

**Collaborative Research Project on  
The Impact of China-Africa Relations**

**An assessment of the Impact of China's Investments in Sudan**

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## **Summary**

The study examines the impact of China's investments in Sudan in terms of its positive and likely negative effects; data drawn from secondary and primary sources is used for the purpose. Tabular analysis and graphs are used to review the scale of operations of the investing firms. An understanding of the behavior and motivations of these firms is gauged in the light of Dunning OLI framework and its various extensions. The results of the assessment reveal that, China's FDI in Sudan since 1996 is basically resource-seeking and it had augmented the technological and financial capabilities of the country's oil sector. China's private FDI, albeit small, is found to contribute to creation of capacity in import-substituting industries. The policy implications of these findings are highlighted.

## ***Acknowledgements***

This study has benefited from the valuable comments, contributions and suggestions of colleagues at the various workshops organized by AERC's Asian Driver Programme. We thank the collective support of colleagues at MOFNE and MEM and the fieldwork collaborators for providing data. The financial support provided by the AERC is duly acknowledged. We, however, remain solely responsible for the views expressed and for the errors.

## **I. Introduction**

Sudan's relationship with China has a long history; formal diplomatic relations started three years after Sudan's independence in 1956. Since then, China maintained good relations with Sudan's various political regimes in consistence with its doctrine of respecting sovereignty and non-interference. Formal economic and technical assistance between the two countries was coordinated by the 1962 agreement on Economic and Technical Cooperation (ETC), which remains effective. In 1970 a Cultural, Scientific and Technical Protocol (CSTP) was also signed. These agreements boosted project-based assistance in infrastructure and public buildings, and encouraged a flow of professional staff, mainly in the Chinese assisted hospitals' projects. Between 1970 and mid 1990s Sudan received US\$ 100 million free interest loans for construction of two bridges, the Friendship Hall, 410 km of tarmac road, one textile mill, a hospital as well as rice cultivation and fishing projects. The last decade witnessed a remarkable inflow of China-based foreign direct investment (FDI) into Sudan's oil sector amounting to nearly US\$ 7.6 billion. This upsurge in FDI is accompanied by substantial investments from India and Malaysia and by non-oil FDI from the Arabs states and China itself.

In post 1990s China emerged as a giant developing country or even a new ascending power in the international political and economic system. The vibrant industrialization underlying this process has generated large-scale demands for natural and fuel resources both inside and outside China. The decade also marked a shift in the orientation of the country's foreign policy from an emphasis on ideological and cultural motives with political payoffs towards diversified and more corporate-oriented interests guided by profit motives.

It is often argued that China's oil multinational corporations (COMNCs) have structures and internal dynamics that differentiate them from a typical Western counterpart. They are not necessarily profit-oriented but seek to realize the energy security strategy of their home state. Hence, China's oil investment is part of a broad emerging grand strategy based on soft balancing against the United States. Wojtek and Brock (2008) used information on 30 countries targeted by COMNCs to test this proposition. The evidence showed that while profit motive and competitive opportunity hold in the short run, there is also indication to suggest that these firms invest more in countries that might someday play a supporting role in China's efforts to counter American global hegemony. The COMNCs are looked at as lacking corporate social responsibility; the benefits of their operations are unevenly distributed among the social groups. This creates grievances often leading to conflicts and further exacerbating existing ones, (Switzer 2002 and Patey 2007).

China is seen not only as a big consumer of petroleum after United States, but as a challenger to its hegemony. It is alleged that China's approach to trade and FDI, especially in the African context, represents a "neo-liberalism" with Chinese characteristics or a "Beijing consensus", which is in sharp contrast with what the West has had on offer through "Washington consensus" and "Post Washington consensus". This process of unfolding bipolarism, analogous to US-Soviet competition during the Cold War, would therefore provide an alternative "new developing model" for less developed countries (LDCs) to choose. China's oil investment in Sudan is often cited along these lines and deemed a good case for illustrating China's new model of development, (see Chan 2006 and Lange 2009).

## 1.1. The research Issues

The broad objective of the study is to assess the opportunities and challenges associated with the recent upsurge of China's FDI into Sudan as a basis for beneficial policy discourse between decision makers and other stakeholders in China and Sudan. The assessment distinguishes between oil-based and non-oil FDIs, due to the lumpier nature of the former and the associated political economy considerations.

We argue that some stylized complications characteristically associated with inflows of FDI into countries at early stage of their "investment development path", were interpreted as if they are indented policies and used to portray a political economy that does not exist. The operation of the Chinese oil companies in Sudan is assessed against this background in some recent general papers on the issue and in most of media overages. Such misinterpretation has generated further complications of their own in term of flattening the policy leverage of the government to address the original challenges of a typical extractive model. More specifically the following issues are assessed:

- An inventory of FDI inflows from China including their sectoral breakdown and an analysis of trends;
- An estimation of the extent to which this FDI represent the creation of new or augmented production capacities or a change in ownership of existing production units;
- An analysis of the extent to which overall Chinese FDI inflows are bundled with aid;
- A description of the regulatory regime governing FDI inflows and the extent to which they embody China-specific provisions;
- An analysis of the characteristic of major Chinese FDI, i.e., whether they are resource-seeking or market-seeking, and whether the output is targeted at the domestic or external market;
- An assessment of the economic benefits that arise from major Chinese FDI in terms of exports expansion, reduction of import dependence, contribution to value added and employment, government revenue, etc;
- An assessment of the extent to which major Chinese FDI exclude or strengthen the position of locally-owned enterprises;
- Analysis of the ownership structure of incoming FDI, i.e., wholly-owned, joint ventures with local partners or joint ventures with other foreign partners or joint ventures with local and foreign partners ;
- Outside of the specific investments, an assessment of the spread effects of the FDI to the other sectors of the economy in terms of skill development and capability building, the use of local inputs, supply chain management and technology transfer;
- A comparative analysis of the characteristics and practices of Chinese FDI and those from other sources;
- A determination of features, size and sectoral distribution of the country's investment in China (if any) and the nature of support such outward investments received from the home government as well as from Chinese Authorities;
- An articulation of options for supporting the development of locally owned firms that can partner effectively with Chinese FDI and also invest in China;

- An articulation of strategies for taking maximum advantage of low cost of delivery of development infrastructure by Chinese construction companies while maintaining quality;
- An articulation of strategies for ensuring high quality of Chinese construction services, discouraging unwholesome business practices and controversial labor practices;
- Articulation and analysis of the policy responses necessary to optimize investment relations with China if and when China acquires the attributes of an advanced industrialized economy and the associated changes in the features and pattern of its investment relations with the country.

Corresponding to these research issues the following policy questions will be assessed:

- What mechanisms are available for encouraging the inflow of beneficial Chinese FDI and discouraging the inflow of harmful ones?
- What policies might be introduced to maximize the positive impact of incoming Chinese FDI in terms of employment creation, forex generation, value deepening, employment, training, local sourcing and technology transfer?
- To what extent can inward Chinese FDI be directed to meeting the needs of the less advantaged population, through associated product and production technology?
- How effective policies towards incoming Chinese FDI be determined at the national level and other regional bodies?
- How can Chinese FDI be leveraged to provide preferential access to Chinese markets?
- How can governments play off Chinese and other sources of FDI to maximize the development impacts of FDI?

FDIs vary considerably by type, motive and impact on the host. The classical literature on growth provides several reasons why FDI may result in enhancing the growth of the receiving country. In addition to the direct, capital augmenting effect, FDI indirectly may permanently increase the growth rate through spillovers and diffusion of technology, ideas, management know-how and the like. Recently, the literature on the determinants of FDI, inline with Dunning's Ownership-Location-Internalization (OLI), gives an alternative explanation. Inwards FDI is intended to take benefit of host country's (locational) advantages instead of diffusing new technologies emanating from donor country. The ultimate effects of such investments depend on the absorptive capacity of the host- captured by the differences in the stage of the 'investment development path' (IDP) between host and home economies- as well as on the investment climate in terms of human capital, public and private infrastructure, legal environment and the like. The FDI-IDP has interesting policy implications in terms of enhancing the absorptive capacity of the host for uptake of FDI depending on the stage of its development relative to the home.

The rest of the study is organized as follows: the next section presents a background discussion on the macro performance, business environment of Sudan and existing FDI promotion policies, implementation mechanisms in place and how they far. Section III contains the review of literature on FDI, the theory of FDI in order to motivate the theoretical framework and the method to be used in the analysis. Section IV presents the analytical framework and the methodology of analysis. Section V contains the results of the empirical analysis at the sector and firm levels. FDI in oil is assessed at the sector level in terms of its benefits, that is, revenues

from oil export, capacity building, linkages with local firms through subcontracting and partnership and technological transfer including an indication of the benefits of non-oil FDI attracted by the oil boom. The cost of such venture is reflected by the outflow of the oil firms' revenue share as well as by the non-pecuniary impact as manifested in resource Dutch disease, the environmental and social challenges including the divestment campaigns following the allegations of human right abuse in connection- previously with Southern Sudan civil war- and recently with Darfur conflict. The scale of operations of other Chinese firms attracted by the oil boom is indicated in terms of their market orientation, value addition, employment creation, use of local inputs, supply chain developed/ displacement of local firm, capacity building and import-substitution export-orientation tendencies. The adequacy of existing FDI promotion policy is also indicated. The final section concludes and highlights the policy recommendations.

## **II. Background**

### **II.I. Business environment**

Sudan is endowed with diversified natural resources, by Sub-saharan African standards, and has always been facing the challenge of productive utilization of such resources to embark on sustained growth and structural transformation. During 1960-2007 the growth of trend real GDP alternated remarkably between negative and positive growth over 1960-1973 and 1974-2007 respectively. The trend growth for the whole period is positive but insignificant<sup>1</sup>. The mal designed policy programs and advices, the natural disasters and the entrenched civil conflicts and unrest, *inter alia*, provided explanation for such decimal performance and waste of opportunities (see Ali and Elbadawi, 2002).

This sagging growth record- except the oil-driven growth period, and this is yet still plagued by notable income inequality and increased poverty- has been mirrored by changing political regimes and ideologies. A shifting emphasis on relative roles of private and public investments in the economy has thus recurred with varying political doctrines and orientations. Following a prolonged era under colonial British rule and a development policy geared towards availing raw materials (cotton) for manufacturing sector at home, the state emerged predominantly at the country's independence investing heavily in the agricultural sector, which accounted for around 61% of real GDP. The role of private capital in developing the economy was acknowledged by the first national government. In 1956 the Approved Enterprise Concessions Act (AECA) was introduced to encourage domestic and foreign private businesses. However, the role of private foreign capital was adversely affected by the October revolution in 1964. Although the socialist slogans at the time were not articulated in the state policy, yet foreigners start to liquidate their business and hence the flow foreign investment is discouraged. By early 1969, these socialist slogans were formally adopted; all commercial banks were nationalized along with more than seventy major corporations.

The experience of the abortive-left-wing coup in 1971 triggered a reversal of direction; nationalization was rolled back in a view to broaden participation in the development process. Following the constitutional change at the time, the economy comprises the public, co-operative, private and mixed sectors, latter legislation and policies regarding foreign investment in the

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<sup>1</sup> Updated based on Ali and Elbadawi (2002).

1980s and 1990s were considered within this framework. This new tendency to improve investment legislation and restore the confidence of foreign investors had facilitated the inflow of FDIs in early 1970s. The upsurge of these foreign investments is also encouraged by the then recently signed Addis Ababa peace agreement and the 1971 oil price hike which precipitated huge Arab surpluses. The Foreign Companies Registry shows that between 1971 and 1983 150 such companies were registered. Notably, a number of oil firms were attracted e.g. Chevron; Total; Eastern Texas; Union Texas and Sun Oil. In 1978 Chevron discovered oil in its region of concession, and by the time of developing Unity and Hejilij oil fields to exploit an estimated 250 m/b reserves, the second civil war broke in 1983. The oil factor was integrated into the many causes of this civil war. Chevron's installations and oil fields became a target for attack and as a result operations were suspended by 1984.

Despite the fact that FDI over 1971-83 was relatively small in quantity compared to other types of international capital inflows- official project assistance, humanitarian aid and adjustment programme lending- its notable operation in form of foreign firms marked a significant qualitative transformation<sup>2</sup>.

Virtually no significant FDI inflow recorded between 1984 and 1995, due to intensification of the civil war and the associated political instability, for example the period witnessed four changes of the political regimes. However, the investment climate was improved to a great extent following the application of macroeconomic reforms initiated in 1992. The divestiture of numerous public enterprises was an integral part of the reform. The technical committee for the disposal of public enterprises listed 117 SOEs for privatization; of which fifty-seven were privatized between 1992 and 1997. A new Investment Encouragement Act was introduced in 1996, amended in 1999 and 2001. By 2002 a Ministry for Investment (MOI) was established as one-stop-shop bringing together diversified, but project related authorities: Land Authority, Customs Authority, Tax Chambers and Commercial Registrar. Its mandate includes firm licensing, construction permit and firms import licensing. The sealing of the Comprehensive Peace Agreement, provided an enabling environment for these reforms. The achieved political and economic stability was the foremost requirement for mitigating business risks and alleviation of fears of foreign investors about a revival of investment policy and laws.

## **II.II. Growth and structure of the China's FDI**

Sudan stated formal economic relation with China in 1958. At that time the country moved towards bilateral trading to market the accumulated stock of its cotton, the main export crop, following the recede of cotton prices in the aftermath of the Korean trade boom of 1950s. A barter deal of 1.0 million Sudanese pounds worth of cotton for textile, sugar, iron and steel from China was agreed on. The ensuing trade arrangement was formalized latter in the 1962 (ETC) agreement; which remains effective.

Economic relation between the two countries was further boosted in 1970 following the visit of the Sudanese president to China. In same year a Cultural, Scientific and Technical Protocol (CSTP) was signed. Between 1970 and mid 1995 Sudan received about US\$ 100 million free

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<sup>2</sup> The balance of payments reported no 'FDI' up to 1976, in 1977; 13.4 millions US dollar was reported (see Ahmed 1986).



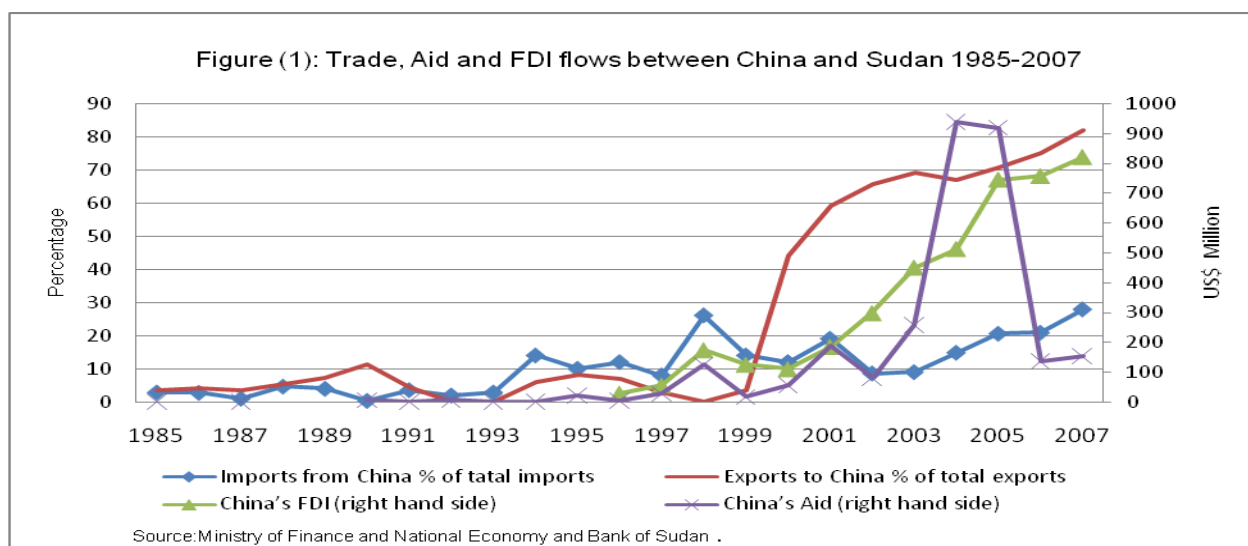
interest project-based loans with extremely easy repayment terms. Eight projects were identified by the Sudanese part for channeling China's aid. These included the construction of two bridges, the Friendship Hall, 410 km of tarmac road linking Median and Gedarif, Hassaheisa textile mill, a hospital as well as rice cultivation and fishing projects.

Generally China economic partnership with Sudan was limited before oil. Since 1958 trade and aid continued, however, there was no significant business expansion and interest to expand trade and aid beyond the (ETC) and (CSTP) agreements. In late 1996, the government through its Ministry of Energy and Mining, called for OMNCs to engage in its oil sector<sup>3</sup>. Many companies showed interest and consequently the Greater Nile Petroleum Operating Company (GNPOC) was established as a consortium with the State Petroleum owning 25% of the stake, China National Petroleum Corporation (CNPC) 40%, Petronas Carigall Overseas of Malaysia 30%, and the Sudan Petroleum Company (Sudapet) 5%. Following the US sanction against the government in 1997, the State Petroleum sold its shares to a Canadian firm, Tilsman. But due to pressures of NGOs and stakeholders for divestment on human right ground Tilsman withdrew from business in early 2000s, by selling its shares to the Indian oil company, ONGC Videsh. China involvement in (GNPOC) marked the development of a qualitatively different relation with Sudan in terms of the consequent economic and political impact.

Figure (1) depicts the overall trends of trade as well as aid and FDI flows from China over 1985-2007. As seen, trade with China represents small percentage of Sudan's overall trade before the advent oil. The spike in Sudan's exports in 1990 was due to growth in cotton export to China, afterwards both exports and imports declined to a negligible percentage. However, there was little improvement as a result of the efforts to encourage trade between the two countries, including a Chinese trade fair in Khartoum in 1993. The relatively high increase in imports since 1993 was driven by the growth of private sectors demand for Chinese machineries and transport equipments as well as by the fact that all the Chinese companies holding contracts in construction and oil import their equipments from home. The massive increase in Sudan's export since 2000 is driven by oil export to China. Despite the increase in Sudan's demand for Chinese machineries and other raw materials, overall imports remains relatively diversified.

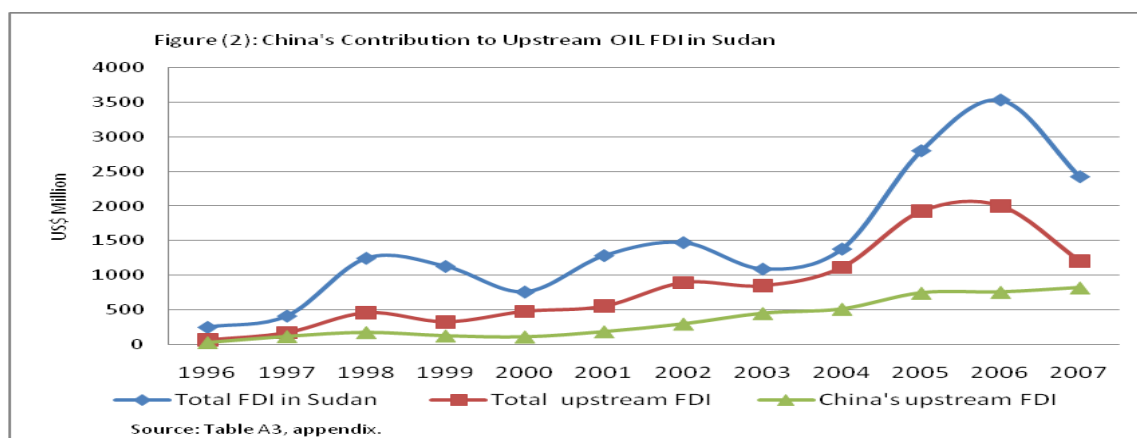
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<sup>3</sup> Chevron sold its concession in 1992 as the Sudanese government began to look for a way out of its serious economic decline.



The inflow of China's FDI started from a scratch in 1996 and reached a level of about US\$ 820 million by end of the review period. Contracted aid grew by a lower rate, but exceeded FDI flows during the period of main operation in Marawi dam over 2003 and 2005.

FDI, the variable of interest, is shown in figure (2) which depicts the flow of total foreign investments in Sudan, upstream investment and China's contribution. The inflow of FDI in Sudan since 1996 is driven by oil investment. The non-oil FDI, from all sources, is attracted in the service sector and light manufacturing and seems to follow investment in oil sector closely. China's oil-FDI contributed mostly in the initial upstream FDI over 1996-99, since then the contribution of other partners started to pick-up to reach 1.2 US\$ billion before falling to less than third of this level in 2007. The overall share of China-based oil-FDI was increasing through out the review period and averaged 43 percent.



China's contribution to oil export infrastructure is significant. Table (1), which summaries the stock of these investments, indicates that Chain's share in oil infrastructure is more than 50 percent.

Table (1): FDI in Oil Export Infrastructure and China's Contribution

Pipeline	Cost in million US \$	CNPC share	
		Value	Percentage
Moglad Basin	1220	488	40
Melut Basin	1170.2	550	47
Fola	366	366	100
	2756.2	1404	50.9

Source: Ministry of Energy presentation on "Sudan-China 50 years of Cooperation; Khartoum 2009, Sudan.

After Chevron declined its interest in 1992, the Sudanese oil industry was dominated by many players, mostly non-Western oil firms. Table (A2) lists the operating firms according to (MEM, 2005) data. A brief description of these firms in terms of partner; share; block and date of agreement is provided. Parts (a) and (b) show respectively the producing firms and those engaged in green field exploration. As seen in the table with the exception of Lundin (IPC Sudan Ltd) (Sweden\Switzerland) all Western-based firms declined their interest in Sudan oil. Lundin justified its interest on the basis of need for constructive engagement especially with the government of the Southern Sudan.

All the Chinese firms involved in Sudan oil sector are state owned enterprise (SOEs); table (2) lists these firms by type of work. As seen 13 companies were engaged in the indicated activities at various stages and all are either affiliates of the CNPC or other China's SOEs.

Table (2): Chinese firms operating in Sudan oil sector

Work type	Number of companies	Name of company
Drilling	2	ZPEP and GWDC
Logging	1	CNLC
Seismic survey	2	ZPEP and BGP
Mud logging	2	ZPEP and CNLC
Catering	1	ZEIGIN SERVICES
Information technology	1	CHINA WISDOM
Construction	3	CHENDONG; DUBEC and CPECC
Pipeline	3	DUBEC; CPECC and CPPE
Well heads and casing bits	1	CPTDC
Cementing	1	GWDC
Research	2	RIBD and DAJIN
Training	4	CNLC; ZPEP; GWDC and CPECC

Source: Ministry of Energy presentation on "Sudan-China 50 years of Cooperation; Khartoum 2009, Sudan.

The upsurge of China FDI in Sudan since 1996 was accompanied by substantial inflows of investments attracted in oil and other sectors of the economy, (figure 1). Table (3) provides a

summary of the total non-oil FDI and the contribution of China-based firms over 2000-2008. As appears, China's non-oil investment averages about 2 percent of the total and the bulk of it was registered in 2000 following the first year of commercial utilization of oil and in 2007. Despite the small size of this investment it was carried by firms of a completely different structure, mostly private small and medium size businesses. The Companies' Registry's list of 'reserved business names' includes 203 firms classified by nationality as Chinese. The register contains limited information relating to nationality, company's name and business address, which are required in the first phase- out of ten steps- for complete registration with (MOI). A firm at this stage can conduct business, without claiming the stipulated investment concessions or tendering government contracts. The registry of (MOI) contains 97 of fully licensed Chinese private or Chinese joint private firms. The remaining firms are either in the process of completing registration with the Ministry or are engaged into subcontracting, petty businesses including trading.

Table (3): Total Non-Oil FDI in Sudan and China's Contribution

Year	Total Non Oil FDI (TNOI) Million US\$	China Non-Oil FDI (CNOI) Million US\$	Percent CNOI/TNOI
2000	91.26	29.04	31.82
2001	154.32	0.01	0.01
2002	176.88	1.01	0.57
2003	131.04	5.28	4.03
2004	165.72	3.39	2.05
2005	560.00	4.16	0.74
2006	953.80	6.98	0.73
2007	848.82	25.30	2.98
2008	740.52	6.66	0.90
Total/ Average	3822.36	81.83	2.14

Source: MFNE and Ministry of Investment Company Register 2000-2008.

Table (4) shows information on the structure of the FDI of China's private enterprises. Although the table does not provide exhaustive listing of all Chinese private business in Sudan, it seems that over time a growing number of such firms are attracted to Sudan following the oil boom. The wholly private foreign is the preferred mode of entry compared to joint venture with Sudanese private sector, 67 versus 30 firms. All of the documented firms were SMEs in terms of employment-size class. About 6.8 thousand jobs appear to be created by these firms, but the distribution of the employment by nationality is not available.

Table (4): The structure of the FDI of China's private firms in Sudan 2000-2007

Year of Licensing	Number of firms	Number of employees	Foreign private	Private joint
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2000	7	569	4	3
2001	1	80	1	0
2002	1	34	1	0
2003	10	876	6	4
2004	10	460	9	1
2005	12	755	6	6
2006	17	934	9	8
2007	22	1592	20	2
2008	17	1528	11	6
Total	97	6828	67	30

*Source:* Ministry of Investment Company Register.

### **II.III. Policies and institutions promoting China's FDI in Sudan**

The motivation for FDI flow between any two countries involves a complex matrix of relations, however, the policies and institutions advocating FDI in the host and home are important catalyst. We provide an overview of the main policies and institutions promoting the flow of FDI from China to Sudan.

On the Chinese part

Since mid1990s China's intensified efforts to make its go-out policy successful particularly in Africa. The policy is designed to exploit China's comparative advantages, strengthen corporate sector, create Chinese footprint, and open new markets and access to key inputs. China's FDI policies towards Sudan evolved within this general frame. The already existing bilateral relations were strengthened in 1987, the two countries agree on the set-up of Sino-Sudanese Committee for economy, trade and technical cooperation latter upgraded into Sudanese-Chinese Joint Ministerial Committee in 1993. Investment protection agreement and the agreement on prevention of dual tariff were also signed in May 1997. The period 1994 -2008 witnessed active exchange of visits of top officials. Nineteen visits were undertaken; thirteen from the Sudanese part including two presidential visits and six from China's part including one presidential visit. More important, China's policy of non-interference, which is also maintained with other LDCs, created an enabling environment for continued economic cooperation with Sudan.

In addition to bilateral dealings, China's backup Sudan in multilateral forums on Darfur issue, for example in the UN<sup>4</sup>, in line with its non-interference policy and in the African Union, through provision of US\$ 400 thousands to support the organization mediation on the conflict. Also, since 2006 the mutual visits of the Forum on China-Africa Cooperation (FOCAC) were often used by Chinese officials to urge the Sudanese part for more flexibility on Darfur conflict.

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<sup>4</sup> Since 2001 China voted against 8 out of 22 resolutions of the UN Security Council on Darfur conflict.

Along with the political leverage, Chinese companies offer diversified investment package due to ability to bundle technology and support of their home state. As implied in table (A2), the CNPC and its subsidiaries coordinate the main oil operations, which would help in reducing implementation costs. In addition, China's aid-projects in Sudan, like the case in other SSA, were without political strings attached and were carried out by SOEs, with almost all project components sourced from home to ensure timely and efficient completion. Since the advent of oil Sudan increasingly receives cheap loans from China with generous repayment terms.

#### On the Sudanese part

The role of investment, particularly FDI, in the development process has been emphasized since the political independence in 1959. Generally the country's policies and institutions for FDI promotion came along way from the (AECA) in 1956, with vague definition of FDI and diversified implementing authorities to a full fledged Ministry with clear mandate. The (MOI) determines the priorities in granting the licenses, and facilities in light of the Encouragement of Investment Act of 2001. The exemption granted to interested investors covers all imported goods used by the investor's project, including capital allowances for depreciable assets to be used in production. Depreciation allowance is calculated during the year of complete tax exemption on the basis of replacement value. Foreign investors are guaranteed profit repatriation; right to import products related to the project and assurance against confiscation of invested funds.

Foreign investment is protected against non-commercial risks through binding international instruments; Sudan is a member of World Bank's Multilateral Investment Guarantee Agency (MIGA), and the International Center for the Settlement of Investment Disputes (ICSID). The private sector investment arm of the World Bank Group, in coordination with Foreign Investment Advisory Services (FIAS), conducted a study on administrative barriers to private sector development in Sudan. The study came-up with reform agenda aimed to reduce the burden of doing business on investors as well as with an elaborated action plan for reform and design solution for improving the capacity of key implementing institutions. Recently the (MOI) follows the World Bank Guidelines in its FDI promotion strategies. Despite the progress of Sudan in the World Bank doing business indices between 2005 and 2008, much remains to be done to improve starting and closing business as well as dealing with licenses, (see table A4). The results of the World Bank (2007) investment climate study indicated that more effort is needed to combat corruption and improve transparency in enforcement of regulations, (World Bank 2009).

In a new orientation towards adoption of more social responsible investments, the Central Bank of Sudan established a dedicated microfinance unit to enact the Multi-Donors Trust Fund. US\$ 40 million were allocated by the Central Bank to encourage the commercial banks and investment institutions to develop a niche investment product that will increasingly attract retail investors.

Sudan and China historical relations were further strengthened by Sudan's policy of looking east<sup>5</sup>. This orientation in the country's foreign policy came as a result of the escalating economic difficulties since the UN and the US sanctions, respectively, in 1996 and 1997 for not playing

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<sup>5</sup> The term often refers to the main players in the region; China, India, Japan, Malaysia and Korea.

active role in the southern civil war and more recently on allegation of human right abuse in Darfur and supporting terrorism. The more frequent visits of top Sudanese officials remain the main channel for boosting relations with China. The Sudanese-Chinese Friendship Society was formed following the Sudanese president visit to China in 1995. Also the two countries agreed on cancellation of diplomats and business visas, and set up a mechanism for regular coordination between their respective ministries of foreign affairs. The ruling National Congress Party and the Communist Party signed an agreement on cooperation in 2003. Eight economic agreements were signed during the latest vice president visit to China in 2008. Important among these are the protocol of agricultural cooperation including set-up of a pilot agricultural technology demonstration center in Sudan and the signing of a memorandum of understanding on the migrations procedures of Chinese workers in Sudan. It is also notable that nineteen agreements were signed during the visit of China's president in 2007 involving projects-aid and debts cancellation amounting, in all, to about US\$ 0.5 billion.

### III. The literature review

Recently China's economic influence globally has increased in terms of trade level, investments made and loans provided. In particular China's DFI has risen remarkably following the "go-out" strategy. These developments have spurred considerable interest and concern about the motivations and the implications of the increasing Chinese outward presence especially in (SSA). There has been much discussion in popular media and more recently in scientific literature about the evolving engagement of China with Africa. Some of the research appeared on special journals issues notably; *the European Journal of Development Research*, Vol. 21 Issue 4, 2009, *World Development*, Vol. 36 No. 2, 2008, and the *Review of African Political Economy*, Vol. 35, No. 1, 2008. Africa-based research on the China-Africa relationship appeared on scoping studies of 18 countries and further developed into a second-stage of 22 more detailed country case-studies<sup>6</sup>.

Generally it is noted that, as from 1988 there has been very rapid growth in capital inflows to the developing countries, and since early 1990s there was a significant shift in the composition of total capital flows to developing countries towards FDI away from other flows, Bosworth and Collins (1999). Optimism about inflows of FDI to developing countries, especially SSA derives from many observations. *Inter alia*, increased flows of FDI may enhance the saving gap of these countries and hence their GDP growth. The competition of incoming firms for location and market potentially could increase the opportunities for technological transfer. In addition, given the orientation of FDI towards tradable sector this could expand export growth and hence ease the pressure on the balance of payments. Some of these gains are corroborated by empirical research. For instance, the results of macroeconomic studies showed that FDI brings about a one to one increase in domestic investment thereby contributing to growth, Bosworth and Collins (1999). Moreover, Borensztein, De Grogrio and Lee (1995) found that a one percent point increase in the ratio of FDI to GDP in developing countries over the period 1971-89 was associated with a 0.4 to 0.7 percent point increase in the GDP per capita growth, with the impact

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<sup>6</sup> See ([www.aercafrica.org](http://www.aercafrica.org)).

varying positively with educational attainment as an indicator of a country's ability to absorb technology, (Ajakaiye *et al* 2009, p.7). Notwithstanding these gains, the experiences in SSA, and outside the region, indicate that FDI may incorporate inappropriate technology, the incoming firms may not integrate local firms in their network chains or even eliminate such firms altogether. In particular resource-seeking FDI could develop into export enclaves completely isolated from the domestic economy and may accelerate the depletion of these resources. More important, repatriation of profits could develop into serious balance of payments.

The key results from the scoping studies show that, although China's FDIs to Africa is small is it increasing over time. The distribution of these investments is rather geographically dispersed, yet five countries (Angola, Nigeria, South African, Sudan and Zambia) accounted for more than half of the FDI stock in 2005. It is also reflected in these studies that China's FDI is attracted to specific sectors mostly; oil and minerals, physical infrastructures, agriculture, manufacturing, services and retail trade. Oil, minerals and physical infrastructure were the main sectors targeted by China's investment in SSA, Ajakaiye *et al* (2009).

The central policy issue facing SSA, including Sudan, is how to maximize the gains from the upsurge of China investments, which provide a window for finance and technological transfers, while addressing the potential and possible challenges. Kaplinsky and Morris (2009) suggested unpacking the streams of these FDIs, and the use of a micro-oriented approach to focus more on the behaviors of the investing firms to improve our understanding of the source of gains and challenges presented and what policy can do. By placing China's investment in Africa in its historical context, four types of investors were identified: central-state-owned firms, provincial-state-owned firms, Chinese private firms incorporated in China, and small firms operating in Africa owned by Chinese 'migrants'. Each type of investors has its own characteristics, but the first two, SOEs the first movers, were differentiated from their western counterparts by being closely and strategically bundled with aid and trade links. The authors suggest that the SSA countries can benefit by developing a strategy of integrating aid, trade and FDI vectors similar to that which is being pursued clearly by the Chinese SOEs. However, this needs to be coordinated informally and bilaterally between the concerned governments.

The Chinese private sector FDI, the second movers, as well as Chinese immigrant investors are relatively under researched. One reason may be that, private firms were recognized in China for the first time in 1982 as supplementing entities to SOEs, but such ownership form was only properly defined in 1988, was acknowledged to be an integral part of the Chinese economy in 1997 and had its legal status strengthened in 1999 (Voss *et al* 2008). Chinese immigration has long history; however, recently interest develops on the role of those migrants as the trading hubs of China's trade access into the global economy.

Gu (2009) studied the private FDI of firms incorporated in China, the analysis is based on interviews in both China and Africa with Chinese entrepreneurs and African policy-makers. Eight provinces and regions in China and in Ghana, Nigeria and Madagascar were survived. The results of the study reveal that the number of China-incorporated firms who have established operations in SSA is substantial. The official records quite underestimate the number of these firms.. It is also shown that many of the Chinese investors are drawn to Africa by intense competition at home, and that contrary to much of the current conventional wisdom, the Chinese



state offers little support to these private investors. Kragelund (2009) compiled data from various sources to review the trend of China's investments in Zambia; the results showed that by 2006, China had become the largest foreign investor in Zambia, with 184 documented investments. It was also found that these investments diversify away from resource-seeking; the Chinese investors were mostly attracted into manufacturing followed by services and construction. In the same vein, and contrary to the view that China's FDI may indirectly hurt Africa's manufacturing sector, Ancharaz (2009) study of the Mauritian case explains the resilience, in particular, of the clothing and textile industry in the face of China's challenges. It was shown that the prudent government policies, in collaboration with the private sector help to mitigate the impact of the Chinese firms investing in the Mauritian export processing zones (predominantly in clothing). Mauritius also gains from Chinese aid in construction and infrastructure.

Mohan (2009) highlighted the trends of the fourth type of China's investors in Kaplinsky and Morris's taxonomy. The study showed that although the Chinese migrants in Africa have long history they remain scattered, except in couturiers like South African and Mauritius. However, in post 1990s this diasporas increasingly play a role in facilitating FDI by private sector and provincial SOEs through networking.

China's investments in Sudan generate heated debate in popular and specialized literature alike. Much of the discussion was triggered by the operations of China's firms in the country's oil sector, which was abandoned by their Western counterparts. The optimists draw on the case of Sudan to point that China's deal of combining FDI, non-interference and aid not tied to political situation, provides an alternative "new developing model" for African countries to choose. In contrast, others argued that such deal is problematic, it has let to irrational governance and deterioration of transparency in Sudan, (Sahu, 2008). Before sealing peace in 2005, the argument was that China's FDI has exacerbated the Southern conflict and caused displacement of civilians, (Patey, 2006; and Crisis Group, 2008). Recently Darfur conflict is linked to these investments, (Crilly, 2005).

The subsequent sections of this study show that the COMNCs are not the sole player in the Sudanese oil sector, and the behavior of these firms is not atypical, in terms of profit orientation, given the strategic importance of oil and symbiotic relations often spanning the oil company and the home-host states. Obviously, production of oil as such is not a source of violence or corruption, but politicization of oil is the main reason driving these problems.

Outside oil, there is a noticeable increase in the number of private Chinese firms, with great potential for contribution in import-substitution and hence improving competitiveness in the industrial sector.

## **IV. Theoretical framework and methodology**

### **IV.I. The theory of FDI**

Early research on the impact of "factor movement", conducted by trade theorists, focuses on factor cost advantage promoting international trade given factor immobility. For example the Heckscher-Ohlin-Stolper model developed in 1930s predicts that, given identical constant return

to scale production functions in two competitive economic spaces, the with-trade “spatial equilibrium” is characterized by factor income equalization and the locally-scarce factor of production will be worse off. However, the work of Losch (1939), subsequently integrated into the theory of location, implies that, for two comparably endowed economic spaces, if trade takes place, along with factor mobility, and a typical producer is able lower the average production and/or transport costs, then the spatial equilibrium will be consistent with a hierarchical ranking of the productive units, ordered by their average production and transport costs. Such ‘spatial equilibrium’ of ‘natural monopoly’ is not consistent with factor income equalization and in a dynamic setting may develop backlash effects leading to polarization between and within economic spaces. These theoretical inputs provided the intellectual source for subsequent researches on factor movement embedded in foreign direct investment.

Historically the investigation of the outcome from FDI in LDCs involved cost-benefit analysis of individual FDI project as well as the overall effect of FDI flow on growth of the host. The former concept arose out of a need to quantitatively assess whether a person, business or society at large would experience a net benefit or net loss from a given project. Protocols of this analysis have evolved over time and increasingly adapted for more complex cases. Lall and Streetan (1977) provided an example of FDI assessment using cost-benefit approach. At a macro-level, early growth literature, focusing on LDCs, upheld that the inflow of FDI could augment the marginal productivity of labour; the ‘abundant factor’, and reduce the marginal product of capital; the ‘scarce factor’. Other benefits may include higher tax revenues especially from private FDI (if it is not attracted in the first place by low tax) and know-how spillover effect to the domestic firms through technological demonstration effect or through pressure that compel them to adopt more efficient methods (MacDougall, 1960). These views were also articulated in the two-gap model developed by Chenery and Strout (1966) on the count that developing countries suffer from shortage of both savings and foreign exchange. The most benign model of FDI along these lines contends that the potential host is caught up in a poverty-laden equilibrium, with low productivity levels leading to low wages and thereby low levels of saving and investment which in turn result in perpetuating low productivity. FDI can break this cycle by complementing domestic saving and supplying more efficient and effective management and product and production technologies (Cardoso and Dornbush, 1989).

Early writings on FDI also consider firm specific motives for internalization. Vernon (1966), for example, pointed to the potentials of realization of economies of scale that reduce average cost as an explanation for internalization of firms. He argues that products pass different stages of development and that demand may vary across countries, hence firms would be able to exploit economies of scale by expanding production abroad. Another explanation that draws on the theory of organization postulates that internationalizing firm could exploit imperfections in the local product and factor markets (Hymer, 1976).

In late 1970s Dunning developed an eclectic approach, which often used to explain the reasons for FDI, the factors determining its level and how it may impact the host country. The approach draws on various theoretical stands: trade theory, organization theory, internalization and transaction cost theories. Dunning’s approach postulates that, for a typical firm, FDI is motivated by holding ownership specific advantage (O) the firm wants to exploit in foreign location (L) but cannot do this ‘advantageously’ except through internalization (I) (Dunning 1979, 1981). The OLI framework could be highlighted in the following: first, firm may possess net ownership

advantages vis-à-vis firms of other nationalities in serving particular markets. These firm-specific advantages largely take the form of the possession of tangible or intangible assets such as know how, brand name, and scale economies that, at least for a period of time, are exclusive or specific to the firm possessing them. Second, the firm would seek a host country which demonstrates relative country-specific advantages over others in terms of infrastructure, resources, policies, culture, attitudes and so on. Third, assuming the first and second conditions are satisfied, the firm has to decide on the entry mode. It would be more beneficial to the enterprise possessing these advantages to use them itself rather than selling or leasing them to foreign firms. That is, the firm prefers to internalize its advantages through an extension of its own activities rather than externalize them through licensing and similar contracts with independent firms. Utilization of these advantages may be in conjunction with some factor inputs (including natural resources) outside firm's home country; otherwise foreign markets would be served entirely by 'trade' and domestic markets by domestic production. The strategies and tactics of the MNCs vary and may include the following four groups of motives: natural resource seeking, market seeking, efficiency seeking, and strategic asset seeking.

The OLI formwork was extended in many occasions; first, the (IDP) was introduced to impart dynamics to the basic OLI. The IDP attempts to explain the link between the net-FDI (i.e. outward FDI minus inward FDI) and the level of development (Dunning, 1981, Dunning and Narula, 1996, 2004). The IDP postulates five stages where FDI remarkably changes patterns as a country develops. In the initial stage, the host attracts very little FDI, if any, and when it occurs, it is mainly inward FDI to exploit available comparative advantage, typically in the natural resource sector as the intra-industry investment and trade are very low. In the second stage, the country develops certain advantages that attract some MNCs to move in. These advantages are typically undifferentiated, e.g. cheap but unskilled labour, emergence of sizable market for MNCs to take advantage of due to the increasing intra-industry trade, but as the (O) advantage is very weak, no outward FDI takes place. If it happens, it is still small and directed to countries at similar stage in the IDP. In the third stage, both intra-industry investment and trade are increasing; the host is able to create sophisticated and differentiated advantage through infrastructure and human capital development. These 'created assets' attract market-seeking MNCs but also increasingly efficiency-seeking ones. Outward FDIs also take place in this stage and are directed mainly to backward countries or to countries in similar stage of IDP, but are also increasingly aiming at acquiring more advanced countries' strategic assets that can further develop the domestic firms. In the fourth stage, a strong industrial base is developed and the country engages in massive outward FDI targeting advanced countries, hence it become net exporter of FDI. In the final stage, as the case in the now advanced countries, there is increased convergence in inward and outward flows.

The OLI-IDP framework not only provides an explanation of the FDI and its likely impact on the host and how the individual components of the OLI changes with stages of development, but it also furnishes a base for policy interventions at any given stage in terms of creating the prerequisite for move to a higher level of the IDP as well as attracting the MNC-related development strategies that the host is interested in (Narula and Dunning, 2009).

Another extension attempts to incorporate the political factors that are likely to influence the MNCs (Jean, 1988). Even Dunning (1981) eclectic approach refers explicitly to government interventions of various kinds when discussing the sources of ownership, location and

internalization advantages. However, these sources are essentially assumed exogenously given to the MNC. Jean (1988) argument was, why ownership advantage not be extended to include political ‘knowledge or expertise’. These political advantages can take the form of better intelligence about political actors and opportunities as well as more readily access to political opinion and decision-makers. Rugman (1981) considered these political resources as “intermediate products” whose market could be internalized by the MNC. But why the MNC is better off vis-à-vis the local firm in developing and using these political knowledge and expertise, while the latter firm is more familiar with domestic political resources and enjoys favorable nationalistic sentiment? In this regard, it is hypothesized that the MNC overcomes this disadvantage on the basis of greater resources; support from their home state and multinationalization. Internationalization helps explain why the ownership of better political intelligence, access and influence skills are often built-in the hierarchy of the MNC (Jean, 1988).

A widely debated extension of the OLI emerges from a recent strand of literature in connection with the Third World MNCs emanating mainly from China and India. For instance, Mathews (2006) showed that these firms are characterized by ability to internationalize very rapidly, while undertaking organizational innovation through networking, and hence the OLI may not adequately describe the behavior of the Asian late-comers. Mathews suggested an alternative LLL model to account for the sources of advantages of emerging MNCs; namely, (i) *Linkage*: the ability of these firms to focus not only on their own existing advantages, but more on how to acquire external advantages through linkages; (ii) *Leverage*: ability to leverage resources through networking rather than getting advantage from internalization; and (iii) *Learning*: ability to learn, imitate and build advantage from know-how in linkages and leveraging processes. However, the LLL could be taken as an explanation of the sources of ownership advantage rather than an extension of the basic framework.

In a recent contribution Narula and Dunning (2009) showed how globalization and networking influence the nature of OLI comparative advantages. *Inter alia*, value-adding activities become increasingly knowledge or information-intensive. Accordingly, the firm-specific intangible assets, especially intellectual capital, have become more mobile, and the host L advantage is increasingly weakened. The governments of the developing countries now increasingly compete with each other to attract mobile investment.

#### **IV.II. The methodology**

The debate on the FDI-assisted development is still raging. One reason for this is, perhaps, the preoccupation with policy prescriptions, especially among the ‘falling-behind’ countries, on how to break the paucity of their low saving and investment equilibrium, which often emphasizes a normative perception of development. The basic OLI model has survived so far because it draws from various theoretical stands and predicts both positive and negative impacts on development of FDI in a way consistent with the Schumpeterian view of development as a historic process<sup>7</sup>.

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<sup>7</sup> Schumpeter (1936) provided a positivist view of development as lopsided, discontinuous, and disharmonious process. In this sense development is problem solution- problem creation process (see Nixon, 1987).

As noted earlier, the bulk of the recent China's FDI in Sudan was attracted in the oil sector. A typical OMNC usually operates in a market with extensive political intermediaries for the following reasons:

First, crude oil is not a single homogeneous product, but it touches every aspect of other products. It is a base for a wide range of industries including, *inter alia*, infrastructure; textile, plastic, synthetic rubber, frozen foods, and pharmaceuticals. More importantly, oil is the base for a wide range of energy resources and is of importance to the maintenance of industrialized civilization itself.

Second, oil is a depletable resource. The World Energy Outlook 2007 published by the International Energy Agency reveals that global oil supply was 84.4 million bb/d while consumption was 85.3 million bb/d. It is also noted that, given the current consumption levels, and assuming that oil will be consumed only from reservoirs, known recoverable reserves would be depleted around 2030, potentially leading to a global energy crisis. However, there are factors which may extend or reduce this estimate, including the rapidly increasing demand for petroleum in China, India and other developing nations; new discoveries; energy conservations and use of alternative energy sources and new economically viable exploitation of unconventional oil sources.

Third, given the consumption and production patterns, oil was developed into the security agenda of all national states let alone the biggest consumers the USA and China. Despite the presence of numerous players in the oil sector, global oil industry is still controlled by a few OMNCs. For example the top 10 OMNCs are among the 500 fortune and their revenues collectively add up to US\$ 18.9 trillion in 2006 equivalent to one third of world GDP.<sup>8</sup> These business agglomerates are often more powerful than a typical national state in LDCs. Although the top 5 OMNCs are privately owned<sup>9</sup>, arguably the essence of their power is not limited to the realization of hedonic profit, but largely lies in their ability to put specific technological, institutional, legal and political barriers on the common use of resources and know-how. In addition the energy security concerns of the home state are directly and indirectly linked to the OMNCs.

Due to these reasons, a symbiotic relationship develops between the home state, the OMNC and host state. The integration of private ownership, public office and state institutions becomes indispensable for internalization of the "political intermediate products" in oil business. Shared interests between these parties enable a typical OMNC to shield against the business risks other investors usually face. Generally, the 'fluid boundaries' between the firm and the home-host states complicate the analysis of oil investments.

It is a challenge to define relevant units of account to furnish a base for an empirical evaluation of the social costs and benefits of China's oil FDI in Sudan. Another challenge relates to the disaggregation of the FDI in Sudan oil into Chinese and others for separate assessment. Due to these limitations, sector-level information is used to assess the consequences of China's oil-FDI, and firm level information is used to describe the non-oil component of these investments.

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<sup>8</sup> See CNNmoney.com: A profit gusher of epic proportions.

<sup>9</sup> These are ExxonMobil, BP, Shell, Chevron and Total.

The analysis proceeds as follows; first, the contribution of China's investment to capital formation in the oil sector is highlighted; the payback of such investment is reflected in terms of the overall sectoral yields, current government share and contribution to GDP. China is not the sole investor in Sudan's oil, nonetheless, it is the main player and its investment in this venture is the largest overseas energy project in terms of host-state payback. Arguably, the spread effects of these investments transcend the usual financial calculus of yields, contribution to GDP and economic space to include the resource-related violence, environmental effects, and exposure to global pressures emanating from NGOs, activists and Corporate Social Responsibility. The study gives an overall qualitative assessment of these non-pecuniary effects. Second, the information on licensed Chinese firms, according to the registry of the Ministry of Investment, is used to describe the non-oil FDI. The registry contains information on invested capital, sector of business and geographical distribution of licensed firms. This data did not give information on firm's balance sheet; however it provides an idea about the sector and location-attributes that motivate the firm to register. Due to this limitation, the complementarity and competitiveness relating to scale of operation of these firms is highlighted by further information collected from a sample of them, matched with local counterpart by employment size class. The complementary and competitive effects of FDI can be direct or indirect (Kaplinsky and Morris, 2006). In this study, direct complementarities are assessed in terms of linking domestic firms in supply chains and opening up markets for cheap raw materials for them, (approximated by import intensity of input). In the case of oil FDI this also includes provision of appropriate cheap technology as well as subcontracting of local firms. The direct competitive effects include displacement of local firms, through, for example, cost-cutting approximated by value-added per worker, whereas in the case of oil the indirect effect of competitiveness includes divestment resulting from the pressures of human-right activists and NGOs.

More specifically the following hypotheses are evaluated for the non-oil business:

First, the Chinese firms create complementarity, and save forex due to use of more raw materials sourced from the domestic market.

Second, the Chinese firms are more competitive vis-à-vis the local counter part due to increased labor productivity, managerial competence, and more work-shifts.

Third, Chinese firms impart labor skills through their on-job training programs.

Simple probability model is developed to assess the likelihood that the Chinese firms differ from the local counterpart. Information on 20 such firms (foreign private or joint) matched by employment-size with 20 private local counterparts is used to evaluate these hypotheses. Data is collected by implementing the industrial establishment survey questionnaire of 2001. The following variables motivated by the hypotheses are constructed as follows. First, import intensity of input is developed to test the first hypothesis. The intensity is measured as the share of imported input to the gross sales; import of capital goods is not sampled, hence this proxy may underestimate import content of intermediate consumption. Second, value added per worker and the education of the manager are used for the second test. Value added per worker is defined as the difference between gross sales and the intermediate consumption over total number of

workers at the firm level<sup>10</sup>, and the manager's education is dummy-coded equaling 1 if the manager has a university degree and zero otherwise. Finally, the availability of training program at the firm level is dummy coded; equal to 1 if the firm has training program and zero otherwise. This variable is developed for the third test. Also three location dummies were included to control for firm location within the three towns of Khartoum State (Khartoum, Omdurman, and Bahry, with Omdurman being used as the reference category). In order to improve the efficiency of estimation, the variables for the first and second tests were further dummy coded depending on whether the firm's score is greater than the overall group average (dummy is equal 1) or equal or below average (dummy set to zero). The dependent variable is a dummy variable if a Chinese firm is observed and zero otherwise. The results of group mean difference test is reported to help the interpretation of the probability model.

## V. The empirical Analysis

### Trend, stock and orientation of China's FDI

The background section shows that initially China's FDI contributed to most of the upstream FDI over 1996-99, afterwards the contribution of other partners started to pick-up to reach 1.2 US\$ billion around 2005, the year of enacting the CPA, before falling to less than a third of this level in 2007. However, China's oil-FDI was increasing over 1996-2007 and averaged 43 percent, it also contributed by 50 percent to the oil export infrastructure.

Table (5) presents a summary of the stock of investment by the Chinese firms and their motivations. As seen the bulk of FDI is committed by the SOEs and is attracted in crude oil production and oil export infrastructure. Although the size of the Chinese market-seeking FDI is small, it is carried out by a large number of private firms. It is not clear whether these firms were incorporated in China or established by 'migrants', i.e. Chinese workers in Sudan. As indicated earlier, the listing of the companies' registry includes more than double the number registered with the (MOI), (shown in the table). These firms are either in the process of registration with the ministry or most probably are conducting business and are not interested for time being in (MOI)'s incentive package.

Table (5): Stock and orientation of China's FDI in Sudan

	Resource-seeking	Market-seeking
No of Firms	13	97
Type of firm	SOEs	Private
Stock of FDI (\$ million)	7560	81.83

Source: based on tables (A1 and A2), MIO registry.

### Structure of ownership of the Chinese firms

<sup>10</sup> The measurement of the variables defined so far in the first and second tests was carried out following the guidelines of sections 4.9-4.11 pp. 135-6 of the report on the Comprehensive Industrial Survey 2001, Sudan.

Table (6) highlights the distribution of the Chinese firms by ownership structure, as seen the major companies in the oil sector are SOEs, and enter in varied joint venture arrangements due to complementarities in oil investment. The first three SOEs-public-joint; are the CNPC, ZPEP and China Wisdom, the other forms of partnership, 7 firms, and sole-foreign, 5 firms, engaged in oil services mainly drilling, Logging, catering and well heads and casing. As indicated earlier, the wholly private foreign is the preferred mode of entry for the majority of the private firms.

Table (6): Structure of ownership of the Chinese firms in Sudan

	Chinese SOEs			Chinese private		
	Public joint	Foreign and Public joint	Foreign	Foreign private	Private joint	Total number
Chinese SOEs	3	7	5	-	-	13
Chinese private	-	-	-	67	30	97
Total	3	7	5	67	30	110

Source: based on tables (A1 and A2), MIO registry.

#### Sectoral distribution of the Chinese private firms

Generally the documented Chinese private firms were attracted into manufacturing, 74 firms, services, 17 firms and agriculture 6 firms. Tables (7) and (8) respectively provide further description of the firms in manufacturing and the service sectors.

Table (7): Private Chinese Firms in Manufacturing by Major Division

Mina division of activity	No. of firms	Percentage	Employees
Mining	3	4.1	622
Food processing	3	4.1	162
Textile	2	2.7	78
Furniture	4	5.4	189
Paper	2	2.7	114
Plastic	10	13.5	417
metallic	2	2.7	141
Construction	36	48.5	1530
Machine assembly	1	1.4	106
Leather	5	6.8	269
Electronics	4	5.4	172
Pharmatheutical	2	2.7	114
Total	74	100	3914

Source: MIO registry.

Table (8): Private Chinese Firms in Services by Major Division

Mina division of activity	No. of firms	Percentage	Employees
Restaurants and Hotels	3	17.6	85



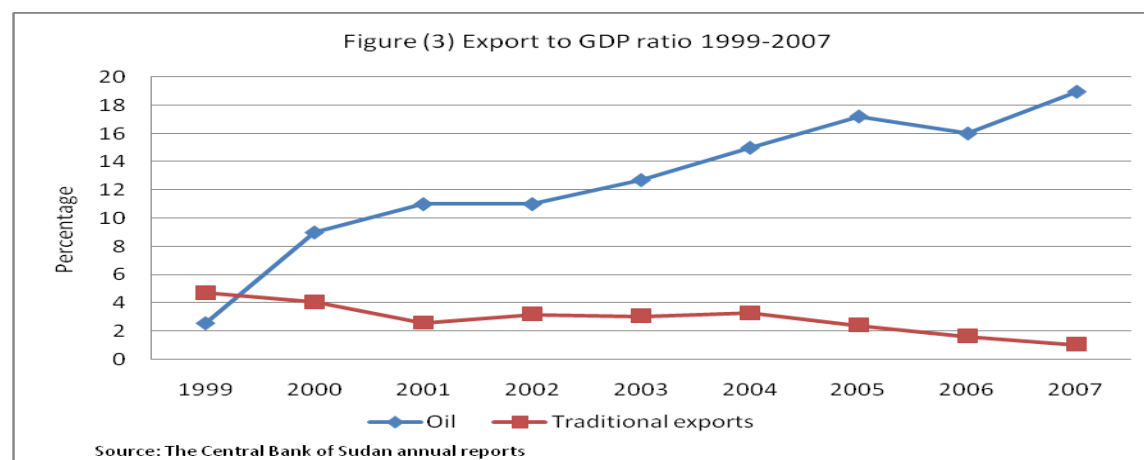
Engineering; mechanics services	4	23.5	140
Transportation	6	35.4	399
Advertisement	3	17.6	79
Medical services	1	5.9	9
Total	17	100	712

Source: MIO registry.

As seen in table (7) construction attracted the bulk of incoming firms as indicated by number of enterprises and size of employment. Manufacturing of plastic products ranks second in terms of number of firms and third in terms of employment size. Although mining attracted 3 firms, yet it ranks second by employment size. Table (8) reveals that transport services attracted more firms and the number of jobs generated are much higher than in other sub-division within the service sector. Engineering and mechanics services come in the second rank. As noted, the information of the (MOI) registry gives an indication of the magnitudes involved rather than actual figures. However, the information reflected by these tables implies that the interests of the incoming Chinese firms were quite diversified and the bulk of these firms were engaged in manufacturing activities mainly in the construction sector.

#### Marketing implications of China's FDI

Crude oil is the most important product of the Chinese companies in Sudan. Output is targeted at both the domestic and export markets. Currently Sudan is self-sufficient in key oil products, and the supply to the domestic market is constraint only by the local refining capacity, (World Bank 2009). Figure (3) depicts the trend of oil exports over 1999-2007, as appears there is striking shift in the composition of exports, about 90 percent of Sudan exports now come from oil, by itself this is an evidence of the Dutch disease. The rising income from oil wealth also contributes to a gradual shift in demand from basic goods to manufacturing and services. The sectoral distribution of the documented Chinese private firms suggests that these firms targeted the space created in the domestic market in the manufacturing and service sectors.



#### The role of China's FDI in augmenting productive capacity

China's FDI contributed mainly in creating capacity in the oil sector. As seen in the lens of the OLI framework, it could be said that the Chinese OMNCs have the (O), ownership-advantage- in terms of the technology and financial resources which Sudan lack, however, it processes the oil resources needed to complement the (O) to make internalization viable. These firms, with their Indian and Malaysian partners, have managed to develop the dormant oil sector in a mid of civil conflicts and Western sanctions into the country's leading export'; and they demonstrate ability to manage all facets of a petroleum extraction operation to international industry standards, (see Alden 2007).

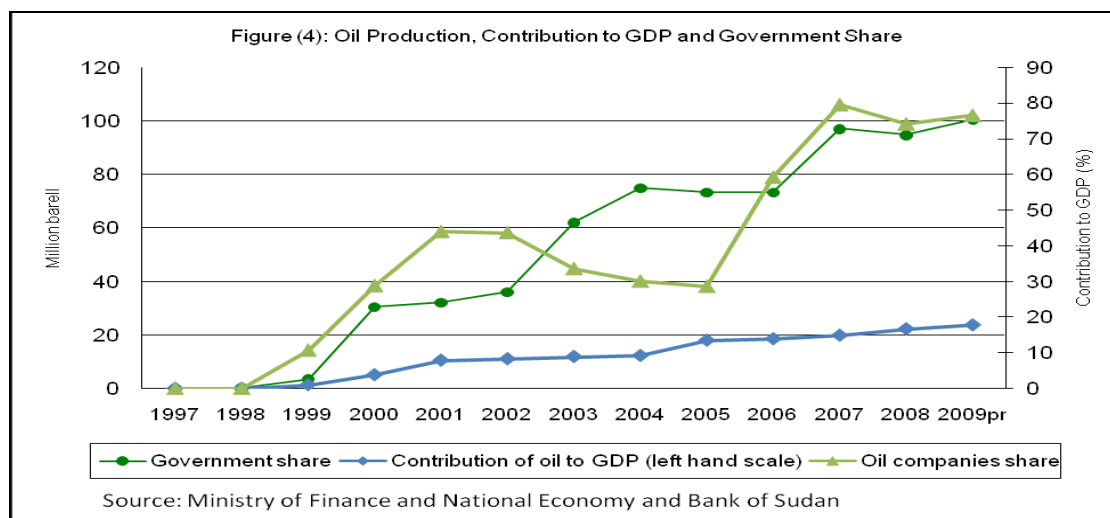
While the size of Chinese private FDI is small it appears to contribute to the productive capacity in the import-substituting industries (ISI) followed by the service sector. A relatively large number of incoming private firms were attracted into the construction and plastic production, which entail transfer of equipments. In addition, some of the firms in the service sector operate their own fleets which are an addition to the domestic capacity in road transport carriers. Other firms were attracted to render engineering and mechanics services.

#### Overall benefit of China's FDI

China's oil investment has the double effect of expanding the export sector, (see figure 3), and reducing Sudan's dependence on imported key oil products. The investment of the CNPC in the domestic refining capacity has contributed to (ISI), which in turns augments domestic value addition and gave rise to other processing industries based on oil namely plastic products and road construction.

Windfalls from Crude oil production are the major value added, and the share of the government started from scratch to reach about 56 percent in 2008. All oil revenues are channeled through the public sector, which publishes aggregate data on crude oil production and government share (Sudan Ministry of Finance web site).

The contribution of petroleum to economic activities has progressively grown from 1 percent in 1999 to an estimated 18 percent by 2009, figure (4). Real GDP showed strong growth bout over 1999-2008 with the rate of growth averaging 7.9 percent. The share of the OMNCs represents and outflow in terms of repayment of the invested capital.



The size of direct employment generated by China's FDI in the oil is limited due to capital intensity of this investment. The MEM (2009) showed that about 3000 jobs for nationals were created in the oil sector. However, as noted earlier the private Chinese FDI seems to generate much more jobs.

#### China's FDI complementarities and competitiveness

All oil companies in the producing fields work jointly with Sudapet, which is an affiliate of Sudan's National Petroleum. The Company holds all licenses and its shares ranges from 5 percent to 30 percent.

Five large Sudan-based companies were involved in provision of transport, feeder roads construction, civil work and seismic survey services, (Table A2). In turn; some of these firms, notably Hijilig Oil Serevice and Danfodio Ho, sub-contracted numerous local providers. These two firms also worked jointly with other China-based companies in providing service for the construction of Marawi Dam. Danfodio Holdings, which is the largest commercial and construction company in Sudan with 12 subsidiaries, has implemented 35 contracts with Chinese firms<sup>11</sup>. The company even internationalizes in joint venture with China's Transtech Engineering to build a US\$ 634 million railways project in Mauritania.

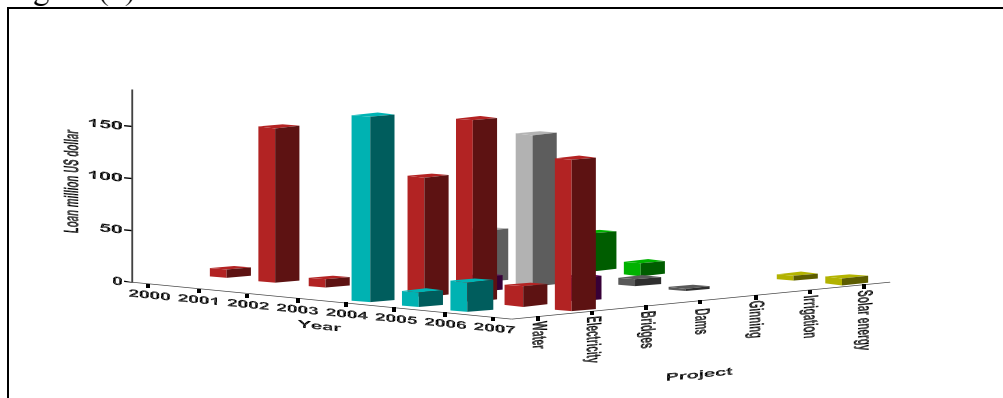
About 31 of the licensed private Chinese firms enter into joint venture with Sudanese counterparts; and hence contributed to strengthen them. Some of the incoming firms operate in processing imported inputs and components for business-drumming-up industry. Their activities include advertisement designs, business logo and paper design as well as ICT components assembly. A niche urban market is created for numerous local firms to engage in. Some of the local firms already started similar activities and benefiting from the markets for cheap raw materials opened-up by the Chinese private firms. As a broad generalization it could be said that, China's FDI is more complementing with domestic firms than competing.

<sup>11</sup> <http://www.danfodiocc.com/companyprofile.htm>.

## Is China's FDI in Sudan bundled with aid?

A look at figure (1) suggests that the answer is yes. Particularly Sudan borrows more from China after its conventional sources of credit dried-up due to the huge arrears and loss of seal of approval for new loans. In addition, the Western sanction limits the country's access to loans and aids from non-official sources. By default, China increasingly provides loans and aid-in-project to Sudan. For example, project-based lending increased more than 18 times from \$ 0.01 billion over 1970-2000 to \$ 1.84 billion over 2000-2007. Figure (5) depicts the distribution of loans ordered by sum over project 'activities' for the latter period. As seen, with the exception of ginning which received less than 0.01 percent of the total, the rest of loans were committed in infrastructural projects mainly electricity, water and dams. The repayment schedule and the interest charged on these loans are not available. However, the charges in general vary from zero to 3 percent and the repayment period from 3 to 30 years, (MFNE 2008).

Figure (5) Sector distribution of China's loans to Sudan



Source: Based on data from the MFNE (2008).

Does China FDI differ in character from FDI sourced from other sources?

In the wake of the liberalization since 1989 there are many reason advanced for promoting multilateral dealing and delinking of aid, trade and FDI vectors, which were inevitable to combine during the colonial era for the sake of developing export sector of the colonies, Kaplinsky and Morris (2009). Notwithstanding, China's FDI in Sudan represents an integrated vector of aid, trade and FDI. One reason is situational, in the lens of the OLI-IDP; Sudan exemplifies a typical accumulation model, dominated by natural resource extraction and import substituting industries (ISI) with limited intra-industry investment and trade. These are not Sudan's specific characteristics. As explained by Dunning (2000), the majority of the countries in stage 1 and 2 of their IDP exhibit such traits and are disadvantaged by globalization, which weaken their L and are not able to sufficiently supply the kinds of facilities the MNCs need to complement their own O advantages. Moreover, the opportunities for sequential FDI remain limited especially in higher value added activities, which provide the most significant potentials for spillovers. With limited assets and L advantages to offer MNCs, resource seeking is often the only FDI to occur. In such case an integrated vector of aid, trade and FDI is bound to arise at least to coordinate a "big push" in the export sector. Another reason is that Sudan is under sanction for a long time, which makes it difficult for the country to source the needed investment multilaterally.

Increasingly, the large Indian firms investing in SSA's resource and infrastructure sectors follow a strategy similar to the Chinese MNCs, and it is not a bad strategy at all. The SSA countries can adopt an analogous strategy of integrating the aid, trade and FDI vectors to leverage investors to meet their complementary developmental and infrastructural needs Kaplinsky and Morris (2009). Sudan could follow such wisdom to attract more Chinese FDI into its declining agricultural sector. It is noted earlier that, this sector attracted mere 6 small private firms. Food processing, and enhancing value addition in the traditional export sector are other potential candidates. As pointed by Kaplinsky and Morris agreements on bundling can be reached informally through government-to-government discussions without running-up against WTO rules.

A major problem Sudan faces relates to the misinterpretation of the classic symptoms of the resource-curse associated with the export enclaves by the activists and NGOs to propagate for invest-or-divest. Such enclaves are typically isolated from the rest of the economy often politicized and remain a source of violence over distribution of resource rent in many LDCs. Collier (2007) pointed to the violence over distribution and the Dutch disease of natural resource abundance as critical internal reasons for the failure of the countries of the bottom billion. The other two reasons relate to lack of accessibility to global markets resulting from being landlocked with bad neighbors and bad governance. Generally Bichler and Nitzan (1995) pointed to an external reason for propagation of conflicts relating to the possibility of linking the conflict to the weapon-dollar-petro-dollar coalition of large defense contractors and OMNCs.

However, oil *per se* is not a direct cause of Sudan conflicts, yet the oil factor furnished an important base for negotiating the CPA, sealed in 2005, and the distribution of the natural resource rents was enshrined in the Wealth Sharing Protocol. This is one of the few cases where the conflicting parties agree on a clear formula for sharing the resource rents and embark in the peace consolidation, however, sanctions and pressures from the international civil societies continue, which send a vexing message.

Sandra (2004) pointed that many Western-based OMNCs operating in crude oil production in Africa use strategic philanthropy so that they can relate directly to local communities and so avoid civil society pressure. Investment in Sudan's oil is the largest overseas energy project of COMNCs, seen through the (LLL) framework, the venture provided them with, *learning*, a test-bed for future FDI. Equally important China's oil companies also start to follow the suit of the strategic behavior of the Western giants, for instance, by 2009 US\$ 35 million was donated by these firms for public welfare projects in the upstream areas in Sudan.

### The spillover effects of China's FDI

China oil investments incorporate transfer of technology in the upstream operations as well as downstream in refineries and oil-export infrastructure. In addition training of local staff in oil industry is included in the extraction agreement. Outside oil generally, China's transfer to Sudan simple technology, often labor intensive and is not subject to the complication of the 'year models', which tends to reduce the costs of inputs. Moreover, an opportunity is opened for local firms to benefit from linking to imported inputs sources especially in advertising by linking up

with the Chinese private firms. Firms in the construction sector start to imitate their Chinese counterparts, for example many domestic firms converted to use the system of pre-fabricated blocks for roofing, (Ali 2006). Also key Sudanese firms enter in joint venture with the Chinese firms, others benefited from subcontracting. As pointed, Danfodio Holdings has further transnationalized with a Chinese counterpart.

### The Case study

Information on 20 Chinese firms (foreign private or joined) matched by employment class-size with 20 private local counterparts is used to evaluate the hypotheses in section (IV.II). This sample design is not stratified; however it gives snapshots about the scale of operation of these firms.

The total number of employees in the Chinese ‘case firms’ amounted to 392, with about 32 percent Sudanese. Table (9) provides a summary of the results of the group mean test for four variables; gross sales per worker, manger education, value added per worker and the import intensity of inputs. As seen, the Chinese private firms use more imported inputs in comparison to the Sudanese ‘control’ firms. They also tend to generate more gross sales and value added per worker. The group difference in manager education is not statistically significant between groups. Table (10) augmented these variables with additional controls and for more testing using the Logit modeling.

Table (9): the results of Group Mean Test

Variable	Chinese firms average	Sudanese firms average	T-value	Significance
Manager education (years)	12.5	12.1	0.67	0.506
Import intensity of input	65.9	53.7	3.217	0.003**
Gross sales per worker (in \$)	18455.3	15813.3	1.942	0.061*
Value added per worker (in \$)	5578.1	5229.5	1.941	0.060*
No of observations	40			

\*\*and \* denote significance at less than 1%, and 10% respectively.

Source: fieldwork data.

Table (10) Performance Indicators of China’s Small Enterprises in Sudan, (Logit results)

Variable	Coefficient	z-Statistic	Prob.
Constant	-3.392	-2.361	0.018
Manager education	1.201	1.167	0.243

Import intensity of input	2.030	2.114	0.035
Value added per worker	1.770	1.782	0.075
Training program	0.452	0.472	0.637
No. of work-shifts	2.020	1.885	0.059
Khartoum	1.575	1.210	0.226
Bahri	-0.343	-0.272	0.786
Log likelihood	-17.10876		
McFadden R-squared	0.382932		
No of observations	40		

The dependent variable is a dummy taking value of 1 if a Chinese owned firm (or joined with local firm) is observed and zero otherwise. The reported z-statistics are for the test that the underlying coefficient is zero.

*Source:* Source: fieldwork data

The McFadden R-squared implies that the overall fit of the model is good; however not all individual coefficients are significant and they are not readily interpretable as marginal effects. However, the antilog of odds greater than unity gives an idea about the likely occurrence of the effect in question. Import intensity of inputs is significant, with antilog of 7.61, implying that an increase in import intensity of inputs is more likely to be associated with an additional investing Chinese firm relative to the reference category (the Sudanese firm). This could be taken to mean that an additional incoming Chinese private firm is more unlikely to create complementarity through development of supply chain with local firm. This also indicates the weaknesses of the inter-industry linkages and trade in Sudan in consistency with the countries of stage 1 and 2 of their IDP. Notwithstanding, their relatively high import intensity, an addition to value added appears to be more likely associated with an additional Chinese firm relative to the control. This result may be due to a substantial tax exemptions enjoined by some of these firms, which is not reported in the data, but the results also show that these firms are more likely to work more shift, and hence tends to reduce the per-unit costs of other inputs. The rest of the variables are not significant implying that both types of firms behave similarly.

## **VI. Conclusions and policy implications (to be further refined)**

### **VI.I. Conclusions**

The broad objective of the study was to examine the impact of the recent upsurge of China's investment in Sudan in terms of its positive and likely negative effects in order to identify areas where policy can best capture the benefits of this venture, while addressing the potential challenges. Data drawn from secondary and primary sources is used for the purpose. Dunning OLI framework and its various extensions were used in understanding the behavior and motivations of the Chinese firms investing in Sudan. Tabular analysis and graphs were used to highlight the scale of operation of these firms in terms of sectoral distribution; value addition; structure of ownership; market orientation; spillover/backlash effects; employment and capacity development; use of local input; development of supply chains; contribution to technological transfer and augmentation of local firms.

The main result of the study is that, about 98 percent of China's investment since 1996 is oil-seeking and was carried by the SOEs. The investments of these companies have augmented the technological and financial capabilities of Sudan oil sector. Outside oil the size of China's FDI is limited; attracted mainly by the booming economy and concentrates on the service sector. Notwithstanding the size of this investment, it was carried by a large number of private Chinese SMEs emerging as 'second movers' encouraged by the presence of the SOEs and the space created by the oil boom.

Oil export has substantially contributed to the national economy; arguably it mirrors the advent of the Gezera scheme. Real GDP showed strong growth about over 1999-2008 with the rate of growth averaging 7.9 percent. Oil revenues contributed by more than 50 percent to central budget and the GoSS completely depends on these revenues. In addition to the direct FDI-trade complementarily, the economy indirectly benefited from the resultant relief of the energy constraint on domestic production.

Oil investment has also benefited and strengthened local firms. Five big companies by Sudan standards were involved in the provision of oil service. Two of these firms, Danfodio Ho. and Hijilig oil Co., worked jointly with other Chinese companies in providing service for the construction of Marawi Dam. Danfodio Holdings, which is the largest commercial and construction company in Sudan with 12 subsidiaries, has implemented 35 contracts with Chinese firms. The company even internationalizes in joint venture with China's Transtech Engineering to build a US\$ 634 million railways project in Mauritania.

The licensed private Chinese firms were attracted mainly into manufacturing followed by the services sector. Oil wealth has generated a shift, though limited, in urban demand away from the basics toward manufacturing and services, which created a space for these firms. Unlike the SOEs in the oil sector, their activities were more labor intensive.

The surge in China's FDI in Sudan was made possible by the sustained increase in demand for commodities worldwide over the last decade and by the vibrant industrialization process in China. The liberalization policies pursued by several countries including Sudan and China have created an enabling environment for the movements of FDI, trade and other financial flows. Over the last decade Sudan remains committed to macroeconomic reform, and introduced a series of investment promotion Acts, which since 2002 were coordinated and implemented by the (MOI). Hence, the open door policies upstream and downstream, the need for resources, the historic relations, and China's stance on non-interference smooth the progress of its companies in Sudan.

Contrary to the general perception, the Chinese resource-seeking companies are not the only OMNCs operating in Sudan. Many firms were engaged in upstream production and related services. A large number of private Chinese SMEs were engaged in various activities outside the oil sector in persuade of profitable opportunities, and if employment is the only measure of size they are even larger than the OMNCs operating in Sudan combined. Gu (2009)'s study, drawing data from comparator countries, showed that the Chinese private firms were pushed out, not by state incentives, but by shier fierce competition at home and low profit margins.



China FDI in Sudan is bundled in developmental aid, soft loans as well as debt cancellation, and this is not only explainable by China 'new model' of catalyzing its investment, but equally by the fact that the country was dropped from the list of the major Western donors since 1996. However, China aid facilitated the implementation of key infrastructural projects; in electricity, roads, bridges and water, which are important for improving investment climate. In all of the key aid-projects Chinese companies' work jointly with domestic firms, for example in the case of Marawi dam the joint venture included many local and other foreign firms.

Sudan faces the challenge of mitigating the risks of the resource-Dutch disease. The country is still a small producer of oil. Agriculture remains the main backbone of the economy in terms of employment generation and production of food staples. However the contribution of this sector to the real GDP, along with manufacturing declined by more than 6 percent since the advent of oil. Currency appreciation resulting from the integration of oil money into the economy reduces the competitiveness of non-oil exports, leading to reduction of output and employment particularly in agriculture.

## **VI.II. Policy recommendations**

Sudan's policies and institutions for FDI promotion came along way from the (AECA) in 1956, with vague definition of FDI and diversified implementing authorities to a full fledged Ministry with a mandate to determine the viability of the incoming FDI projects in the light of the national priorities. The MOI is a subscriber to the World Bank's Multilateral Investment Guarantee Agency (MIGA), and the International Center for the Settlement of Investment Disputes (ICSID).

However, policies for FDI promotion needs to acknowledge that, Sudan is at an early stage of its IDP and faces the challenge of transformation to fit into the current global division of labor. Recently the world market witnessed a rise in the share of trade in intermediate goods characterizing a shift in comparative advantage from natural-resource-intensive towards manufacturing, service and knowledge intensive industries. The attraction and motivation of manufacturing FDI with substantial spillovers require massive up-front expenditures on human capital and infrastructure before the domestication of any of these positive externalities takes place.

A large number of Chinese private investors were attracted specially in the manufacturing sector. These small size firms have great potential for creating capacity in import-substituting industries, value addition and employment. Hence, rather than gearing the incentive structure towards the eye catching big incoming firms, the (MOI) needs to develop a more simplified licensing procedures to attract these firms specially in joint ventures with the Sudanese private sector in order to diversify away from the politically loaded dealing with China SOEs. The Chinese private SMEs can fit-in the easy stage of import-substituting industrialization currently characterizing the Sudanese economy and can adapt their production to a large number of low income consumers.

Recently eight protocols were signed between Sudan and China for cooperation in the agricultural sector, including set-up of a pilot agricultural technology demonstration center in Sudan, along with a memorandum of understanding on the migrations procedures of Chinese workers in Sudan. Although, developing agriculture and imparting, agrarian technology and skills is important, yet such package need to be bundled with more market access for Sudan semi-processed traditional agricultural products, and infrastructure for linking producers to local markets.

It is arguable that Sudan was pushed by sanctions since 1996 and latter on by the pressures of the international civil societies and NGOs to play the ‘China card’. Obviously, diversification of the sources of FDI and technology is important. Still Sudan obtains some critical technological and components through products third market with high costs. Hence Sudan needs to study carefully its agreements and protocols with China to ensure maximum benefits from these deals, which are back-up by its oil. The (MOI) needs to be strengthened and linked to other specialized national institutions to effectively monitor and supervised the implementation of the key investment projects- irrespective of who is investing- and to ensure their viability and continuity.

Beyond bilateral deals, Sudan can benefit to great extent form coordination with the regional economies, for the simple reason that, the world is networked and is not flat. Cooperation remains essential for coordinating developmental complementarities. Infrastructure, food security and health are examples of activities with great transboundary benefits of complementarities, and are areas for developing and strengthening multilateral dialogue beyond the principle of bilateralism. Some of the landlocked countries, with bad neighbors and access to markets, mentioned in the list of the bottom billion by Collier (2007) are in the region. Obviously coordinating transboundary infrastructural projects to enhance the accessibility of these countries is of critical importance, China’s official stance and announced commitments towards its engagement in Africa emphasize the promotion of multilateral dialogue mechanisms. The mediation efforts of China on Darfur issue were coordinated through the African Union and the Forum for China African Cooperation

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## Appendix

Table (A1): China’s Contribution to Upstream Oil FDI in Sudan (millions US\$)

YEAR	TOTAL (FDI) in Sudan (TFDI)	TOTAL Investment Upstream (TIUS)	Percent TIUS/TFDI	CHINA Investment Upstream (CIUS)	Percent CIUS/TFDI	Percent CIUS/TIUS
1996	251.3	64	25.5	26.42	10.5	41.3
1997	413.9	170.5	36.7	115.3	27.9	67.8
1998	1248	458.5	36.7	172.61	13.8	37.6
1999	1130	326.65	28.9	123.74	11.0	37.9
2000	760.5	478	62.9	108.8	14.3	22.8
2001	1286	553	43.0	183.9	14.3	33.3
2002	1474	895	60.7	297	20.1	33.2

2003	1092	849.1	77.8	450	41.2	53.0
2004	1381	1115	80.7	512.8	37.1	46.0
2005	2800	1926.2	68.8	745.9	26.6	38.7
2006	3532.6	2003.9	56.7	758.1	21.5	37.8
2007	2425.2	1206.3	49.7	821.9	33.9	68.1
Total/ Average	15434	10045.65	52.3	4316.47	22.7	43.0

Sources: Total FDI: Ministry of Finance and National Economy (MFNE); total upstream FDI and China's share were compiled from MEM (2009).

Table (A2): Companies Operating in Oil Production and Exploration

Consortium Representing Member	or Partners and their Shares (in brackets)	Blocks	Agreement Date
<b>Part A: Operating Blocks</b>			
GNPOC	CNPC (40), Petronas (30); ONGC (25), Sudapet (5)	1, 2, 4	1997
PDOC	CNPC (41), Petronas (40); Al Thani Petroleum, UAE (5), and Sinopec, China (6), Sudapet (8)	3, 7	2000
CNPC	CNPC (95), Sudapet (5)	6	1995
WNPOC-1	Petronas (68.875), ONGC Videsh (24.125) and Sudapet (7)	5A	1997
<b>Part B: Explorative Phase</b>			
WNPOC-2	Petronas (41); ONGC Videsh (24.5); Lundin IPC (24.5) and Sudapet (10)	5B	2001

SUDAPACK 1	Zafir, Pakistan (85). Sudapet (15)	9, 11	2005
SUDAPACK 2	Zafir (83) Sudapet (17)	A	2005
RSPOC	CNPC (35), Petronas (35), Express Petroleum & Gas, Nigeria (10), Sudapet (15), High Tech, Sudan (5)	15	
PETRO SA	Petro SA, South Africa (80), Sudapet (20)	14	2005
WNPOC-3	High Tech (8), Sudapet (15), Petronas (77)	8	2003
QAHTANI & OTHERS	Al Qahtani, Saudi Arabia (33), A. A. In. (5), High Tech (7), Dindir Petroleum (15), Sudapet (20), Ansan (20)	12A	2006
CNPC, PERTAMINA & SUDAPET	CNPC (40), Sudapet (15), Pertamina, Indonesia (15), Africa Energy, Nigeria (10), Express Petroleum & Gas (10), Dindir (10)	13	
LUNDIN	LUNDIN (100)	16	
ANSAN	Ansan Wikfs, Yemen (66), Sudapet (34)	17	2006
TOTAL	Total, France\Belgium (32.5), Kufpec, Kuwait (27.5), Nilepet (10), Sudapet (10), Open (20)	B	2004
APCO	High Tech, Sudan (65), Sudapet (17), Khartoum State (10), Hegleig, Sudan (8)	C	2003
H-OIL & MINERALS Ltd	No details available	Ea	

Source: Ministry of Energy and Mining (MEM), 2005.

PDOC=Petrodar Operating Company; WNPOC=White Nile Petroleum Operating Company; APCO=Advanced Petroleum Company and RSPOC=Red Sea Petroleum Operating Company.

Table (A3): Companies Operating in the Main Oil Services in Sudan

Type of Work	Name of Company	Country
Drilling	ZPEP & GWDC	China
Logging	CNLC	China
Seismic survey	ZPEP & BGP	China; China-Sudan
Mud logging	ZPEP & CNLC	China
Catering	ZEIGIN SERVICES	China
Information technology.	China Wisdom & BPC	China; China-Sudan
Construction	Chendong; CPECC; Schlumberger; TECHNIP & Danfodio Con. Co.	China; China Germany; Argentina & Sudan
Pipeline	CPTDC; CPECC; DUBEC; CPPE; Sudapet Mannesman & OGP	China; China; China; China; Sudan; Germany & Malaysia
Well heads and	CPTDC	China



casing bits		
Pumps and well accessories	Reda Pumps; Dal-WIER	Germany; Sudan-UK
Cementing	GWDC ; ZPEP & Schlumberger	China; China & Germany
Transport & road construction	Nawras Tran. Co.; Hijilig Oil Serevice; Danfodio Ho. Kas	Sudan
Training	CNLC; ZPEP; GWDC & CPECC	China

Source: MEM (2009).

Table (A4): Sudan Rank in the World Bank Doing Business Indicators

Sudan's Doing Business Ranking	2008 rank	2005 rank	Change
Doing Business	149	160	11
Starting a Business	111	75	-36
Dealing with Licenses	135	97	-38
Employment	155	164	9
Registering Property	35	27	-8
Getting Credit	131	143	12
Protecting Investors	151	141	-10
Paying Taxes	90	131	41
Trading Across Borders	142	164	22
Enforcing Contracts	146	159	13
Closing a Business	183	151	-33

Source: compiled from <http://rru.worldbank.org/BESnapshots/Sudan/default.aspx>.