

# MULTINATIONAL ENTERPRISES IN AFRICA: A STUDY OF GERMAN FIRMS IN SOUTH AFRICA \*

By

B.Michael Gilroy<sup>\*</sup>, Thomas Gries<sup>\*\*</sup>, Willem Naude<sup>\*\*\*</sup>, Karl-Heinz Schmidt<sup>◊</sup> & Nobert Bauer<sup>◊</sup>

An earlier version of this paper was prepared for the International Jubilee Conference on the *Economic Empowerment of Southern Africa* In Celebration of the 75<sup>th</sup> Anniversary of the Economic Society of South Africa Glenburn Lodge, Muldersdrift, South Africa 13 September 2001, 15h30

## Abstract

A key feature of globalisation is the increasingly important role of Multinational Enterprises (MNEs) as vehicles for Foreign Direct Investment (FDI). Economic theory recognises that MNEs can benefit economic growth in developing countries through generating positive externalities (so-called spill-over effects). These spill-over effects occur predominantly through the R&D and innovation of MNEs, their outsourcing to local firms, their training of local labour and the payment of higher wages by MNEs to retain good labourers. All of these benefits can be important for Africa, the world's poorest continent, in order to accelerate growth. However, the extent to which African countries benefit from spill-over effects of MNEs remains to be empirically investigated. The need for such an investigation is can be motivated with reference to the trickle of annual FDI flows destined for Africa. In this light the present paper present results from an empirical survey of German firms in South Africa. South Africa may be an interesting case in which to study the impacts of MNEs on African development as it has a significant presence of foreign firms. German MNEs specifically have been involved in the South African economy for over a century.

Key words: *Multinational Enterprises, Foreign direct investment, Africa, South Africa, Germany, Endogenous growth theory.*

---

\* This paper is the outcome of a research project that was funded by the National Research Foundation (NRF) of South Africa. We are grateful to a number of participants at the 75<sup>th</sup> Conference of the Economic Society of South Africa, held on 13 September 2001 at Glenburn Lodge, Muldersdrift, South Africa, for their comments. The usual disclaimer applies.

<sup>\*</sup> Professor of International Business Studies, Department of Economics, University of Paderborn, Germany

<sup>\*\*</sup> Professor of International Growth and Business Cycle Theory, Department of Economics, University of Paderborn, Germany

<sup>\*\*\*</sup> Professor and Director of Research, Faculty of Economic and Management Sciences, Potchefstroom University, South Africa. *Contact person* : [EBNWAN@puknet.puk.ac.za](mailto:EBNWAN@puknet.puk.ac.za) , Tel. (018) 299 1440 .

<sup>◊</sup> Professor of Public Economics and Social Politics, Department of Economics, University of Paderborn, Germany

<sup>◊</sup> Graduate student of International Business Studies at the University of Paderborn, Germany

# MULTINATIONAL ENTERPRISES IN AFRICA: A STUDY OF GERMAN FIRMS IN SOUTH AFRICA

## 1. INTRODUCTION

In a context of globalisation Africa requires investment by multinational enterprises (MNEs) to improve its competitiveness and to facilitate micro-level structural changes required for reducing its riskiness for investment. The process of economic development is to a large extent contingent upon the cumulative effects of appropriation and development of technological advancement in which MNEs play a central role (Gilroy (1993), pp.163-18).

Most of the literature<sup>1</sup> now accepts the fact that the inflow of FDI through MNEs increases local development and utilisation or upgrading of resources (compare Dunning (1993/1996), Caves (1996)). Many of the arguments found are based upon the insight that both home and host countries may gain from FDI when resources are not inevitably fully employed which leads to an industry-specific and complementary nature of capital and technology.

Africa might be in low-growth equilibrium trap, unless factors and conditions can be identified whereby MNEs can become more involved in African economies. Economic theory recognises that MNEs can benefit economic growth in developing countries through generating positive externalities (so-called spill-over effects). These spill-over effects occur predominantly through the R&D and innovation of MNEs, their outsourcing to local firms, their training of local labour and the payment of higher wages by MNEs to retain good labourers. All of these benefits can be important for Africa, the world's poorest continent, in order to accelerate growth. However, the extent to which African countries benefit from spill-over effects of MNEs remains to be empirically investigated.

This paper is therefore motivated by the fact that the role of MNEs in Africa had not yet been rigorously researched. To therefore broaden the understanding of the role of MNEs in Africa's economic performance, an empirical study of German firms in South Africa<sup>2</sup> was undertaken during 2000.

German firms in South Africa offer a potential rich field of investigation into the impacts that MNEs can have on a developing country. There are around 560 German firms in South Africa employing more than 65 000 people. The average German firm has been operating in South Africa for 22 years with some firms' presence pre-dating South Africa's industrialisation. Given the importance of skills, technology and innovation for competitiveness in a global environment the study of these firms will focus on the technological spill-over effects of these firms in South Africa. Thus, the paper will report in particular on the training, remuneration, innovation, R&D and outsourcing behaviour of the German firms in South Africa, as these are identified in the literature on MNEs and endogenous growth theory to be the most significant channels for spillovers (or positive externalities) to occur.

The paper is structured as follows. In section two the fundamental benefits of MNEs in accelerating economic growth in developing countries is set out with reference to the evolving understanding of the nature of MNEs. In section three the historical engagement of German firms in South Africa is described, and the current profile of German firms discussed. Section 4

---

<sup>1</sup> Of course, there exists much controversial evidence of MNEs being linked to inequitable income and power distribution, environmental debasement, and societal deprivation. Although many such instances are indeed quite spectacular or extreme in nature, they usually represent isolated examples and should not immediately be postulated to be the typical case of MNE behaviour.

<sup>2</sup> South Africa may be an interesting case in which to study the impacts of MNEs on African development as it has a significant presence of foreign firms. Mundorf (1993:125) estimates that foreign firms account for almost 40% of the total production of the private sector in South Africa.

present the results from the survey of 31 firms in 2000, with particular emphasis on the R&D, innovation and outsourcing practices of these firms. Section 5 concludes with a summary and conclusions.

## 2. MNEs, KNOWLEDGE CREATION AND KNOWLEDGE SHARING

The aim of this section is to provide a theoretical basis from which to approach German MNEs in South Africa so as to be able to evaluate the extent to which MNEs can make a contribution to economic growth and catching up. It is indicated that the motivation for the existence and operation of MNEs in the global economy has changed over the past decades and that the need to innovate imply that MNEs may favour knowledge-rich locations (that facilitate knowledge creation and knowledge sharing) over knowledge poor locations (such as might be the case in much of Africa).

Multinational enterprises (MNEs) have often been defined in the literature simply as organisations that engage in foreign direct investment (FDI) and own or controls value-adding activities in more than one country (see e.g. Dunning (1974, p. 13), Dunning (1993/96, p.3), Casson (1985, p. 31))<sup>3</sup>. Ghosal and Westney (1993, p. 2) describe the MNE as “one of the most complex forms of organisation currently in existence.”

The enormous literature on the institutional phenomenon MNE has undergone rapid evolutionary changes throughout the years (see the twenty-five volumes of the United Nations Library on Transnational Corporations, e.g. Dunning (1992)). Significant theoretical contributions in the areas of international trade, industrial organisation, international finance, transaction-cost approach to economic organisation, business administration, taxation, and elements of law and political science have all been successfully applied to the domain of multinational enterprise analysis (compare e.g. Dunning (1993/96), Caves (1996), Helpman (1984), Ethier (1986), Cantwell (1991), Markusen (1984, 1995)).

The basic starting point goes back to neo-classical theory that is primarily a theory of prices and the allocation of resources. The firm is interpreted essentially to be a ‘black box’, i.e. factor inputs such as land, capital and labour are simply transformed by the given technology (production function) into final consumer products and services sold in perfectly competitive markets. What role then do firms play as economic organisations? R.H. Coase (1937) was one of the first modern authors to raise the question as to why firms exist? The answer he gave was that firms must be interpreted as internal markets for transactions that do not take place on external arm's length markets due to transaction costs that reflect the fact that external markets are not perfect. Given non-perfect markets, internal transactions allocated by fiat, i.e. administrative organisation through hierarchies instead of simple price allocation may prove to be more profitable and cost-minimising due to ‘transactional advantages’ over the market.

The original studies focusing on MNEs and searching for an explanation of the phenomena are Penrose (1956, 1959), Dunning (1958), Behrman (1962), MacDougall (1960) and Kemp (1964). The advancement of the theory of monopolistic competition during the 1930s and Hymer's (1960) defiance of the capital arbitrage perspective of FDI flows being based upon relative differences in interest rates led to new insights. The basic (Hymer)/Kindleberger (1969) hypothesis is that a MNE must have some non-marketable advantage over foreign domestic firms

---

<sup>3</sup> However, McMannus (1972) pointed out that the essence of the phenomenon of international production is not simply the transfer of capital, but rather the international extension of managerial control over foreign subsidiaries. Various other studies have defined multinationals in alternative ways (see e.g. Aharoni (1971), Macharazina (1981)). The editors, J. Stopford and J.H. Dunning, of the *The World Directory of Multinational Enterprises* (1982, 1992), for example, define multinationality according to three criteria: (1) at least 5 percent of consolidated sales or assets from foreign direct investment, (2) at least 25 percent of the voting equity in at least three foreign countries, and (3) at least \$75 million in sales from foreign operations.

that is sufficient to overcome the natural obstacles of operating in some distant foreign market. The relevance of Hymer's work is found in essentially every study of MNEs. As postulated by Dunning and Rugman (1985, p. 228), Hymer's contribution and great insight was in articulating the process of FDI as an international extension of industrial organisation theory. Along these lines of thought FDI was due to the existence of imperfect competition, product differentiation and barriers to entry.

Thus, the common strand in the line of thought from Coase to Hymer is the notion of the firm as an internal market for transactions that are not economically permissible on spot markets. Given such transactional advantages of an internal market, the implication is that pure 'market failure' exists or imperfect markets for other reasons. As pointed out by Penrose (1996, p. 562), such considerations still do not distinguish the MNE from domestic firms.

The traditional model of enterprises starts with the assumption that the particular means of contributing financial capital to the productive unit will define the structure of the enterprise. The enterprise is thus an institutional scheme for organising the interests of 'owners' or equity contributors (Milde (1987)). The specific class of capital contributors and its institutional conception (common ownership/shareholding) form the centre of the organisational structure. All other inputs are integrated into this structure through specific 'external' markets (the labour market, the market for technical and administrative know-how, the non-equity capital market, etc.). Some inputs are conceived of as being "physically" integrated into the enterprise (managers, employees) through special contracts (Schanze (1986)).

This traditional enterprise model has been further developed, analysing the enterprise as a 'set of contracts' or a 'nexus' perspective of the enterprise (Reve (1990), Alchian and Demsetz (1972), Jensen and Meckling (1976)). This nexus model of the enterprise discards the notion of a vested priority of one specific asset. Rather, it stresses that all input/output relations should be analysed as interlocking functions of the enterprise concept (compare e.g. Schanze (1986), Johnston and Lawrence (1988)). The nexus model, however, fails to explicitly recognize the value-added effects of international networks.

Along the lines of the nexus model, the 'constitution' of the enterprise is defined by the constitution of institutional "interfaces" of the various input/output relationships (Schanze (1986)). The initial nexus model as proposed by Alchian and Demsetz (1972) and Jensen and Meckling (1976) relies solely on a contractual interface. Input/output relations are described through contractual arrangements. However, as mentioned above, the importance of non-contractual interfaces and relationships has also been observed in the literature. Williamson, Wachter, and Harris (1975), for example, have argued that the characteristics of internal labour markets give the organisation efficiency advantages over alternative institutions. Radner (1975) has discussed the performance and survival implications of simple rules for allocating managerial efforts. Rules may substitute for full optimality, since sheer complexity makes its obtainment impossible. Boorman (1975) has analysed the equilibrium and welfare properties of *informal networks* of ties that permit information acquisition to individuals, the need for which arises randomly. The importance of such effects for corporate networking has been emphasized e.g. by Mueller (1986).

Transactional diversification through contractual or relational arrangements often represents an entrepreneurial mechanism for capturing potential integration economies (economies of scale, economies of scope and ray economies) associated with the simultaneous supply of inputs common to a number of production processes geared to distinct final product markets (Teece (1980, p. 224)). For example, inter-enterprise collaboration in basic research in non-stabilised frontier technologies occur to the extent that no single enterprise can solely bare the costs of such research, and yet no enterprise can risk losing access to a new technology that membership in a research and development pool potentially provides. It has been observed in the literature that especially research and development facilities have become increasingly regionalised (see e.g. Mytelka (1987), Burstall and Dunning (1985), Cantwell (1988), Cantwell (1996) Santangelo

(2000)). Local entrepreneurial competitiveness attracts global competitors, resulting in the *clustering* of multinational enterprise activities. Locally embedded value added and the subsequent localised knowledge spillovers resulting from it create spatial agglomeration economies, which generate competitive enterprise advantage based on untraded externalities. Markusen and Venables (1999) have demonstrated that through such linkage effects FDI acts as a catalyst which generates the development of local industry such that domestic firms may one day reduce both the relative and absolute position of MNEs in the industry. The welfare gains are unambiguous.

The important aspect hereby is that active co-operation inter-enterprise network structures through 'New Forms of Internationalisation' in no way diminishes the private appropriation of quasi-rents. Rather, it is much more the case that 'externalizing' various transactions internationally through inter-enterprise collaborative agreements liberates funds for further development activities that are more likely to enhance an enterprise's competitive position (Mytelka (1987)). Arrow (1975) has demonstrated theoretically that vertical integration can generate better information, increasing profit level when input supply uncertainty exists and when an investment type decision is of an ex ante nature. He demonstrates further also that an upstream industry can appropriate the benefits of better information by *giving* the information to the downstream industry. Thus, while vertical integration is sufficient, it is not always necessary. The possibility of a deviation of labour between enterprises and the importance of mutual exchanges of information has long been recognised by economists since Alfred Marshall's analysis of 'industrial districts'.

Framing the phenomenon of know-how trading among rivals within the context of a prisoner's dilemma, Von Hippel (1989) has also studied what he terms 'collective invention' and reciprocity. His data show that individuals and enterprises commonly revealed information of apparent competitive value to both existent and potential rivals based upon reciprocity. Informal know-how trading possesses a lower transaction cost than more formal agreements to license or to sell.

Often the high cost of research and product development and the rapid pace of product obsolescence (shortened product life cycle) have compelled MNEs to *co-operate* in research and development while they *compete* in production, marketing, and servicing of their product variants. The fierce and rapid expansion of internationalised competition has made two factors vital for enterprise survival: (1) Flexible and quick reaction to changing market conditions. (2) Positioning of enterprises ('strategic partnering') in such a manner that they themselves compete to influence the *functioning of future markets* (Mytelka (1987)). This dual concern of MNEs has accelerated the rate of technological change, obliging these firms to engage in new growth and internationalisation strategies that reduce costs and enhance the flexibility of knowledge production throughout their networks. This perspective may be useful to understand the behaviour of MNEs in Africa. Originally, the economic incentive for enterprises to go multinational may simply be to take advantage of differences in factor prices by utilising a firm-specific intangible asset in a foreign country (Helpman and Krugman (1985)). This may also have been the initial motivation for MNEs to enter African countries a couple of decades ago. Today, in globally competitive environment where world trade in high-value added manufacturing products dominates, enterprises have a further economic incentive – need - to expand beyond the point of factor price equalization. The flexibility achieved by network membership suggests that the advantages of multinationality itself may be greater than expected from traditional trade theory. Even if factor prices are equal, incentives based upon co-operative competition and knowledge creation make further use of firm-specific operational and functional complementarities economically feasible.

Knowledge creation can thus be expected to significantly influence the activities and motivations of MNEs. As recently pointed out by Teece (1998, p. 58), knowledge sharing itself can often be the basis of competitive advantage: "...the competitive advantage of firms in today's economy stems not from market position, but from difficult to replicate knowledge assets and the manner

in which they are deployed.” Obstacles in the knowledge creation process may keep MNEs from fulfilling an optimally beneficial role in a country.

According to recent patent statistics, the 700 largest industrial companies – most of them MNEs – account for half of all commercial innovations (Cantwell (1996), pp. 145-180). Cohen and Levinthal (1989) and Burger (1999, p. 118) further emphasizes the fact that the ‘spillover efficiency of MNE technology transfer’ requires that one takes account of the ‘double function’ of research and development (R & D) activities of firms. R & D activities of enterprises are simultaneously essential for innovative as well as imitative activities. Local enterprises that do not invest in learning cannot expect spillovers to have a significant effect on their level of efficiency. Training externalities, they point out, do not work when the absorptive capacity in the local firm is insufficient. Local companies, however, that do invest in training obtain additional learning economies over time (learning to learn effects), i.e. they achieve comparative advantages in external knowledge exploitation capabilities. One of the central prerequisites for endogenous regional development is the ability of the region, to adapt their economic and social structures and potentials to changing external challenges (Thierstein and Langenegger (1994)).

It is not only a question of MNEs bringing their advanced technology to the location. Another precondition for a potential technology/knowledge spillover requires that receivers invest in technological learning or in their absorptive capacity. Basically, it is the creation of an innovative-imitative environment which is desirable since given that firm-specific know-how is mobile, which definitely applies to the case of unembodied technology, “... then know-how is not only the knowledge concentrated in one location but the whole stock of intrafirm know-how worldwide (Burger, (1999), p. 121).” Ozawa (2000, p. 218) has termed such knowledge transfer effects accordingly as the ‘market-hitchhiking’ effect of trade and investment of MNEs. Thus, MNEs can bring in new ‘created assets’ such as technology and skills which potentially result in *external economies of concatenation* which enhances the catching-up processes and serve as powerful driving forces for economic development and structural accommodation and social upgrading processes. Since countries are characterised by different levels of industrial advancement MNEs act as vital catalysts for structural evolution. “Both leaders (‘lead geese’) and emulators (‘follower geese’) can mutually benefit from interactions with each other in terms of trade and investment opportunities (Ozawa (2000), p. 217).”

To what extent are MNEs activities in Africa driven by imperatives of knowledge creation, and to what extent to this lead to knowledge sharing (or knowledge transfers)? The remainder of this paper will explore these central issues by studying the behaviour of German MNEs in South Africa.

### 3. GERMAN FIRMS IN SOUTH AFRICA: ORIGINS AND PROFILE

According to the South African – German Chamber of Commerce (SAGCC) there are around 560 German firms employing roughly 65 000 people active in South Africa. Most of these enterprises are in the secondary sector. Gütschleg (1999) identifies the machinery, electronic, chemical, pharmaceutical, automobile, and metal production sectors as the major hosts for German firms respectively. Gütschleg (1999:81) found that the average German firm has been operating in South Africa for 22 years. The major industrial areas of South Africa can be found in the Pretoria-Witwatersrand-Vereeniging (PWV) region, the Durban-Pinetown region, the Port Elizabeth-Uitenhage region, East London and the Cape peninsula. Of all German companies Gütschleg (1999:91) identified 89 percent in the Gauteng region, six percent in the Eastern Cape, four percent in the Western Cape and only one percent in Kwazulu-Natal. Thus, German firms tend to follow the presence of local agglomeration advantages and economies of scale.

There are strong historical and commercial ties of over a century between Germany and the Republic of South Africa. Historically, a host of German pundits in the field of mineral extraction and commercial trading already engaged in South Africa at the outset of the 19th

century. It seems that investment decisions by German firms in the first half of the 20th century were being determined by the location advantages of South Africa; i.e. production costs, transportation costs, delivery time, favourable exchange rate, arbitrage opportunities in natural resources and protecting customs rates.

Table 1 shows some of the early German commercial involvements in South Africa. Today, still about 30 percent of the white population pertains of German descent, i.e. around 1 million people.

In this context, Mundorf (1993) differentiates two groups of German South Africans. First German-Afrikaansers with old local roots in South Africa. Second, there are about 90 000 Africa-Germans who still hold a German citizenship and live in South Africa principally due to economic reasons. Also, cities like Heidelberg, Wuppertal, Heilbron, and Frankfurt still reflect the profound German influence in South Africa. Economically, Germany already became the second most important trading partner for South Africa in 1914. A temporary setback due to the aftermaths of the two world wars occurred but did not significantly harm the established relations.

German firms seem to work within an institutional network through a consultancy infrastructure that has evolved over time. For example, there exists about 13 institutions like the German Chamber of Commerce, the Goethe Institute, the Association of German Engineers (VDI), the South African Initiative for German Business (SAFRI) etc. which support the German industry and its community in South Africa and elsewhere. Another example provided by Mundorf (1993) is the establishment of the Deutsch Afrika Linien (DAL) in 1934 which still runs the export business for companies like Audi, BASF, Degussa, Hoechst, MAN, Mercedes, Volkswagen and Demang-Duisberg (Gilroy and Broll 1987:1).

*Table 1: Historical Engagement of Germans and German Firms in South Africa*

<u>Year</u>	<u>Name of Personality or Company</u>	<u>Activity</u>
1795	Dr. Friedrich Liesching	Production of natural remedies
1823	Dr. Otto Landsberg	Export of tobacco
1839	Josef and Adolf Mosenthal	Trading company
1852	Hamburgian company	Trading company
1868	SIEMENS	Electric industry in Cape Town
1895	AEG	Supply industry
1912	Ernest Oppenheimer (Anglo American Corp.)	Diamond company
1930s	Mannesmann Demag	Steel and Coal refining industry
1948	Volkswagen	Automobile production
1949	Union of German Exporter and Importer Association	Predecessor of SA-German Chamber of Industry and Commerce
1950	BASF partnership with SASOL	Coal refining plant
1958	Mercedes-Benz, East London	Automobile production
1962	Lufthansa	Airway transport

*Source: Mundorf, Dirk (1993:108 –112); Gütschleg, Dirk (1999:12) and expanded by the authors.*

From table 1 can be seen that German MNEs such as Siemens and AEG commenced their business operations even before the industrialisation process in South Africa started. The post-war period can be classified as a period for the German automobile, electronic, chemical and its supply industry. The intensification of the relations between the two countries began in the 1960s and is still continuing, although as will be indicated in the next section, there is evidence

that many German firms are experiencing severe constraints in South Africa and that many considers leaving South Africa.

#### 4. SURVEYS OF GERMAN FIRMS IN SOUTH AFRICA

##### 4.1 Survey of Perceptions

Since December 1993/January 1994 Gunter Pabst has conducted a qualitative survey amongst the members of the Southern African-German Chamber of Commerce and Industry. The most recent survey was conducted in May – July 2000 (see Pabst, 2000). It is a particularly noteworthy feature of German firms' involvement in South Africa that these firms can be classified overall as medium-sized based on the fact that the vast majority employs less than 100 workers.

For instance in Pabst's survey, more than 89 out of 140 firms employs less than 100 labourers, and that 6 firms had more than 2000 employees. The survey by Pabst (2000:2) shows that since 1995, the majority of respondents (70%) indicated that they had not been creating any new jobs. The survey results of Pabst (2000) suggest that German MNEs in South Africa perceive labour productivity and the activities of labour unions to be an obstacle in job creation. For instance in 2000 80% of all respondents felt pessimistic and very pessimistic about the accountability of labour unions and 69% felt pessimistic and very pessimistic about the adequacy of labour productivity. In the presentation of the extended quantitative survey conducted by the authors (see below) these results are substantiated and some possible reasons for the dissatisfaction with South African labour will be identified.

The questionnaire used by Pabst (2000) contained sections dealing with economic climate, basic political structures, basic economic structures, importance of certain conditions for doing business, intentions and views with respect to affirmative action and Black Economic Empowerment (BEE). The salient results are:

- 56% of firms regard the economic climate as either good or satisfactory with 14% regarding it as bad and very bad.
- 64% of firms are confident and very confident in the maintenance of a market driven economy in South Africa.
- 79% of firms expect an escalation of crime and violence.
- 67% of firms view labour regulations as unfair.
- 80% of all firms have considered or started or completed affirmative action programmes.
- 83% of firms are pessimistic as to whether corruption would decrease.
- 77% of firms have a pessimistic and very pessimistic view of the competence of the civil service.
- 36% consider incentives for investment not to be inadequate whilst 36% are neutral.
- Adequate returns on investment, maintenance of transport infrastructure and higher productivity of the labour force are cited by the majority of firms as the most important requirements whilst 98%- 100% of firms would like to see less crime and violence, better environmental protection, maintenance of educational standards, and access to international TV.
- 26% of firms signified their intention to leave South Africa, with 11% considering disinvestments. Only 45% considered increasing their investment in South Africa.

From the above the conclusion is that firms are experiencing severe constraints as is reflected in the high rate (almost a third) of firms considering to leave South Africa or disinvest, the negative view of the adequacy of labour and concerns over educational standards, and worries about crime, violence, corruption and the incompetence of civil servants.

In the next section results from a more expansive and quantitative questionnaire-based survey conducted by the authors during 2000 is set out and contrasted with some of the salient features

of German firms already identified in this section. It is an aim of this paper to establish in the next section how German firms are contributing to promoting economic growth and catching-up in South Africa especially through spill-over effects due to knowledge creation and knowledge sharing, as described in section 2.

## 4.2 Knowledge Creation and Knowledge Sharing by German Firms in South Africa

### 4.2.1 Methodology

The study made use of a structured questionnaire that was mailed to over 600 German firms in South Africa. The list of firms was obtained from the Southern African-German Chamber of Commerce and Industry. About 55 firms responded (10%), of which 31 questionnaires (about 5%) were satisfactorily completed. About 15 firms were visited during September – October 2000 and case studies prepared of these firms in the South African economy. The relatively small sample size makes it difficult to generalise the results and also precluded econometric analysis. However, the results are broadly consistent with the results from Pabst's survey of perceptions, as well as results from the National Enterprise Survey (NES) conducted in South Africa in 2000. This survey was the first that required rather detailed responses from the firms on a wide range of issues from labour turnover and R&D to competitive intelligence practices and networking. In this paper, the focus will be on the innovation, R & D and technological spill-over effects (or potential therefore).

### 4.2.2 General Overview

Table 2 below show that motor vehicles, metal products and chemicals are the sectors in which German firms more active in South Africa.

Most firms surveyed had between 1 and 5 plants (offices) in South Africa. About 96% of firms had between 1 and 5 plants (offices) and 4% had between 6 and 10 plants (offices). In 88% of the cases, firms' products/services were in conformity with ISO requirements. On average, German companies in South Africa spent about 3% of total sales on marketing - R8.06m, R8.91m, and R9.04m for the three consecutive years, 1997, 1998, and 1999, respectively. This shows a significant and steady increase in nominal marketing expenditure of 12% of the period. Most German firms in South Africa face significant competition. On average, there are 2 competitors per firm with a range of 1 and 3. In total 34 new competitors enter the market per year on average.

*Table 2 : Firms, sales and employees of German Firms in South Africa 1999*

Sector	Number of Firms	Sales		Employees	
		total (Mio. R.)	per firm (Mio.R.)	total	per firm
Motor vehicles & metal products	10	7.227	1.216	6.396	1.089
Chemicals & rubber manuf.	5	94	19	375	71
Pharmaceuticals	3	110	37	257	86
Electronics	4	52	13	190	48
Construction & Textiles	2	170	85	220	110
Transport	3	709	236	302	101
Finance a.o. services	4	274	69	354	89
Total	31	8.636	279	8.094	261

German firms in South Africa behave roughly in accordance with the traditional textbook model of MNEs / FDI. For instance they tend to produce mainly for the domestic market (i.e. their investment decision is not based on using South Africa as a competitive platform for exporting)

and as will be shown they pay higher wages than local companies and operate very much within “enclaves” from the local economy- although there are exceptions.

For instance, the focus on the domestic market is clear from considering that marketing expenses/budgets have increased for the last three years. Bearing in mind sample problems, only 4% of all questioned companies are engaging in foreign trade suggesting that German MNEs are in South Africa to service the domestic market and that the country may not be seen to be attractive as a platform for international production. Transport and logistical services in South Africa is seen as having a substantial negative influence on the sales of companies. However, despite this exports have increased by 155% over the past three years indicating the domestic market pressures may be forcing these firms to find other outlets as well<sup>4</sup>.

#### *4.2.3 Labour Remuneration and Skills*

The total wage bill per firm surveyed ranged from R 28 million to R 33 million between 1997 and 1999. In 1999 the average wage (per employee) was R8900 (i.e. US\$ 1000) per month. This is significantly higher than the average South African monthly wage and consistent with theories of FDI that postulate that MNEs will pay more to keep their better employees.

High wages is stated clearly as one of a number of measures used by German firms in South Africa to attract and maintain good employees. The survey found the following measures were part of the employee retention strategy of firms: creating a good environment, recognition, care and motivate employees and support teamwork (46%); followed by well pay (29%) and finally by means of financial bonuses or rewards (14%). More than 66% of all firms do not experience negative problems in maintaining technical expertise.

Almost two-thirds (59%) of German companies regard employment equity measures as valuable. The overall majority of firms (72%) do not consider existing labour market regulations to negatively affect investment decisions. However, despite the latter finding about 53% of German firms surveyed indicated that labour market regulations do restrict further employment of local labour – a finding consistent with the finding of Pabst (2000).

The South African labourers employed consistent on average of 45% low skilled, 42% medium skilled, and 15% is highly skilled occupations. It was established that 69% of German firms view the existing skills in South Africa to be appropriate for South Africa’s technology. However, 56% stated that training quality and skill levels in South Africa are inadequate to allow further technological transfer from abroad. Thus 66% of all questioned companies send some of employees to Germany for training and expatriates play a significant role in the top management of all firms. Furthermore about 61% of all German companies provide outside/external training to suppliers or clients. Spending on training and education by the firms in the sample increased by 24% between 1997 and 1999.

#### *4.2.4 Research & Development & Innovation (Knowledge creation)*

The “knowledge creation practices” of the investigated firms include expenditures for R & D, expenditures for foreign licenses, patents owned by the individual firm and/or by the relevant group of firms.

From table 3 it may be surmised that only a few firms supplied information on R & D-expenditures. This is not surprising because of intensive competition in the markets and the effects of oligopolistic behaviour of large companies – in South Africa as in other countries. The data however suggest that distinct types of entrepreneurial behaviour determine the level and the relative changes of R & D-expenditures in the individual firms. The firms’ behaviour regarding

---

<sup>4</sup> The major destination of German trade are neighbouring countries as well as Europe and especially Germany. Other importing countries of German manufactured goods in South Africa are: Mauritius, Malaysia, England, Poland, Spain, Indonesia, Chile, Finland, Tanzania and USA.

R&D in table 3 differ as to (a) the size (number of employees), (b) the relative change of R & D-expenditures and (c) their average amount per employee.

*Table 3: R & D -expenditures of German firms in SA according to firm -size (employees) 1999*

Firm-size: employees	R & D -expenditures			
	total amount (1.000 R)	change (%)	per employee (R)	
	1997	1999	1997/1999	1999
145	50	100	+ 100,0	690
48	15	10	- 33,3	208
120	1.000	200	- 80,0	1.667
130	800	1.100	+ 37,5	8.462
6	50	60	+ 20,0	10.000
5.906	7.000	14.000	+ 100,0	2.371
Σ 6.355	8.915	15.470	+ 73,5	2.434

German firms in South Africa react on the changes of their environment by variable instruments of investment and business policy. The changes of R & D-expenditures are just one of these instruments. The investment in R & D and the level of R & D-expenditures depend on the environmental changes and on the expectations by the management of the individual companies. There are small firms demonstrating an expansive or a hesitant R & D-policy, and we find medium-sized and larger firms practising an expansive R & D-policy. In particular, table 3 shows that “medium-sized” firms tend to spend more on R & D than either very small or very large firms.

The second indicator of knowledge creation, the expenditure on licenses, can be seen from Table 4. From the table it appears that expenditures on foreign licenses are complementary to the expenditures for R & D - that is they are not a substitute of in-house R & D.

The innovative practices of the considered firms are indicated by their information on the evaluation of information technology and communication technology business and the related support services in South Africa. Following from the survey data, two thirds of the investigated firms accept the services as being adequate to support the IT & CT Business. Interestingly, the remaining one third of the firms do not only deny the quality of these services, but they also report not to finance any R & D-expenditures, not to evaluate the skills in South Africa if they are appropriate for the technology used, not to finance expenditures for foreign licenses and not to hold own patents. Nevertheless, these firms admit that they have earned profits. In 50 % of the considered firms (“No adequate IT & CT Business”) profits/employee ranged from R10 000 to R100 000.

*Table 4: Expenditures of German firms in SA on foreign licenses and agreements 1997 and 1999*

Sector	Employees (number)			Foreign Licenses (1.000 \$)		
	1997	1999	99/97 +/- %	1997	1999	99/97 +/- %
Motor Vehicles	82	147	+ 77	38	70	+ 84
Metal Products	5.779	5.906	+ 2	8.600	12.100	+ 141
Chemicals & rubber	204	411	+ 101	666	856	+ 29
Textiles	200	200	0	250	250	0
Fin. a.o. services	240	260	+ 8	100	100	0
Total	6.505	6.722	+ 3	9.654	13.376	+ 39
Sector	R & D -expenditures (1000 R) 1999		Foreign licenses (1.000 \$) 1999			
Motor Vehicles	100		70			
Metal products	14.000		12.100			
Chemicals & rubber	1.100		856			
Textiles	-		250			
Fin. a.o. services	-		100			

Finally, despite the noted increase in R&D, few new jobs have been created. Employment in these German firms increased by only by 4% per annum since 1997. Table 5 shows out the number of new jobs created in some of the investigated firms. Out of 31 investigated German firms in South Africa only 6 have created new jobs by technological innovations, i.e. 20 % (1999). These were in chemicals manufacturing, motor vehicles, pharmaceuticals production and finance a.o. services. It should be pointed out however, that no firm terminated jobs as a result of technological progress or innovations.

*Table 5: New jobs created by Germany firms in SA 1999*

Sector	Empl.	New jobs		Foreign Licenses (1.000 \$)	Profits (+) Losses (-) (1.000 R)
		number	per empl.		
Chemical	21	8	0,38	66	.
Chemicals	130	4	0,03	90	.
Fin. a.o. services	260	30	0,12	100	.
Motor Vehicles	20	2	0,10	-	+ 250
Motor Vehicles	36	4	0,11	-	+ 3.700
Pharmaceuticals	15	2	0,13	-	+ 1.500

Thus it can be concluded that the medium-sized German firms in South Africa are innovative enterprises in terms of innovative practices related to the number of employees and the creation of new jobs. Secondly, the investigated firms avoid lay-offs of employees, but they probably try to train and retrain them in-house and on-the-job or to some extent also out-of-house. The potential for growth of productivity, production, sales and profits conclusively seems to be at the most promising level – at least for the management of the concerned firms – in the group of medium-sized innovative enterprises.

#### *4.2.5 R&D and Exports*

Table 6 gives some insight into the relationship between exports and actual R & D-expenditures; they expose the interest of the management in the stabilization and growth of the concerned companies in South Africa. Though the management of the selected firms is pessimistic as to the inflation rate of the South African economy during three years time, half of the considered

companies had decided to invest in R & D during the past three years, which means that they trust the South African economy to be stabilized in the near future. Especially medium-sized and larger companies turn out to be more optimistic as to the reduction of inflation rates. From this point of view it is not surprising, that they had decided to invest in production capacity and R & D in South Africa.

*Table 6: Exports and R & D -expenditures 1997 and 1999 and expectations concerning the inflation rates by selected German firms in South Africa*

Value of exports (1.000 S)			Amount spent for R & D (1.000 R)			Expectations in 3 years' time concerning inflation		
1997	1999	1997 = 100	1997	1999	1997 = 100	+	-	(constant)
2.800	4.730	169	50	100	200			=
300	250	83	-	-	-	+		
-	-	-	15	10	67	+		
4.000	3.000	75	-	-	-	+		
200	150	75	1.000	200	20			=
4	6	150	-	-	-	+		
212	1.167	550	800	1.100	138		-	
635	628	99	(R & D in Germany)			+		
10	10	100	50	60	120	+		
10	2	20	0	0	0	+		
19.300	84.660	339	7.000	14.000	200			=

#### *4.2.6 Knowledge Sharing : Outsourcing and Technology Transfers*

About 88% of all German firms in South Africa were found not to have a procurement policy. However, almost half of all firms questioned engage in outsourcing and function as information or service centre for many other African firms.

The survey contained several questions that focussed on networks of German firms in South Africa. They concerned especially outsourcing activities. Though the answers did not provide quantitative data on inputs and procurement policy of all the firms, the collected data offer information about specific cases of procurement policy under the conditions of new technologies, open markets and international factor mobility.

Table 7 suggest the following. Firstly, about 45 % of the investigated firms sourced their inputs from small enterprises in South Africa. Mainly medium-sized firms were involved in the procurement business. One should keep in mind that the regional-economic impact of internal input-relations should not be neglected. Together with activities in technology-transfer (TTr) and in-sourcing of investment capital the inputs of resources from small firms are determinant factors of "inward industrialization" and regional economic development.

Secondly, only about 42 % of the investigated firms were involved in TTr to suppliers and clients in South Africa in 1999. These firms tend to be medium-sized firms.

Thirdly, the data suggests that about 62 % of the firms have outsourced functions of the firm to other firms in South Africa during the past three years. Medium-sized and larger firms are more involved than small firms.

Thus outsourcing by small German firms tend to be of a short-term nature. Outsourcing by medium-sized and large firms are of a longer-term nature and more often based on written contracts.

*Table 7: Employees and percentages of inputs from small firms in SA 1999*

Firms with ... employees 1999	Number of firms	Percentages of inputs from small firms 1999 %	Firms with TTr to suppliers and clients in SA 1999	Outsourced functions over past 3 years
1-19	10	50; 5; 60;	3	5
20-99	10	1; 90; 100; 10; 20;	4	6
100-199	7	16; 1; 4; 1;	4	5
200 a.m.	4	25; 40;	2	3
Total	31	14/31 = 45,1 %	13/31 = 41,9 %	19/31 = 61,3 %

Not only the direct questions for technology transfer but also further indirect questions of the survey were focussed on the diffusion of new technologies. For example the information about restructuring or reengineering activities by the investigated firms suggested that the management was orientated to innovations and flexibility of the transformation process on the firm level. Reengineering activities need new technological knowledge. It will be transferred from outside, or it must be developed in-house. The German firms in South Africa to a minor extent utilize their contacts to German companies in Europe. Instead, they make use of their contacts to firms and institutions of TTr in South Africa. The supply of specific services by the company offices in South Africa was found at a relatively large rate in the medium-sized and larger enterprises. The percentages of firms that were involved in this supply of services and in reengineering activities were the same as to both criteria.

Though the survey data on the activities and institutions of technology transfer are limited, from the available information it may be concluded that the medium-sized and larger firms are relatively stronger involved in R & D and in the diffusion of new technologies, but that also small firms are active innovators, mainly in the field of product innovations and smaller, but important process innovations. This conclusion is supported by results of comparative studies on the diffusion of new technologies in European countries.

## 5. SUMMARY AND CONCLUSIONS

A key feature of globalisation is the increasingly important role of Multinational Enterprises (MNEs) as vehicles for Foreign Direct Investment (FDI). Economic theory recognises that MNEs can benefit economic growth in developing countries through generating positive externalities (so-called spill-over effects). These spill-over effects occur predominantly through the R&D and innovation of MNEs, their outsourcing to local firms, their training of local labour and the payment of higher wages by MNEs to retain good labourers.

All of these benefits can be important for Africa, the world's poorest continent, in order to accelerate growth. However, the extent to which African countries benefit from spill-over effects of MNEs remains to be empirically investigated. The need for such an investigation is can be motivated with reference to the trickle of annual FDI flows destined for Africa.

In this light the present paper present results from an empirical survey of German firms in South Africa. South Africa may be an interesting case in which to study the impacts of MNEs on African development as it has a significant presence of foreign firms. German MNEs specifically have been involved in the South African economy for over a century.

The study made use of existing survey data on German firms in South Africa, a new structured questionnaire that was mailed to over 600 German firms in South Africa, as well as case studies of about 15 firms. The survey data and list of firms was obtained from the Southern African-German Chamber of Commerce and Industry. About 55 firms responded to the structured questionnaire (10%), of which 31 questionnaires (about 5%) were satisfactorily completed. One

possible reason for the relative low rate of completion is due to the length and detail required by the questionnaire. This survey was the first that required rather detailed responses from the firms on a wide range of issues from labour turnover and R&D to competitive intelligence practices and networking.

Since 1994 the Southern African-German Chamber of Commerce and Industry conducted brief annual surveys of the perceptions and opinions of German firms in South Africa. From the analysis of the findings of this qualitative survey of the Southern African-German Chamber of Commerce and Industry it was concluded in this paper that German MNEs have an important role in South Africa in terms of significant employment that is directly generated. However, it seems that these firms are experiencing severe constraints as is reflected in the high rate (almost a third) of firms considering to leave South Africa or disinvest, the negative view of the adequacy of labour and concerns over educational standards, and worries about crime, violence, corruption and the incompetence of civil servants.

The position of many German MNEs in South Africa may thus be tenuous and may be obscured by the expansion of a few very large German MNEs. Not many companies engage in exporting and it seems the reason for German MNE presence in South Africa is to serve the domestic market. In the latter regard their constraints seem to reside in the labour market and uncertain macro-economic environment. As such German MNEs have not been creating significant new job opportunities, despite increasing investments in R&D activities advancements in technology. A lack of skills and concern about educational standard were expressed by firms and most prefer to train their workers in Germany.

As a result of these constraints, coupled with increased competition pressures, German MNEs have been investing more in R&D, marketing and training. The primary manner in which these knowledge creation activities spill over into the local market was found to be through labour retention policies (training, higher salaries and better employment conditions) and through outsourcing. The constraints identified may be a reason why more direct technology transfers as a way of knowledge sharing is currently almost non-existent in the behaviour of German firms in South Africa. Raising the assimilative capacity of South African human capital and creating an environment for technological learning seems to be the policy recommendations from this study.

## REFERENCES

- Aharoni, Yair (1971), On the Definition of a Multinational Corporation, *Quarterly Review of Economics and Business*, 11 Jg., Bd. 3, pp. 27-37.
- Alchian, A.A., Demsetz, H. (1972), Production, Information Costs, and Economic Organization, *American Economic Review*, Vol. 62, No. 5, December, pp.777-795.
- Arrow, K.J. (1962), The Economic Implications of Learning by Doing, *Review of Economic Studies*, 29 (June), pp. 155-173.
- Arrow, K.J. (1975), Vertical Integration and Communication, *Bell Journal of Economics (Symposium on the Economics of Internal Organization)*, VI(1), pp. 173-184.
- Behrman, Jack N. (1962), Foreign Associates and Their Financing, in: Mikesell, Raymond F. (Ed.), *U.S. Private and Government Investment Abroad*, Eugene, Oregon, pp. 77-113.
- Berger, Bettina (1999), How Important is Foreign Direct Investment for Late Industrialising Countries?, *Intereconomics*, May/June, pp. 115-123.
- Blank, Michael (1996), *Wirtschaftliche Verflechtungen deutscher mittelständischer Unternehmen mit der Republik Südafrika*, Europäische Hochschulschriften: Reihe 5, Volks- und Betriebswirtschaft; Bd. 2014, Peter Lang, New York.

- Boorman, S.A. (1975), A Combinatorial Optimization Model for Transmission of Job Information through Contract Networks, *Bell Journal of Economics* (Symposium on the Economics of Internal Organization), VI(1), pp. 216-250.
- Burger, Bettina (1999), How Important is Foreign Direct Investment for Late Industrialising Countries?, *Intereconomics*, May, June, pp. 115-123.
- Burstall, M.L., Dunning, J.H. (1985), International Investment in Innovation, in: Wells, N.E.J. (Ed.), *Pharmaceuticals Among the Sunrise Industries*, Croom Helm, London.
- Cantwell, John A. (1988), The Contribution of recent Foreign Direct Investment in Services to a Changing International Division of Labour, University of Reading Department of Economics, Discussion Papers in International Investment and Business Studies, Series B, Vol. I (1988/1989), No. 117.
- Cantwell, John A. (1991), A Survey of Theories of International Production, in: Pitelis, C.R., Sugden, R. (Eds.), *The Nature of the Transnational Firm*, Routledge, London, pp. 16-63.
- Cantwell, John A. (1996), Transnational Corporations and Innovatory Activities, in: UNCTAD (Ed.), *Transnational Corporations and World Development*, London, Bonn.
- Casson, Mark C. (1985), Transactions Costs and the Theory of the Multinational Enterprise, in: Buckley, Peter J. and Casson, Mark C., *The Economic Theory of the Multinational Enterprise*, Macmillan, London, pp. 20-38.
- Casson, Mark C. (2000b), *Economics of International Business: A New Research Agenda*, Edward Elgar, Cheltenham, UK, Northampton, MA, USA.
- Caves, Richard E. (1996), *Multinational Enterprise and Economic Analysis*, Second Edition, Cambridge Surveys of Economic Literature, Cambridge University Press, New York.
- Coase, R.H. (1937), The Nature of the Firm, *Economica* 4, November, pp. 386-405.
- Cohen, W.M., Levinthal, D.A. (1989), Innovation and Learning: The Two faces of R& D, *The Economic Journal*, September, Vol. 99, pp. 569-596.
- Dunning, John H. (1958), *American Investment in British Manufacturing Industry*, Allen & Unwin, London.
- Dunning, John H. (1974), *Economic Analysis and the Multinational Enterprise*, Allen and Unwin, London.
- Dunning, John H. (1993/96), *Multinational Enterprises and the Global Economy*, Addison Wesley, New York.
- Dunning, John H. (Ed.) (1992), *The Theory of Transnational Corporations*, United Nations Library on Transnational Corporations, Routledge, London.
- Dunning, John H. (Ed.) (2000), *Regions, Globalization and the Knowledge Based Economy*, Oxford University Press, Oxford.
- Dunning, John H., Rugman, A. M. (1985), The Influence of Hymer's Dissertation on the Theory of Foreign Direct Investment, *American Economic Review* (Papers and Proceedings), Vol. 75, pp. 228-232.
- Ethier, W.J. (1986), The Multinational Firm, *Quarterly Journal of Economics*, Vol. 101, pp. 806-833.
- Fatemi, Khosrow (Ed.) (2000), *The New World Order: Regionalism and the Multinational Corporations*, Pergamon, New York.
- Ghosal, S. and Westney, D.E. (Eds.), (1993), *Organization Theory and the Multinational Corporation*, St. Martin's Press, New York.
- Gilroy, B. Michael, Broll, Udo (1987): „German Multinationals“, *Multinational Business Quarterly*, No. 1, pp. 1-11, and available as: *Internationalisierung der Wirtschaft, Sonderforschungsbericht 178, Serie 11, Nr. 19, Fakultät für Wirtschaftswissenschaften und Statistik, Konstanz: Universität Konstanz.*

- Gilroy, Bernard Michael (1989b), *Economic Issues of Multinational Enterprise*, (Konstanzer Schriften Zur Aussenwirtschaft, Bd. 3), Hartung-Gorre Verlag, Konstanz.
- Gilroy, Bernard Michael (1993), *Networking in Multinational Enterprises: The Importance of Strategic Alliances*, South Carolina University Press, Columbia.
- Grossman, Gene M., Helpman, E. (1991), *Innovation and Growth in the Global Economy*, The MIT Press, Cambridge, Massachusetts.
- Gütschleg, Dirk (1999): *Deutsche Unternehmen im neuen Südafrika*, Berlin: Deutscher Industrie- und Handelstag.
- Helpman, E. (1984), A Simple Theory of International Trade with Multinational Corporations, *Journal of Political Economy*, Bd. 92(3), pp. 451-471.
- Helpman, E., Krugman, P.R. (1985), *Market Structure and Foreign trade: Increasing returns, Imperfect Competition, and the International Economy*, The MIT Press, Cambridge, Massachusetts.
- Hymer, S.H. (1960), *The International Operation of Firms: A Study of Foreign Direct Investment*. MIT Press, Cambridge, Mass., 1976.
- Jensen, M.C., Meckling, W. (1976), Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure, *Journal of Financial Economics*, 3, pp. 304-360.
- Johnston, Russell, Lawrence, Paul R. (1988), Beyond Vertical Integration – The Rise of the Value-Adding Partnership, *Harvard Business Review*, July-August, pp. 94-105.
- Kappel, Robert (2000): Schatten der Zukunft, in: Freitag, [On-line], URL: <http://www.freitag.de/2000/37/00370701.htm> from 08.09.2000.
- Kemp, M. C. (1964), *The Pure Theory of International Trade*, Prentice Hall, Englewood Cliffs.
- Kindleberger, C. P. (1969), *American Business Abroad: Six Lectures on Direct Investment*, Yale University Press, New Haven.
- Lucas, Robert E. (1988), On the Mechanics of Economic Development, *Journal of Monetary Economics*, 22(3), pp. 3-42.
- MacDougall, Donald (1960), The Benefits and Costs of private Investment from Abroad: A Theoretical Approach, *The Economic Record*, 36, March, pp. 13-35.
- Macharazina, K. (1981), Entwicklungsperspektiven einer Theorie internationaler Unternehmenstätigkeit. Modell- und Verfahrensvorschläge., in: Wacker, W.H., v.H. Hausmann, B. Kumar (Eds.), *Internationale Unternehmensführung*, Berlin, pp. 33-56.
- Markusen, J.R. (1984), Multinationals, Multi-plant Economies, and the Gains from Trade, *Journal of International Economics*, Vol. 16, pp. 205-226.
- Markusen, J.R., Venables, A.J. (1999), Foreign Direct Investment as a Catalyst for Industrial Development, *European Economic Review*, Vol. 43, No. 2, February, pp. 335-356.
- McMannus, J. (1972), *The Theory of the International Firm*, in: Paquet, G. (Ed.), *The Multinational Firm and the Nation State*, Collier-Macmillan, Ontario, Canada.
- Milde, Helmut (1987), Managerial Contracting with Public and Private Information, in: Bamberg, G., Spremann, K. (Eds.), *Agency Theory, Information and Incentives*, Springer Verlag, Berlin.
- Mueller, Robert K. (1986), *Corporate Networking: Building Channels for Information and Influence*, The Free Press, New York.

- Mundorf, Dirk (1993): Bedeutung von Investitionen deutscher Industrieunternehmen für die Wirtschaft Südafrikas, Europäische Hochschulschriften, Vol. 1361, Frankfurt am Main: Peter-Lang Verlag.
- Mytelka , Lynn Krieger (1987), Knowledge-Intensive Production and the Changing Internalization Strategies of Multinational Enterprises, in: Caporaso, James A.(Ed.), A Changing International Division of Labor, Lynne Rienner Publishers, Boulder Colorado, pp. 43-71.
- Nonaka, I., Takeuchi, H. (1995), The Knowledge Creating Company, Oxford University Press, New York, NY.
- Pabst, Günter (2000), Sixth Survey of German Enterprises in South Africa: Views, Opinions, Judgements, Intentions and Considerations with Regard to Policy and Economy, Southern African – German Chamber of Commerce and Industry, Johannesburg, July, <http://www.germanchamber.co.za> .
- Penrose, Edith (1956), Foreign Investment and the Growth of the Firm, Economic Journal, Vol. 66, June, pp. 220-235.
- Penrose, Edith (1959), The Theory of the Growth of the Firm, Blackwell, Oxford.
- Penrose, Edith (1996), Multinational Corporations, in: Eatwell, John, Milgate, Murray, Newman, Peter (Eds.), The New Palgrave : A Dictionary of Economics, Volume 3, Macmillan Press Limited, London, pp. 562- 565.
- Pohlentz, Friederike Louise (2000), Educational Attainment as a Proxy for Human Capital in Models of Growth and Development: A Critical Survey, University of St. Gall Dissertation No. 2427, Difo-Druck OHG, Bamberg.
- Radner, R. (1975), A Behavioral Model of Cost reduction, Bell Journal of economics (Symposium on the economics of Internal Organization), VI(1), pp. 196-216.
- Reve, Torger (1990), The Firm as a Nexus of Internal and External Contracts, in: Aoki, Masahiko, Gustafsson, Williamson, O.E. (Eds.), The Firm as a Nexus of Treaties, Sage publishers, London, pp. 133-161.
- Romer, P. (1986), Increasing Returns and Long-Run Growth, Journal of Political Economy, 94(5), pp. 1001-1037.
- Romer, P. (1989), What Determines the Rate of Growth and Technological Change, World Bank Working Papers, WPS 279, World Bank.
- Romer, P. (1990), Endogenous Technical Change, Journal of Political Economy, 98(5), pp. 71-102.
- Romer, P. (1993), Idea Gaps and Object Gaps in Economic Development, Journal of Monetary Economics, 32(3), pp. 543-573.
- Santangelo, Grazia D. (2000), Inter-European regional Dispersion of Corporate research Activity in Information and Communications Technology: The Case of German, Italian and UK Regions, International Journal of the Economics of Business, Vol. 7, No. 3, pp. 275-295.
- Schanze, Erich (1986), The Constitution of the Firm, in: Daintith, Terence, Teubner, Gunther (Eds.), Contract and organization: Legal Analysis in the Light of Economic and Social Theory, Walter de Gruyter Verlag, Berlin, pp. 204-218.
- Stopford, J. and Dunning, J.H. (Eds.), (1982/1992), *The World Directory of Multinational Enterprises* , Macmillan, London.
- Teal, F. (1999). "Why can Mauritius Export Manufactures and Ghana not?" Working Paper 99/10, Centre for the Study of African Economies, University of Oxford.
- Tece, D. J. (1980), Economies of Scope and the Scope of the Enterprise, Journal of Economic Behavior and Organization, Vol. 1, pp. 223-247.

Teece, D. J. (1998), Capturing Value from Knowledge Assets: The New Economy, Markets for Know-How, and Intangible Assets, *California Management Review*, Vol. 40, Nr. 3, Spring, pp. 55-78.

Thierstein, Alain, Langenegger, Thomas (1994), Der Prozess der Internationalisierung: Handlungsspielraum für Regionen?, *Aussenwirtschaft*, Bd. IV, pp. 497-525.

UNCTAD (2000), *World Investment Report, 2000*, United Nations, New York.

Von Hippel, E. (1989), Cooperation Between Rivals: Informal Knowhow-Trading, in: Carlsson, Bo (Ed.), *Industrial Dynamics: Technological, Organisational and Structural Changes in Industries and Firms*, Kluwer Academica Publishers, Boston, pp. 157-175.

Williamson, Oliver E., Wachter, M.L., Harris, J.E. (1975), Understanding the Employment Relation: The Analysis of Idiosyncratic Exchange, *Bell Journal of Economics (Symposium on the Economics of Internal Organisation)*, VI(1), pp. 250-260.