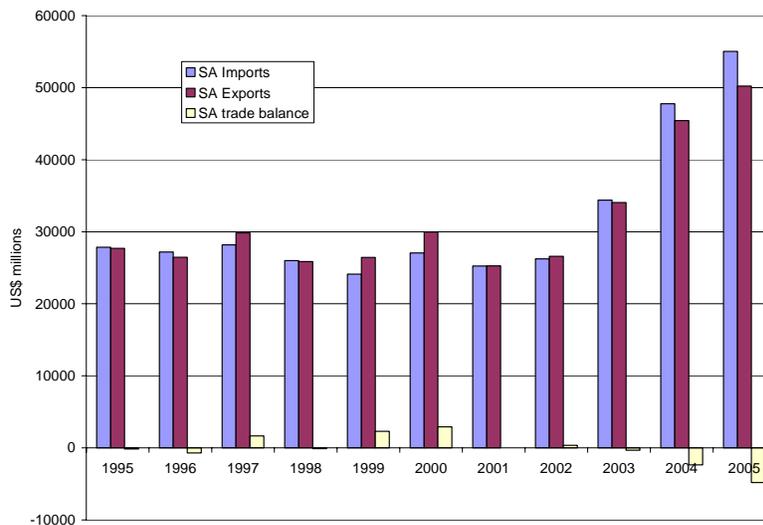
Source: World Bank, World Development Indicators

The evolution of global demand, and the relative prices of different groups of products, has been crucially affected by China's industrial development strategies (White and Alves, 2006; Rodrik, 2004b). A good example is the case of steel. China's demand for steel, linked to its investment and infrastructure oriented growth path, underpinned a spike in the international steel price, to reach historic highs in 2004 and 2005. Suddenly steel changed from being an 'old industry' to being branded as 'dynamic' (see UNCTAD, 2005). However, a key element in China's

development strategy is to ensure local capacity in key industrial inputs such as basic metals, despite being relatively resource poor.¹ Significant expansions in China’s steel production were planned based on the anticipation of development requirements. These came on stream in 2005 and 2006, meaning that China was no longer a large net importer and is likely to become a marginal net exporter in the coming 12 months. At the same time, China has ensured steel is competitively priced domestically, even while requiring some imports at the margin.

The comparison with South Africa is stark. South Africa is a resource and energy rich country, and a major net exporter of products such as steel and aluminium. But, prices are at or above international averages and no advantage is conferred on downstream industry. The resource-based exports also underpin a strengthening exchange rate, while expectations of a continued boom in resource prices have partly led to capital inflows that underpin a burgeoning trade deficit. The pattern of comparative advantage has thus remained locked into capital-intensive products, and the exchange rate ensures that unskilled labour is expensive in international terms.

Figure 1. South Africa total trade flows



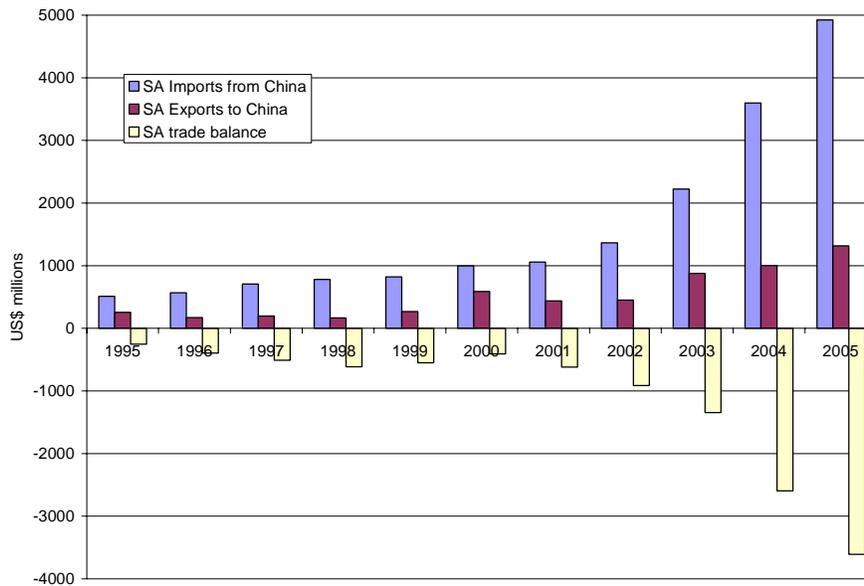
Source: Quantec

The changing profile of South Africa’s trade with the world as a whole is reflected in its trade with China. South Africa has rapidly built up a huge trade deficit with China, at the same time as the aggregate trade deficit has grown (Figures 1 and 2). Indeed, the trade deficits with China in 2004 and 2005 were of the same order as South Africa’s total trade deficits, of three to four billion dollars. In other words, it could be argued that the increased imports from China in these years are

¹ In per capita terms, China has 8.3 per cent of the world average resources of oil, 4.1 per cent of natural gas, 25.5 per cent of copper, 9.7 per cent of aluminium and 40 per cent of cultivable farmland (Bijian, 2005).

largely responsible for the South African trade deficit. Of course, this does not hold, in and of itself, as the overall deficit reflects the much larger total trade flows of South Africa. But, what makes South African – China trade flows so interesting are the implications they hold for South Africa’s patterns of comparative and competitive advantage.

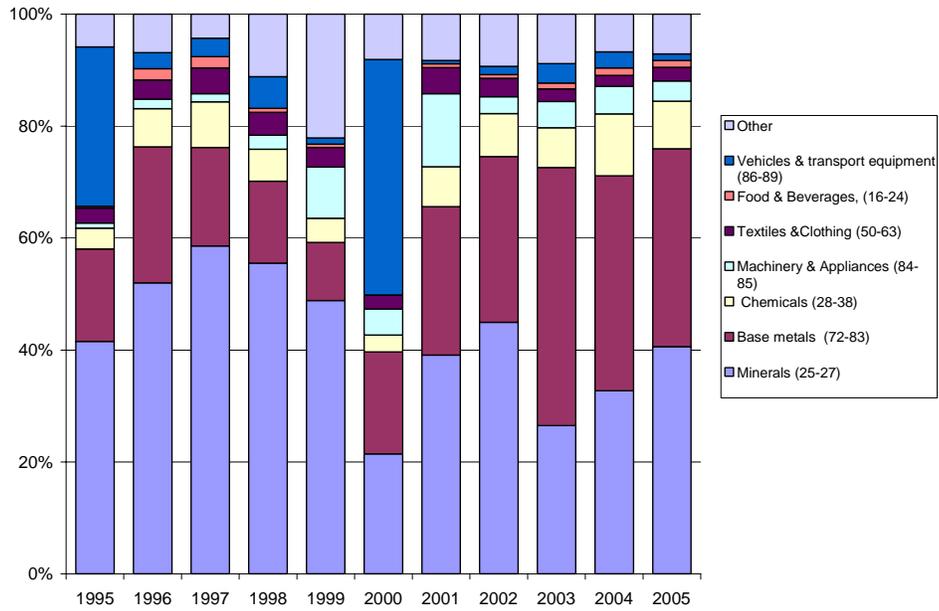
Figure 2. South Africa’s trade flows with China



Source: Quantec

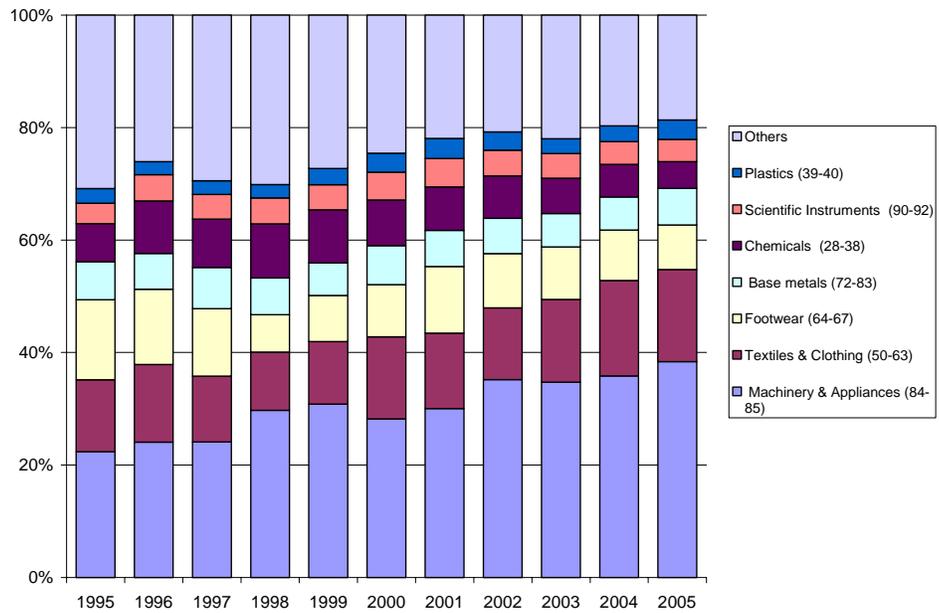
South Africa’s export profile to China has, if anything, become more resource-oriented if one takes into account base metals and chemicals (Figure 3). By comparison, the share of more sophisticated manufactured products in imports from China has increased, especially in machinery, which includes electrical consumer goods and computers (Figure 4). Despite China’s much lower GDP per capita, South Africa’s trade flows with China are similar to what would be expected with a more industrialised country.

Figure 3. South African exports to China



Source: Quantec

Figure 4. South African imports from China



Source: Quantec

China's strategic interests

Strategic concerns on the part of China also underlie foreign direct investment flows, with significant implications for South Africa. China has clearly articulated the objective of securing energy and resources, with African countries high on its list (Kaplinsky et al., 2006; Zweig and Jianhai, 2005, Alden, 2005a and 2005b; Hale, 2005). To further this objective the Chinese government has identified a list of countries and resources in which investment is eligible for subsidies from the government. In seeking access to oil resources, Chinese companies are aggressively participating in extraction in countries such as Saudi Arabia and, at the same time, China is encouraging major downstream investments (in petrochemicals plants) in China by Saudi Arabian companies to improve the capacities and technological standards in these activities (Steinhilber, 2006).

China has also taken advantage of 'gaps' where target countries have been marginalized by industrialised countries and major multinationals (Vines, 2006). One example is the advancement of soft credit to the Angolan government, linked to oil exports. Another case is Sudan, where Chinese companies have secured significant rights to oil, while the USA and others have branded the Khartoum government as a 'rogue state' and have been seeking UN sanctions in response to the war in the South of Sudan and atrocities in Darfur.²

The China – Africa Cooperation Forum was established in 2000 to promote Chinese trade and investment in African countries (Lihua, 2006; LePere and Shelton, 2006; Hale, 2005). In 2003, Prime Minister Wen visited several African states, notably oil producers. In January 2006, the Chinese government issued a paper on 'China's Africa Policy' which sets out broad principles of cooperation in the areas of political interests and international fora, economic interests, cultural exchange and security (Lihua, 2006).³ This was followed in April and May 2006 when President Hu Jintao visited Kenya, Morocco and Nigeria to announce cooperation agreements, strongly focused on oil exploration and exploitation (Vines, 2006). China's strategic focus on energy has also underpinned Sasol's involvement in two coal-to-liquids plants currently in the planning phase (Naidu, 2006; Sickinga, 2006). The intensity of China's interactions with targeted states is also illustrated by the fact that Brazil's development minister visited Beijing nine times in 2003 and 2004 (Zweig and Jianhai, 2005; White and Alves, 2006).

² According to *The China Monitor April 2006*, China now procures 28 per cent of its oil and natural gas from Africa, with Sudan and Angola the leading exporters.

³ Ministry of Foreign Affairs of the People's Republic of China (2006) 'China's Africa Policy', January 2006, <http://www.fmprc.gov.cn/eng/zxxx/t230615.htm>

The interest in African energy and resources has led Alden to highlight the importance of African countries' negotiating positions (Alden, 2005a). In particular, he raises the importance of negotiating for asymmetric access, through saying 'no' to initial terms being offered, and using the importance of resources to China to ensure good terms. These terms can include joint ventures, technology transfer and training tied into resource-seeking and exploiting investments.

China's policies and engagement with regard to FDI in its domestic economy could point the way here. China has followed specific objectives to do with access to technology and international distribution networks in its relationships with transnational corporations investing in China. It has leveraged its advantages, such as the attraction of its large domestic market, to place conditions on FDI to maximise the positive development impact on the local economy. At the same time, China has sought to build very large Chinese transnational corporations (Nolan, 2002). This has included targeting approximately 180 companies for state support to grow and internationalise, aiming at becoming major multinationals among the ranks of Fortune 500 (Alden and Davies, 2006).

The implications for South Africa is not to copy, but to learn from the approach and experience, adapting it to the nature of the South African economy and its challenges. We further argue that decisions with regard to South Africa's developing economic relationships with China must be based on a forward-looking analysis, which goes beyond an assessment of trade flows to take into account the patterns of change underway. This requires an understanding of China's strategic interests and the ways in which they are being pursued.

China, sub-Saharan Africa, and South Africa

Recent analyses (Kaplinsky et al., 2006; Jenkins and Edwards, 2005) of the implications of China's rapid growth for African economies have identified the primary channels through which impacts are transmitted as being:

- Trade flows
- FDI/production (including integration in global value chains)
- Aid flows

In addition to the direct effects, there are very substantial indirect effects. These include the impact that China's growth has on relative world prices, with higher prices of commodities and lower prices of labour-intensive manufactures, even where there is no direct China – South Africa trade flow.

Most is known about the direct effect of trade flows. In this regard Kaplinsky et al. (2006) and Jenkins and Edwards (2005) conclude that the negative effects on Sub-Saharan African countries are relatively small, while there are large gains to consumers. This is based on the observation that cheap Chinese imports tend to displace imports from other sources not local production. South Africa may be somewhat different in this regard. In sectors such as clothing, textiles and furniture there is evidence that local producers are being hard hit by cheap Chinese imports. Moreover, potential growth in various consumer goods industries may also be negatively affected. But, Jensen and Sandrey (2006) find overall welfare gains nevertheless from modelling a SACU-China FTA despite production losses in these sectors.⁴

However, the other channels are also very important, as are the indirect effects. In this regard, the impacts of China's growth (and, to a lesser degree, of India) pose fundamental questions for South Africa's growth and development trajectory. This paper seeks to address some of these questions, and not to replicate the trade analyses that have been done already. The direct trade effects are, however, the easiest to measure, while the other effects are far from obvious. But, the mistake should not be made of equating measurability with size of impact. Indeed, the reverse may well be the case.

In order to explore the wider impacts of China's growth on the South African economy we focus on five selected broad industry groupings. These groupings minerals, base metals, machinery & equipment, agro-processing and automotive. These groupings are not selected in order to examine the major direct competitive import threats such as in clothing or furniture. Rather, they are chosen to explore the implications of the gains from trade on the export side, including resource-based and agricultural products, and two groupings of more sophisticated manufactures where South Africa might be expected to have a competitive edge over a less developed economy. In addition, we examine the wider indirect effects, especially the implications of China's growth on the relative prices of resources. The sector analysis enables an exploration of the links between the various impacts, in the context of the development patterns in South Africa.

2 Overview of Chinese industrial development and policies

An important premise of this paper is that the developing economic relations between China and South Africa cannot be understood in the absence of an appreciation of the underlying patterns of development and industrial policies.

⁴ We discuss the factors underlying the trade analyses further below.

China's very impressive growth performance has been driven by investment, which has been around 40 per cent of GDP. Approximately two thirds of investment has been in the construction of infrastructure. Of the investment in machinery and equipment, the great majority has been domestically financed, with foreign investment contributing only a very small share (Shane and Gale, 2004).

China's industrial growth has been abnormally related to international trade for a country of its size, with a trade to GDP ratio in excess of 70 per cent. It is also export-oriented in the sense that China has continued to run a major trade surplus since 1990, with the exception of 1993, together with the build-up of huge foreign exchange reserves. These reserves totalled \$400bn in 2003. The growth of manufacturing exports has been supported by the fixing of the exchange rate and strict capital controls. More recently, under intense pressure from the USA in particular, the currency has been allowed to appreciate modestly. By comparison, the Rand has strengthened very considerably against the US\$, and thus against the Chinese currency, while the trade and current account balances have recorded major deficits.

Manufactured exports have been dominated by labour intensive products such as clothing and toys (Broadman et al, 2007; World Bank, 2004). Exports of more sophisticated products have grown strongly in the past decade, and China's export basket is now much more sophisticated than would be expected of a country of its level of GDP (Rodrik, 2006). While this may be a little misleading to the extent that it is linked to the outsourcing of assembly operations by multinational corporations to take advantage of low wage costs (and the undervalued currency), it is also due to government strategies of investing heavily in engineering, science and technology (Huang and Wang, 2002; Von Zedtwitz, 2005). The evolution of industrial competitiveness in China is important in the context of a possible trade agreement, as is the role of government. As South Africa aims to improve the value-added and technology levels of its exports, China poses a major challenge, both because of competition in these areas, and because China's growth itself raises the relative prices of raw materials, internationally (Jenkins and Edwards, 2005; Lall and Albaladejo, 2004; Lall and Weiss, 2005; Shafaeddin, 2004).

Industrial policy

Improved productivity levels, production capabilities and entry into new product areas have generally underpinned the diversification of manufacturing activity associated with higher growth in industrialising countries (Imbs and Wacziarg, 2003). There are many reasons why market forces do not promote such developments (at least at the pace seen in China). Relative prices, which provide incentives to invest, reflect existing production possibilities, not potential activities. Linkages between

new activities are also not taken into account in market prices (Rodrik, 2004a; Machaka and Roberts, 2003). Financial markets are subject to information imperfections, implying under-investment relative to socially optimal levels (Roberts, 2004; Stiglitz, 1993). Similar sub-optimal outcomes are implied by market failures related to education (Broadman et al., 2007; Sidiropoulos, 2006).

China's industrial performance is related to government policy. It is also notable that, contrary to interpretations which emphasise the importance of reducing government regulation if private sector activity is to be stimulated, China's growth has taken place under extensive state regulation of economic activity, including the behaviour of foreign firms (Nolan, 2001 and 2002; IBM, 2006, Deloitte, 2006). China's industrial policy, however, has had a clear focus on the development trajectory envisaged, and the tools required to influence firms' decisions.

State support for fixed investments and in research and development, often through direct state ownership, is one important area (Shane and Gale, 2004; Huang and Wang, 2002). China has also strongly encouraged mergers and acquisitions to ensure the development of large, internationally competitive firms.⁵ In 2001, the Chinese Government announced that the country will develop 30-50 state-owned firms to become globally competitive corporations through mergers and acquisitions, restructuring, public offerings and cooperation in the subsequent five years (Nolan and Zhang, 2002). Before the WTO accession these selected Chinese global firms were supported through tariffs, technology transfer in lieu of domestic market access, limitations to domestic marketing channels, government selection of international partners for joint ventures, government procurement policy, preferential loans from state banks, privileged access to listing on international stock markets (Shane and Gale, 2004; Gale 2005; Gale and Collender, 2006).

The reform and consolidation of state-owned firms has, however, been coupled with the maintenance of vigorous rivalry between firms. China has clearly separated changes in ownership from competition, opting for the latter in the reform process, while continuing with state-ownership. The active rivalry is a major stimulus in the evolutionary industrial policy process that supports the growth of its industries such as aerospace, petrochemical, pharmaceuticals, power equipment, steel, coal mining, telecommunication and motor industries (Nolan, 2002). In industries as diverse as steel and pharmaceuticals, the restructuring and reform has thus encompassed rapid modernisation, investment in R&D, technology and technology capability, strategic mergers and acquisitions, improved productivity (as a result of rapid output growth), product identification and diversification (Nolan and Yeung, 2001).

⁵ Such as in the auto sector (Just Auto.com, 2005)

Despite the impressive growth, Chinese firms still fall behind major multinationals in many product areas outside labour-intensive manufacturing (IBM, 2006, Deloitte, 2006; Regmi and Gehlhar, 2005). In industry cases studies of aerospace, pharmaceuticals, oil, car assembly, steel and coal mining, Nolan (2002) finds that Chinese companies are not globally competitive due to a combination of external and internal factors. These include:

- Focus on low-value goods, and relatively poor technical capabilities
- Lesser known global brands
- Too much diversification
- Domestic competition from smaller players
- Low purchasing power from majority of population
- Local interests in maintaining local jobs and assets work against concentration
- Bureaucratic corruption and poor bureaucratic commitment
- Control of global value chains by few integrators

By comparison, major multinationals have become system integrators controlling the entire value chain through IT, procuring systems, marketing, human resource development, R&D and transfer of best practices (Best, 2001; Chang, 1998).

This is consistent with some analysts who have argued that the rise of China as an industrial powerhouse has been grossly exaggerated. They note that much of the rapid growth in manufacturing output of relatively sophisticated products is in fact in assembly (IBM, 2006; Deloitte, 2006). Plants of US, European, Japanese and Korean firms locate assembly operations in China to take advantage of cheap labour, and to more easily access the Chinese market, but the more complex components are exported to China and the R&D remains in the home country. In this sense the growth dynamic fits a similar pattern as in clothing and textiles, rather than reflecting a fundamental change in industrial capabilities.

But, as will be seen in the industry case studies below, such as that of steel, the picture is mixed. Chinese industrial policies have continued to vigorously promote the ongoing development of firm capabilities, realising major improvements in products and processes. This has been coupled with adoption and adaptation of technologies from multinationals investing in China, through various mechanisms including joint ventures. In addition, there are cases of Chinese firms improving technological capabilities through outward acquisitions (Goldstein et al., 2006; Luo, 2006; IBM, 2006, Deloitte, 2006).

The fundamental point in this debate is the importance of understanding the trade flows as the outcomes of the decisions of major firms, within international value chains, and the development of production capabilities which underpins the changing patterns of specialisation (Broadman et al., 2007; Goldstein et al, 2006; Imbs and Wacziarg, 2003; Sidiropoulos, 2006). China's approach is distinguished by the way in which it has supported large local firms in key industries, while ensuring competitive rivalry, and not necessarily under private ownership. At the same time China has adopted an approach of strategic engagement with foreign multinationals.

3 Analysis of South Africa-China trade flows

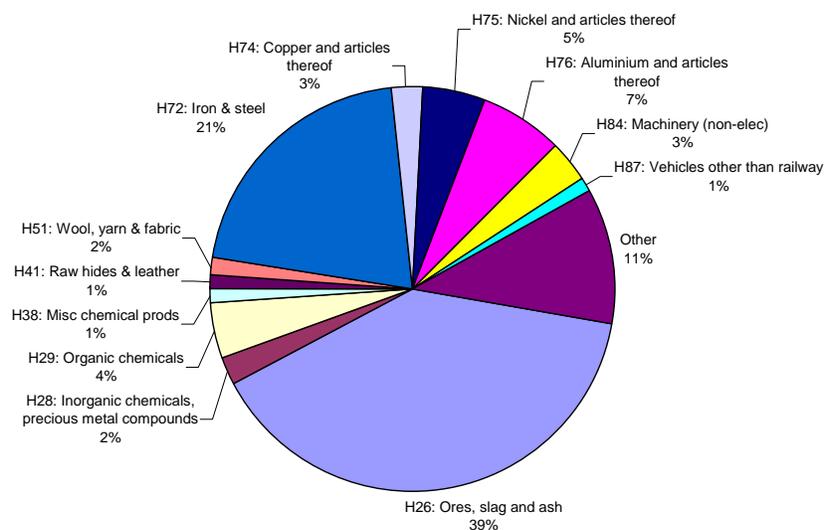
As illustrated above, trade between South Africa and China has grown strongly since 2001, which coincides with strong growth in South African trade with the world as a whole. However, imports from China have increased much more rapidly than exports, and a sizeable trade deficit has therefore opened up.

Our objective here is not to repeat the detailed analysis of South Africa – China trade flows which has been done elsewhere (Wilcox and Van Seventer, 2005; Jensen and Sandrey, 2006). Instead, we briefly review the patterns and summarise the picture which emerges. This includes assessing whether China's exports are complementary or competing with those of South Africa. In this we also refer to similar studies done for Latin American and East Asian countries (Lall and Weiss, 2005; Lall and Albaladejo, 2004), as well as studies for sub-Saharan Africa as a whole (Kaplinsky et al, 2006; Jenkins and Edwards, 2005). This lays a basis for the assessment of the factors underlying the developing economic relations as they relate to South Africa's economic development trajectory through taking five major sectors, with existing or potential significant export capabilities.

3.1 Profile of South African Exports to China

A more disaggregated assessment of South Africa's exports to China only reinforces the overall picture outlined in the introduction. The exports are dominated by mineral ores, in unprocessed form, basic iron & steel, also with low value addition, along with other basic metals (Figure 5). Other product groupings include basic organic and inorganic chemicals, and textile products. But, even within textile products, we find that the exports are overwhelmingly of raw, unprocessed wool. Other categories, which we explore in more detail below, are machinery & equipment and various agricultural and agro-processing products which together are an important part of the 11 per cent of 'other exports'.

Figure 5. South African exports to China, 12 largest, 2005



Source: Quantec

The South African export patterns are thus in line with those of other African countries. In this sense, South Africa and China's areas of comparative advantage are complementary rather than competing (see Jenkins and Edwards, 2005; Kaplinsky et al., 2006).

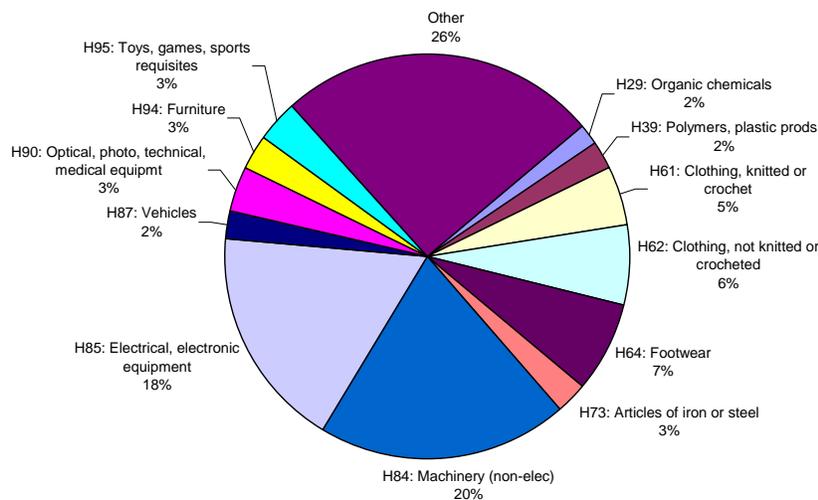
In the case of South Africa, the patterns are those that would be expected of a less-developed, resource-dependent country, despite the fact that South Africa is at a much higher level of development than China in terms of simple GDP per capita indicators. The patterns also do reflect the different endowments and the implications of those endowments for exchange rates (Frankel et al., 2006). But, it is important to remember that far from strong resource earnings being the driver (suggesting a trade surplus along with currency appreciation) South Africa has run a growing trade deficit both with China and the world. South African industry has thus failed to realise the opportunities represented by growing Chinese demand, outside of resources.

This is consistent with findings of Wilcox and Van Seventer (2005) that mining and basic processing has taken an increasing share of South Africa's exports while China has succeeded in moving away from basic processing to advance manufacturing over the same period.

3.2 Profile of South Africa's imports from China

China's exports to South Africa are much more diversified than South Africa's exports.⁶ The largest industry groupings are electrical and non-electrical machinery. As described below, these are highly differentiated groupings, including consumer electrical goods, computing equipment and capital goods for investment by firms. Exports in these categories have also grown very strongly over the last ten years. In addition, there are significant South African imports from China of other technical products such as medical and optical equipment.

Figure 6. South African imports from China, 12 largest, 2005



Source: Quantec

It is important to highlight that there are also still very significant imports of ultra labour-intensive products, namely footwear, clothing and furniture. And, in the textile, footwear & clothing categories in which Chinese imports compete they typically have a share of more than 50 per cent of imports (Jensen and Sandrey, 2006). For South Africa, the impact of labour-intensive imports has an important positive dimension in that it means lower prices to consumers of these products (see Jenkins and Edwards, 2005). And, it is likely that in the absence of imports from China, the products would be imported from other low wage economies, and would not be made locally. The possible exception is the import of wooden furniture, in which South Africa has an advantage due

⁶ Wilcox and Van Seventer (2005) note that at the six digit level there are approximately five times as many products in imports from China than in South African exports to China.

to its local timber, and which is an industry that has recorded high rates of growth (Kaplinsky and Morris, 2006).

3.3 Sectors in which China and South Africa complement, and compete, with each other

Much of the recent analysis on the trade impact of China on South Africa, and indeed on Africa, highlight the complementary nature of the trade patterns. This is clearly the picture that emerges from the overall patterns. This is consistent with other analyses of the extent to which China's trade patterns are complementary rather than competitive with regard to different groups of developing countries (see, for example, Shafaeddin, 2004; Lall and Weiss, 2005; Broadman et al., 2007; Vines, 2006). At this basic level of analysis of trade flows it suggests that there are substantial gains from increased trade.

There are products such as clothing and furniture where Chinese exports pose major competitive threats to producers in African countries, however, South Africa is affected to a lesser degree to the extent that the competitiveness of South African firms is not in the very low cost, large volume products (Vines, 2006). The South African electronic equipment sector is also affected negatively by greater Chinese competition (Jensen and Sandrey, 2006). The overall welfare gains arise from allocative efficiency – that is consumers benefit from cheaper products in sectors in which South Africa is not competitive (in the sense of having a trade deficit), while declines in these sectors means resources (capital and labour) are assumed to be better allocated to other activities in the economy. While the effects on consumers are relatively straightforward, the gains from the reallocation of factors depends on assumptions as to factor mobility which are not necessarily justified where, for example, labour mobility in practice depends on retraining (requiring time and money). Problems with the fundamental assumptions underlying such analyses of gains from trade liberalisation have been widely noted.⁷

With regard to the gains from trade, Wilcox and Van Seventer find that 'there is enormous potential for trade with China' (2005: 214). They reach this conclusion by assessing products which China imports and that South Africa exports. They further assess products where South

⁷ See Roberts (2000) for a review of studies of trade liberalisation episodes. The expanding (export) sector may not grow at a faster rate to absorb all or most of the workers released from the contracting (import-competing) sector. In the absence of such smooth adjustment, the burden of structural reforms may disproportionately be borne by unemployed unskilled workers retrenched from the declining sector. As Greenaway & Nelson (2001: 33) observe: "There is considerable evidence that while we may not be dead in the long-run, we may be quite a bit older by the time the economy fully adjusts to shocks of any magnitude". Rodrik (2004b) notes that 'Among all reforms [of the 1980s and 1990s], trade liberalization was perhaps the most striking in its extent', but these reforms 'have produced disappointing results'. And, 'even the simplest of policy recommendations – "liberalize foreign trade" is contingent on a large number of judgement calls about the economic and political context in which it is implemented' (Rodrik, 2004c).

Africa does export to China, but where these exports are impeded by tariffs and other protection. Similar broad findings arise from the modelling exercise of Jenson and Sandrey (2006) and from the World Bank's assessment of the actual and potential gains from increased trade between Africa, and China and India (Broadman et al., 2007).

The products so identified are mainly in chemicals, base metals, precious metals, and motor vehicle groupings, with some potential in machinery and equipment. In other words, exports to China will further entrench the specialisation of South Africa exports in resource-based products, notwithstanding motor vehicles and the sub-groupings of machinery (although these are mainly in filtration and purifying equipment, which we discuss below). Jensen and Sandrey (2006) further find that 40 per cent of the welfare gains from a full FTA are due to raising export prices due to improved access to the Chinese market, primarily for natural resource exports and non-ferrous metals. The export diversification and move to higher value products which China has achieved so successfully is therefore not foreseen for South Africa through greater South Africa – China trade. These analyses of the gains from trade are subject to the problems faced by such simple trade analyses and ignore the lessons that 'what you export matters' (Hausman et al., 2006).

A second group of issues relates to the indirect effects. Chinese growth has had major impacts on the relative international prices of products, with sustained higher prices of resource-based products such as basic metals (Sidiropoulos, 2006; Broadman et al., 2007; Baffinland Iron Mines Corporation, 2005; Jenkins and Edwards, 2005). These developments have important implications for South African industrial development. Even if South Africa does not increase exports to China of products such as steel and aluminium, higher international prices suggest strong incentives for South Africa to continue to increase exports of these products. This has the effect of further concentration of South Africa's exports in capital-intensive products, and the concomitant increase in imports of both relatively labour-intensive, and more technologically sophisticated, products.

The pattern of South African specialisation matters, especially if we accept that externality effects, innovation, and the differentiation of products by design, quality and characteristics is significant. In this case, all activities are not equally beneficial - some activities are more dynamic than others in terms of their development path (Hausman et al, 2006). Specialisation in primary and resource-based products is not just a concern because these products may not be labour-absorbing; it is also a concern because these products do not offer a long-term development trajectory based on the ongoing improvement of broad-based production activities in an economy, which is the basis for sustained industrial development.

We return to these broad themes after studying the cases of five industry groupings in more depth.

4 Sector Focus 1: The Mineral Sector

4.1 Overview of the minerals sector

The products within the minerals sector produced by a combination of primary extraction, concentration, smelting and refining processes are critical inputs in the manufacture of most products. While the scope of the mineral sector is vast, there are four categories that have particular bearing on the trade relationship between South Africa and China (and dominate South Africa's minerals exports overall). These are gold, platinum group metals (PGMs) (of which platinum and palladium are the most important), coal and iron ore.

Gold

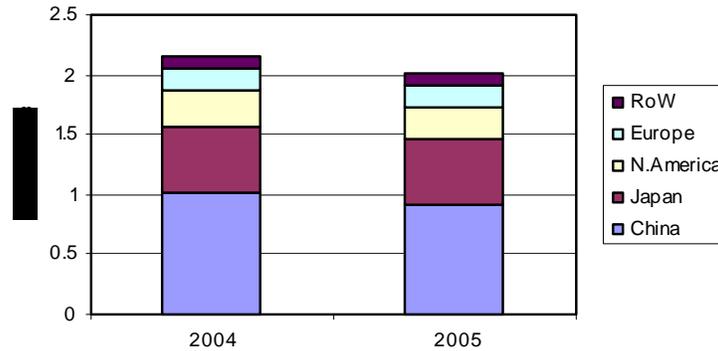
Gold remains an important mineral globally with demand driven by the international jewellery sector. Although South Africa is the leading global producer, low prices and increasing complexity and difficulty associated with the extraction process have undermined the competitiveness of the local industry and PGMs have become more important in precious metal exports.

China is a major producer and consumer of gold and since 1998 has replaced Canada as the fourth largest global producer (Goldletter International, 2005). Direct state involvement via regulation and investment targeting has been fundamental to the expansion and increasing international success of the Chinese gold industry. Although deregulation of the gold market has commenced in recent years, imports of the precious metal are still controlled by the country's four state-owned commercial banks and jewellery imports are only allowed to seven firms designated by the central bank (Goldletter International, 2005).

Platinum Group Metals (PGMs)

Global demand for platinum and palladium resources has been increasing steadily over the past few years, driven in part by rising consumption rates for jewellery in the East, particularly China, and partly by its industrial use in the manufacture of autocatalysts (Figure 7). In 2004, Chinese jewellers purchased an estimated 31 tonnes of platinum and 22 tonnes of palladium, representing 45 per cent and 77 per cent respectively of world PGM demand for jewellery and 12 per cent of world PGM demand (see Johnson Matthey, 2005).

Figure 7. Platinum demand, jewellery



Source: Johnson Matthey

Demand for platinum and palladium are forecast to grow by about 3 per cent per annum and 5 per cent per annum respectively over the next four years. However, demand-supply patterns within the jewellery sector are price sensitive. When, for example, the platinum price strengthened in 2004, demand for the metal by Chinese jewellery manufacturers dropped in favour of white gold and palladium (USGS, 2006). The concomitant implications of such price fluctuations on the supplier sector are significant as producers in South Africa were forced to postpone expansion programmes until jewellery demand stabilised. Demand in the industrial applications sectors, by contrast, has been more stable owing to environmental regulations governing automobile emissions. Platinum and palladium are used in the manufacture of autocatalysts to convert noxious emissions from petrol and diesel-driven vehicles. While demand has over the past few years been driven by the European and US markets, China is expected to be a key market in the coming years as car production increases and emissions standards are enforced and tightened.

South Africa is the world's principal producer of platinum and palladium, followed by Russia. South Africa also possesses the largest known deposits, estimated at 100 000 tonnes. Investment decisions by the leading producer companies are subject to constant evaluation and re-assessment depending on the platinum price. In southern Africa, given the current high pricing climate, a wave of greenfield and brownfield expansions are planned, both in South Africa and in Zimbabwe, over the next five years to meet projected demand (DST, 2005).

Iron ore

As the principle source of primary iron and key input in the manufacture of steel, global demand for iron ore has received a massive boost from China's industrial expansion programme. China

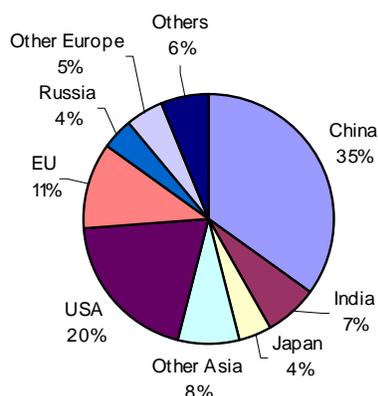
currently represents about 90 per cent of the growth in global iron ore imports. Chinese steel manufacturers have been forced to seek foreign suppliers with high quality iron ore reserves to compensate for poor quality internal deposits. Leading iron-ore producers, particularly in Brazil and Australia, have benefited from this surge in demand and have upgraded operations to meet supply requirements. However, the process has also reinforced their position as primary mineral exporters as imports are used domestically in Chinese downstream manufacturing industries (Baffinland Iron Mines Corporation, 2005).

Policies have recently been introduced in China in an effort to regulate the import process, particularly the problem of sub-standard ore imports, excessive importing, and to control bidding prices by domestic traders. Iron ore prices increased by 71.5 per cent in 2005 and a further 19 per cent in 2006, as the world's three largest firms, CVRD, BHP Billiton and RTZ, were able to exercise pricing power. Although South Africa only provides four per cent of total world iron ore exports, with Kumba Resources the main local iron ore producer, it has benefited from China's recent growth and expansions are planned to boost future local capacity, particularly at the Sishen mine, which will bring its share in the market to an estimated six per cent.

Coal

China is both the largest producer and consumer of coal in the world. With volumes of over two billion tonnes a year, both production and consumption account for nearly 35 per cent of the world total (Figure 8). Chinese coal now also has a considerable impact on shipping trade, providing as much as 80 million tonnes of exports a year (the world's third largest coal exporter) with Japan and South Korea the primary markets. The country has emerged as a serious competitor to Australia and Indonesia for the Japanese market. This is a reflection of very strong growth in Chinese coal production in recent years, outstripping local demand growth (Banchemo Costa Research, 2005).

Figure 8. World coal consumption (Mt oil equivalents)



Source: Banchemo Costa Research, 2005

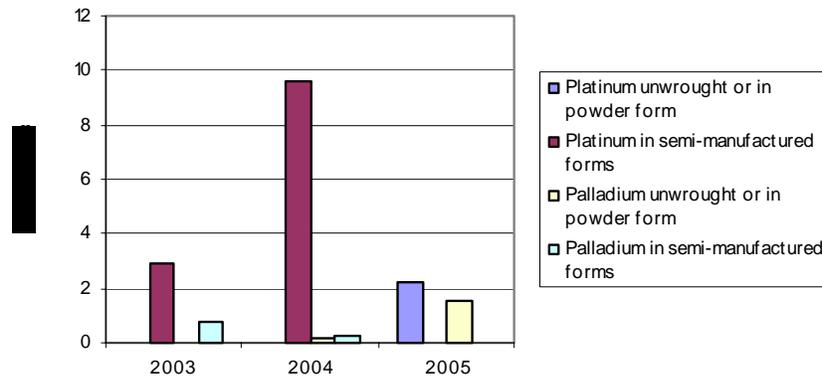
The significance of the Chinese coal industry to current industrial policy debates resides in the government's approach to addressing bottlenecks, boosting the industry's capabilities, and ensuring it has the capacity to meet and sustain internal demand requirements. Having gone through extensive structural realignment, Chinese coal producers are now in the process of establishing alliances, restructuring, and merging into groups. The level of concentration in the industry has risen substantially. The Chinese government has encouraged foreign involvement in the sector in order to increase productivity, however, this is done via partnerships to ensure the transfer of technical and managerial skills in addition to primary inputs (Hongjiu, 2004; Heyes, 2005; Banchemo Costa Research, 2005). Great progress has been made in some of the coal-related universal and key technologies. A comprehensive technological support system has also been established, comprising research aimed at boosting production and efficiency, technological development, equipment manufacturing and personnel training (Hongjiu, 2004).

South Africa can draw lessons from China's approach to developing its local coal industry not only to provide vital energy inputs to its expanding domestic industries, but for export purposes as well. The government's stance to developing the sector is proactive with an emphasis on developing competencies along the value chain (including the local machinery and equipment sector) through partnerships with foreign companies; ensuring well managed mines through transfer of knowledge, technology and management best practices; facilitating/targeting investment; and, encouraging firms to buy local before importing.

4.2 Mineral Sector Trade Flows

South African exports of platinum and palladium to China are relatively new, commencing in 2003. What is apparent from the graph is the degree of fluctuation in demand, with platinum in semi-manufactured form reaching a peak in 2004 and ceasing in 2005 and the increasing importance of palladium (Figure 9).

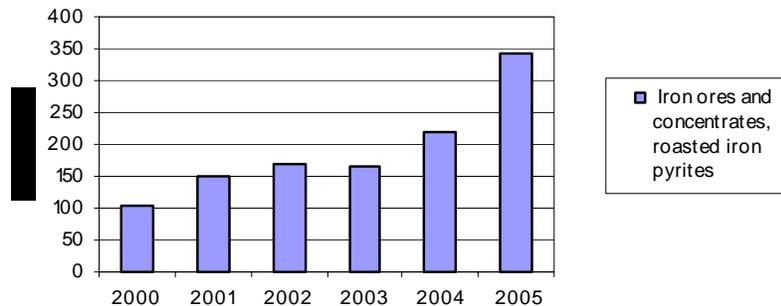
Figure 9. SA exports of platinum and palladium to China, 2003-2005



Source: Quantec

Chinese demand for iron ore has been steadily increasing and can be attributed to the increased local demand for steel (Figure 10).

Figure 10. SA exports of iron ores and concentrates, roasted iron pyrites to China, 2000-2005



Source: Quantec

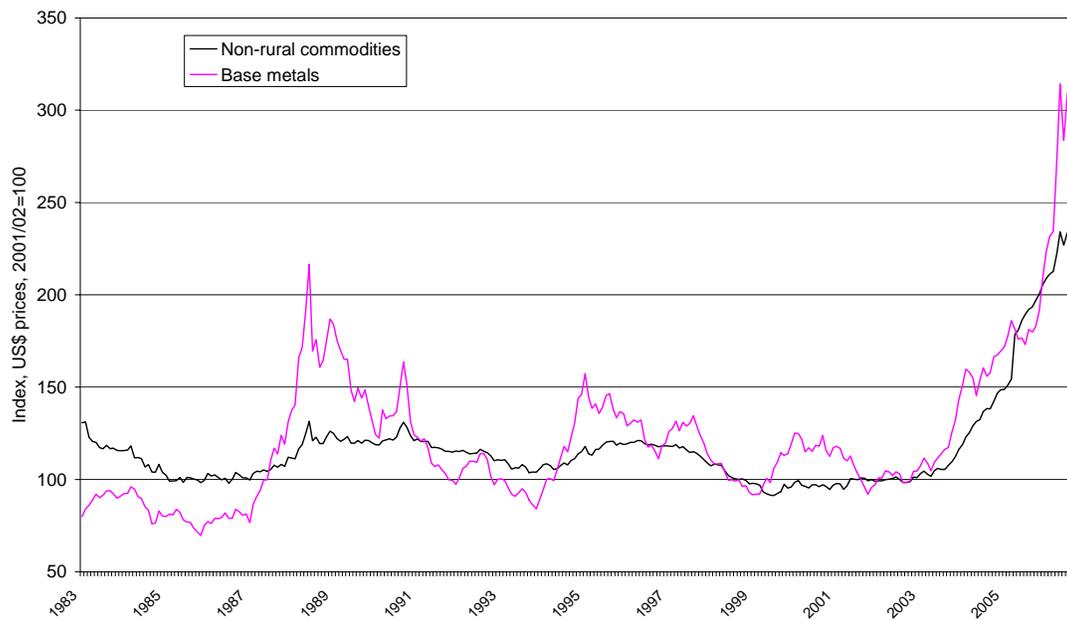
4.3 Analysis of Mineral Sector

The analysis of recent trade flows of select mineral products between South Africa and China undertaken above highlights two important issues pertaining to industrial development and trade relationships. Firstly, the trade relationship between the two countries is driven by China's need to obtain critical primary raw materials needed in all types of manufacturing activities. In the case of iron ore, it is for basic iron and steel manufacture. For platinum and palladium, it is for jewellery and autocatalyst manufacture. As the principal global producer of PGMs, increased demand from Asian markets for such minerals has contributed to maintaining South Africa's mineral export revenues.

Secondly, the analysis highlights the differences in approach regarding the support of strategic industries. In both China and South Africa the gold and coal industries are significant minerals not only in terms of the size of the available deposits, but also the level of domestic consumption and export. The Chinese government promotes the development of the local gold and coal industries through active involvement and regulation, ensuring that firms fulfil domestic needs before targeting the export market. Strategic alliances are encouraged with international firms in particular technological areas to facilitate knowledge and skills transfer and integration of activities along the value chain.

But, the indirect effect of China is as important as the direct effect. The rapid industrialisation of China, together with India, has led to a very substantial spike in the prices of non-rural commodities including basic metals and minerals (Figure 11). These prices have more than doubled since early 2003, representing by far the biggest price increases in the last twenty years. In addition, while base metals prices have been relatively more volatile, the overall non-rural commodities has fluctuated in a much narrower band until recent years. South Africa has been relatively slow to adapt to these movements, partly because of constraints in transport, such as bottlenecks at Richards Bay coal terminal and on the iron ore line from Sishen to Saldanha. Partly, the gains were counterbalanced by the strength of the Rand against international currencies, underpinned by capital inflows (of which a significant proportion was portfolio in nature). These factors meant that while South African export earnings benefited from the price spike, investment in expanded in response has lagged behind placing the balance of payments in a vulnerable position, with a large trade deficit.

Figure 11. International prices of non-rural commodities



Source: Reserve Bank of Australia

Note: Base metals is subset of non-rural commodities

4.4 Implications for Mineral Sector

China's long-term strategy with regard to acquiring necessary minerals is to make the best of both domestic and foreign resources. A range of measures have been introduced to facilitate this including stable supply channels, multinational policies, and diversified trading models (such as common trading and long-term contracts on buying mines, encouraging companies to jointly operate mines with overseas companies).

There is a range of key issues which affect the South African mining industry:

- Logistics constraints inhibiting the increased exports of minerals to China (although being addressed through infrastructure plans).
- Currency & commodity price fluctuations which impact on the projected returns, while large minerals exports themselves contribute to currency strength and volatility.
- South African investments continue to be predominantly in upstream activities, while downstream activities are limited, especially in industrial uses of precious metals.

- The technological challenges associated with deep-level mining is an area in which South African firms have a distinct advantage – a key challenge is to use these capabilities.
- South Africa could learn lessons from the localisation drive in the coal industry in China.

Notwithstanding the relative lag in increasing production and exports of minerals and resource based exports, the demand for resources represented by China’s rapid industrialisation poses major challenges for South Africa’s economic development. There are two related questions when viewed from the perspective of the country as a whole: how to maximise the returns to be earned; and, how to utilise those returns. This suggests:

- gearing infrastructure investments to increase the exploitation of resources, but removing any subsidy element implied or otherwise,
- establishing mechanisms to prevent the effective windfall overlie distorting the domestic economy,
- ensuring that a portion of the revenues from resource exports is invested in long-term human and physical capital formation.

There are many examples of countries that have established ‘minerals stabilisation funds’, including Saudi Arabia (oil), Chile (copper) and Botswana (diamonds). These funds are part of a strategy to prevent overvaluation of the currency in boom periods, while also providing a ring-fenced source of long-term savings (held offshore) (see Auty, 2001; Sachs and Warner, 2001). In many countries the fund is coupled with state ownership of the major resource-extraction companies, however, this is not necessary if government has the political will to tax super-revenues in boom years.

5 Sector Focus 2: The Base Metal Sector

5.1 Overview of the Base Metal Sector

Base metals comprise the manufacture of ferrous and non-ferrous metals. Ferrous metals consist of steel and stainless steel. There are a great many more non-ferrous metals, but the main ones which we focus on here are aluminium, copper and nickel.

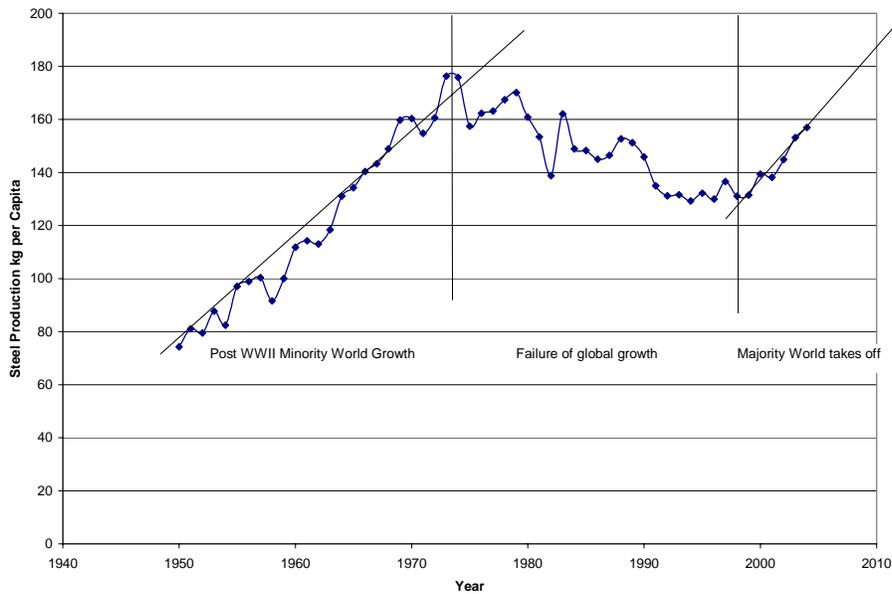
It is important to remember that, while there has been increasing use of non-ferrous metals, steel remains by far the most important. The centrality of steel, together with the perception of its

strategic importance (due, in part, to the needs for arms and weapons manufacture), meant that in most countries the industry was state-owned until the last two decades. Now, the steel industry is overwhelmingly in private hands and consolidation is underway through mergers and acquisitions by the major steel groups such as Mittal and Arcelor (the world number one and two).

The growth in demand from China's rapid economic development represents a sea change for the global base metals industries. Together with industrialisation under way in India, China's growth means an increase in global per capita steel consumption, after decades in which it declined, reflecting the overall stagnation in developing countries (aside from the very small Asian 'tigers') and growth in the 'post industrial' nations of Europe and North America (Figure 12).

South Africa has the most export oriented steel industry after Ukraine, and is among the lowest cost locations internationally, in terms of input costs for steel production (Chabane et al., 2003). South Africa has also invested significant sums in stainless steel and aluminium industries, almost entirely for export. After iron and steel, aluminium is the most used metal in the world. It is very light, durable and corrosion resistant and is widely used in a variety of applications.

Figure 12. Long-term steel consumption trends



Source: Mintek

The processes of aluminium extraction and smelting are very energy consuming. South Africa does not have resources of bauxite being the primary mineral input to aluminium. Instead, the attraction of South Africa as a location for aluminium production is the low cost of energy, which derives largely from coal, as well as government historic investment decisions. South Africa

produced 2.7 per cent of global aluminium in 2005 and was the 8th largest producer. China was the largest producer with 23.1 per cent, and Russia second with 11.7 per cent.

The major investments made in basic iron & steel, stainless steel and aluminium production in South Africa, and the large net exports of these products, reflect cost advantages due to resource endowments, cheap energy and high levels of government support. The developments in global demand, reflected in Figure 12 above, are thus of huge importance.

South Africa's base metals industry is now entirely in private hands, mostly of large multinationals (Table 2). The implications of developments in this industry depend in the investment and location decisions of these companies, and on their behaviour with regard to the local market.

Table 2. Ownership of SA's base metals operations

Industry		Company
Steel	Flat steel	Mittal Anglo American (Evraz)
	Long steel	Mittal AngloAmerican M&R Independents
Stainless Steel		Acerinox
Aluminium	Primary Al	BHP
	Rolled Al sheet	Anglo American (Hulettts)

But, while international demand has grown strongly, China has invested strongly in its own steel making capacity. It has hugely increased volumes and has also improved the quality of its own production. At the same time, prices have remained low in China. These have been attained despite China not having the resource endowments required for most base metals.

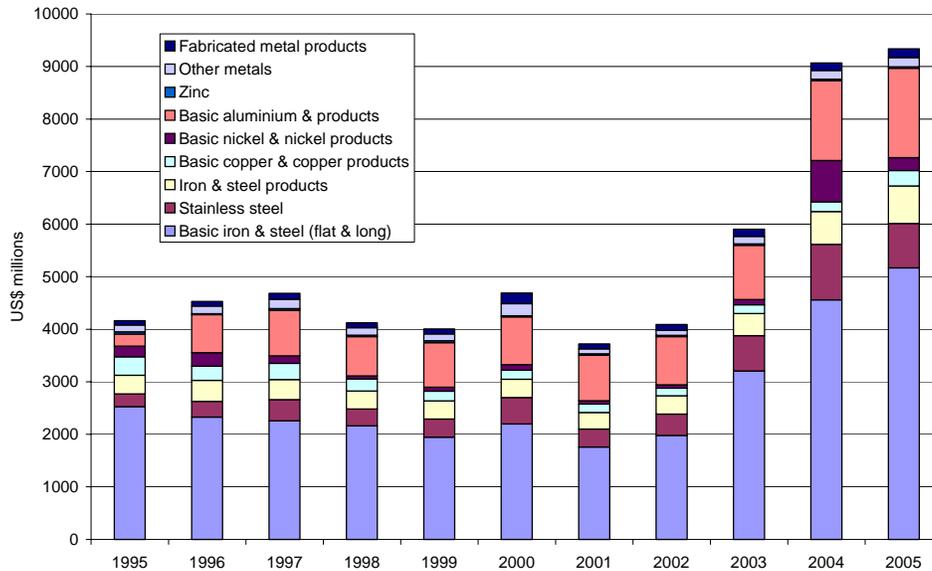
The questions raised are fundamental ones of what should be the nature of an industrial strategy, given the likely future developments.

5.2 Base Metal Sector Trade Flows

South Africa's exports to China are dominated by iron & steel, followed by aluminium and nickel (Figure 13). Whereas in the case of aluminium and nickel these categories include articles made thereof, in the case of steel, articles made of steel are separate and much smaller. These include steel such as in the form of steel tubing. Fabricated metal products, which involve much greater value addition, have an almost insignificant share of exports to China.

The developments in South Africa’s exports of base metals to China are strongly reflective of the rapid improvements in China’s industrial capabilities and policies. China’s infrastructure investment and rapid growth of downstream manufacturing is steel-intensive, and acted as the main stimulus for higher steel prices in recent years as China sucked in steel imports. South Africa’s exports to China increased strongly as a result, especially in 2003.

Figure 13. South Africa’s base metal exports to China



Source: Quantec

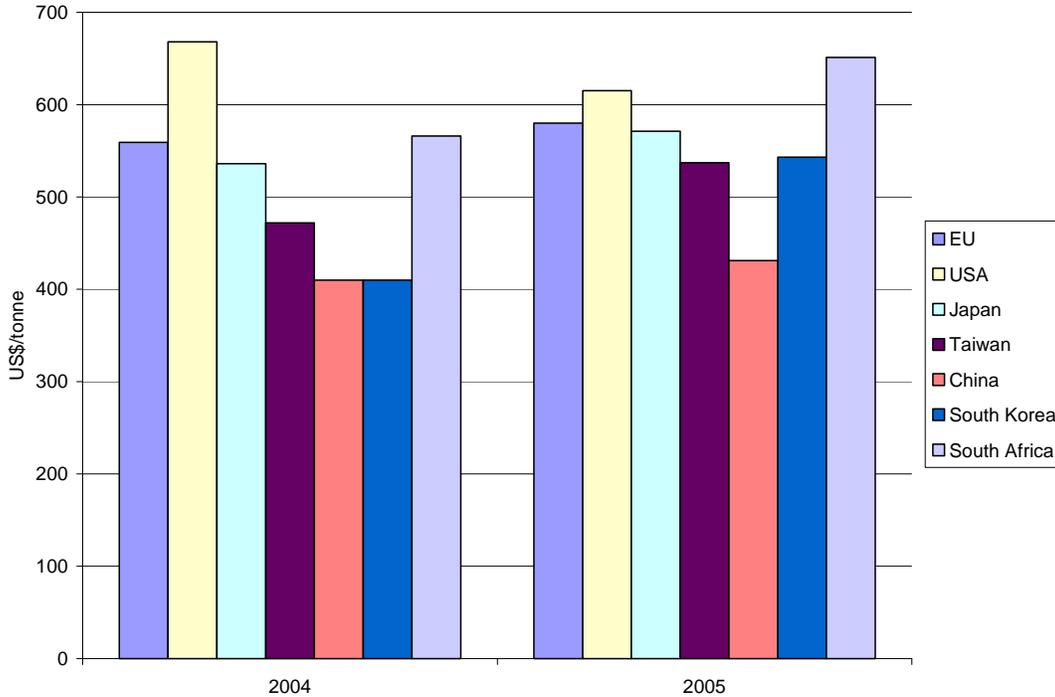
As noted above, China has been investing heavily in both increased steel production and quality. As these investments came on stream, they meant that China’s need for imports dramatically reduced, and South Africa’s exports of base metals fell in 2004, before growing once more in 2005. The growth in 2005, however, was notably in products such as stainless steel, nickel and copper. Carbon steel and aluminium exports were static.

5.3 Analysis of the Sector

South Africa’s basic metals exports clearly illustrate how the driving force of the returns from the South Africa – China economic relationships is China’s industrial policy. China’s policies with regard to basic metals are driven by the imperative of ensuring sufficient, competitively priced material inputs for its rapid industrial growth and infrastructure development. Even when China remained a net exporter of steel, in 2004 and 2005, its domestic steel prices were below most other countries (Figure 14). By comparison, South African prices do not reflect the low local costs of production, being set at the ‘import parity’ level (Chabane, et al., 2003). This means that industries

using steel as an input receive no cost benefit from the low steel production costs and, indeed, have faced prices in recent years that are high by international comparison (Figure 14)

Figure 14. Domestic prices for Hot Rolled Coil



Source: MEPS (for South Africa, calculations from Mittal price lists, for price to large buyer, with 4.5% volume discount, 2.5% settlement discount; 2005 average for SA from Jan-Aug)

While China is not a low steel production cost location, it has a ‘Steel Industry Development Plan’, announced by the Chinese Government on 20 July 2005, aimed primarily at competitive local supply of steel to downstream industries.⁸ The plan reinforced the priorities already being pursued, and the tools utilised to achieve the key goals of meeting local demand, increasing the proportion of high grade products, and increasing the efficiency of input use especially energy. To this end, government (in the form of the National Development and Reform Commission) approves investments, promotes further rationalisation, and major efforts in R&D and technology adoption. In addition, export of high energy consuming primary and semi-processed products (including coke, ferro-alloy, pig iron, ferrous scrap, ingot and billet) are subject to export taxes. Exports of basic aluminium are also subject to a five per cent export duty.

The greater production of basic metals in China, however, underpins continued high prices for minerals inputs, primarily iron ore. To the extent that South Africa’s steel industry is backwardly

⁸ Steel Business Briefing, ‘China’s Steel Industry Development Policy’, July 2005. www.steelbb.com

integrated into iron ore, higher international ore prices lock South African producers into an even more competitive position compared with their non-integrated international rivals.

5.4 Implications for Base Metal Sector

In short, China welcomes imports of material inputs it requires for manufacturing, as these underpin competitive industrial production, and low prices. But, it aims to maximise the value-addition, including the manufacture of products such as steel and aluminium. In many respects, South Africa policies and industrial development trajectory has been the opposite. It has allowed exports of basic metals produced at very low costs due to the country's endowments rather than the efficiency of its firms to coexist with import parity pricing and, until recently, modest import protection. Far from dis-incentivising exports in order to encourage competitive pricing of basic metals in the local economy, firms have been encouraged to export while effectively 'shorting' the local market to maintain high prices. The setting of prices at import parity levels in South Africa, that is, without reference to local rivalry, suggests a possible FDI link - in attracting investments in the basic metals industries to foster local competition. In this regard, Broadman et al. (2007) find that Chinese and Indian investors play an important role in product market competition in African markets.

The continued growth in global demand for base metals and their inputs, underpinned by China and India, implies continued relatively high prices even although China's investment in expanded capacity in base metals production means it is not a major net importer. China's growth in steel production will sustain input prices. This is to the benefit of South African steel firms to the extent that they are backwardly integrated into their supply of raw material inputs and justifies major capital expenditure in expanded output, as has been seen recently.⁹

The broad trajectory implies further investment in South Africa in expanded output for export, but will do nothing to change the position of South African firms using base metals as their main material inputs. In addition, most of the substantial profits to be earned in base metals on the back of South Africa's resource endowments and cheap energy go to the multinational owners.

⁹ For example, Mittal is currently undertaking a major investment in expanded capacity.

6 Sector Focus 3: Machinery & Equipment Sector

The development of capabilities in machinery & equipment is generally viewed as a key part of industrialisation. And, according to the trade analysis of Wilcox and Van Seventer (2004), there had been growth of South African machinery exports to China. Wilcox and Van Seventer also identified some potential in this regard, based on China's imports profile. China's strongly investment-led growth path means strong demand growth for capital goods, including machinery and equipment.

While South African manufacturing performance has been relatively poor over the last decade, especially outside of heavy industries such as basic metals and basic chemicals (Roberts, 2004), capabilities have been developed in particular niches within machinery equipment, such as associated with the requirements of mining (COMMARK, 2004; Walker, 2004; Walker and Minnit, 2006; CSID, 2005; Mintek, 2005).

We assess the performance of the machinery & equipment sector and the potential represented by trade with China, particularly focusing on niches in which South Africa has competitive capabilities.

6.1 Overview of the Machinery & Equipment Sector

Machinery & equipment is a highly differentiated industry grouping covering the broad categories of electrical and non-electrical machinery. It covers capital equipment purchased by firms as part of expenditure on fixed investment, and consumer durables such as electrical and electronic products and appliances. Non-electrical machinery & equipment consists of the manufacture of: engines & turbines (except aircraft, vehicles & motor cycle engines); pumps, compressors, taps & valves; bearings, gears, gearing & driving elements; ovens, furnaces; lifting & handling equipment; general purpose machinery; agricultural & forestry machinery; machine tools; machinery for metallurgy; machinery for mining, quarrying & construction; machinery for food, beverage & tobacco processing; machinery for textile, apparel & leather production; weapons & ammunition; other special purpose machinery; household appliances; and office, accounting & computing machinery.¹⁰ Electrical machinery includes the manufacture of: electric motors, generators & transformers; electricity distribution & control apparatus; insulated wire & cable; accumulators, primary cells & primary batteries; electric lamps & lighting equipment; and other electrical equipment.¹¹

¹⁰ It has the Standard Industrial Classification of 356-359.

¹¹ It has the Standard Industrial Classification of 361 – 366.

Although they need advanced technology in order to be competitive, manufacturing of machinery is quite a labour-intensive process¹² and the sectors employ a large number of semi- and unskilled employees. Growth of the sectors in South Africa has the potential to create jobs if the appropriate measures are in place, such as competitive input prices, skills development and training, and reliable services (electricity and logistics). The sectors are benefiting from an increase in investment spending across the economy; the key short-term challenge is to ensure they are competitive relative to imports. With trade liberalization and increasing international integration of the South African economy, both imports and exports have increased significantly, although large trade deficits persist in both sectors.

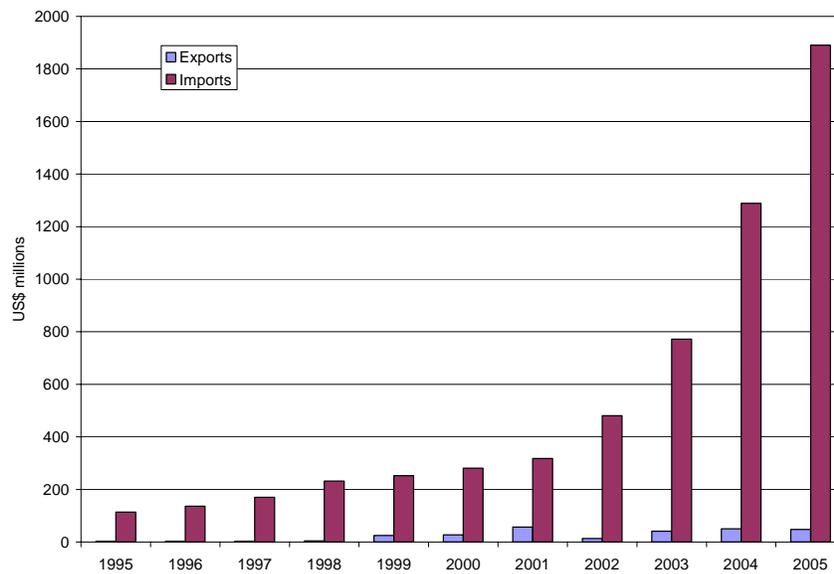
Both sectors have recovered somewhat in recent years following the effects of very weak domestic demand linked to low levels of investment spending in the 1990s. The recovery is expected to continue and even accelerate with increased government spending, lower interest rates and expansion of electricity generation capacity.

6.2 Machinery & Equipment Sector Trade Flows

The trade flows of machinery and equipment between South Africa and China reflect a large and growing deficit (Figure 15). Indeed, exports are almost negligible, while imports have grown strongly.

¹²In South Africa, of the 28 major manufacturing sectors, machinery & equipment is the 8th most labour-intensive and electrical machinery is the 12th most labour intensive, based on 2004 capital:labour ratios.

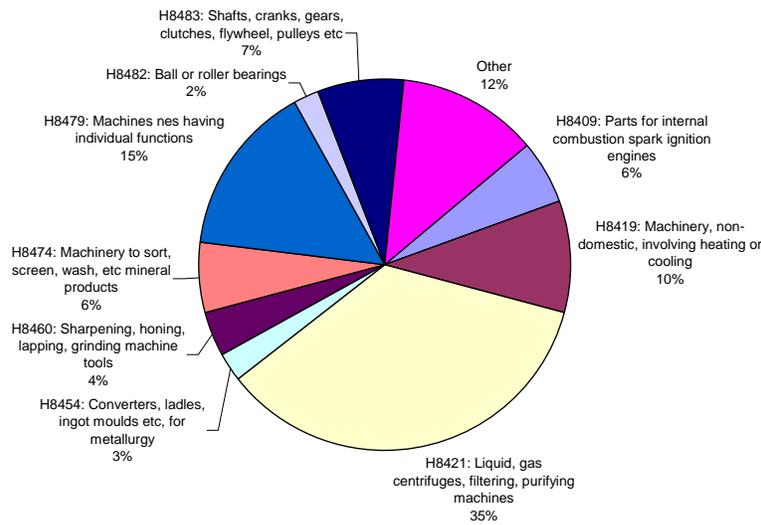
Figure 15. SA – China trade flows



Source: Quantec

Leaving aside the ‘other’ categories, the main exports are of: Liquid, gas centrifuges, filtering, purifying machines; Machinery, non-domestic, involving heating or cooling; Shafts, cranks, gears, clutches, flywheels, pulleys etc; Machinery to sort, screen, wash, etc mineral products; and Parts for internal combustion spark ignition engines (Figure 16). Of these, three are essentially automotive components. The first category of filtering and purifying machines is dominated by catalytic converters which have recorded very fast growth on the back of the incentives provided by the Motor Industry Development Programme. There are two further categories which reflect engine components and gears. The other two categories are related to South Africa’s capabilities in mining equipment. The heating or cooling machinery reflects ventilation and refrigeration systems for deep level mining, while sorting and screening machinery for mineral is clearly part of minerals processing.

Figure 16. SA exports to China, 2005



Source: Quantec

A similar picture emerges if one looks at the product categories in which South Africa recorded a trade surplus. There are just nine such categories, as follows (ranked by the size of the surplus):

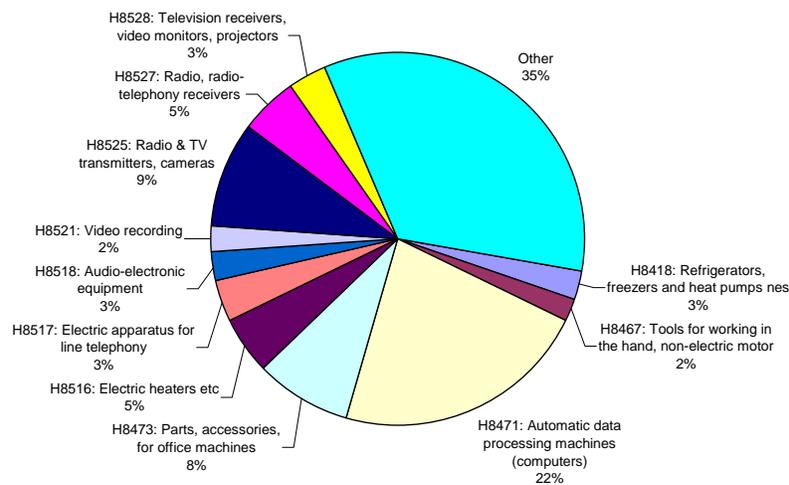
- H8421: Liquid, gas centrifuges, filtering, purifying machines
- H8419: Machinery, non-domestic, involving heating or cooling
- H8460: Sharpening, honing, lapping, grinding machine tools
- H8454: Converters, ladles, ingot moulds etc, for metallurgy
- H8448: Auxiliary machinery and parts for textile machinery
- H8530: Electrical signalling and traffic control equipment
- H8479: Machines nes having individual functions
- H8436: Machinery for feedstuffs, poultry, beekeeping
- H8474: Machinery to sort, screen, wash, etc mineral products

The exports, albeit very small in value terms, of categories such as sharpening and grinding machine tools, and machinery for metallurgy indicates some potential in niches in addition to the mining machinery and auto components identified above. However, one concern is that these categories may include second hand machinery, such as for textiles and metallurgy.

Imports

The main imports from China are broadly of consumer electrical and electronic goods, and computers (Figure 17).

Figure 17. Machinery & equipment imports from China, 2005



Source: Quantec

6.3 Analysis of the Machinery & Equipment sector

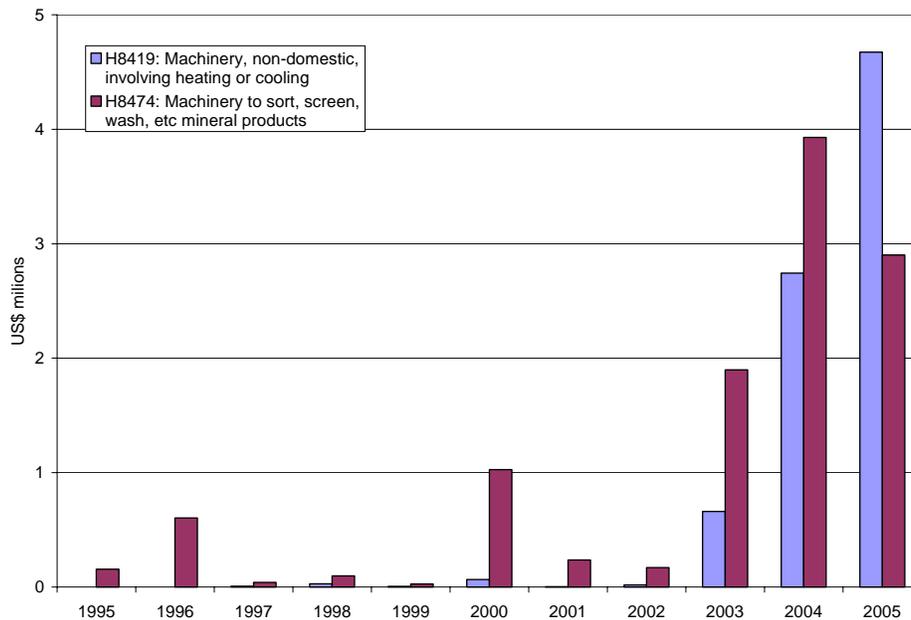
South Africa's capabilities in mining machinery emerged gradually, largely in response to the mining industry's need for specific equipment and processes suited to local conditions. A demanding client base providing a sustained source of demand culminated in a diverse, sophisticated and internationally-competitive supplier industry, providing high-tech capital equipment, consumables, and support services to the local mining community (Walker and Minnitt, 2006). Over time such competencies (*inter alia* shaft sinking, deep level drilling, ventilation, pumping, mineral processing, smelting and refining) were adapted and migrated to other industrial sectors (construction, power generation, transport) as well as exported to mining operations overseas.

Key to the development of machinery & equipment as a late-industrialising country is the adoption and adaptation of technologies. For example, repair of imported valves, followed by reverse engineering and local innovation have underpinned the development of niche capabilities in valve manufacture. In the manufacture of pumps, local capabilities have been developed in conjunction with multinational corporations who dominate this industry (Phele and Roberts, 2005). This is part of the four dimensions which can be identified in the processes of technology and industrial development: technological upgrading within industries, entry into more complex activities; increasing local content involving local innovations and design; and the mastering of more complex technological tasks within industries (Lall, 1994). While local demand specificities in mining have fostered the development of capabilities in certain product niches, the question is to what extent these capabilities are the base for wider development of this sector. In this case, China offers a promising market for South African industry, however, it depends on whether the other dimensions required are being appropriately supported.

Over the past five years, South Africa's mining equipment exports have been on the increase. This can partly be attributed to the boom in commodity prices and concomitant expansion of existing and new operations both locally and elsewhere in the world, requiring the purchase of new and additional equipment and machinery. However, most of the equipment is for niche applications. If one looks at the flow of mining machinery exports between South Africa and China over the past decade, there are two products that have witnessed an increase in exports as a consequence of the industrial boom within the country: machinery to crush, sort, screen and wash mineral production; and, machinery, non-domestic, involving heating and cooling.

As evident from Figure 18, in 2004 machinery to crush, sort, screen and wash mineral production fell just below the US\$4 million mark, while non-domestic machinery for heating and cooling was above the US\$2.5 million mark. In 2005, exports of the latter category exceeded that of machinery to crush, sort, screen and wash mineral production, which decreased slightly, achieving a figure over US\$4.5 million.

Figure 18. Exports of mining machinery to China



Source: Quantec

While these export figures are significant, it is important to note that although machinery to crush, sort, screen and wash mineral production includes large crushers and grinding mills, nearly 80 per cent of exports are actually of parts (components) for screening and sorting. Many of the large assembled crushers and grinding mills are actually imported from elsewhere into South Africa. Moreover, a significant proportion of the original equipment manufacturers (OEM) based in South Africa import much of the crushing technology while most of the associated screens are produced locally. And, it is these screens that are mostly exported. One factor driving local manufacturing of screens is the bulky nature of the product. Another factor contributing to the significant exports is that the screens wear quite quickly and are somewhat of a consumable (COMMARK, 2004).

As China continues to open up and grow its mining (and manufacturing) sector, the need for sophisticated solutions and equipment will increase. This presents a unique opportunity for South African suppliers to get involved in the sector. An example of niche areas in which South African firms could get involved is in the provision of safety equipment (97 per cent of Chinese coal mines are underground mines, all are mash gas mines and explosions are common, and less than 35 per cent of mines are equipped with safety equipment ranging from security equipment and gas control

systems to fire monitoring and control equipment)¹³ and mechanised mining equipment (rate of coal mining mechanisation in China is 40 per cent) (Heyes, 2005).

While South African mining machinery firms are currently exporting equipment to China with some success, the export basket needs to be broadened to include finished products as well as components across a range of niche areas. Identifying and capturing available opportunities, however, requires a much more focused approach to planning in South Africa and demonstrates the need for local action, not only in terms of communicating the specificities of China's demand/requirements to potential suppliers, but also putting in place appropriate support mechanisms to facilitate and drive the process.

6.4 Implications for Machinery & Equipment Sector

The increasing diversification of the Chinese manufacturing base into more specialised product lines, together with its comparatively low manufacturing costs, has effectively narrowed the opportunities available to countries such as South Africa to compete effectively for global market share in particular commodity/mass-manufactured goods. The review of the profile of exports between South Africa and China highlights that future opportunities in the export of machinery and equipment are most likely to be in niche product categories in which South Africa has already developed capabilities (such as mineral processing) and which embody a relatively high degree of know-how and expertise. In effect, China has already leapfrogged South African industry in capabilities in this sector, and has engaged effectively with multinational corporations to 'catch-up' these capabilities. It has done this together with aggressive support for appropriate training and education.

Capitalising on such opportunities that do exist for South African firms requires ensuring the appropriate support systems are in place locally to facilitate and drive the process. In particular, enhancing the local skills base (both artisan and professional), boosting testing facilities, and encouraging partnerships between small and medium sized firms along the supply chain to foster technology transfer and entrepreneurship, are all required. At the same time, greater awareness of opportunities for partnerships and joint ventures in China, as well as support in overcoming trade barriers, is needed by South African firms in order to capitalise on the opportunities within the growing Chinese economy.

¹³ In 2005, a South African manufacturer of gas-detection equipment entered into a joint venture with China's largest manufacturer of gas-detection devices to produce equipment for 80% of the country's mines (see *Engineering News*, 2005)

7 Sector Focus 4: The Agro-Processing Sector

Agriculture and agro-processing are often viewed as an area of potential for South Africa, while China, by comparison, is a relatively and poor country given its population size. In particular, higher value and niche agricultural products such as citrus vegetables, mariculture products (including shellfish) and specialised oils have been targeted for export oriented development. We therefore examine the South Africa - China trade performance in these products, and the factors which underlie this performance.

7.1 Overview of the Agro-Processing Sector

South Africa's geographic and climatic variation in different regions of the country has given rise to the country's ability to produce various agricultural products. Key horticultural products include table grapes, citrus fruits, apples, pears, avocados, pineapples, mangoes, and a wide range of vegetables. Animal products include ostrich products, dairy products, wool, mohair and leather, and fisheries.

South African agricultural exports in 2004/5 amounted to R22.9 billion while agricultural imports amounted to R13.2 billion. In the past 5 years the country has run an agricultural trade surplus, while exports have generally been of higher value goods. The main exports in terms of value included wine, citrus fruit, grapes, pears and quinces and sugar. The main exports destinations were the EU, Japan and African countries. The key agricultural imports were rice, wheat, undenatured ethyl alcohol, oilcake and meat and edible offal.

South Africa is very competitive in terms of global market share and export orientation in the citrus, pear, avocado, wine, grape and apples sectors. In 2001/2002, South Africa ranked the third largest exporter of citrus fruit in the world and the number one exporter in the southern hemisphere. It is also the second largest exporter of grapefruit and the fifth largest exporter of lemons. South Africa ranked number one in production and efficiency of pears in 2004.

Some fruits are mainly used for juice (apples) or canning (pineapples) depending on the type of fruit. By comparison, almost 70 per cent of oranges are exported fresh. South African vegetables are mainly consumed at home, with only two per cent being exported. While field crops like maize and wheat are mainly for local and regional consumption, grains such as rice and wheat are imported to supplement local demand.

Although South Africa is competitive in its key agro-export products, it faces government subsidies and barriers to trade in other countries. Most major producers in the global market are highly subsidized and have large price support and budget support from their governments. This is especially true of EU, USA, China, Japan and other producers in the global market. In addition, some of these countries have major trade barriers to South African products, even in cases where there is a free trade agreement such as the EU. Although there has been pressure to lower protection and eliminate subsidies in these markets, change has been slow and it will take 15-20 years in some markets like the EU to completely remove these barriers.

Another key factor affecting agriculture and agro-processing is the growing concentration in the value chain globally. Increasingly fewer countries and producers are responsible for the production of certain commodities. Similarly, concentration is also taking place in the post-harvest part of the value chain (Gale, 2005; Regmi and Gehlhar, 2005). Industrialised country supermarkets and other foodservice providers such as hotels and restaurants have increasing influence over the produce supplied to the consumer and its packaging, as well as the changes in health and safety standards. Some of the major 'system integrators' practice category management, which involves the use of very few suppliers for a specific commodity.

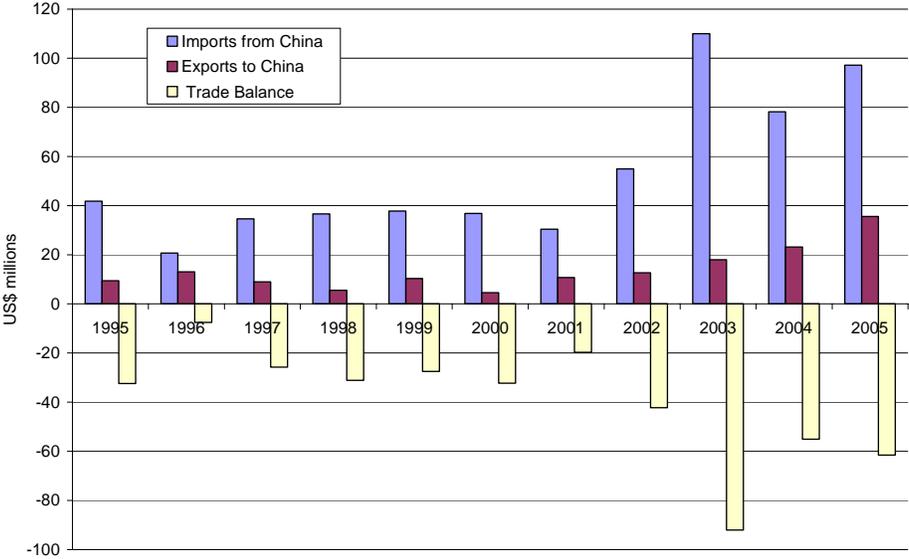
There are also high standards to meet in the form of the international sanitary and phyto-sanitary standards. Countries such as the USA, EU, Japan, China have their own additional requirements.

Thus South African industry is competing against producers who get massive support from their governments, who operate in countries with very large and protected domestic markets that they dominate and with well established marketing and distribution systems, infrastructure and financial services (Gale and Collender, 2006). These producers are generally in countries where the exchange rates are much more stable and they are world price setters by virtue of the high levels of production and market size.

7.2 Agro-Processing Sector Trade Flows

The value and variety of agro-products traded between South Africa and China has increased in the past ten years. But, the balance of trade is not what might have been expected given the different endowments of the two countries. South Africa has had a trade deficit with China for the last ten years and it is increasing (Figure 19).

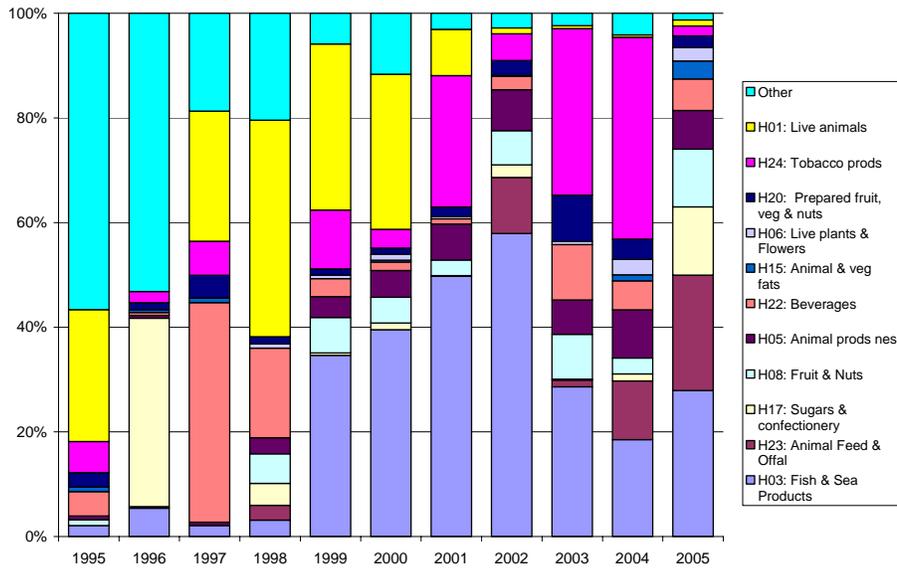
Figure 19. South Africa’s agricultural products trade balance with China



Source: Quantec

In the last five years, key South African exports have been fish and molluscs, animal feed and animal products, as well as fruit and nuts (Figure 20). These product exports have all grown over the period, although the shares have been quite volatile from year to year. The growth of animal feed exports in 2005 reflects the emphasis in China on growing the animal farming sector.

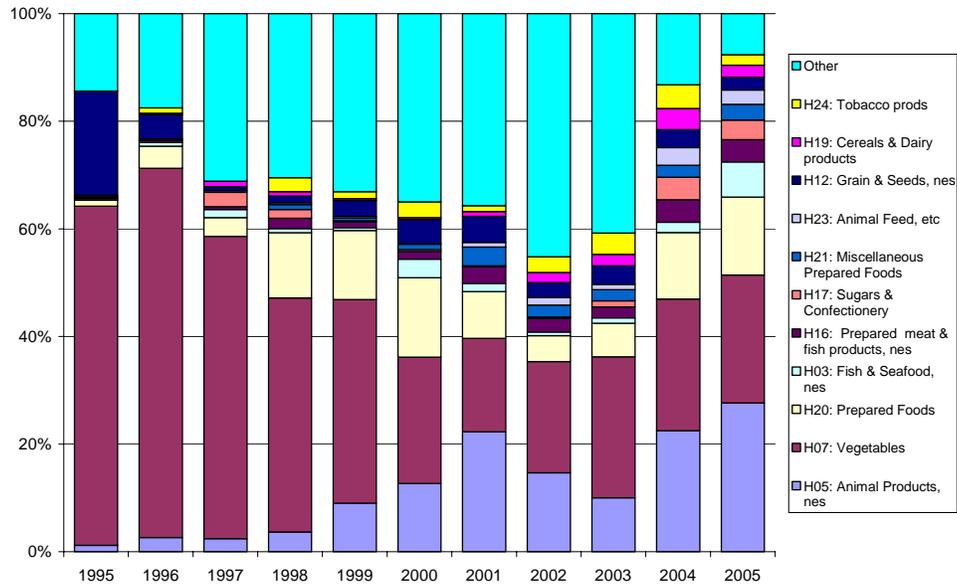
Figure 20. South African exports of agricultural products to China



Source: Quantec

Agricultural imports from China are dominated by animal products, vegetables and prepared foods, and shares have remained relatively stable (Figure 21). In 2002 and 2003 there was a large import of maize from China. Interestingly, while in the past South Africa exported tobacco products to China it is now the reverse.

Figure 21. South African imports of agricultural products from China



Source: Quantec

7.3 Analysis of the Agro-Processing Sector

The South African agro-processing sector has the local and European markets as its main targets for high value products. It has also increased its productivity over the years and remains competitive (Department of Agriculture, 2005). However, it faces challenges at home and abroad. Although productivity has increased over the years, producer prices and income have been under pressure due to a strong value of the Rand. Prices for inputs like fertilizer are relatively high as are interest rates for investment. By comparison, the main target markets have subsidies and price support systems, and continued protection.

The South African agro-processing sector was deregulated in the late nineties and this has seen subsidies and protection reduced or removed within a very short time span. The most protected sub-sector is the sugar industry, while the fruit sub-sectors do not enjoy such protection at all.

Enforcement of international quality and safety standards play a major role in accessing global markets today and this requires investments in R&D, technology, skills and knowledge management. In South Africa, inspection and control of quality and standards of export products is carried out by the Perishable Products Export Control Board which charges for its services. Some quality inspections are also carried out by the producer associations for the various commodities.

Unlike many producers in the global market, South African agro-processors do not generally have enough presence in the target markets to enable them to build relationships with global system integrators who influence what gets to the consumer and raise their opportunity to be category managers (Department of Agriculture, 2005).

On the other hand, China's agro-processing sector does not have as many years of experience in producing agro-products for some of the more sophisticated markets like the EU. They also do not have a long-established concentrated private retail sector, as South Africa has. Production units in China are also small and land is a scarce resource. Larger commercial farms have only been introduced recently to improve productivity. China's agricultural policies tend to be biased towards grain, oil and meat production which is capital and land intensive, rather than labour intensive (Solot, 2006).

In some areas, such as deciduous fruits and oranges, China already has well established production. Yet, the quality of their produce is not as good as that of South Africa's as it is oriented to meet the needs of the domestic market, which is mainly low income. As the income

level in China continues to rise, and the foodservice and the retail sectors dictate the quality of products, South Africa would be expected to have a growing competitive advantage.

China's large population and increasing income levels is expected to lead to increased demand in high quality produce and variety as the lifestyles change thereby increasing opportunities for more South African agro-product exports. The trade performance, however, reveals little evidence of this being realised. The China market evidently has huge potential for South African agro-produce, but will continue to be challenging.

Chinese producers enjoy a relatively stable exchange rate pegged to the dollar and low interest rates. The recent government policy of providing small farmers with loans will go a long way in increasing productivity in Chinese agro-processing sector. China subsidizes its producers through tax rebates, infrastructural loans and export subsidies. It also imposes restrictions to its markets through quotas, tariff quotas, licensing and VAT.

7.4 Implications for Agro-Processing Sector

The strengthening of the rand, high input prices and high interest rates will reduce the ability of producers to invest in the sector in the long run and this can impact on the competitiveness of the sector. Likewise, the fast reduction protection of the domestic market as compared to more established and highly subsidised markets like the US, EU and Japan will likely harm the competitiveness of the sector.

South African producers and government needs to build stronger relationships with key players in the global value chain in order to maintain its market share and competitiveness. The future depends of strategic partnerships at the national, regional and global level in order to remain competitive.

South African exports markets are too limited and concentrated on the EU. There is also a need to do more aggressive promotion and marketing of South African agro-products globally to find new markets and increase market share.

Prices from high value agro-products such the fruit exported by South Africa have been increasing and are likely to improve as demand increases. But, they may also remain volatile due to oversupply in the global market due to high production in large producer countries; and therefore the need to create niches and brands of the South African products.

Penetrating the Chinese market requires the South African government to practically find solutions for the sector to deal with the domestic and global challenges faced by domestic producers. The demand opportunities reflected in growing Chinese incomes is a major potential driver for South African agriculture, but these opportunities are not going to be utilised without concerted action.

8 Sector Focus 5: The automotive sector

Both China and South Africa have capabilities in the automotive sector and high potential growth markets because of their upcoming middleclass. The following section looks at the dynamics of the automotive sectors in both countries and look at potential implications for trade relations.

The automotive sector has been one of the best performing sectors of manufacturing in South Africa, aided by the Motor Industry Development Programme (MIDP). Over the past decade (1995-2005) value-added has grown at an average rate of five per cent per annum, approximately twice that for manufacturing as a whole, while investment has increased at 15.4 per cent per annum, fast outstripping the average for manufacturing (of 3.1 per cent). While the automotive sector accounted for less than six per cent of manufacturing investment in the mid 1990s, it accounted for a very substantial 15 per cent and then 18 per cent in 2004 and 2005. And, while there have been substantial job losses in manufacturing, especially in the late 1990s, employment in the automotive industry has been stable. There as been a gradual move towards higher skill levels, with skilled and highly-skilled employees accounting for 55 per cent of total employment in 2005, compared with a share of just under half for all manufacturing.

The MIDP incentivised exports through an export-import complementation programme aimed at encouraging manufacturers to concentrate a small number of models to achieve economies of scale (through export), while being able to import models not assembled locally. In addition, duty free import permits can be earned through the export of components. Although initially, firms focused on a narrow range of components, led by catalytic converters and seat leather, as will be seen below, the range has diversified and has included more complex products in recent years (Barnes et al., 2004).

China has greatly expanded its auto industry, with both local firms and transnational corporations as major participants. We assess what the relative competitive capabilities and specialisations in South Africa and China mean for the developing economic relations between the countries and particularly whether South Africa has developed and can retain the competitive strengths which appear to have been fostered by the MIDP.

8.1 Overview of the Automotive Sector

Motor vehicles are complex manufactured products, dominated by global transnational corporations, with international sourcing of components, and networks of suppliers. The industry has been at the fore-front of the success of some Asian rapidly industrialising countries, in developing their competitive capabilities with a strong export orientation, particularly in the cases of Japan to South Korea where local auto firms ultimately succeeded on the international stage. These countries had interventionist and highly supportive policy regimes. Other countries have not achieved this success, such as Malaysia.

South Africa was the world's 19th largest producer of vehicles in 2004, accounting for only 0.71 per cent of global production. Auto exports have grown strongly, to account for 17 per cent of all manufacturing exports, although it still runs a substantial trade deficit. The sector has seen increased growth in terms of local market size, exports and imports over the last 14 years. In 2005, the total local aggregate market was about 620,000 cars. Total domestic production amounted to 525,000 vehicles of which 140,000 were exported (NAAMSA, 2005). Over sixty percent of the vehicles produced, exported and sold locally are passenger cars. In an evolving pattern of production specialisation, most car exports are luxury passenger cars and light trucks ('bakkies') with the main markets in Europe, Japan and the US. Both car and component products are mainly for the local market, with about a third being exported. South Africa imported at least 233,000 vehicles in 2005, with 90 per cent being passenger cars.

South Africa had 12,368 automotive firms with 312,825 employees of which 62 per cent were in the distribution, service and trade sub-sectors in 2006 (NAAMSA, 2006). Of the eight firms that manufacture cars in SA five are wholly-foreign owned and three have foreign majority shareholding (Research Channel, 2006) and all are Original Equipment Manufacturers (OEMs). These firms are all integrated into the global value chains of their parent companies and compete with sister-companies to produce a limited number of models locally. There are 500 component manufacturers, 350 of them supplying directly to the OEMs and the rest mainly to the aftermarket and market for older cars. Eight of the top global component manufacturers and three of the top four tyre manufacturers have invested in South Africa. First tier suppliers tend to be foreign firms on the cutting edge of technology and R&D. Local-owned component firms tend to supply less technologically sophisticated components as opposed to their foreign competitors. By and large, R&D and design functions of both the car manufacturers and the foreign component manufacturers are based in industrialised countries and not in South Africa. As a result, South Africa remains a manufacturing and assembly location in their global networks.

South Africa's Motor Industry Development Programme

Imports tariff on CBU (Completely Build-Up Units) and original equipment components in South Africa were 32 per cent and 26 per cent respectively in 2005. They are expected to be reduced to 25 per cent and 20 per cent respectively by 2012 when the current phase of the MIDP ends. The MIDP is a key policy instrument for the SA automotive sector. It was initially introduced in 1995 and will run until 2012 and has been reviewed several times. There are two MIDPs, one for the passenger cars and light commercial vehicles (LCV) sector, and the other for the medium and heavy commercial vehicle sector. The objectives are to 1) improve sector efficiency, international competitiveness and global integration 2) encourage growth and exports in the automotive sector, 3) make vehicles affordable locally, 4) stabilise employment in the sector, 5) create a balance between foreign exchange earnings and usage in the sector. In order to achieve these it uses reduction of tariffs on automotive imports and duty rebates instruments such as the duty-free allowance, productive asset allowance and import/export complementation scheme using tradable import rebate credit certificates (IRCC). In addition, the MIDP did away with separate local content requirements, while there is a prohibition on the importation of second hand cars. In 2005, the industry received import credit certificates worth R18.6bn (NAACAM, 2006; NAAMSA, 2005; Flatters, 2005).

The Chinese Auto-industry

The size of China's population together with rapid growth in recent decades has catapulted China up world rankings to become the fourth largest world producer of vehicles in 2004. In 2005 it became the second largest automotive market in the world after the US, replacing Japan. China accounts for about 23 per cent of world car market growth (Deloitte, 2006). It had a total market of 5.75 million cars and produced 5.85 million cars in 2005. Moreover, it became a net exporter in 2005 for the first time exporting 170,000 vehicles of which 60 percent were light commercial vehicles (LCVs). China imported about 160,000 cars in 2005. The total automotive trade in 2005 was US\$350bn, with imports worth US\$150bn and exports US\$200bn. Exports of components amounted to US\$8.6bn while imports in 2005 were US\$1.6bn.

Until China started opening up its market just before joining WTO in 2001 there were only two or three foreign firms in China and most of the firms were either owned central government or provincial government. After joining WTO more firms were allowed to enter the market and this has allowed independent Chinese firms like Geely and Chery to join the sector in addition to many other foreign firms in partnerships with local firms (IBM, 2006; Luo, 2005). Since 2001, China's

automotive sector has seen a rapid increase in the number of firms and FDI and local investment. The sector has seen FDI of about US\$20bn since 1994 (IBM, 2006). This has led to fears of overheating and overcapacity of the sector until the state had to intervene through policies to prevent over-investment and overcapacity in 2003 to 2005 (Deloitte, 2006).

The Chinese automotive sector employs over 1.5 million people. It consists of over 100 vehicle manufacturing firms and over 5000 component manufacturers. Both state-owned and TNCs are important, with around 25 joint ventures between foreign firms and mostly state-owned firms. Foreign firms are allowed up to two joint ventures per category of vehicle manufactured but cannot own a more than 50 per cent share in a vehicle manufacturing firm. The foreign firms in China include the big OEMs such as Volkswagen, General Motors, Honda, Nissan, Toyota, Kia, Ford, Daimler Chrysler, Renault, BMW, Suzuki, Fiat, PSA and Mazda. However, independent local firms have increased their share of the local market to 25 per cent. (IBM, 2006; Marukawa, 2005; Luo, 2005; Lee & Fujimoto, 2003).

There is no limit to foreign ownership in the component manufacturing sector in China. There is therefore, a combination of wholly foreign-owned component suppliers, state owned and independent suppliers. A large proportion of the products of the component sub-sector are exported as opposed to the vehicle manufacturing sub-sector that is mainly for the domestic market. Most components are exported to developed markets particularly the US, Japan, Asia and Europe, by foreign-owned firms or joint ventures.

The strategies of Chinese automotive firms differ according to the make up of the nationality of ownership. For instance, local independent firms and local state-owned firms want to export their vehicles but their foreign partners feel that the focus should be on the domestic market. Foreign firms do also not share the IP with their local partners for fear of illegal use and fear of consequent competition in the international market with their current partners. In joint partnerships, foreign firms are paid fees for use of their technology and IP, in addition to their share of profits.

The Chinese auto-sector faces challenges and is not well developed in terms of quality, R&D, product development, innovation, production processes and systems, safety and emissions standards, distribution networks, sales channels, vehicle financing, marketing, used car market, after-sales service and dealerships. Because most people are only buying cars for the first time little is known about customer needs and preferences. These include style, value of used cars, when they will change for a second car, style and credit-worthiness amongst others (IBM, 2006; Deloitte, 2006; Luo, 2005). Foreign partners regard the quality of their Chinese partner's products to be of low quality and needing at least 15-30 years to catch up with international standards.

(IBM, 2006; Deloitte, 2006; Luo, 2005; Lee & Fujimoto, 2003). However, Chinese firms are buying in technology, foreign firms and plants, expertise and R&D and production process from well reputed international firms as a way to develop their own IP and brands. These are measures to ensure improvement of the quality of their products and process in order to enter the global value chain and overcome the short-comings mentioned earlier (Deloitte, 2006; IBM, 2006; Just-auto.com, 2005; Luo, 2005; Lee & Fujimoto, 2003)

China has several policies and instruments in place to enhance competitiveness, efficiency, export and global integration, innovation and consolidation of the sector. These include investment in the auto research, development and innovation, high import tariffs on CBU, CKD and SKD as well as assembled components like engines and chassis; requirement of foreign firms to form joint ventures with local firms, limits in size of investment in auto sector, limiting new entry into the sector, establishment of export processing zones and measures to ensure low input costs to the sector (Deloitte, 2006; Eun & Lee, 2002; Francois & Spinager, 2004).

As part of the process of preparing to join the WTO, China started reducing its tariffs which were as high as 100 per cent in the years before 2001. It continued to do so as part of the WTO agreement that stipulates that China reduces its tariffs on goods such as auto parts and vehicles by July 2006. Since July 2006, the tariffs on components, completely-built-up vehicles (CBU) and completely-knocked-down vehicles (CKD) are 10 per cent, 25 per cent and 30 per cent respectively.

Domestic car prices of vehicles are 18-68 per cent higher than international prices in China due to highly protective measures in place at the national and provincial levels such as tariffs, limited players in certain locations, and prescriptions as to the type of vehicles taxi's are allowed to drive. However, there has been price competition in the market in the last three years that has reduced prices slightly.

Other policies and government interventions that will continue to have an impact on the auto-sector include taxes based on engine size, accession to Euro emission standards, IP enforcements, vehicle financing, environmental compliance, infrastructure development, fuel prices changes, administration and fees on second-hand cars.

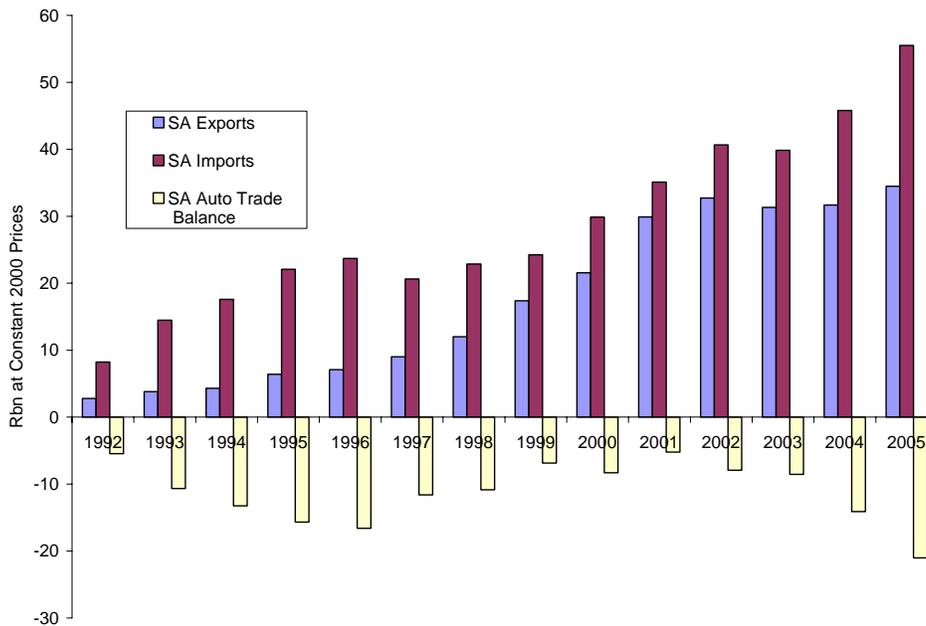
8.2 Automotive Sector Trade Flows

While by far the largest exports are of built-up vehicles, there are significant exports of components. In addition, local content averaged about only 20 per cent of locally produced vehicles (Research Channel, 2006). Component exports in 2005 were worth \$3.7bn,¹⁴ with the most significant component exports being automotive catalytic converters and stitched leather components. These underpinned growth of auto components under the MIDP and auto catalysts still accounted for 43 per cent of all component exports in 2005 despite there being a cap placed on the credits to be earned. In recent years there has been the growth of more sophisticated components, particularly engines (both spark ignition and diesel engines) as well as engine parts. Together these accounted for just over 10 per cent of component exports in 2005, while there were also significant exports of transmission shafts and axles.

As with the picture for all products, trade flows with China reflect a large and growing trade deficit. China has not been an important export destination for South African auto products. Automotive exports to China have declined at a rate of minus 7.14 per cent over the last ten years from their high point of \$74mn in 1995 to a mere \$35mn in 2005 (Figure 22). While exports in 1995 consisted mainly of larger passenger cars (with capacity between 1500-3000cc), by 2005 the main exports were catalytic converters (43 per cent), vehicle parts (20 per cent), diesel trucks (15 per cent), engine parts (7 per cent), brake systems (2 per cent) and other automotive components. The main exports in 2005 all had growth rates ranging from 70 per cent to over 250 per cent over the past ten years. However, in the past three years there has been a turnaround in exports, with more diversification and increased sophistication in the top export automotive products to include items such as diesel trucks in 2005 (Table 3). The share of automotive exports in total South African exports to China has declined dramatically from 29 per cent in 1995 to a merely 2.7 per cent in 2005. This is mainly due to the increased commodity exports to China.

¹⁴ This includes tyres and parts of motor cycles, bicycles, cranes and earthmoving equipment.

Figure 22: China-SA Automotive Trade 1995-2005



Source: Quantec

Table 3: Profile of Top SA Automotive Exports to China in terms of Value Share

2003	2004	2005
Catalytic Converters (38.4%)	Motor Vehicle parts (42.15%)	Catalytic Converters (47%)
Parts and accessories (30.50%)	Catalytic Converters (32.17%)	Motor Vehicle Parts (20.11%)
Vehicle Parts (16.81%)	Engine Parts (5.48%)	Diesel Powered Trucks > 20 tons (15.25%)
Parts for spark-ignition engines (8.4%)	Parts and Accessories (5.37%)	Parts for Engines (7.4%)
Mufflers and exhaust (1.04%)	Steering wheels (4.26%)	Mufflers and Exhaust Pipes (2%)
	Axles (3.41%)	Brake System Parts (2%)
	Mufflers and Exhausts (1.11%)	Safety Belts (1.25%)
		Leather seat covers and seats (1.08%)

Source: Derived from Quantec Database

By comparison with exports, South Africa’s imports from China have increased steadily over the last ten years, at an average rate of 36 per cent per annum, from a value of around \$13mn in 1995 to about \$290mn in 2005. Importantly, the automotive imports from China have changed dramatically in terms of type and value of imports. In the early 1990s the imports consisted mainly of bicycles and their components. By the mid-nineties, more motor cycles and parts started to take an increasing share of the imports. By the late nineties motor vehicle parts, components and accessories had a significant share. In the last five years, imports from China include vehicles, dump trucks, components and parts such as brake systems, clutches, wheels, steering wheels and transmission systems.

Generally most of the imports are complements to South Africa's production, in the form of bicycles, motor cycles and small vehicles, while South African production has focused more on luxury cars and small trucks. However, in components, especially for the aftermarket, there is direct competition.

8.3 Analysis of the Automotive Sector

The car markets in both China and South Africa are growing relatively fast and are both driven by the passenger car demand. Production, exports and imports have increased in both countries over the last ten years. China also has well developed sub-sectors that manufacture motorcycles, bicycles, heavy and light trucks, buses, coaches and trailers, while South Africa is only starting to move into the production of buses and the production of medium and heavy commercial vehicles is relatively small.

Both countries aim to grow exports and both countries are aiming to attract TNCs to locate investments in both assembly plants and in components. While South Africa has succeeded in growing exports of vehicles and a few components, and is increasingly well integrated into international production chains, it continues to run a large trade deficit. By comparison, China succeeded in running a trade surplus in 2005 for the first time, and has a larger share of local firms in the industry (many state-owned). Its competitiveness has been built on a stable and undervalued currency, low input prices, low labour costs, skilled labour and policy measures to increase local content and develop the downstream sectors. But, its industry appears less well-integrated into international TNC networks, with quality problems and overcapacity in inefficient plants. Some of the inefficiencies in China are exacerbated by the interplay between the interests and policies of central government and provincial government who control many of these firms (Eun & Lee, 2002; Francois & Spinager, 2004). Lack of global distribution and sales networks, unknown brands and low safety and emissions standards are also great handicaps for Chinese cars to enter western markets. The domestic R&D and design functions of the auto-industries of both China and South Africa are not highly developed and they thus rely on the use that of the IP of foreign firms whose functions are located in these firms' home countries.

Domestic prices of vehicles are relatively high compared to world prices in both countries. In China it ranges from 12-68 per cent above world prices. Similarly, South African car prices for vehicles are on average 14 per cent higher than in other countries. Some models are even 42 per cent higher. The high prices are attributed to the retention of protection (albeit declining) under the MIDP.

China's policies and customer's sensitivity to price are resulting in some of their indigenous firms specialising in low-cost small vehicles that they are starting to export. In contrast, South Africa's vehicles are towards the medium and luxury end leaving a gap in the market for affordable car for the majority of people who are low income groups.

8.4 Implications for Automotive Sector

The automotive sector represents a possible case where South African trade flows with China could conform to what would be expected from a more advanced industrial economy trading with an economy with a lower level of GDP per capita. Notwithstanding the overall trade balances, South Africa has developed competitive export capabilities in more sophisticated products, both vehicles and components, and could benefit in these products from greater access to the Chinese market. The developing capabilities in China in smaller and low-end passenger vehicles (as well as bicycles and motor cycles) potentially provides more intense competition in these segments of the South African market to the benefit of consumers.

But, the trade flows are largely contingent on the decisions of major TNCs. Exploiting export opportunities to China depends on the decisions of global OEMs as to the location of production capacity around the world. South Africa almost entirely depends on these decisions and the policies and competitiveness considerations which influence them. China, by comparison, has local many more auto firms, including making built-up vehicles albeit still with major challenges in meeting international quality and design standards. The future of South Africa's auto sector depends on the ongoing transition, from support under the MIDP to a sound long-term competitiveness foundation based on production capabilities. Based on the analysis here, the opportunities from better access to the Chinese market could be an important part of this transition.

9 Conclusions and Implications for SA-China Economic Relations

China's rapid growth over the past two decades and more has undoubtedly had a huge impact on the global economy. Analyses of the trade effects on other developing countries such as South Africa have highlighted the largely favourable effect, with Chinese exports tending to be more complementary than competing in the case of African and Latin American countries (Jenkins and Edwards, 2005; Kaplinsky et al., 2006; Broadman, et al., 2007). But, this is because China has essentially leap-frogged Latin American and African countries which have largely failed to progress in developing their manufacturing capabilities outside of a few sectors.

As Lall and Weiss (2005) observed with regard to Latin American countries (LAC), '[t]he pattern of bilateral trade between LAC and China, with the former specializing increasingly in primary and resource based products and the latter in manufactures, is almost a classic illustration of colonial trade between developing and industrialized regions'. The same statement largely applies to South Africa. Lall and Weiss go on to argue that the pattern of comparative advantage of Latin American countries has downgraded in technological terms as the countries have specialised in products with slow growth in international trade and relatively few technological benefits. China is exporting products that are far more sophisticated than would be expected for its level of development (Rodrik, 2006).

The trade analysis therefore begs huge questions as to the implications of China's rapid industrialisation for South Africa's changing patterns of specialisation and, as such, on its industrial development trajectory. Externalities, innovation and related market failures in industrial activities mean that changing the patterns of specialisation matters. Involvement in dynamic activities means more sustainable industrial development based on improved capabilities which supports ongoing improvements in wages and per capita GDP.

From our analysis, the impacts of China on South Africa are far-reaching. Rapid Chinese growth, and South Africa's resource-based exports to China, entrenches South Africa's pattern of specialisation in primary and resource-based products. We find very little evidence of South African export diversification to China in response to its growing demand. The reinforcement of existing patterns highlights the importance of a vigorous set of policies if South Africa's industrial development trajectory is to be altered. The position of South African upstream resource-based industry relative to downstream industry is in stark contrast to China's approach. China's development of upstream industry has been essentially to develop local capabilities in so far as product is required by downstream industry. This is clearly partly due to the relative resource scarcity of China. But, having ensured investment in local capacity in upstream production, such as of steel and basic chemicals, the major concern is with competitive pricing locally, not with exports of such basic products. This is reflected in strong disincentives to export, such as the export tax imposed on basic aluminium.

The sustained higher levels of demand for minerals and basic metals driven by Chinese (and Indian) growth also means better margins in these industries compared to the 1990s when demand faltered because of the Asian financial crisis and contraction of demand in Eastern European economies. With exports of these products now very profitable, justifying investment in expanded output as we have seen in mining, steel and basic chemicals, it is important that South African

downstream buyers obtain competitive pricing, in line with net export prices. Indeed, the encouragement of competitive rivalry between firms, many of whom remain state-owned, is a key feature of China's development strategy. China has combined far-reaching intervention, and state-ownership, with competitive rivalry to discipline large industrial corporations. In each of these aspects it differs sharply with the approach of South Africa.

While China has an active industrial policy, the Chinese state is not, however, monolithic. Rivalry between provinces in China drives the attraction of major investments and is placing stress on resources such as energy and water at the same time as the national government seeks to promote rationalisation in key industries and prevent over-investment. Pressures are also building on the under-valuation of the currency which has underpinned the competitiveness of industrial investments. This, in turn, is linked to questions as to the soundness of the lending for some of these investments. While it is difficult to speculate on the sustainability of the high growth rates recorded, two features are worth highlighting. First, the aggressive promotion of outward FDI by China, including by state-owned enterprises in energy mean that the large current account surpluses will be more balanced by capital outflows rather than reserve accumulation.¹⁵ Second, the state has indicated its willingness to alter incentives to discipline investments in sectors, such as the use of export duties on energy intensive basic metals.

The assessments of the machinery & equipment and automotive sectors highlight that China poses a major challenge to South Africa's aims to improve the value-added and technology levels of its exports. This is the case both because of competition in these areas from Chinese firms, and because China's growing production itself exerts downward pressure on the relative prices of these products internationally. It is striking that a country such as South Africa, with a deeper industrial base developed over recent decades, has been overtaken in these products. Some of the reasons are undoubtedly to do with the size of the Chinese economy and the ability to attract multinational corporations to invest. However, the development of major local Chinese firms in industries such as white goods goes beyond the attraction of simple assembly operations and reflects the success of Chinese industrial development strategies.

These strategies include leveraging the attractions of the Chinese economy in bargaining with TNCs. The use of joint ventures has enabled the development of local production capabilities, and has built-on linkages with local inputs industries. At the same time, TNC concerns over intellectual property has seen some firms locate only assembly operations in China to take

¹⁵ In this, China is also following a well worn path in line with a 'colonial' trajectory. It is also notable that financing for Sasol's major coal to liquids projects in China has not required FDI inflows, but have been largely locally financed.

advantage of low labour costs. The point, however, is that the Chinese approach is based on strategic engagement to unlock the bundle of capabilities controlled by TNCs including access to international marketing and distribution, ownership of brands, as well as technology (Chang, 1998). In addition, Chinese firms are starting to engage in outward acquisitions of industrialised country firms as another way of gaining access to these features (Goldstein et al., 2006).

South Africa has technological strengths in niches such as mining machinery. The boom in mining investment in China and elsewhere provides a major opportunity. There are also opportunities in the automotive sector if patterns of specialisation develop allowing South Africa to benefit from intra-industry trade. But, at present the trade is highly unbalanced in China's favour and the analysis here indicates that such opportunities will be lost without much more concerted action to build local production capabilities.

This is part of a wider question as to what will China import if and when the currency appreciates and it moves towards more balanced trade? It will continue to import raw materials, including the oil being secured by its state-owned corporations in various countries. It will also import products such as iron ore from South Africa, and platinum, whether embodied in catalytic converters or not. But, in general, the tariff escalation with higher value-added being maintained by China will maintain the bias to exports products in close to the primary form. There are some important product groupings within agriculture and agro-processing where Chinese demand represents a major opportunity. But, here also, China's strategy is to import lower value products, such as soya protein from Brazil, while supporting higher value products locally.

Lastly, China's strategic interests in Africa as a whole have implications for South Africa. China's international relationships are evidently geared to ensuring access to resources. This underpins Alden's analysis that African states are in a relatively strong bargaining position (Alden, 2005a; Sidiropulos, 2006). But, utilising these strengths, and minimising the negative implications of China's interaction with the weak states which characterise many African countries, requires a strategic engagement in which South Africa could play a leadership role. Such a role could realise gains to South African industry from being input suppliers to major resource projects. This role probably also implies South Africa being more aggressive in developing infrastructure regionally, and for the South African state being a very active participant.

In conclusion, it is evident that the important developments reviewed in this paper stretch far beyond those that are normally considered in a trade negotiation. Without addressing these developments, however, the important questions facing the South African economy with regard to relations with China will remain unanswered.

References

- Alden, C. (2005a) 'Leveraging the Dragon: Toward "An Africa That Can Say No"', *YaleGlobal Online*, 1 March 2005, downloaded on 24 April 2006.
- Alden, C. (2005b) 'China-Africa relations: the end of the beginning', in Draper and Le Pere (eds.)
- Alden, C. and M. Davies (2006) 'A Profile of the Operations of Chinese Multinationals in Africa', *South African Journal of International Affairs*, 13 (1), 83-96.
- Auty, R. (2001) 'The political state and the management of mineral rents in capital surplus economies: Botswana and Saudi Arabia', mimeo, Lancaster University
- Baffinland Iron Mines Corporation. (2005) 'Iron ore industry trends and analysis, Baffinland Iron Mines Corporation, 30 September, 1-14.
- Banchero Costa Research. (2005) 'The Chinese Coal Industry in 2005', China Focus Study – September 2005, Bancosta red studies volume 5, Banchero Costa Research, Italy.
- Barnes, J. R. Kaplinsky and M. Morris (2004) 'Industrial policy in developing economies: developing dynamic comparative advantage in the South African automobile sector', *Competition and Change*, 8(2), 153-172.
- Best, M. (2001) *The New Competitive Advantage*. Oxford: Oxford University Press.
- Bijian, Z. (2005) 'China's "Peaceful Rise" to Great-Power Status', *Foreign Affairs*, 84(5), 18-24.
- Broadman H., G. Isik, S. Plaza, X. Ye, Y. Yoshino (2007), *Africa's Silk Road: China and India's New Economic Frontier*, Washington: The World Bank.
- Chabane, N., J. Machaka, N. Molaba, S. Roberts, M. Taka (2003) '10 Year Review: Industrial Structure and Competition Policy', background paper commissioned for South African Government 10 year Review, June 2003, www.sarpn.org.za

Chang, H-J. (1998) 'Transnational Corporations and Strategic Industrial Policy', in Kozul-Wright, R. and R. Rowthorn (eds.) *Transnational Corporations and the Global Economy*, Basingstoke: MacMillan.

COMMARK. (2004) 'Cluster Initiative for the Mining Equipment Manufacturing Industry: Phase I Industry Overview Report', COMMARK/Ekurhuleni Metro Joint Initiative, December.

Competition Commission (2005) 'MIDP Review 2005: Participation by the Competition Commission of South Africa'

CSID (2005) 'The State of Industry in Ekurhuleni: Manufacturing performance and firm competitiveness', Paper prepared by the Corporate Strategy and Industrial Development (CSID) research unit, School of Economics & Business Sciences, University of the Witwatersrand, June.

Deloitte (2005) 'Exports: Opportunities and Challenges for the Chinese Automotive Industry'

Department of Agriculture (2005) 'Competitiveness in the International Agricultural Trends in the Agricultural Sector', Department of Agriculture, Pretoria.

Draper, P. and G. Le Pere (eds.) (2005) *Enter the Dragon: Towards a free trade agreement between China and the Southern African Customs Union*, Johannesburg: SAIIA and IGD

Engineering News (2005) 'Agency helps build new markets for exporters', *Martin Creamer's Engineering News*, 21 January.

Flatters F. (2005) 'The Economics of MIDP and the South African Motor Industry' Queen's University, Canada, www.frankflatters.com

Francois J. F. and D. Spinanger (2004) 'Regulated Efficiency, World Trade Organization Accession, and the Motor Vehicle Sector in China', *World Bank Economic Review*, 18(1), 85-104

Frankel J. et al (2006), 'South Africa: Macroeconomic Challenges after a Decade of Success', CID Working Paper No 133, Harvard University

Gale, F and Collender, R (2006) 'New Directions in China's Agricultural Lending', Outlook Report No. WRS0601, USDA.

Gale, F. (2005) 'China's Agricultural Imports Boomed During 2003-2005', Outlook report No. WURS0504, USDA.

Goldletter International. (2005) 'China has emerged as the 4th largest gold producer', Goldletter International, April.

Goldstein, A., F. Bonaglia, J. Mathews (2006) 'Accelerated Internationalization by Emerging Multinationals: the case of White Goods', mimeo.

Greenaway, D. & Nelson, D. (2001) 'Globalization and Labour Markets: Literature Review and Synthesis', Research Paper 2001/29, Leverhulme Centre, The University of Nottingham.

Hale, D. (2005) 'How China's need for commodities will change global geopolitics', in Draper and Le Pere (eds.)

Hausman, R., J. Hwang, D. Rodrik (2006) 'What you export matters', mimeo

Heyes, D (2005) 'Demand for Supply', Palladian Publications Ltd.

Hongjiu, P.U (2004) 'Coal Industry Investment: The Outlook to 2030', Speech prepared by the First Deputy Director, China National Coal Association, 23 April.

Huang, J. and Q. Wang (2002) 'Agricultural Biotechnology Development and Policy in China' *AgBioForum* 5(4), 122-135

IBM and University of Michigan (2006) 'Inside China: The Chinese View Their Automotive Future', IBM Consulting Services in Association with Transportation Research Institute and the Office for the Study of Automotive Transportation, University of Michigan, USA.

Imbs, J. and R. Wacziarg (2003) 'Stages of Diversification', *American Economic Review*, 93(1), 63-86.

Jenkins, R. and C. Edwards (2005) 'The Effect of China and India's Growth and Trade Liberalization on Poverty in Africa', mimeo, Report for DfID.

Jensen, H. G. and R. Sandrey (2006) 'A possible SACU/China Free Trade Agreement (FTA): Implications for the South African manufacturing sector', tralac Working Paper No8/2006.

Johnson Matthey (2005) 'Platinum 2005 Interim Review', Johnson Matthey, 11-14.

Kaplinsky, R. and M. Morris (2006) 'Dangling by a thread: How sharp are the Chinese Scissors?', mimeo, report for DfID Trade Division, January.

Kaplinsky, R., D. McCormick, M. Morris (2006) 'The Impact of China on Sub-Saharan Africa', report for DfID.

Lall, S. (1994) "The East Asian Miracle Study: Does the Bell Toll for Industrial Strategy?" *World Development*. 22(4), 645-654

Lall S. and Weiss J. (2005) 'China's Competitive Threat to Latin America: an Analysis for 1990-2002', *Queen Elizabeth House Working Paper Series* 120

Lall, S. and M. Albaladejo (2004) 'China's Competitive Performance: A Threat to East Asian Manufactured Exports?', *World Development*, 32(9), 1441-1466.

Lee C. and T. Fujimoto (2003) 'The Chinese Automobile Industry and the Strategic Alliances of China, Japan and US Firms: The Cases of FAW, Dongfeng-Nissan and Shanghai-GM' International Motor Vehicle Program, MIT, USA, Aichi University, Japan and University of Tokyo, Japan

Lihua Y. (2006), 'Africa: A View from China', *South African Journal of International Affairs*, Volume 13(1), 23-32

Luo J. (2005) 'The Growth of Independent Chinese Automotive Companies', International Motor Vehicle Program, MIT, USA

Machaka, J. and S. Roberts (2003) 'The DTI's new 'Integrated Manufacturing Strategy? Comparative industrial performance, linkages and technology', *South African Journal of Economics*, 71(4), 679-704.

Marukawa T. (2003) 'The Supplier Network in China's Automobile Industry from a Geographic Perspective' Institute of Social Science, University of Tokyo. www.iss.u-tokyo.ac.jp/~marukawa/suppliernetwork.pdf

Mintek (2005) 'The South African Platinum Industry Cluster', report by Mintek for the Department of Science and Technology, Pretoria.

NAAMSA (2006), 'SA Car Sales and Exports Data' NAAMSA

NAAMSA (2005), 'NAAMSA Annual Report 2005' NAAMSA

Naidu, S. (2006) 'South Africa's relations with the People's Republic of China: mutual opportunities or hidden threats?', in Buhlungu, S., J. Daniel, R. Southall, J. Lutchman (eds.) *State of the Nation 2005-06*, Pretoria: HSRC Press.

Nolan P. (2002) 'China and the Global Business Revolution' *Cambridge Journal of Economics* 26, 199-137

Nolan P. and G. Yeung (2001) 'Big Business with Chinese Characteristics: Two Paths to Growth of the Firm in China Under Reform' *Cambridge Journal of Economics* 25, 443-465

Nolan P. and J. Zhang (2002) 'The Challenge of globalization for Large Firms' *World Development* 30(12), 2089-2107

Phele, T. and S. Roberts (2005) 'The Impact of the Minerals Sector on Industrial Competitiveness: Linkages and the Development of Capabilities in the Capital Equipment Industry in South Africa', Globelics, Tshwane, November 2005.

Regmi, A and Gehlhar, (2005) 'New Directions in Global Food Markets', Agriculture Information Bulletin No. AIB794, USDA

ResearchChannel (2005) 'South Africa's Road Industry 2005', Creamer Media

ResearchChannel (2006), 'South Africa's Automotive Industry 2006', Creamer Media

Roberts, S. (2000) 'Understanding the Effects of Trade Policy Reform: the case of South Africa', *South African Journal of Economics*, 68 (4), 607-638

Roberts, S. (2004) 'Investment in South Africa – a comment on recent contributions', *Development Southern Africa*, 21(4), 743-756

- Rodrik D. (2004a) 'Industrial Policy for the Twenty-First Century', report for UNIDO
- Rodrik D. (2006) 'What's So Special About China's Exports?' *NBER Working Paper* 11947
- Rodrik D.(2006) , 'Understanding South Africa's Economic Puzzles', CID Working Paper No 130, Harvard University
- Rodrik, D. (2004b) 'Rethinking growth policies in the developing world', Luca d'Agliano Lecture in Development Economics, 8 October, 2004, Torino, Italy.
- Rodrik, D. (2004c) 'Growth Strategies', mimeo, paper for *Handbook of Economic Growth*
- Sachs, J. and A. Warner (2001) , 'The Curse of Natural Resources', *European Economic Review* 45: 827-38.
- Shafaeddin, S.M. (2004) 'Is China's accession to WTO threatening exports of developing countries?', *China Economic Review*, 15, 109-144.
- Shane, M and Gale, F (2004) 'China: A Study of Dynamic Growth', Outlook Report No. WRS0408, USDA.
- Sichinga, J. (2006) 'Sasol's entry into China', presentation to South African Institute of International Affairs, 29 September 2006 by Sasol's Manager of Coal to Liquids Development.
- Sidiropoulos E., 'Options for the Lion in the Age of the Dragon', *South African Journal of International Affairs*, 13(1), 97-113
- Solot, I. (2006) 'The Chinese Agricultural Policy Trilemma', *Perspectives* 7(1), 36-46
- Steinhilber, J. (2006) 'China – A new actor in the Middle East and North Africa Region?', Friedrich Ebert Stiftung Foundation, Dialogue on Globalization Occasional Paper No.24, Berlin.
- Stiglitz J. (1993), 'The Role of the State in Financial Markets.' *Proceedings of the World Bank Conference on Development Economic 1993*.
- UNCTAD (2005) *Trade and Development Report 2005*

USGS, (2006) 'Platinum-Group Metals', U.S. Geological Survey, Mineral Commodity Summaries, January.

Vines A (2006), The Scramble for Resources: African Case Studies, *South African Journal of International Affairs*, Volume 13(1), 63-75

Von Zedtwitz M. (2005) 'International R&D Strategies in Companies from Developing Countries: The Case of China', UNCTAD

Walker, M. (2004) 'Sustaining Competitive Advantages: The Role of the Minerals Inputs Cluster in the Economic Growth and Development of South Africa – A Preliminary Assessment', Unpublished Doctoral thesis, School of Engineering and the Built Environment, University of the Witwatersrand.

Walker, M. and R. Minnitt (2006) 'Understanding the dynamics and competitiveness of the South African minerals inputs cluster', *Resources Policy*, 31, 12-26.

White L. and P. Alves, 'China in Africa: A Relationship of (Un)equals in the Developing World', in *South African Journal of International Affairs*, Volume 13(1), 55-62

Wilcox, O. and D. Van Seventer (2005) 'Current and potential trade between South Africa and China', in Draper and Le Pere (eds.)

Zweig, D. and B. Jianhai (2005) 'China's Global Hunt for Energy'. *Foreign Affairs*, 84(5), 25-38