

decaying buildings on land with fast growing value do not ensure redevelopment, this certainly makes up one of the necessary market conditions. Another condition is the public involvement. The public sector is especially interesting as it is able to invest the huge capital needed for physical and social infrastructure development and to manipulate the market forces.

Theories concerned with explaining the 'socio-spatial' changes must include the interface of the market directed, commercial sector and the non-market based public sector. More than anything the London Docklands emphasizes the need to implement the public sector in urban redevelopment – and the political dimension in an understanding.

Note

1. Especially Harvey 1973, 1978 and 1982.

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South-South trade in manufactured goods – with a case study of India's export of capital goods to Tanzania

Steen Folke, Thyge Enevoldsen, Helle Fischer, Niels Fold

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South-South trade in manufactured goods expanded rapidly through the 1970s, but stagnated in the early 1980s. The leading exporters in South-South trade are the newly industrialising countries that account for about half of South-South exports of manufactured goods and an even greater share of the export of capital goods. A case study of India's export of capital goods to Tanzania reveals that financial and transportation problems act as barriers to South-South trade. In a development perspective, however, the crucial question is whether South-South trade will result in a successful transfer of technology.

Keywords: South-South trade, Capital goods, Technology transfer, Development strategy, India, Tanzania.

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Over the last fifteen years an extensive literature has been published on the tendency towards a new international division of labour, which first of all has appeared in the development of the newly industrialising countries, the NICs. Traditionally the less developed countries (LDCs) have exported food stuffs and raw materials to the developed countries (DCs), which in return have exported manufactured goods to the LDCs. This geographical division of labour between the South and the North was established in the colonial epoch, but it continues today. However, the NICs have developed in the last twenty years a substantial export of manufactured goods – textiles, clothing, electronics – primarily to the DCs. The development of manufacturing industry in certain LDCs has to a large extent been carried out by transnational corporations of the DCs and the most important moment of attraction has been low-cost labour. This new tendency in the North-South division of labour has been extensively researched, e.g. by Fröbel et al. (1977) and Ernst (ed., 1980).

This article deals with a dimension in the tendency towards a new international division of labour that so far has not been given much attention, namely the South-

South dimension, or in other words the division of labour between the LDCs.

It must be conceded that this dimension neither in quantitative nor in qualitative terms – seen in relation to the established development strategies – carries much weight as compared to the crucial North-South dimension. A strengthening of South-South cooperation, however, is an important goal in the efforts of the LDCs to accomplish a New International Economic Order. To escape the dependency which follows from a one-sided export – both with respect to products and trade partners – most LDCs aim at diversification. A strengthening of trade with other LDCs is one of the means as well as a goal in itself.

Among the newer tendencies in the division of labour between the LDCs is a growing emphasis on trade in manufactured goods. The development of South-South trade has wider implications for the international division of labour, because the trade comprises machines and means of transportation in growing quantities, products which have hitherto been monopolized by the DCs.

A certain division of labour between a number of LDCs in some cases can be traced back to the 1950s or even before. Especially in Latin America regional integration schemes have a long history, but the fundamental integration of each of the Latin American countries in the North-South division of labour has not been challenged. Some of the more recent tendencies can be seen as a continuation of this, but at a higher level so to speak.

There are, however, a number of development tendencies which do not have the same historical roots. The oil-producing LDCs have established a division of labour with other LDCs, which in all cases has resulted in growing trade and which in some cases has meant exchange of oil for manufactured goods. Moreover, some of the biggest and most industrialised LDCs, e.g. Brazil and India, have established a transcontinental export of manufactured goods to a number of African LDCs. Furthermore, the Asian NICs and the ASEAN-countries have developed a certain regional division of labour, in which trade in manufactured goods plays a growing role. Over the last fifteen years regional cooperation has also gained prominence in several parts of Africa.

These examples of tendencies towards a new division of labour between the LDCs are not results of any uniform or common development strategy. In common they have certain goals: industrialisation, diversification of exports, reduction of dependence. But apart from this the development strategies are varied because of differences in resource base, historical conditions, and economic-political systems.

POLITICAL AND THEORETICAL BACKGROUND

Within the UN-system both UNCTAD, UNIDO, and

UNDP have actively promoted South-South trade and cooperation for a number of years. UNDP on a regular basis publishes a magazine entitled "Cooperation South". UNIDO devoted most of its "Industry and Development Global Report 1985" to a quantitative study of the potentials in South-South cooperation. UNCTAD has dealt with South-South trade in numerous ways in conferences, documents and reports. At present the main effort of UNCTAD aims at establishing a Global System of Trade Preferences (GSTP) for South-South trade. A recent overview of the problems and prospects of South-South trade can be found in UNCTAD (1986). A number of articles dealing with various aspects of South-South cooperation are found in two books, edited by Gauhar (1983) and Pavlic et al. (1983).

From the research-based literature on South-South trade we shall mention only a few examples, outlining the main views. In an article Stewart (1976) gives three main arguments in favour of South-South trade: reducing dependency on the North, insulating against fluctuations in the North and strengthening the bargaining power of the South. Among the barriers to South-South trade she mentions the absence of South-South transport and communications, restrictions by the multinational corporations on technology (re-)export, and foreign aid tied to purchase in the North.

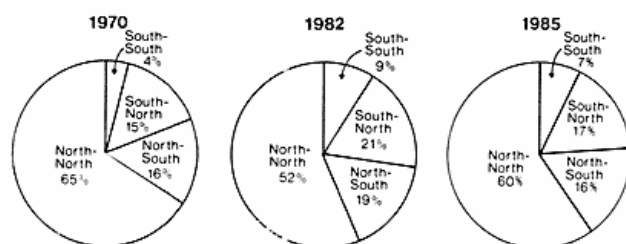
Ventura-Dias (1985) summarizes the possible dynamic gains from South-South trade: learning-by-doing, generation of domestic technological capabilities, transfer of appropriate technology and – very important – the development of a more integrated industrial structure.

Vaitsos (1982) demonstrates that the main beneficiaries of the integration efforts in Latin America have been transnational corporations from the North (first of all the United States). He is highly critical of conventional integration theory.

These authors have in common that they view South-South trade in manufactured goods as something that may – under certain conditions – contribute to genuine development in the Third World.

A prominent example of research reaching the opposite conclusion is Havrylyshyn & Wolf (1981). Among their conclusions is a recommendation of a general liberalisation of the foreign trade of the LDCs. A special effort to develop South-South trade is not seen as meaningful. Instead, it is recommended that the NICs continue to export to DCs, whereas it is recommended for the remaining LDCs to increase their export of food and raw materials to the NICs (in continuation of an already existing trend). An increased South-South trade in capital goods is not seen as having any particular development potential.

These conclusions are in perfect harmony with the principle of comparative advantage – and with the general views of the World Bank (who sponsored the research) –



but entirely isolated from any discussion of the needs of a dynamic development process in the LDCs. In that context it is characteristic that the LDCs' dependence on the DCs is not regarded as a problem. Furthermore, the entire analysis is carried through without even mentioning the transnational corporations which are responsible for a great portion of the trade.

In contrast to the World Bank analysis our study is based on some of the goals specified by the LDCs. An eminent spokesman, former Tanzanian president Nyerere, has outlined some of the perspectives in South-South cooperation, aiming at what he terms "collective self-reliance" (Nyerere, 1982). However, he has also warned that there is a risk of repeating the dependency imbalances, known from the North-South relationship, if in a South-South framework the stronger seek to exploit the weaker ones.

SOUTH-SOUTH TRADE

South-South trade grew from 4 % of world export in 1970 to 9 % in 1982 (fig. 1). Most of the expansion was in fuels, following the growth in the unit price of oil in 1973 and 1979. South-South trade in fuels expanded from 3.8 bill.US\$ in 1970 to 75 bill.\$ in 1980 and to 143 bill.\$ in 1984. As a result the relative share of fuel products in South-South exports went up from 35 % in 1970 to 54 % in 1980. If fuel is omitted the expansion was primarily due to increased South-South trade in manufactures, mainly in machinery and transport equipment (Standard International Trade Classification, SITC 7). The relative share of SITC 7 in South-South exports increased from 9 % in 1970 to 22 % in 1985. The share of manufactures (total) was only 29 % in 1960, 46 % in 1970 and 64 % in 1985 (table 1).

The international crisis in the early 1980s has hit South-South trade as it has hit world trade in general. In absolute figures the value of South-South trade decreased in 1982 and 1983. In relative terms the share of South-South trade in world exports declined to 7 % in 1985 because of the reduced value of oil trade (fig. 1). During the crisis the South has found it increasingly difficult to finance imports, regardless of the origin of the products. Increased debt service, which in 1970 amounted to 15 % of the value of the total export from the South, and to 24 % in 1982, puts stress on the reserves of foreign exchange; so does the reduced export earnings and the high oil-prices in the early 1980s. The ratio of debt service to export earnings

differs considerably between regions. In Asia it was less than 10 % in all the years between 1973 and 1983, while in Latin America borrowers were paying as much as 54 % of their exports in debt service in 1982.

To this could be added a lot of problems specific to South-South trade, such as non-convertibility of the currencies, insurance problems etc. Attempt to reduce these problems, for example by establishing clearing houses and barter deals have till now been far from successful.

Despite this South-South trade has been continuously expanding during the years of crisis for some products such as iron and steel, transport equipment and textiles.

South-South trade in manufactured goods

We have carried out a study of the South-South trade in manufactured goods since the 1960s. In this article we can present only a fraction of the results of our research. Readers who want to know more are referred to the research report (cfr. the note at the end of the article).

One part of our study is a comprehensive quantitative analysis of the South-directed export of manufactured goods of more than 80 LDCs. The analysis covers the years 1962, 1967, and 1972-1980s (according to the availability of data; the most recent data for some countries are from 1979, for others from 1986, and anything in between). The data have been acquired from the UN data base COMTRADE.

One of the results of the analysis has been a grouping of the countries according to their "performance" as South-South exporters of manufactured goods. They have been divided into four groups:

- I. South-South exporters of capital goods and other advanced goods.
- II. South-South exporters of a diversified range of manufactured goods.
- III. South-South exporters of a few, mostly simple manufactured goods.
- IV. Countries with an insignificant South-South export of manufactured goods (in relative terms).

	1960	1970	1980	1985
Food	44.2	32.8	24.6	24.8
Raw materials	27.4	21.0	15.6	11.5
Manufactures (SITC 5-8)	28.5	46.2	59.6	63.7
Of which:				
Machinery and transport eq.	3.7	9.0	19.9	21.9
Total (- SITC 3 and 9)	100	100	100	100

Table 1. South-South trade by commodity group (apart from fuels (SITC 3) and miscellaneous (SITC 9)). South in this context excludes socialist countries in Asia. Due to rounding the percentages may not always add up. (Source: UNCTAD, 1981; UNCTAD, 1987)

Because of the limited space here, we shall concentrate on the first of these groups, which is the most interesting in our context. But first a few words about the other groups. Most of the Latin American countries are found in Group II together with a small number of relatively developed African and Asian countries, whereas Group IV includes most of the oil exporting LDCs as well as some countries exporting traditional products (foodstuffs, raw materials).

Group I comprises the most developed South-South exporters of manufactured products, and taken together they play a dominating role in South-South trade in manufactures. The group has been defined on the basis of three criteria. First, all the countries in this group export a diversified range of manufactured goods to the South. Secondly, capital goods and other advanced goods (SITC 7) play a significant role in the South-directed export of these countries. Thirdly, their export of manufactures to the South has been at least 5 % of their total export.

Thus defined the group comprises the following seven countries: Argentina, Brazil, Mexico, India, Singapore, Hong Kong and South Korea. In other words it is more or less the NICs which turn out to be also the leading South-South exporters of manufactures. As is well known some of them have been very dynamic exporters of manufactured products to the North, but South-directed exports of manufactures are important in all of them (least so in Mexico). Taiwan is not included in this study, since (for political reasons) no data concerning Taiwan are available in the UN data base. Had the data been available, there is little doubt that Taiwan would have ended up in this group.

The dominating position of this group in *South-South trade in manufactures* can readily be seen in table 2.

During the entire period 1967-83 these seven countries have had about 50 % or more of the South-directed exports of manufactured goods (in the broad sense) of all the countries included in the study. Considering the coverage of the study it is safe to say that the seven contribute about half of all South-South exports of manufactures.

A more detailed examination of the figures in table 2 has to be carried out with some caution, mainly because the number of countries reporting is so different in the different years, varying from 80 in 1975 to 33 in 1983. It can be seen that in 1980 Mexico and in 1983 both Mexico and India are among the non-reporting countries. Obviously, this as well as the changing presence/absence of other, less important countries influences the figures.

Looking at the countries individually it is noteworthy that Singapore ranks first all the time. Brazil and, even more so, South Korea are the upcoming stars, exhibiting a very dynamic growth both in absolute and relative terms (Brazil only until 1980).

Turning to *South-South export of capital goods* and other advanced goods – SITC 7 – the dominance of Group I is even more pronounced, as can be seen from table 3. The seven countries together cover 75-80 % of the total South-South exports of SITC 7, machinery and transport equipment (the 1983-figure of 90 % of course is exaggerated because of the small number of reporting countries). Again Singapore ranks first most of the time, followed by Brazil and (in 1983) South Korea. During the entire period South Korea has been extremely dynamic, whereas Brazil and Argentina have been severely hit by the crisis in the early 1980s. This is also reflected in the 1983-figures for manufactures (table 2), but the SITC 7-export has been hit much harder than the rest.

Of course, there is nothing sensational in all this. It is

	1967			1975			1980			1983		
	Mill.\$	%	Rank	Mill.\$	%	Rank	Mill.\$	%	Rank	Mill.\$	%	Rank
Argentina	103	4	9	618	4	10	1451	3	8	1093	3	5
Brazil	125	5	8	1820	11	2	5546	12	2	4769	15	3
Mexico	72	3	11	405	2	13	?			?		
India	238	9	2	1285	8	3	1440	3	9	?		
Singapore	512	20	1	2269	14	1	8759	20	1	10070	31	1
Hong Kong	219	9	3	762	5	8	2539	6	5	1921	6	4
South Korea	43	2	15	920	6	4	5250	12	3	6818	21	2
<hr/>												
Group I, total	1312	52		8079	48		24985	56		24671	77	
(No. of countries)	7			7			6			5		
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LDCs, incl. Group I	2540	100		16678	100		44803	100		31970	100	
(No. of countries)	56			80			63			33		

Table 2. Group I countries' export to the South of manufactures (broad definition). Manufactures are defined here after SITC, Rev. 1, as: 013, 032, 048, 053, 06, 0713, 0722, 0733, 073, 0741,

09, 110, 122, 2312, 2313, 2314, 243, 251, 266, 332, 35, 4, 5, 6 (-667), 7, 8. Due to rounding the percentages may not always add up. (Source: UN data base COMTRADE)

	1967			1975			1980			1983		
	Mill.\$	%	Rank	Mill.\$	%	Rank	Mill.\$	%	Rank	Mill.\$	%	Rank
Argentina	20	9	3	347	12	3	409	4	8	144	2	7
Brazil	28	12	2	588	21	1	2240	24	2	1531	19	3
Mexico	12	5	6	121	4	7	?			?		
India	16	7	5	243	9	4	461	5	6	?		
Singapore	86	37	1	553	20	2	2369	25	1	2743	34	1
Hong Kong	20	9	4	121	4	8	511	5	5	378	5	4
South Korea	5	2	8	173	6	6	1164	12	3	2547	31	2
Group I, total	187	80		2146	76		7154	76		7343	90	
(No. of countries)	7			7			6			5		
LDCs, incl. Group I	233	100		2809	100		9447	100		8140	100	
(No. of countries)	56			80			63			33		

Table 3. Group I countries' export to the South of machinery and transport equipment (SITC 7). Due to rounding the percentages may not always add up. (Source: UN data base COMTRADE)

well-known from many studies that the countries in Group I (plus Taiwan) are leading among the LDCs in the production of capital goods and other advanced goods. The capital goods sector – and indeed the entire "sector" behind SITC 7 – is bigger and more complex than in other LDCs. What is brought out here is the fact that this pattern is also reflected in the structure of exports to the South.

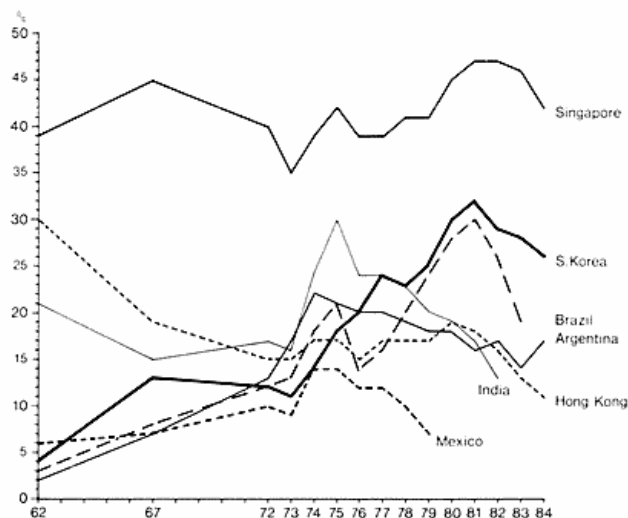
Fig. 2 shows the South-directed export of manufactured goods 1962, 1967, and 1972-84 as per cent of total exports for the countries in Group I. During the entire period Singapore has been in a class of its own in so far as exports of manufactures to the South have constituted around 40 % of the total exports. This reflects the special role of Singapore as entrepôt for the entire South-East Asian region. India with its century-old textile industry was an early trader in manufactures (particularly textiles), but the South-directed export of manufactured goods has remained relatively stable around 20 % of total exports in the period 1962-80 (except the peak year, 1975: 30 %). Also Hong Kong was an early industrialiser among LDCs, and this is reflected in the figures. Initially South-directed exports of manufactured goods were relatively important, covering 30 % of the total in 1962, but soon the overwhelming dominance of the Northern markets was established and the share of the South-directed exports of manufactures fell to around 15 % and has remained there since the early 1970s.

The three Latin American countries and South Korea all started their export of manufactures to the South in the 1960s. Brazil and South Korea have been particularly dynamic in this respect with South-directed export of manufactures growing from almost nothing in 1962 to around 30 % of total exports in 1980-81. In Argentina the

development was similar from 1962 until the mid-1970s where the South-directed export of manufactures constituted more than 20 % of the total exports, but since then it has been decreasing in relative terms. In Mexico the South-directed export of manufactures has never been very important; it reached a maximum of 14 % of total exports in the mid-1970s and has been falling since. This both reflects the predominant North-direction of Mexico's manufactured exports (particularly to the United States) and the growing importance of oil exports.

From fig. 2 it can be seen that the period 1974/75 – 1980/81 is the period in which the South-directed export of manufactured goods is of greatest importance in all the Group I-countries. For all the reporting countries (i.e. all except Mexico) the relative importance decreases after 1980-81, and this is particularly marked in the case of Brazil. The crisis after the second oil price shock in 1979 has hit South-South trade hard, especially in Latin America.

It is a common feature of almost all LDCs that their South-directed export of manufactured goods is predominantly directed to other countries on the same continent. This is also true of the countries in Group I, but relatively speaking, with the exceptions of Mexico and Singapore, they are more intercontinental than most other LDCs. For the years 1975-81 this is particularly pronounced in the cases of Brazil and Hong Kong, who sent 30-40 % of their South-directed exports of manufactures (in the broad sense) to other continents (than Latin America and Asia, respectively). Since 1981 this intercontinental share has been falling considerably in Hong Kong, whereas it has been growing further – to almost 60 %! – in Brazil in 1983. The remarkable figure for Brazil, however, is the combined result of a concerted overseas "drive" and a



serious set-back on the Latin American continent.

The countries in Group I are South-South exporters of manufactured goods in the sense that manufactures make up most of their South-directed export. Only Argentina has a relatively important South-directed export of non-manufactured products, but even in this case manufactures contribute 50-60 % of the South-directed exports. In the other six countries manufactured goods (in the broad sense) make up more than 70 % of the exports to the South (in Hong Kong and South Korea more than 90 %).

The Group I countries, however, are not South-South exporters of manufactured goods in the sense that their South-directed exports are larger than those directed to the North. Only in the case of Singapore has the South-directed share of manufactured exports (in the broad sense) been slightly above 50 % (average 1975-81). In Argentina it has been slightly below 50 %, in Brazil and India around 40 %, in Mexico and South Korea just above 25 % and in Hong Kong below 20 %.

So although South-directed exports of manufactures are important in the Group I-countries, none of them is a specialized South-South exporter in the same way as a number of countries in Group II and III, whose export of manufactured products is almost exclusively directed to the South. More than any other LDCs the countries in Group I have developed a capability to export manufactured products to the North, often competing with products from DCs.

In Mexico, India, Hong Kong and South Korea the export is dominated by manufactures in the narrow sense (i.e. SITC 5-8). They also constitute more than half in Brazil, Argentina and Singapore, but processed agricultural products play a significant role in Argentina and Brazil, and petroleum products are very important in Singapore. Chemical products (SITC 5) are relatively unimportant in all the Group I countries except Mexico.

SITC 6 (mostly intermediate products) is important in all the countries, except Singapore, very much so in South Korea. Capital goods and other advanced goods (SITC 7) by definition play a relatively very important role in all the countries. Finally, SITC 8 (largely finished products) is important in all the countries, except Brazil, and very much so in Hong Kong.

In the cases of Mexico, Hong Kong and South Korea the product groups which are important in the South-directed export are also (and usually even more so) important in the North-directed export. So, measured in this way, there is no special South-South strategy in the export. Conversely, in the cases of Argentina, Brazil, India and Singapore the manufactured exports exhibit a dual structure. Some product groups are exported primarily to the North, others primarily to the South. So in this sense there is a South-South strategy for part of the manufactured exports from these four countries. But this was more conspicuous around 1979 than in the most recent years, because of the special problems and set-backs in the Southern markets, following the recession after the second oil price shock.

Turning to the differentia specifica of Group I, the export of machinery and transport equipment (SITC 7), this has been relatively much more important in the South-directed export of Argentina, Brazil, Mexico and India than in their total export. In Singapore, Hong Kong and South Korea, on the other hand, it has carried almost the same weight in the exports to the South as in the total exports. In 1979 the South-share of the export of SITC 7 was three-fourths in Argentina and India, two-thirds in Brazil, one half in Singapore, one third in South Korea and one fifth in Mexico and Hong Kong. So among the Group I countries Argentina, Brazil and India are the most interesting as South-South exporters of capital goods and other advanced goods, at least measured in this crude and purely quantitative way. It is on this background – among other things – that India has been singled out for a case study of its export of capital goods to Tanzania.

India's export of capital goods to Tanzania

An increased trade in capital goods and technology (in the wider sense, embodied or disembodied) is an integral part of any South-South, or "collective self-reliance" development strategy.

Among the Group I-countries India and Brazil have the most developed and complex capital goods sector. Although Brazil's export of capital goods has been much more dynamic than that of India, the latter's export of capital goods has another distinguishing feature: much of it is in the form of project exports, based on the relative abundance of managerial ability, engineering capacity and skilled manpower. Hence India's export of capital goods is a prime example of the technologically most

advanced South-South trade flows.

On the importing side, Tanzania has been selected for a number of reasons. Viewed from Tanzania, India has been one of the most important Third World suppliers of capital goods. Viewed from India, Tanzania has been among the major markets for capital goods.

In terms of level of development Tanzania belongs to the least developed countries. Its industrial sector is comparatively small and weak, and in many respects it has the same problems as so many other poor African countries.

The transfer of technology – here in the form of Indian exports of capital goods – presents special problems in such countries which lack a comparable, indigenous technological capability.

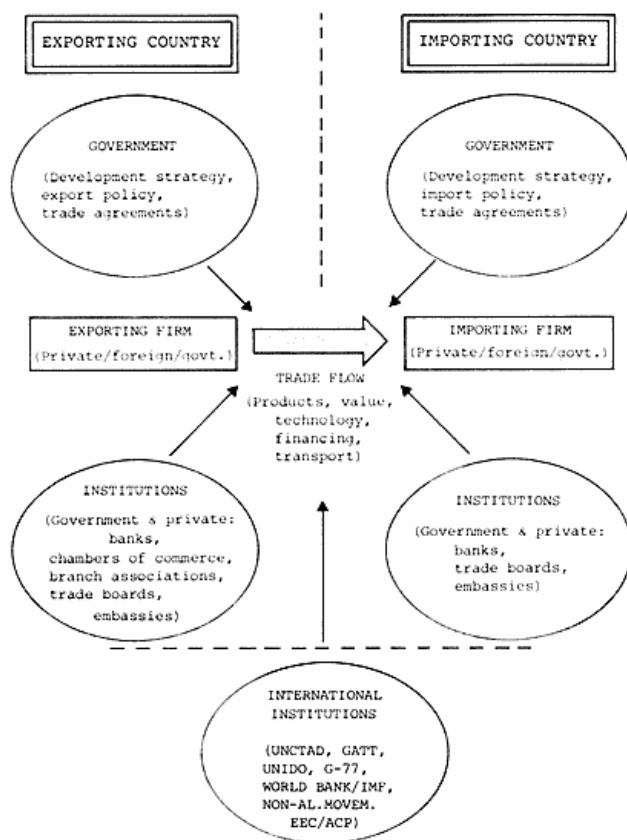
Furthermore, both India and Tanzania have for a number of years been ardent advocates of South-South trade and cooperation. This has also materialized in their own trade, part of which is based on Government-to-Government agreements and financed by Indian soft loans. Hence India's export of capital goods to Tanzania is a mixture of politically backed trade and trade on purely commercial terms.

A model of the analytic approach followed in this case study is shown in fig. 3. The basic idea is to study the trade flow in its development context in both the exporting and importing country. This entails analysis at three different levels in both countries, namely at the level of the firms, directly involved in the trade, at the level of institutions (public and private), dealing with the trade, and at the level of Government, responsible for trade and development strategy and policy. So far as we know this is the first time that a study using such an approach is carried out.

India's export of capital goods to Tanzania increased rapidly through the 1970s and reached a peak value of 22.6 mill.\$ in 1979 and then dropped again to a level around 8 mill.\$ per year in 1981 and 1982. In the following years it almost came to a standstill because of Tanzania's economic crisis and default. The total value of India's export of capital goods to Tanzania in the years 1972-1982 was 86.4 mill.\$ (in the case of project exports these figures only cover the hardware component). In the context of world trade, obviously, this amount is minute, but as example of a South-South trade flow it is significant enough.

By far the most important product group was food processing machinery, accounting for almost one third of the total. Indeed, relatively speaking, in the years 1977-1980 the export of food processing machinery to Tanzania constituted between 22 % and 60 % of India's total export of this product group to the South. Actually, this is largely explained by one big case of project exports, namely the setting-up of a complete turn-key sugar plant.

Our study is based on a sample of Indian firms, exporting capital goods, and their trading partners in Tanzania.



MODEL OF THE ANALYTIC APPROACH

Altogether the sample covers about half of India's export of capital goods to Tanzania in the years 1977-1982. Most of this section is based on information obtained in these firms, primarily through interviews with leading management representatives.

Most of the exporting firms in the sample are big and some are among the biggest in India, but we have deliberately included a few medium-sized and small firms in the sample in order to include their experience of doing inter-continental trade. Of the firms in the sample three are among the top-six in India's industrial project exports, namely Bharat Heavy Electricals Ltd., Hindustan Machine Tools, and Walchandnagar.

The trade in capital goods is dominated by *project exports*. In the sample only about 10 % of the total value (of equipment exported) are accounted for by *product exports*. No doubt, our preoccupation with covering in a small sample a fair share of the total export value has led to an over-representation of project exports in the sample. But project exports certainly do play a dominant role, although not quite to that extent.

The research report on the case study contains a detailed analysis of the trade flows. Here we jump directly to some of the conclusions.

Perhaps the most important lesson from the case study

concerns the *transfer of technology*. Since we have studied the trade in capital goods in a development context the ultimate test of success or failure lies in their daily use. With few exceptions the technology embodied in the capital goods has been labelled "appropriate" both by the exporter and the importer – appropriate in the sense of being relatively simple, sturdy and easy to operate and maintain. But this is not the same as saying that the technology has been appropriate in the more literal sense. Our study has shown that this has often not been the case. We have not just dealt with the properties of the machines as such, but also with the services attached and the training effort involved. In our view a successful transfer of technology not only entails the installation of the machine but also the transmission of the skills necessary to handle it (operation, maintenance, repair).

We found that in some cases a successful transfer of technology, thus defined, had indeed taken place. The *machines imported on a product basis* (e.g. el-motors and machine tools) appear to be functioning without any significant problems and to the satisfaction of the importers. The more selective approach to technology represented by imports on a product basis has obviously paid off. But unfortunately for India this type of export plays only a marginal role. Generally speaking, product exports are much less profitable than project exports, and Indian firms have great difficulties in competing with others in this field where price competition may be very stiff. No doubt, some of the other Group I countries – e.g. South Korea and Taiwan with a more efficient production of a more limited range of capital goods – have a greater potential in product exports.

It is more interesting that some of the *projects in the small-scale industrial sector* also represent – in a limited sense – a successful transfer of technology. Examples of this are some textile units, set up with very simple and cheap power looms, and a number of common facility workshops, set up with simple and cheap machine tools. The machinery does function and the necessary skills have been transmitted. Nevertheless, the Tanzanians would prefer machines that are a little more advanced and of higher quality. The Indian machines are quite easy to repair, but even so it is a problem that they break down more frequently. Limitations in their range, speed, flexibility and precision are likewise handicaps, but this, of course, has to be viewed in the light of their price.

The *large-scale industrial projects*, on the other hand, which include a big sugar factory and a farm implements factory, to a varying degree have been failures. Since they account for the lion's share of India's export of capital goods to Tanzania, it is primarily because of them that the whole story has been far from successful. The technology embodied in each machine in these projects is usually "appropriate" or, at the most "intermediate" (not ad-

vanced). But the scale and complexity of the projects – involving in some cases hundreds of machines – are such that transfer of the entire package of technology becomes a much more complicated matter. The weaknesses and deficiencies found in some of the machines are magnified in this context, sometimes with disastrous consequences for the entire project.

This is not to say that the Indian exporters bear the sole responsibility for the problems. On the contrary, it can easily be argued that the main problems have been on the Tanzanian side. The economic crisis has hampered the projects in many ways: lack of raw materials, energy, spare parts, foreign exchange. Deficiencies in the Tanzanian development strategy and planning system have played their roles. In a more fundamental sense the crucial problem is that Tanzania simply does not have the capacity – first of all in terms of skilled manpower – to absorb the packages of technology embodied in the large-scale projects. It must be remembered that similar problems exist with respect to large-scale projects based on import of capital goods from the DCs.

However, the Indian firms involved certainly have their share of the responsibility. Apart from the quality of the goods, which has already been discussed, there is the whole question of the *services* attached to the delivery. In both small-scale and large-scale projects it was a frequent complaint that the services were highly unsatisfactory. In most cases the execution of the projects left much to be desired and after-sales or after-commissioning service was very limited. Considerable resources were used for training of Tanzanians both in India and on the spot, but even so the training was judged to be inadequate in many cases.

Here lies a paradox. The greatest weaknesses were found in precisely those areas where India does have a comparative advantage. Because of the relative abundance of engineering capacity and managerial ability in conjunction with low wages for highly qualified technical manpower, Indian firms should be able to handle the entire software component of the projects in a satisfactory manner. Payments problems may be used as an excuse, but after all the project exports by and large were profitable for the Indian firms.

The firms will have to improve their performance if they want to continue their export (to Tanzania and other LDCs). Until now the performance has earned the Indian firms a bad reputation in Tanzania. We encountered statements like: "They just go after the quick buck" and "Indian businessmen will do anything to win the contract, but afterwards ...". Some sort of monitoring and quality control by the Indian Government would be helpful and reasonable in view of the financial backing provided by the Government.

There is, however, no guarantee that an improved per-

formance by the Indian firms will result in a growing share of the markets for capital goods and technology exports in the Third World. For one thing, Indian firms are competing with much larger firms from the North that enjoy the dual advantage of a well-established presence and abundant resources (compared to the Indian firms). Moreover, these firms are frequently backed financially by their respective Governments in a way that renders Indian competition impossible (more about this below). Both for Indian firms and for other potential Southern exporters these problems are most pronounced in the field of large-scale project exports.

A highly placed Indian official in Dar es Salaam said to us: "I do not think Indian technology can work here in Tanzania; maintenance is a tremendous problem, and because of the cost involved it is simply impossible for India to give the necessary backup".

We think that is a fair judgement so far as the large-scale projects are concerned. But we believe that a case can be made for the South-South *transfer of appropriate technology* in the form of small-scale projects. India can offer machines which are simple and cheap, and India does have the capacity to handle such projects. What is more important, Tanzania does have the capacity to absorb this kind of technology/projects, and it fits well into the development strategy. But it will require some changes on both sides to make a success story out of this kind of trade and transfer of technology.

In spite of proclamations Tanzania has not given due priority to the development of the small-scale industrial sector. Without allocation of the necessary resources on the Tanzanian side a successful transfer of technology cannot take place. On the Indian side improvements are needed in the execution of the projects and particularly in the services attached (incl. training) to delivery of goods.

A minor, but not unimportant, lesson from our case study has to do with *transportation problems* in the widest sense. We found that India has a handicap in the transportation sphere despite its favourable location right across the ocean from Tanzania. In terms of transportation costs India is quite competitive, but frequency, regularity and dependability of sailings pose problems. Such problems are serious in relation to project exports where uncertainty impedes planning. Delays in shipments may be very detrimental to the execution of projects. In the Indo-Tanzanian trade there are several examples of this – and, no doubt, it is a general problem in South-South trade. The same is true of the poor standard of packing which has been partly responsible for some of the damage inflicted on machinery in transit. The dearth of container services is an obvious handicap.

Although most of India's Southern competitors (the Group I countries) are better off in some of these respects the transportation problems generally act as barriers to

South-South trade. These problems, of course, can be remedied, but it will take a long time to catch up with the DCs. Apart from their abundant resources they enjoy the advantage of transportation and communication systems developed over many decades to cater for the needs of North-South (and South-North) trade.

In the literature on South-South trade in the liberalist, neo-classical tradition there is a tendency to focus on tariff and protective non-tariff barriers as the key factors holding back trade. In our case these factors were of only marginal importance. This, of course, is closely related to the fact that our study deals with capital goods and most of it in a project context.

We found that *financing* was the most important bottleneck in India's export of capital goods to Tanzania, and we believe this has wide applicability to South-South trade in capital goods. This trade – and, indeed, the North-South trade in capital goods – is not taking place in anything resembling a free market. A lot of the trade is politically backed, as was the case with India's export. For Tanzania's import of capital goods the source of finance has simply been the most important determinant. This, no doubt, is also the case in many other low-income LDCs. As a consequence *foreign aid* has become one of the most important competition parameters in this field (perhaps the most important).

We found that India has no chance of competing with the DCs on the terms of financing. The DCs can offer and have offered Tanzania capital goods on terms ranging from very favourable loans to outright grants. This has undercut India's comparative advantage in the areas where it exists. The low price of Indian products and projects, based on low wages, is more than offset by the aid-determined financial terms its competitors from the North can offer. Hence financial aid and development assistance from the North – tied to imports from the donor country – are working strongly against increased South-South trade and cooperation.

This problem is not easy to solve. For the LDCs scarcity of capital is a fundamental condition. The DCs have always used foreign aid to boost own business interests.

For years the LDCs have been discussing the establishment of a South-bank or some other financial institution that could participate in financing South-South trade. At present that seems as remote as ever. With oil money no more readily available, again the main problem is where to get hold of the necessary capital. In the foreseeable future a more realistic approach is simply to circumvent the financing problem by resorting to counter trade. India has recently struck a barter trade deal with Zimbabwe, trading tractors and other manufactured goods for asbestos. Both India and Tanzania are actively considering barter as a way out of the impasse for the trade between the two countries. In the 1980s this has been a general

trend in the debt-ridden Third World (Hoffmann, 1987). Though cumbersome, counter trade in one or the other form simply may be the only way.

CONCLUDING REMARKS

It has been our aim to analyze the trade in capital goods between India and Tanzania within the framework of *development strategy* – as viewed from both the exporter's and the importer's side.

Compared to other Group I countries *India* has the most broadspectred technological capability. In conjunction with managerial ability and the low level of wages for highly qualified technical manpower this has made India especially competitive in project exports. Another distinguishing feature is that transnational corporations are relatively unimportant in India generally and in India's South-directed export of capital goods in particular. Further, there is a large public sector in India's capital goods industry, and both public and private companies are engaged in South-directed export. Finally, India's development strategy is overwhelmingly inward-directed, based on import substitution industrialisation in the framework of a huge internal market and aiming at self-reliance. Only in the last decade has export promotion gained prominence in Indian economic policy. In all these respects there are marked differences between India and other Group I countries.

Compared to other LDCs – viewed as potential importers of capital goods from the South – *Tanzania* also has a number of distinguishing features. First of all, it is a very poor country, classified as among the least developed by the UN. Secondly, it has had a peculiar development strategy aiming at self-reliance and based on an industrialisation dominated by parastatal companies. Thirdly, due to a number of adverse circumstances (in conjunction with the development strategy) Tanzania has been more seriously affected by economic crisis in the early 1980s than most LDCs. Nevertheless, the position of Tanzania is not all that different from that of so many other poverty-stricken and crisis-haunted African countries.

The rise and fall of India's export of capital goods to Tanzania have followed the overall trend in South-South export of manufactured goods. This trade was flourishing in the second half of the 1970s, when industrialisation efforts of a number of LDCs were facilitated by the availability of international finance, mainly derived from the recycling of petro-dollars. Recession, protectionism and the debt crisis after 1980 in many cases resulted in a decline in South-South trade. In the Indo-Tanzanian case, however, this development has been much more extreme. The rapid expansion in the late 1970s was to a large extent a result of political efforts. The rapid decline in the early 1980s was first of all due to Tanzania's economic crisis and default, but also to problems in India's capital goods sector.

There is a built-in dilemma in South-South trade and cooperation. As a deliberate strategy South-South trade and cooperation is being actively promoted at the *political level* by politicians like Julius Nyerere. Realization of this strategy involves a shift to the *economic level* which is dominated by commercial interests (irrespective of whether the exporting firms are privately or Government owned). Hence there tends to be a discrepancy between lofty ideals and more mundane considerations involved in the implementation. As we have suggested this may be remedied to some extent by increased Government intervention, but the dilemma cannot be resolved within the existing economic-political order.

Finally – as noticed by Nyerere – there is a risk that South-South trade may develop in a way which creates a "dependency imbalance" much like North-South trade. In many ways the story told here is a case in point. In the Third World India is a giant, Tanzania a dwarf. The trade pattern between the two resembles the trade pattern between North and South: capital goods are exchanged for raw materials and foodstuffs.

In our view the most serious problem illuminated by our case study concerns the transfer of technology. One of the main objectives of Tanzania's development strategy is to foster a degree of self-reliance. But Tanzania's industrialisation has actually made the country more, rather than less dependent on other countries (mainly in the North). The import of capital goods from India has worked in the same direction because Tanzania has been unable to absorb and control the technology embodied in most large-scale projects. Basically the problems have been the same as with similar projects established with capital goods imported from the North. But in practice the difficulties have been even greater with the Indian technology due to the built-in weaknesses of this technology and the limited resources available for follow-up.

However, this need not be so. We have suggested that a South-South transfer of appropriate technology in the form of small-scale projects may take place in a way which is beneficial to both the exporting and the importing country. Such a transfer could take place within a development strategy that would gradually build up the technological capability of the importing country and hence reduce the technological dependency. In spite of all the problems with the Indo-Tanzanian programme for the development of small-scale industry, some of the projects have demonstrated a potential in this area. After all the negative lessons we think this is an important positive lesson for South-South trade and development.

Note

The research report, on which this article is based, is planned to be published in five volumes – all due to appear in 1988 – under the common title "South-South trade and development". The (preliminary) titles of the five volumes are as follows:

- Vol. 1. The trade in manufactured goods among Third World countries – in a development context (General Report).
 Vol. 2. South-South trade in manufactured goods since the 1960s.
 Vol. 3. Togo, Nicaragua and Malaysia as exporters of manufactured goods to the South.
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Morphometry of 150 Danish Lakes with some Considerations on Cartometry

Thorkild Høy

Høy, Thorkild: Morphometry of 150 Danish Lakes with some Considerations on Cartometry. Geografisk Tidsskrift 88:44-54. Copenhagen, 1988.

An overview of the charting of Danish lakes carried out by the author since 1957. Some results are given in a table summarizing the most important morphometric data for 150 Danish lakes. Further considerations are given on cartometry, dependability of figures, especially area figures, and accuracies. Finally a case story is told about the lake, Esrum Sø.

Keywords: Lakes, Elements of charting, Cartometry, Lake morphometry, Esrum Sø.

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Definition of lakes.

It is most common to define a lake as a body of water in hollows in the terrain. If this definition is accepted, lagoons, and possibly also reservoirs are left out. Nonetheless most handbooks e.g. Hutchinson (1975) also deal with what is termed "maritime coastal lakes". When the aim is to prepare a list of lakes inside a country (Denmark), this problem has to be solved. A broad definition is chosen which takes in lagoons and reservoirs and other kinds of artificial lakes. As lagoon lakes are considered those, which are not in open connection with the sea outside, be the hindrance a high water sluice, a sluice combined with pumps, locks, or a more or less permeable bar. This type of lakes will show all grades of salinity, sometimes changing rather rapidly, as most are subject to influx of sea water at stormy high water. Their water levels will, in most cases, oscillate around zero. Sometimes the sluices are rather derelict, leaving room for doubt whether this particular body of water conforms to the definition, v. what is said later about land-locked waters. A few lakes of that type are to be found in the main table: Selsø Sø, Naksø Indrefjord, Gråsten Slotssø, and Kielstrup Sø. If lagoons are left out one runs into difficulties as will be seen later, when the lake list in "Danmarks Areal" 1968 (Areas of Denmark) is discussed.

If, after the definition chosen, a list of Danish lakes after size is made up, a question that might interest the general public, the largest will be Ringkøbing Fjord, and the next Nissum Fjord. Then will follow Arre Sø which is the lake most often deemed the largest. In fact Arre Sø also originated as a lagoon.

Next there is a type of water bodies which here shall be termed indvande (landlocked waters). These are bodies of

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