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# Impact of China's engagement on the sectoral allocation of resources and aid effectiveness in Africa

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Summary

Chinese aid, finance, trade and investment flows to Africa are growing fast. We consider the consequences of these trends using a quantified framework. Very often, adequate data are simply non-available, but we find that existing data provide useful insights on what is ongoing. We first discuss the allocation of Chinese aid, using data on turnover of economic cooperation, and we find it is at least partially comparable to other bilateral aid. We also consider the potential issue created by re-indebtedness of African countries borrowing to China. Second, we show, through studying African import patterns, that the growing importation of Chinese products in Africa can be interpreted as trade creation instead of trade diversion. Hence it has positive rather than negative impact on African economies. Third, we study the influence of Chinese engagement on economic diversification. We show that the usual "Dutch disease" argument is debatable. We find that none of the various dimensions of China engagement has had so far a significant impact, positive or negative, on African economic diversification. For the future, the evolving preferential trade regime offered by China, and its policy of creating special economic zones, could help tip the balance on the positive side.

1- <u>Introduction</u>

The engagement of China in Africa is becoming a major and meaningful phenomenon for the African continent. Beyond the quantitative impact of growing aid, finance, trade and investment flows, this engagement may have significant qualitative impacts on African development, positive or negative. It is often alleged that China engagement will prevent African economies from diversifying, given the heavy role played by extractive industries in this engagement. More generally it is also often stated that China's engagement in Africa could undermine the African development processes, implying an adverse impacts on aid effectiveness. This paper focuses on such questions related to the qualitative impact of China engagement on the development processes in Africa.

The engagement of China in Africa has been already subject to an abundant literature in the field of political science. It has been also studied from an economic viewpoint, but with lots of difficulties given the dearth of available data. Hence, most of the debates on the positive and negative aspects of China engagement in Africa are too often based on informed opinions, rather than on hard data and research results. This paper approaches these debates using as much as possible a quantified framework, in an attempt to go beyond common wisdom.

Accordingly, on a number of questions that deserve research, data are simply not available. Nevertheless, we will attempt to make good use of the existing data. As we will suggest, existing data may provide useful indirect insights on what is ongoing. From a broad aid effectiveness viewpoint, we will discuss notably the allocation of Chinese aid, which conditions in the end its effectiveness. To do so, we will rely on data on turnover of economic cooperation. We will complement this analysis by a discussion of the potential issue created by re-indebtedness of African countries borrowing to China.

We will also show, through studying African import patterns, that the growing importation of Chinese products in Africa, which we relate to the consequences of growing China engagement in Africa, can be interpreted as trade creation but do not lead to trade diversion. Hence it can be considered that such engagement has positive rather than negative impact on African development. Another angle through which one can study the influence of Africa-China trade and investment flows on African development is their impact on African diversification. The usual "Dutch disease" argument is debatable, as we will show. Theoretically, there is not much reason to believe that trade with China specifically undermines the diversification processes in Africa. Empirically, we find that none of the various dimensions of China engagement in Africa has had so far a significant impact, positive or negative, on African economic diversification.

For the future, the evolving preferential trade regime offered by China on some African products could have some positive impact on diversification. We may think also that the policy of creating special economic zones, modelled after Chinese special economic zones, will help tip the balance on the positive side.

The rest of the paper is organized as follows. Section 2 provides background information on the history of China engagement in Africa, on the relevant previous literature, and on stylised facts on China-Africa trade, FDI and aid flows. Section 3 studies aid and financial flows to discuss the aid effectiveness debate. Section 4 examines trade, FDI and diversification. Section 5 concludes and discusses the way forward in the context of the global financial crisis.

## 2- Background information

### a- Brief history of China engagement in Africa

From 1945, year of the foundation of the new Peoples Republic to 1978, year of the launching of opening reforms, China granted number of aids to African countries, most of which were based on political and ideological considerations:

- Internationally, China belonged to the Eastern Bloc in the context of the Cold War;
- Nationally, with the question of the status of Taiwan.

During this period there was almost no Chinese FDI in the African continent. The only investment was limited to government projects that were executed only by entrusted enterprises, and the latter were of course State-Owned Enterprises. Some projects were however economically meaningful. The most famous aid project was the railway Tanzania-Zambia.

From 1979 to the end of 1990, China turned to an African policy combining FDI, trade and aid. During this period, 102 projects have been invested by China in Africa, whose investment amount has reached US$ 51.2 million. Lots of large and medium-size projects have been executed, for instance, a Chinese Timber manufacturer in Kinshasa (Democratic Republic of Congo) was reported to have invested more than US$ 5 million.

At the beginning of the 1990s, China started to reform its aid towards Africa, switching from pure aid to bilateral joint ventures and collaboration between enterprises. In 1995, the Chinese Government reformed modalities of aid, diversifying its engagement from governmental action to enterprise projects. One of the officially stated objectives of Chinese aid is to help the partner country to establish its own economic development projects, and this objective has been pursued through combining aid, FDI, execution of works projects, collaboration in services, foreign trade and export.

From 1995 to the end of 1999, the Chinese Government has signed framework loan agreements with 23 African countries, and it has also financially helped Chinese enterprises to start investing in Africa. Furthermore, 11 "China Investment Development and Trade Centres" have been established by the Chinese Government from 1995 to 1997 in Cameroon, Côte-d'Ivoire, Egypt, Gabon, Guinea, Mali, Mozambique, Nigeria, Tanzania and Zambia. The mission of these Centres is to provide services and security guarantees to Chinese enterprises going to Africa for economic and commercial activities.

In 1998, the State Planning Commission determined a sort of planning blueprint for investment in Africa, which has made for the first time a quantitative analysis of investment targets in Africa by Chinese enterprises. This blueprint indicated that China was starting a strategic transformation of its investment in Africa; moving gradually from trade-related investment to investment in local manufacturing and resource development.[2]

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[2] Source PIAO Yingji, History and Trends of Chinese FDI in Africa, *Overseas Investment & Export Credits*, 5, May 2006 (in Chinese). The author of this paper does not provide more information on the content of this blueprint.

Since 2000, the Chinese Government has adopted the "Outward-Oriented Strategy" (referring to what was initially translated by Chinese officials as the "Going Out Strategy") as an answer to the challenges of economic globalization. Chinese enterprises have mature technologies in the sectors of textile, consumer electronics, construction materials, agriculture, food manufacturing etc., whose high value for money bring lots of benefits to consumers. In addition, Chinese investors in Africa can enjoy not only local preferential policies, but also the benefits of preferential trade policies granted by the EU and the US to African countries. Therefore, the African continent is one of the major regions chosen by China to implement its "Outward-Oriented Strategy". As a matter of fact, China has adopted a series of policies to encourage Chinese enterprises to invest and establish factories in Africa, for instance, relaxation of the restrictions concerning investment abroad, tax-exemption policy concerning the equipment, spare parts and raw materials needed for construction of factories. For enterprises whose investment abroad stimulate export of domestic products and explore new export market, the Chinese government will provide support like simplified administrative procedure and reduced taxes. The Government allows also enterprises abroad to retain all their profits in foreign currency within 5 years after the opening of business in Africa.

### b- Literature review on China engagement in Africa

The recent literature on China engagement in Africa has considered different aspects of this engagement and their interrelations. The principal aspects are aid, finance, trade flows, trade policy, and FDI. The following summary of this literature does not try to be exhaustive, but points to significant studies on these different aspects, which will be subject to further research in the next sections of this paper.

Wang (2007) has provided an attempt to build estimates of aid flows to Africa, and more generally to quantify the engagement of China in Africa. This paper confirms that although aid has dominated China engagement in the past, it has moved gradually to complementary commercial engagement, through trade and FDI.

The amount of aid given by China is also assessed by Brautigam (2008), who discusses all available estimates of Chinese aid. Kragelund (2008) studies all aid flows from new bilateral, non-DAC, donors, and put Chinese aid in perspective. Such aid is still relatively small compared to the major DAC member aid flows.

Recent estimates of infrastructure financing flows are provided by Foster et al. (2009), using a new database based on information released by press. According to this source, Chinese infrastructure finance commitments in sub-Saharan Africa have grown fast and have cumulated to a total of US$16 billion in 2001-2007. Accordingly, most of this financing is not aid in the DAC definition, although part of it has some element of concessionnality.

Several studies focus and the nature and "quality" of Chinese aid to Africa. Many of them are critical of Chinese policy. The major concern, as expressed for instance in McComick (2008) and Penhelt (2007), is that the Chinese government disregard the governance of partner countries in its aid allocation policy. According to Penhelt, China would have a "comparative advantage" in assistance to "unstable and problematic regions and rogue States". Although concrete examples are given, such as Sudan and Zimbabwe, none of these papers attempts to provide statistical evidence that would provide stronger support to this assertion. Similarly, Kaplinsky, McCormick and Morris (2006) point to several examples of fragile states where China is heavily involved.

Davis et al. (2008) provide probably the most positive, informative and neutral study on how China delivers development assistance, and provides very useful details on Chinese aid management and strategy. This study adds also value to the literature through discussing in detail country case studies (Ethiopia, Ghana, and Zambia). Although acknowledging the debatable role played by China in resource-rich countries such as Angola and Sudan, it shows that "China's approach has been one of mutual respect, also awarding small African countries with relatively little economic and political significance, with aid and investment support». On the positive side, Wang (2007) points to the fact that Chinese aid may be a useful complement to traditional assistance, e.g., China is active in infrastructure building, which is badly needed by Africa, while traditional donors allocate relatively less resources to this sector. Foster et al. (2009) show also that China pays now an essential role in financing infrastructure, notably in the sectors of power (mainly hydropower), transport (mainly railroads), and information and communication technology (mainly equipment supply).

On economic and financial consequences of China engagement in Africa, Reisen (2008) studies the possible adverse consequences of China engagement on African country solvency, and concludes that so far Chinese lending has not endangered the positive outcome of the HIPC initiative. Several papers points also to the significant amounts of debt relief granted or promised by China (e.g., Wang, 2007, and Penhelt, 2007)

Trade is another aspect of the China African relations that is subject to lots of discussion in the recent literature. Many authors point to the overwhelming role played by oil and mineral resources. It is often considered that Chinese engagement in Africa is driven primarily by its strategic search for raw materials (e.g., Kaplinsky, McCormick and Morris,2006; Asche and Schüller, 2008). Similarly, Goldstein et al. (2006) insist on the role played by oil and minerals in the expansion of exports from Africa to China, and discuss the so-called "Dutch disease" negative effect possibly caused by China growing demand of oil on African economic diversification.

Zafar (2007) notes also that the growing trade between China and Africa has benefited from trade liberalization reforms implemented on both sides. He reports the positive consequences of tariff exemptions provided by China on a number of products exported by eligible African countries, but points also to the persistence of tariff escalation and tariff peaks. Broadman (2007) comments also on the potentially negative consequences of tariff escalation, which may limit the capacity of African countries to increase the value-added content of their exports to China. Minson (2008) provides a detailed analysis of the benefits that Africa can expect from China's preferential trade policy and concludes that, while such benefits are likely to be modest, the preferences have been thoughtfully tailored to African export capacities.

According to Asche and Schüller (2008), the success of China trade and investment in Africa is related to implicit subsidies provided by Government support programmes with low cost loans, which distort market competition. Conversely, Kernen (2007) points to the fact that trade between China and Africa is not only a matter of inter-governmental relations, but also of multiple networks with private actors who have their own strategies. Chinese privatised companies, as well as the Chinese diaspora, are playing a more and more significant role.[3]

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[3] On the role of the Chinese diaspora, see also the February 2008 issue of the China Monitor published by the Centre for Chinese Studies, University of Stellenbosch.

Broadman (2007) is one of the few studies based on microeconomic data, using a survey on firms in 4 countries South Africa, Ghana, Senegal and Tanzania. This approach provides a wealth of information that are useful to compare the behaviour of Chinese and non-Chinese firms. He finds that trade and investment are complement, in that they reinforce each other. He notes significant investments in non-primary industries such as clothing, food industry, transport, building, tourism, power plants, and telecommunications. He finds that Chinese investment in Africa helps integrate African countries in the global decomposition of the value chain, although for the moment in a limited way (in the apparel industry). It also concludes that Chinese enterprises can have a positive role through technology transfers, and are more active than other enterprises in regional trade. In the end, trade with China could contribute to product and geographic diversification of African exports.

Henley et al. (2008) also study Chinese FDI in Africa using survey data, on firms outside the extractive industry, and compare investors from China, India and South Africa. Chinese firms within the sample of this study are overwhelmingly concentrated in the manufacturing sector, particularly in the textile and apparel industry. This study finds that Chinese firms have been setting up export platforms in East Africa to take advantage of the trade preferential regimes granted by the US and EU to African countries. The picture that it provides is therefore consistent with that of Broadman (2007).

Chen et al (2007) use also a survey to study in detail another strategic sector for China engagement in Africa: the construction sector. This study examines the success of Chinese construction firms and finds that it is due both to cost competitiveness, derived from access to cheap capital, low-cost labour, and cheap building materials, and to political support from the Chinese government. It finds also that the political support enjoyed by Chinese construction firms does not exempt them from the challenges faced by other construction firms in terms of economic and political instability, poor quality of local inputs and weak infrastructure.

In conclusion of this brief survey, China engagement in Africa is more and more viewed as a multi-faceted phenomenon, where the role of the Chinese government is still there, but where market forces and private actors play a gradually bigger role. Many authors point to the risks created by China, related both to economic, financial, and political issues, but others acknowledge the opportunities that this growing Chinese engagement can offer to African countries.

### c- Recent trends in trade, FDI, and aid flows between China and Africa

Trade

Trade is the first variable that researchers consider, because this is an area where some reasonably good data are available. We have at our disposal different sources of data: Chinese official data provided by MOFCOM, and international sources UN COMTRADE data and IMF DOT. Given that we use not only data on Chinese trade but also on African trade, including with non-Chinese partners, we prefer using international data. UN COMTRADE data have the merit of being a primary source, being made of statistics reported by the governments to the UN system, and of containing detailed data that we need in our analysis. One weakness of these data is that the geographic coverage of actually reporting African countries is incomplete. Hence, when we need data covering the whole of Africa, the only possibility is to use "mirror" data, i.e. estimate African trade based on data reported by African partner countries. When doing that, we obtain African imports that are declared FOB

and exports that are declared CIF, which do not provide an accurate evaluation of the trade balance. In addition, UN COMTRADE data are available only until 2006 or 2007, depending on the considered country. IMF DOT is a secondary source, and provides only aggregates, but it provides data up until 2008. Hence we will use IMF DOT data when recent data will be needed and UN COMTRADE data otherwise. IMF DOT data have also the merit of providing directly a correct assessment of the CIF/FOB trade balance. We have checked that the overall trends of China-Africa trade are consistent.

Figure 1 provides a global picture of the fast growing trend of trade between China and Africa using IMF DOT data. African exports to China have been multiplied by about 62 between 1998 and 2008 (equivalent to a yearly growth rate of 41%), and China exports to Africa have been multiplied by about 15 (yearly growth rate of 27%). The difference of trends of imports and exports is due partly to changes in terms of trade, associated in particular with the evolution of oil prices. Chinese imports of petroleum and petroleum products from Africa (UN COMTRADE data) have grown 43% per year during 1996-2006, and they account in 2006 for 73% of Chinese imports from Africa, compared to 19% in 1996. Part of this evolution is due to increased volumes of oil imports, and part is due to price trends: petroleum prices have increased over the 1996-2006 period by 11% yearly in the world markets[4], with notably a sharp rise between 2002 and 2006, which has been prolonged by a further 50% growth from 2006 to 2008. The CIF/FOB trade balance of African countries vis-à-vis China was generally in deficit until 2007, with an average deficit of US$ 1.3 billion from 1998 to 2007, but exhibited a surplus of US$ 1.9 billion in 2008, thanks to the oil and mineral price boom.

Figure 1: China - Africa trade flows
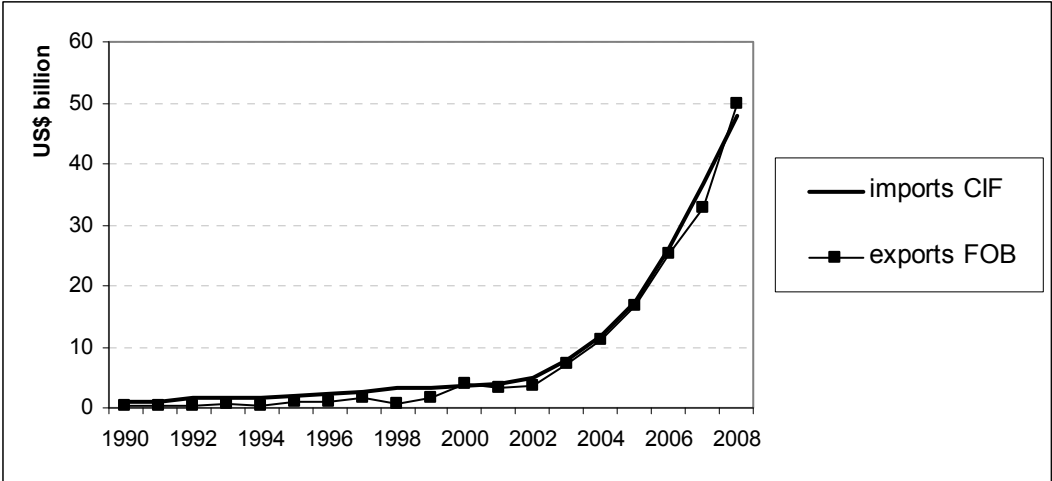


Source: IMF DOT

As a proportion of total African external trade flows, trade with China has become over the past decade very significant. China accounts in 2008 for 11.1% (9.1%) of African exports (imports), compared to 0.9% (3.0%) in 1998 (IMF DOT data). However, these figures aggregating all African countries may be misleading.

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[4] Computed using IMF commodity prices database http://www.imf.org/external/np/res/commod/index.asp

Only few African countries have large exports to China. The median share of the Chinese market in African exports is only 2.7% in 2006, and only 13 countries are above the average (UN COMTRADE data). Among these countries, there are principally oil exporters: Angola, Congo, Equatorial Guinea and Sudan send 30% or more of their exports to China. Chad and Mauritania, which have become recently an oil exporter, sent respectively 10% and 23% of their exports to China in 2006. Gabon, which is exporting both oil and timber to China, sent 19% of its exports to China in 2006. Other countries depending significantly on exports to China in recent years are exporting minerals to the Chinese market (copper: DR Congo, Tanzania and Zambia; cobalt: DRC; coltan: Rwanda) or agricultural raw materials (cotton: Benin, Burkina Faso, Mali, Tanzania; sesame: Ethiopia). The dependence on Chinese market is very recent, starting in 2003 or later, for agricultural product exporters. It is somewhat older for mineral exporters.

Regarding imports, the growing role of China in African markets is more widespread. The share of Chinese exports in African markets is above the African average (9.6%) in 15 countries (UN COMTRADE data). Countries that are principally dependent on imports of Chinese products are diverse and are not necessarily exporting a lot to China: only 6 of them (Benin, DR Congo, Ethiopia, Mauritania, Sudan and Tanzania) depend also significantly on their exports to China. Other countries depending significantly on imports of Chinese products are both relatively rich (e.g., Botswana, Namibia) and relatively poor (e.g., Eritrea, Niger) countries. The reasons behind the growing trend of imports of Chinese products in African countries are not straightforward and go beyond a mere correlation with exports. We will study this trend in a more analytical way using a gravitation model, and show that such a model does not explain well this trend either. Our interpretation is that such trend cannot be understood without reference to other aspects of engagement of China in Africa, notably investment and financial flows.


Foreign Direct Investment

Generally speaking, Chinese investment in Africa had grown fast since 1996, stimulated by Chinese government incentive policy and by the economic recovery of African countries. Until 2005, China has already established more than 800 enterprises in Africa, covering 49 countries.

MOFCOM has issued data on outward FDI by country of destination and by sector for the years 2003 to 2007. Such data are accordingly not very accurate, given that many Chinese foreign investments go through offshore financial investment centres such as Hong Kong or the Virgin Islands. Therefore they underestimate the true amount of Chinese FDI to Africa. These data are based on definitions comparable to UNCTAD definition and can therefore, with the previous caveat in mind, be compared to total FDI received by African countries reported by UNCTAD for the same period. This comparison shows that China FDI to Africa still corresponds to a small part of total FDI to Africa: 1.1% in 2007. But it is growing fast. In 2003 China's share of FDI stock in Africa was only 0.2%. FDI flows exhibit a clear acceleration too. FDI flows to Africa have represented 0.4% of total FDI flows to Africa in 2003, 1.4% in 2004-06 and 3% in 2007. Figure 2 illustrates that FDI from China to Africa grows much faster than FDI from non-Chinese investors to Africa.

Figure 2: China and non-China FDI stocks in Africa
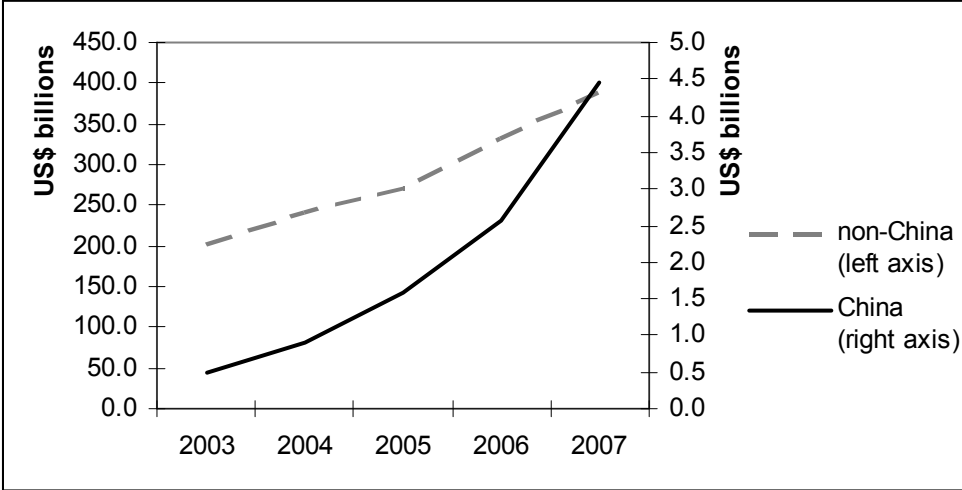


Source: based on MOFCOM and UNCTAD data

Africa is also becoming more significant as a destination of outward Chinese FDI: It accounted for 1.5% of Chinese FDI in 2003, and 3.8% in 2007.

The World Bank (2004) concluded that Chinese investment in Africa was relatively dispersed. The inverse of Herfindhal index computed to measure its geographic diversification is 11.7 in 2007. The same index computed on total FDI to Africa is much higher (17.0 in 2007), suggesting that Chinese FDI is only moderately diversified by country of destination. Its diversification has however somewhat increased over time.

The geographical distribution of Chinese and non-Chinese FDI in Africa have become more and more similar in recent year: their correlation was equal to 0.25 in 2003 (and not statistically significant at 5%) and it has regularly risen to 0.71 in 2007 (and highly significant). Nevertheless, there are still striking differences of destination of FDI for Chinese and non-Chinese investors. Chinese FDI plays a major role, compared to non-Chinese FDI to Africa, in a few countries: Algeria, Sudan, and Zambia and, as from 2007, Mauritius and Niger. These five countries account for 37% of Chinese FDI to Africa, compared to 8% for non-Chinese FDI to Africa. On the other hand, Chinese FDI engagement in Egypt, Morocco, Nigeria, South Africa and Tunisia is relatively small: Chinese FDI in these four countries account for 19% of its FDI to Africa, compared to 52% for non-Chinese FDI to Africa.


Development assistance and financial flows

In absence of data on ODA, it is impossible to give a clear picture of development assistance that China is providing to African countries. Such assistance is administered by no less than 23 line ministries and agencies (Kragelund, 2008). It is almost impossible to disentangle what would be development assistance in OECD/DAC definition and what would be merely financial flows. Chinese development assistance can take different forms: grants extended for social projects (health, education, housing), in the form of material assistance, technical assistance and personnel training; interest-free loans given notably for infrastructure projects; concessional loans provided by China EXIM Bank; and debt relief. According to Kragelund (2008), Chinese aid flows to Africa could be between US$ 731 million (official figure) and US$ 8.1 billion for the year 2005. According to this author, there is little doubt that the official figure is underestimated. For Wang (2007), China's ODA to sub-Saharan Africa could

be between US$ 1.0 billion and US$ 1.5 billion yearly in 2004-2005. According to Brautigam (2008), who uses the Chinese definition (excluding the face value of concessional loans from external assistance budget), China's external assistance to Africa would be about US$ 525 million in 2007 and would reach close to US$ 1 billion in 2009.

Compared to OECD/DAC aid, Chinese aid to Africa is still relatively small. It is however growing fast. In 2006, at the Beijing Summit of the China-African Cooperation Forum, China committed to double the size of its development assistance to Africa from 2006 to 2009; provide US$ 3 billion of preferential loans and US$ 2 billion preferential export buyer's credit to African countries in the same period of time; and cancel government interest free loans that had become due by the end of 2005 contracted by eligible countries. In January 2009, Chinese Minister of Commerce Chen Deming said to press that in 2009 Chinese aid will have doubled compared to 2006, and that "168 debts" due by 33 African countries by the end of 2005 will have been cancelled. [5]

In addition, China EXIM Bank's Vice President Li Jun stated in 2007 at the African Development Bank Annual Meetings in Shanghai that it would provide significant infrastructure and trade financing on commercial terms, amounting to about US$ 20 billion in three years. Following this meeting, the Chinese State Council approved the creation of a US$ 5 billion China-Africa Development Fund, to be administered by the China Development Bank.[6]

Hence, overall, the financial engagement of China in Africa is growing fast and is becoming relatively large. An indirect way of studying this engagement is to consider data on contracted projects published in the China statistical yearbook under the headings "Turnover of Economic Cooperation with Foreign Countries or Regions". Such data must be correlated with financial engagement, given that Chinese financial and development assistance is essentially tied. The definition of this series includes: (1) overseas civil engineering construction projects financed by foreign investors; (2) overseas projects financed by the Chinese government through its foreign aid programs; (3) construction projects of Chinese diplomatic missions, trade offices and other institutions stationed abroad; (4) construction projects in China financed by foreign investment; (5) sub-contracted projects to be taken by Chinese contractors through a joint umbrella project with foreign contractor(s); (6) housing development projects. We add also to this labour services (activities of providing technology and labour services to employers or contractors in the forms of receiving salaries and wages) and design (projects with income for technical services provided to overseas operators) consultation.

Foster et al. (2009) have attempted to estimate the share of turnover of economic cooperation flows that are related to Chinese finance commitment, by subtracting the amount of procurement contracts that Chinese contractors have obtained on multilateral financing. According to their estimates, the bulk of turnover of economic cooperation flows is related to Chinese financing (about 90% in 2002-2005), although Chinese contractors are highly successful in bidding infrastructure contract

Hence, although it is imperfect, the turnover of economic cooperation flows provides accurate information on the trend and pattern of financial engagement of China in Africa. According to

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[5] Source: Xinhua news agency, 20 January 2009.
[6] Source: Lucy Corkin, Christopher Burke and Martyn Davies, China's Role in the Development of Africa's Infrastructure, SAIS Working Papers in African Studies n°04-08.

this indicator, China engagement was relatively stable around US$ 2 billion per year from 1998 to 2002. Since then it has grown fast, to reach US$ 12.7 billion in 2007. Figure 3 illustrates this evolution, and reports also the number of countries with which China has loan agreements.

Data on turnover of economic cooperation suggest also a rather highly concentrated distribution of China engagement, with 6 countries (Sudan, Nigeria, Algeria, Mali, Mauritius, Ethiopia) accounting for more than half of contracted projects in 1998-2002. In 2007, this distribution is even more concentrated, with the first three countries accounting for close to half of the total. Its geographical structure has also changed: new major partners appear, notably Angola and Egypt, while Mali falls to the 15th position and Mauritius to the 20th position.

Figure 3: indicators of financial and development assistance
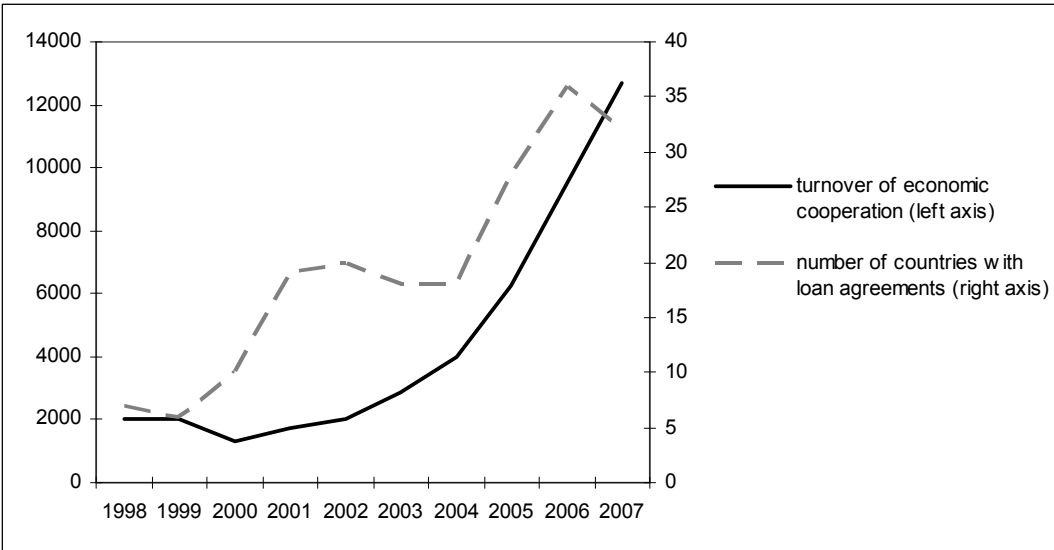


Source: based on China statistical yearbook (various issues) and Brautigam (2008).

Another indirect indicator of the growing engagement of China in Africa can be found in trade data: imports from China can give an idea of the growing financial and development assistance from China given that all this assistance is tied and, except for technical assistance, will involve buying Chinese products. However it is not possible to interpret import data directly in this way, given that a significant part of these imports is not necessarily financed by external assistance. We will come back to this in the next section.

3- Aid and official financial flows from China to Africa and the aid effectiveness debate

a- Geographical allocation of aid and official financial flows (selection of recipient, effect on aid fragmentation)

We will use in this section data on turnover of economic cooperation mentioned previously. This is accordingly a very rough indicator, but this is the only one for which information is

available for statistical analysis. As mentioned earlier in the literature review, China engagement in Africa is usually described as rather concentrated in countries where there are governance issues. By comparison, in the standard literature on geographical aid allocation by donors (see, e.g., and Berthélemy, 2006), aid is positively influenced by size, poverty, and good governance of the partner countries. It is also influenced by political ties, as shown by Alesina and Dollar (2000) using data on proximity of votes at UN General Assembly. It is interesting to test whether such factors also influence the Chinese aid policy, in order to go beyond the common wisdom saying that China concentrates its assistance policy on rogue States.

Our data are not fully adequate to test the effect of income poverty, because turnover of economic cooperation can be financed both by development assistance (in which case it is expected to be decreasing with GDP per capita of the partner country) and by profitable investment (in which case it is expected to be increasing with GDP per capita). In order to control for the existence of opportunities for economic cooperation of Chinese companies related to privately funded projects, we introduce as control variable the stock of inward FDI and a dummy variable for oil rich countries.

The effect of size is tested using population of the partner country as control variable, while all level variables (turnover of economic cooperation, GDP and stock of FDI) are defined per capita (divided by the population size of the partner country).

In order to test the influence of governance issues, we test the various governance indicators of the World Bank.

Finally, the political proximity is measured by the existence of current and past diplomatic relations. This variable is influenced principally by African diplomatic policy decisions, insofar as having diplomatic relations with China is conditioned by their non-recognition of Taiwan independent status. For this variable we try several alternative specifications. First we use the number of years with continuous diplomatic relations. Second, we use a dummy variable for the existence of diplomatic relations the same year. Third and fourth, we use a dummy variable for the existence of at least 5 years (resp. 10 years) of diplomatic relations.

Parameters are not stable over the last decade, which is not surprising given that the engagement of China in Africa has changed very fast in recent years, quantitatively and also qualitatively. We find that our explanatory variables are reasonably good predictors of the turnover of economic cooperation only in recent years, but that none of them can explain it in previous years. The results obtained for the period 2004-2007 are summarized in Table 1.

Table 1: Determinants of turnover of economic cooperation (2004-2007)

|  | [1] | [2] | [3] | [4] |
|---|---|---|---|---|
| GDP per capita | 0.07 | 0.09 | -0.02 | 0.06 |
|  | (0.28) | (0.42) | (0.08) | (0.27) |
| population | -0.38 *** | -0.37 *** | -0.35 *** | -0.33 *** |
|  | (3.01) | (3.25) | (3.03) | (2.72) |
| stock of FDI per capita | 0.44 *** | 0.43 *** | 0.51 *** | 0.45 ** |
|  | (2.61) | (2.72) | (3.08) | (2.65) |
| dummy for oil rich country | 1.54 ** | 1.64 ** | 1.69 ** | 1.60 ** |
|  | (2.24) | (2.57) | (2.58) | (2.34) |

| | | | | |
|---|---|---|---|---|
| number of years diplomatic ties | 0.03 ** | | | |
| | (2.24) | | | |
| dummy for diplomatic ties | | 2.21 *** | | |
| | | (3.50) | | |
| dummy for 5 years diplomatic ties | | | 1.59 *** | |
| | | | (3.02) | |
| dummy for 10 years diplomatic ties | | | | 1.00 ** |
| | | | | (2.20) |
| intercept | -3.66 | -5.34 | -3.54 | -4.41 |
| | (1.05) | (1.66) | (1.06) | (1.28) |
| R2 | 0.551 | 0.606 | 0.584 | 0.549 |
| Number of countries | 52 | 52 | 52 | 52 |

Note: *** (resp **, *) significant at 1% (resp. 5%, 10%) level.  Student-t statistics within brackets.
Method of estimation: between countries. All variable in logs except the dummy variables for diplomatic ties and the control of corruption qualitative indicator.

All estimations are computed using a between country regression, using data for 2004-2007. Table 1 shows that, in recent years, China engagement is not influenced by the GDP per capita of its partner countries, contrarily to what is observed in OECD/DAC donor aid allocation behaviours (see Berthélemy, 2006). We observe a bias towards small countries, likewise with OECD/DAC donors. As expected, the stock of FDI and the dummy variable for oil rich countries have a positive and significant influence on turnover of economic cooperation. The existence of diplomatic relations plays a significant positive role on China engagement in Africa, whatever the specification that is tested. Finally, none of the governance indicators of the World Bank was significant, either positively or negatively (results not reported).

The previous regressions could be biased by a strong error of measurement of the dependent variable, which mixes economic cooperation of Chinese entities financed by public and by private funds. In order to test the robustness of our result, we propose a simple approach, which consist in dividing countries with large engagement of China and countries with small engagement of China. We define the former as countries where, on average for the years 2004 to 2007, the ratio of economic turnover to the GDP of the partner country is above the median. This defines a dummy variable for large vs. small China engagement. We use this dummy variable as dependent variable in a probit model where the explanatory variables are the same as before, averaged over the 2004-2007 period. The results of these probit regressions are reported in Table 2.

Table 2: Determinants of turnover of economic cooperation (2004-2007): probit regressions

| Dependent variable | Dummy variable for China engagement among 50% highest | | Dummy variable for China engagement among 40% highest | Dummy variable for China engagement among 60% highest |
|---|---|---|---|---|
| | Equation 1 | Equation 2 | Equation 3 | Equation 4 |
| GDP per capita | -0.92 *** | -1.20 *** | -1.08 *** | -0.60 * |
| | (2.78) | (3.29) | (2.91) | (1.79) |
| population | -0.37 ** | -0.41 ** | -0.61 *** | -0.47 ** |
| | (2.31) | (2.48) | (3.16) | (2.59) |
| stock of FDI | 0.53 ** | 0.72 *** | 0.58 ** | 0.61 ** |
| | (2.35) | (2.94) | (2.32) | (2.38) |
| dummy for oil rich | 0.85 | 1.19 | 0.68 | |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| country | (1.09) | (1.51) | (0.76) | |
| number of years of diplomatic ties | 0.03 * | | 0.05 ** | 0.04 ** |
| | (1.93) | | (2.39) | (2.19) |
| Dummy for 5 years of diplomatic ties | | 2.91 ** | | |
| | | (2.55) | | |
| intercept | 15.54 *** | 17.91 *** | 20.01 *** | 15.93 *** |
| | (3.13) | (3.42) | (3.48) | (3.04) |
| pseudo R2 | 0.196 | 0.293 | 0.305 | 0.288 |
| nb of countries | 52 | 52 | 52 | 48 |

Note: *** (resp **, *) significant at 1% (resp. 5%, 10%) level. Student-t statistics within brackets.
All variable in logs except the dummy variables for diplomatic ties and the control of corruption qualitative indicator.

Test for the influence of diplomatic ties in the same year cannot be performed because all partner countries which benefit from the largest China engagement have diplomatic ties with China. However we can test the influence of the number of years of diplomatic ties and of the existence of continuous diplomatic ties for at least 5 years (and 10 years, results not reported). As in previous regressions, we find a significant influence of diplomatic ties (equations 1 and 2). The main difference with previous regressions is that this time GDP per capita has the expected negative and significant parameter. On the other hand the dummy for oil rich countries is not significant. Attempts at introducing governance indicators have failed as previously and are not reported. In order to check for the influence of the threshold chosen for separating partner countries with high and low engagement of China, equation 1 is run again for alternative thresholds at 60% and 40% of the sample (equations 3 and 4), without significant change in the results. [7]

Another topical issue in the economics of aid allocation is related to donor coordination. Chinese development and financial assistance is poorly coordinated with other donors' assistance. There is no coordination with other bilateral donors, although some very preliminary discussions have been initiated by China with bilateral donors, towards co-financing of projects (e.g. the French AFD). As for coordination with multilateral donors, China EXIM Bank and the World Bank have signed in 2007 a Memorandum of Understanding aimed at building collaboration between the two organizations, with a particular focus on Africa. According to the World Bank, joint investments will focus primarily on the transportation and energy sectors, and on "sustained-growth" performers such as Ghana, Uganda and Mozambique. There are real efforts being undertaken, for example, over joint financing of infrastructure projects, but such efforts still need to materialize in concrete results. A similar agreement has been signed between China EXIM Bank and the African Development Bank in 2008, as well as an agreement between China's Development Bank and African Development Bank. These Memorandums of Understanding focus on (i) Exchange of information regarding each other's respective activities in Africa; (ii) Sharing of development knowledge and experience; (iii) Providing co-financing or guarantee of public and possibly private sector investment projects; (iv) Exchange or secondment of professional staff; (v) Joint regional, country, economic and sector studies; (iv) Aid harmonization, development policy and strategy coordination; (iiv) and any other areas as may be agreed upon between the parties from time to time. It is too early to observe the possible outcomes of these agreements. AfDB has also a started in some case to co-finance projects with the Chinese most notably in Botswana.

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[7] For equation 4, the oil dummy is dropped because it perfectly predict being among the 60% biggest beneficiaries of China engagement.

It is interesting to test whether China is engaged with similar partner countries as DAC and multilateral donors. This kind of comparison must be considered with cautious, given the vast difference of concepts between ODA and turnover of economic cooperation. Probably the closest concept to turnover of economic cooperation would be, assuming that this turnover is related to Chinese official financing, total official flows, i.e. ODA plus other official flows in OECD/DAC definitions. We find that the geographical distribution of the turnover of economic cooperation is not significantly correlated with the geographical distribution of total ODA and other financial flows received from DAC and/or multilateral donors. This is shown in Table 3, which reports partial correlations of these geographical distributions, holding population constant.

Table 3: Partial correlation between Chinese turnover of economic cooperation
And total official flows from DAC and multilateral donors

| year | DAC flow | Multilateral flows | DAC+Multilateral flows |
|------|----------|--------------------|------------------------|
| 1998 | 0.25 | 0.15 | 0.26 |
| 1999 | 0.02 | 0.06 | 0.05 |
| 2000 | 0.12 | 0.14 | 0.14 |
| 2001 | 0.02 | 0.01 | 0.01 |
| 2002 | 0.09 | 0.02 | 0.10 |
| 2003 | -0.12 | -0.08 | -0.12 |
| 2004 | 0.04 | -0.20 | -0.05 |
| 2005 | 0.14 | -0.21 | 0.08 |
| 2006 | 0.20 | -0.12 | 0.02 |

Source: based on OECD/DAC and MOFCOM data
Note: partial correlation is computed holding population constant. All variables are in logarithms.

This observation suggests that, in spite of lack of coordination with other donors, China engagement does not increase aid fragmentation at partner country level. At this level, the absence of coordination with other donors is not a major source of concern. The fact that China provides assistance to partner countries that are considered by traditional donors as non-deserving development assistance creates however a weakness in the development assistance architecture, given that it can reduce the efficiency of attempts at concerted action by traditional donors, notably vis-à-vis partner countries where there are proven governance problems.

b- Aid and official financial flows allocation by sector

No information is available on the allocation of Chinese development assistance and financial flows at sector level.

We know that development assistance has a large component of support to social service such as health, training and housing. Since 2007, China has offered training for close to 11, 000 Africans. Chinese assistance to Africa in the health sector dates back to 1963. Over the years more than 15,000 Chinese medical personnel have treated an estimated 170 million African patients. Chinese assistance in the form of technical cooperation in the agricultural sector has also been a long tradition in the history of its cooperation with Africa, including recently through FAO. In 2009, China has created a US$ 30 million trust fund at FAO to boost agricultural output in developing countries, particularly in Africa, in a South-South cooperation mode.

On the other hand, financial flows are principally targeted at financing infrastructure projects that are implemented by Chinese companies.

This orientation seems reasonable: grants are given to improve social conditions, while concessional and non-concessional financing goes to projects that create productive capacities. This is a very useful assistance policy given that infrastructure building is a major concern of African countries, and a sector needing much development. Nevertheless, it should be noted that part of the infrastructures that are built with assistance of China, such as stadiums, presidential palaces and conference centres, are not necessarily participating in poverty alleviation.

### c- The Tying of Aid

Chinese development and financial assistance is generally tied. In fact, development assistance itself is usually granted in kind. Financial assistance is given to finance contracts that are implemented by Chinese companies. The only part of Chinese assistance that may be considered as untied is its debt relief. In absence of data, it is impossible to know how much of Chinese assistance is tied, but this proportion is presumably very high. This contrasts with OECD/DAC member country assistance, which is less and less tied. On average, about 90% of DAC member country assistance is untied. Within OECD, only Korea (which is not member of DAC), has still most of its assistance tied.

Aid tying is an economic issue if and only if it leads to higher prices of procurement, by introducing distortion in competition. Goods and services procured by China are highly competitive compared to the same goods and services that would be procured by OECD/DAC member countries. Hence its practice of tying of aid presumably does not create a significant distortion of competition. In addition, Chinese aid tying is comparable to the Korean practice, and to common practice in OECD/DAC countries up until 15-20 years ago.

However, the cost of tying of aid should not be neglected. Beyond potential distortion of competition with other exporters to Africa, the tying of aid may also have adverse consequences on domestic producers. Brautigam (2009) provides a more in-depth analysis of the tying of Chinese aid, and points to the adverse consequences of this practice.

### d- Official financial flows and debt sustainability

In the context of implementation of large debt relief granted to African countries through the HIPC initiative, complemented since 2006 by the MDRI (Multilateral debt relief initiative), the fact that African countries borrow again money from such lenders as China may be a source of concern. It could imply a free riding by new lenders who take advantage of increased payment capacities of HIPC countries resulting from their debt relief. It could threaten also the efficiency of the HIPC initiative in terms of restoration of poor country solvency.

Reisen (2008) has studied this question and concluded to the absence of significant risk of new excess indebtedness in HIPC countries due to borrowing to China. We complement here his analysis by considering not only countries that have reached the completion point of the HIPC initiative but also countries that have reached the decision point by 2007 (so called

interim HIPC countries), given that the decision point already triggers some amounts of debt relief. In addition we use a longer list of countries with high China engagement. Among HIPC countries, Reisen (2008) assumes that Ethiopia, Mozambique and Zambia may have borrowed significant money from China. However the turnover of economic cooperation to GDP ratio of these three countries is only just above the median of African countries. Several HIPC or interim HIPC countries have turnover of economic cooperation to GDP ratio higher than the median: Central African Republic, Congo, Gambia, Guinea, Mali, Mauritania and Sierra Leone. In what follows, we consider that all countries with a turnover of economic cooperation to GDP ratio above the African median have high China engagement and have possibly borrowed money from China.

Using this criterion, we compare the NPV of debt to GDP and NPV of debt to exports of goods and services of countries with high vs. low China engagement for the years 2004 and 2007. Results are reported in Table 4. We find that, although the former countries have higher debt ratios than the latter, the difference is not very significant. In addition, the variations of debt ratios between 2004 and 2007 are not significantly different from one group to the other. These results reinforce Reisen's conclusion that China engagement has so far not threatened the success of the HIPC initiative.

Table 4: comparison of debt ratios for HIPC countries with high vs. low China engagement

|  | Large China engagement | | Small China engagement | | Difference |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | n. obs. | mean | n. obs. | mean | mean |  |
| NPV of debt/GDP ratio 2004 | 9 | 70.7 | 9 | 30.7 | 40.0 | * |
| NPV of debt/GDP ratio 2007 | 14 | 47.6 | 13 | 15.3 | 32.4 | ** |
| Δ(NPV of debt/GDP ratio 2007-2004) | 9 | -16.2 | 9 | -21.8 | 5.5 |  |
| NPV of debt/Exports ratio 2004 | 9 | 272.5 | 9 | 199.7 | 72.8 |  |
| NPV of debt/Exports ratio 2007 | 13 | 159.6 | 13 | 109.7 | 50.0 |  |
| Δ(NPV of debt/Exports ratio 2007-2004) | 9 | -83.6 | 9 | -144.7 | 61.1 |  |

Note: *** (resp **, *) significant at 1% (resp. 5%, 10%) level.

Reisen (2008) conducted also a similar analysis for non-HIPC IDA-only countries that he considered as resource rich and possibly having a large Chinese engagement: Angola, Congo (which we have included in previous analysis as HIPC interim country), Nigeria, Sudan and Zimbabwe. He found that for those countries debt ratios declined in recent years. Our more recent data (with estimates for 2007) corroborate this conclusion. However, the small number of observations does not allow tests of differences with a control group of non-HIPC IDA-only countries with low Chinese engagement. Hence this conclusion is possibly fragile.

Although the risk of excess borrowing from new lenders who do not apply the same rules as OECD/DAC countries still exists, we then conclude that this risk has not year materialized in the case of African countries with high Chinese engagement. Nevertheless, the risk is real for the future, and as a consequence China engagement in Africa may be in some instances a major source of disagreement with IFIs. As example, the IMF said recently that the Democratic Republic of Congo will not qualify for completion of its US$ 6.3 billion (in NPV terms) HIPC debt relief if the terms of its assistance package from China do not change. This package, which involves US$ 9 billion spending in mining and infrastructure project, will actually contribute to increase again the debt of the country by several billions of US dollars.

4- Trade, FDI and diversification


a- Primary commodity exports: the "Dutch disease" argument

China, and other big emerging countries, have increased they demand of raw materials on the international market, notably in the oil sector, and for some minerals such as copper. This may have induced a classical Dutch disease effect, namely a diversion of resources out of tradable good industries outside the booming sector (Goldstein et al., 2006). This Dutch disease effect could reduce the diversification potential of African countries. However, in most African countries tradable goods that are produced are agricultural products rather than manufactured goods. In such cases the negative impact of the Dutch disease on diversification is limited, although a reduction of agricultural activity could have long term adverse effects too. Hence Goldstein et al. propose to complement the standard Dutch disease analysis with a "Leamer's triangle" analysis, which shows that the effect of a commodity boom will depend also on capital and labour endowment, and on the impact of the booming sector on capital and labour markets. They assume that the commodity boom will have a negative effect on diversification because the mining sector is highly capital intensive, and will therefore consume available capital resources that would be needed to build a manufacturing industry.

This argument is however not really substantiated by data in Goldstein et al. (2006). In addition, if a commodity boom stimulates investments in the mining sector, this investment is most often financed by FDI, coming from China or other countries. Such FDI is industry-specific and would not come to Africa if it were not for investment in mining. Therefore, it is not at all obvious that a commodity boom will reduce capital available for investment in manufactures. It could simply increase capital availability in the mining sector. As a matter of fact, the fast increasing FDI flows to Africa observed in recent years is clearly related in many cases to investment in the mining sector.

A bigger source of concern could be that the booming sector also diverts scarce skilled labour resources. However, as stated by Goldstein et al., skilled labour that is needed in the mining sector is very specific too, and it is often imported.

Finally, the Dutch disease effect, if it exists, cannot be related directly to engagement of China in African countries, given that it is related to global market forces rather than trade with China specifically.


b- Trade liberalization between China and Africa

China engagement in Africa has led to major trade flow increases. In economic terms, this trend is equivalent to some extent to trade liberalization between China and African countries. Development and financial assistance granted by China to African partner countries, which is generally tied, reduces the opportunity cost of importations from China. This acts the same way as a subsidy on China exports to African countries. The trade effect of this implicit subsidy is equivalent to a partial trade liberalization of importations of Chinese products in African countries. This could possibly lead to trade creation and diversion effects, which are usually analyzed in standard trade theory. African countries import more Chinese products (trade creation) and could, as a counterpart, import less products from other partners (trade diversion). As in standard trade theory, if there is trade creation and trade diversion the final

result in terms of wellbeing for the African importer countries in uncertain. On the other hand, if there is trade creation without trade diversion, partial trade liberalization provides benefits to the African importers.

We propose to test these creation and diversion effects in a standard gravitation model, in which imports of African countries are explained by GDP and GDP per capita of the importer and of its partner, as well as by geographical and historical variables such as distance, common borders, common languages, and former colonial ties. We include also in this model dummy variables for bilateral relations with China and with non-China partners. Each of these dummy variables is made time specific, so that trade creation and diversion effects can be observed in the pattern of the parameters of such variables over time.

This estimation is performed on all imports flows reported by African countries in the UN COMTRADE database, with all possible partners. We report here estimates using the fixed effects method, which collapses the effect of all the geographical and historical bilateral dummies in the fixed effect parameters. Results are reported in Table 5. Estimates for the parameters associated to GDP and GDP per capita have reasonable values (both GDP and population have a positive influence on trade flows). We find that the parameters associated with the dummy variables for bilateral relations with China increase over time, suggesting a clear trade creation effect over the period 1996-2007. On the other hand, the parameters associated with bilateral relations with non-China partners have no significant trend. We conclude from these estimates that there is no trade diversion effect. These results are also illustrated in Figure 4, which show clearly the significant pattern of trade creation with China and the absence of trade diversion.

Part of the explanation of the increase of imports from China could be due to imports of parts of products newly exported to the United States under the AGOA scheme, which provides generous rules of origin treatment in the apparel industry. Several African countries have started exporting apparels to the United States market having a high content of Chinese textile. In order to check that this AGOA effect does not explain the aggregate patterns that we observe, we have re-estimated our equations with a sub-sample excluding African countries that have exported significant quantities of apparels with high content on non-AGOA/non-US textile to the United States under the AGOA scheme. These countries are Kenya, Lesotho, Madagascar and Swaziland. Results reported in Table 5 do not change significantly. Hence our results cannot be considered as resulting from an indirect effect of the AGOA.

Table 5: Estimation of creation and diversion effects using a gravitation model

| | All African reporters | | | Sample excluding countries importing textile to export apparels under AGOA | | |
|---|---|---|---|---|---|---|
| | unilateral variables | dummies for China partner | dummies for non-China partner | Unilateral variables | dummies for China partner | dummies for non-China partner |
| GDP reporter | 1.07 *** | | | 0.88 *** | | |
| | (4.14) | | | (3.38) | | |
| GDP partner | 0.62 *** | | | 0.41 ** | | |
| | (3.32) | | | (2.18) | | |
| GDP per cap. reporter | -0.50 * | | | -0.30 | | |
| | (1.94) | | | (1.13) | | |
| GDP per cap. | -0.51 *** | | | -0.30 | | |

| | | | | | |
|---|---|---|---|---|---|
| partner | (2.74) | | | (1.61) | |
| intercept | -25.64 *** | | | -19.36 *** | |
| | (5.01) | | | (3.74) | |
| year 1996 | | -0.14 | -0.12 *** | -0.13 | -0.12 *** |
| | | (0.36) | (3.02) | (0.33) | (2.90) |
| year 1997 | | -0.11 | 0.01 | -0.11 | 0.02 |
| | | (0.29) | (0.29) | (0.27) | (0.53) |
| year 1998 | | 0.00 | -0.01 | 0.02 | 0.01 |
| | | (0.01) | (0.13) | (0.04) | (0.20) |
| year 1999 | | 0.12 | -0.13 *** | 0.15 | -0.11 *** |
| | | (0.32) *** | (2.72) | (0.38) *** | (2.32) |
| year 2000 | | 0.24 | -0.19 *** | 0.25 | 0.17 *** |
| | | (0.65) | (3.66) | (0.65) | -(3.24) |
| year 2001 | | 0.30 | -0.20 *** | 0.37 | -0.16 *** |
| | | (0.82) | (3.55) | (0.98) | -(2.90) |
| year 2002 | | 0.35 | -0.08 | 0.37 | -0.04 |
| | | (0.95) | (1.37) | (0.96) | -(0.73) |
| year 2003 | | 0.60 | -0.03 | 0.60 | 0.00 |
| | | (1.62) | (0.46) | (1.56) | (0.00) |
| year 2004 | | 0.79 ** | -0.02 | 0.79 ** | 0.01 |
| | | (2.12) | (0.24) | (2.04) | (0.14) |
| year 2005 | | 1.11 *** | 0.01 | 1.13 *** | 0.04 |
| | | (2.91) | (0.07) | (2.87) | (0.48) |
| year 2006 | | 1.39 *** | 0.08 | 1.41 *** | 0.10 |
| | | (3.53) | (0.86) | (3.48) | (1.12) |
| year 2007 | | 1.39 *** | 0.10 | 1.52 *** | 0.15 |
| | | (3.21) | (1.03) | (3.42) | (1.55) |

Note: *** (resp **, *) significant at 1% (resp. 5%, 10%) level. Student-t statistics within brackets.
Method of estimation: within countries. All variable in logs except the dummy variables.

Figure 4: pattern of trade creation and diversion with China
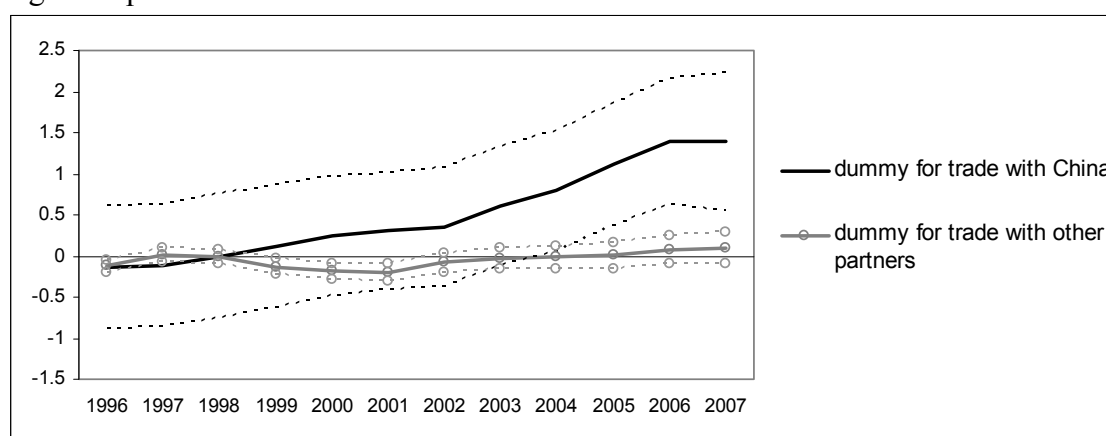


Source: Computed with UN COMTRADE data.
Note: dashed lines represent the 95% confidence interval.

On the export side, China offers significant preferential tariff treatment to a number of African countries. In recent years, it has significantly expanded the list of products that it imports duty-free from eligible African countries. This list covers now more than 250 products and it has been announced that it would be expanded to more than 440 items, possibly by the end of 2009 (Minson 2008). Current preferences are equivalent on average to

a 10% tariff preference, which is quite significant. Minson has estimated the overall economic value of such preferences to US$ 10 million per year.

Products for which China grants tariff exemption are principally raw materials, while transformed products face higher tariffs. This is not favourable to diversification of African exports. However, China grants also tariff exemption for some semi-finished or finished products that several African countries are able to export such as products made of plastic, leather products, and textile and apparel products.

Comparing the AGOA and EBA trade preferential regimes, Collier and Venables (2007) have found that rules of origin are a major determinant of the impact of trade preferences on diversification: the AGOA has a positive impact in some countries due to its loose rules of origin in the apparel industry, contrary to the EBA scheme. Given that the rules of origin imposed by China are also relatively generous, with a minimum of 40% value added in the exporting countries, these tariff exemptions can have a positive effect on African industrialization, insofar as it would help some African countries to develop export diversification based on decomposition of the value chain. This effect would be possibly lower than the effect of the AGOA rule of origin system in the apparel industry, but probably more significant than that of the EBA provision of the European Union.

Up to now, African countries have been little involved in global network of manufacturing based on decomposition of the value chain, except in the apparel industry thanks to the AGOA. But the Chinese industrial companies have a long experience of this. The success of African countries in creating such production network with Chinese partners will however be conditioned by their capacity to be competitive in particular segments of production. As the experience of the AGOA shows, only a few African countries are currently able to reach this stage.

### c- Chinese FDI in Africa and economic development and diversification

There is no recent data on sector detail of Chinese FDI on a country by country basis. Some estimates reported by the World Bank for 1979-2001 give an idea of the structure of initial Chinese FDI. It was principally in manufacturing (46.3%). Resource development sectors accounted for only 27.5%. Services accounted for 18.3% and agriculture for only 7.1%.

Using somewhat more recent data (for 2004), Broadman (2007) states that a great deal of FDI invested in China has been concentrated in extractive industries. However this author notes also that in recent years more FDI flows have been invested in diversifying activities, in such sectors as apparel, agriculture and food industry, construction, transports, tourism, electricity and telecommunications.

A survey conducted by Henley et al. (2008), using a sample of firms investing in 15 African countries[8] built by UNIDO provides some more indication of the structure of Chinese FDI investment in 2005. However, a major weakness of this sample is that is excludes extractive industries. It also excludes small companies (with investments below $500,000). With this caveat in mind, this survey provides indications on sector distribution of non-mining Chinese firms investing in Africa. 32% of such firms were in the textiles and garment industry, 15%

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[8] Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mozambique, Nigeria, Senegal, Tanzania, and Uganda,.

were in mechanical industry, 15% in chemical, plastic and rubber industry, and the rest in services and other activities. Hence, the structure is fairly diversified.

There are some indications that in recent years the share of extractive industries has been relatively high in Chinese outward FDI. According to MOFCOM data, this share has increased from 13.3% in 2004 to 19.8% in 2006. In 2007, reported data show a sharp decline that is hard to interpret (the stock of FDI in mining would have declined from $18 billion to $15 billion, which would imply divestiture from the mining sector). It is highly probable that the share of mining investment is higher in Africa than in other destinations of Chinese FDI. Nigeria, Sudan, Zambia, and Niger, which altogether receive close to half of Chinese FDI, are all countries where total inward FDI is highly concentrated in extractive industries.


### d- Synthesis on Chinese engagement in Africa and diversification

In previous discussions, we have found few arguments in support of the idea that Chinese engagement in Africa is adverse to economic diversification there. The most serious argument, about the Dutch disease, is about the influence of China on World markets rather than specifically about engagement of China in Africa. Nevertheless, it is worth testing this hypothesis. Through its investment, its aid policy and its trade policy, China's engagement in Africa is becoming large, and could have an impact on economic diversification in countries where China is particularly engaged. For instance, the sectoral orientation of Chinese FDI could be more (or less) oriented towards natural resource extraction than that of non-Chinese firms. African partner countries receiving assistance from China may also have policies more favourable to the development of natural resource extraction (or not).

In order to test these ideas, we start by building a rather standard diversification equation. This equation is based on ideas developed notably by Imbs and Wacziarg (2003) and UNECA (2007).

Imbs and Wacziarg (2003) have shown that economic diversification of a country can be related to its economic development, measured by GDP per capita, through an inverted-U shaped relation. Diversification is also positively related to the size of the country, measured by its population size. It can be influenced also by policies. We introduce here two kinds of policy variables. The first one is related to policies that can prevent or promote business creations. We measure it by the time necessary to register a new business. The second policy variable that we introduce is more directly related to diversification: it is the existence in the country of an export processing zone (EPZ) mechanism. The objective of creation of EPZs is mainly to diversify the economy, through fiscal and regulatory exemptions granted to companies that export manufactured goods. In previous literature (e.g. Johanson and Nilson, 1997), the success of EPZs in helping diversification has been debated, partly because some attempts at building EPZs have failed (a classical example is the Zone Franche de Dakar initiated in the 1970s). Nevertheless, there are also examples of success of EPZs (classical examples are given by the EPZ schemes of Mauritius and more recently Madagascar). Finally, we introduce a dummy variable for oil rich countries, to take account of the possibility of a severe Dutch disease effect in such countries.

Our dependent variable is the inverse of a Herfindhal index computed on exports disaggregated at the HS 6 digit level. We use all data reported by African countries in the UN COMTRADE database. We report here regressions computed using a between estimator. The

time dimension of our data is very short, on average about 3 to 4 years per country, from 2003 to 2007, and this is not enough to use time-series information. Our benchmark equation is reported in the first column of Table 6 (all variables are in logarithms, except the oil dummy).

Table 6: Diversification equation

|  | Equation 1 |  | Equation 2 |  | Equation 3 |  |
|---|---|---|---|---|---|---|
| GDP per capita | 0.45 | *** | 0.47 | *** | 0.43 | *** |
|  | (2.99) |  | (6.40) |  | (2.97) |  |
| population | 0.36 | *** | 0.36 | *** | 0.38 | *** |
|  | (3.73) |  | (6.19) |  | (4.03) |  |
| time to start a business | -0.60 | *** | -0.57 | *** | -0.14 | * |
|  | (2.71) |  | (5.67) |  | (1.74) |  |
| EPZ dummy | 0.62 | ** | 0.66 | *** | 0.58 | ** |
|  | (2.37) |  | (5.13) |  | (2.21) |  |
| oil rich country dummy | -2.47 | *** | -2.58 | *** | -2.45 | *** |
|  | (6.07) |  | (10.31) |  | (5.97) |  |
| intercept | -5.31 | ** | -5.58 | *** | -7.09 | *** |
|  | (2.05) |  | (3.91) |  | (3.08) |  |
| estimation method | Between |  | OLS |  | Random effect |  |
| R2 | 0.657 |  | 0.610 |  | 0.570 |  |
| number of observations | 35 |  | 130 |  | 130 |  |

Note: *** (resp **, *) significant at 1% (resp. 5%, 10%) level. Student-t statistics within brackets.
All variable in logs except the dummy variables.

Attempts at estimating an inverted-U relation with GDP per capita failed. Given that all African countries are below the threshold point above which diversification declines with GDP per capita, as estimated by Imbs and Wacziarg (about US$ 16 000, in PPP terms, after conversion of their threshold in 2007 PPP dollar terms), this result is not surprising. Hence we introduce here the GDP per capita in linear form, instead of the usual quadratic form. All parameters are highly significant, and this regression explains a large part of the between variance of the dependent variable. In order to check the robustness of this estimation, we have also performed OLS and random effect estimations, with very similar results (equations 2 and 3).

In Table 7 we use this benchmark equation to test the influence of any effect of China engagement variables on diversification. These variables are: the share of export to China in total export, the share of import from China in total import, the share of the stock of FDI from China in total FDI received, and the ratio of turnover of economic cooperation with China over GDP. It is clear from these results that China engagement in African countries has had so far no significant influence, whether negative or positive, on economic diversification. We find the same results whatever the estimation method (between, OLS or random effect – results not reported).

Table 7: Test of China engagement in diversification equations

|  | Equation 1 |  | Equation 2 |  | Equation 3 |  | Equation 4 |  |
|---|---|---|---|---|---|---|---|---|
| GDP per capita | 0.46 | *** | 0.47 | ** | 0.40 | ** | 0.49 | *** |
|  | (2.93) |  | (2.94) |  | (2.40) |  | (3.03) |  |

| | (1) | | (2) | | (3) | | (4) | |
|---|---|---|---|---|---|---|---|---|
| population | 0.36 | *** | 0.35 | *** | 0.37 | *** | 0.33 | *** |
| | (3.33) | | (3.30) | | (3.50) | | (3.18) | |
| time to start a business | -0.61 | ** | -0.58 | ** | -0.61 | ** | -0.60 | ** |
| | (2.66) | | (2.41) | | (2.51) | | (2.69) | |
| EPZ dummy | 0.59 | ** | 0.56 | * | 0.66 | ** | 0.64 | ** |
| | (2.11) | | (1.92) | | (2.27) | | (2.40) | |
| oil rich country dummy | -2.50 | *** | -2.53 | *** | -2.41 | *** | -2.36 | *** |
| | (5.90) | | (5.87) | | (5.44) | | (5.42) | |
| share of exports to China | 0.01 | | | | | | | |
| | (0.25) | | | | | | | |
| share of imports from China | | | 0.10 | | | | | |
| | | | (0.44) | | | | | |
| share of FDI from China | | | | | -0.03 | | | |
| | | | | | (0.39) | | | |
| turnover of economic coop. with China/GDP | | | | | | | -0.06 | |
| | | | | | | | (0.72) | |
| intercept | -5.27 | * | -5.13 | * | -5.20 | * | -5.98 | ** |
| | (1.88) | | (1.84) | | (1.81) | | (2.15) | |
| estimation method | Between | | Between | | Between | | Between | |
| R2 | 0.66 | | 0.662 | | 0.688 | | 0.663 | |
| number of observations | 35 | | 35 | | 32 | | 35 | |

Note: *** (resp **, *) significant at 1% (resp. 5%, 10%) level. Student-t statistics within brackets.
Method of estimation: within countries. All variable in logs except the dummy variables.


### e- Special Economic Zones and diversification

A new initiative launched by China is the creation of Special Economic Zones (SEZs) in Africa. Given the results that we have found in previous section, this initiative might be relevant in the future for diversification in Africa. Special Economic Zones have similarities with EPZs, insofar as their aim is to stimulate the agglomeration of new economic activities in a given area by providing them infrastructure and other facilities.[9] In both cases, it is expected that this agglomeration will create positive externalities among businesses that will promote a sustainable diversification process. China has a long and fruitful experience at home with SEZs, which have formed the backbone of its industrial development in the 1980s. Nevertheless, there are also some sceptic views about the development impact of such projects, given the enclave nature of SEZs. In addition, this development strategy may be hindered by issues such as lack of infrastructure and institutional governance issues.

The information on SEZs project is scattered and sometimes inconsistent. According to Davies et al. (2008), the Chinese government has announced in the context of the FOCAC the development of 3 to 5 SEZs in Africa, in Zambia, Mauritius, Nigeria, Egypt and Tanzania. In January 2009, the Chinese Minister for Commerce Chen Deminz confirmed that five SEZs have been initiated as follows: the Zambia–China Economic and Trade Cooperation Zone, the Guangdong Economic and Trade Cooperation Zone and the Lekki Duty Free Trade Zone in Lagos, Nigeria, the Egypt-Suez Economic and Trade Zone and the Ethiopian Orient Industrial

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[9] We prefer however keeping the term SEZs for these Chinese projects in Africa, instead of using the term EPZs, given that the building of an EPZ is a domestic policy, and may entail specific measures such as tax exemptions.

Park. In April 2009, Chinese press indicated that China was building 7 economic and trade cooperation zones.[10]

In Zambia, the Zambia China Economic and Trade Cooperation Zone (ZCCZ) has been launched in the copper belt, in view of forming a production chain with the copper smelter of Chambishi. Fifty Chinese companies are supposed to invest US$ 800 million within five years in this area, and the Government of Zambia has promised tax exemption treatment. In early 2009, it hosted ten Chinese firms and 3500 jobs. The activity of the ZCCZ still depends highly on copper. In 2009, the ZCCZ has launched a sub-zone close to Lusaka, in an attempt to extend its business sphere.

In Nigeria, the Lekki Free Trade Zone project was launched in 2007. Located 60 km out of Lagos on the Atlantic coast, it will involve in a first phase US$ 200 million investment from China and in a second phase, open to other foreign investor, US$ 5 billion investment. It is planned to create more than 300,000 jobs, in light and heavy industry and in services. It is conceived not only as an industrial park but also as a new model city. Imported inputs will enter duty-free and investors will be tax exempted. In addition, Nigerian authorities approved in 2009 a project of building a Free Trade Zone in Ogun State involving Gangdong Xinguang Investment Group.

In Egypt, TEDA Investment Holding Company, a Sino-Egyptian joint venture, is responsible for development, construction and operation of the Suez Economic and Trade Zone (SETZ), which will be devoted to textile, petroleum, automotive and electrical appliance industries. The SETZ aims at attracting by 2018 about US$ 300 million of Chinese investment. In its first phase scheduled to be completed by 2011, it would create 10 000 jobs.

In Ethiopia, Jiangsu Qiyaan Investment Group is building an industrial park in Dukem, for a cost evaluated in 2008 at US$ 713 million. It is expected to attract about 80 Chinese companies in textile, leather and construction equipment.

Beyond those announced at the FOCAC meeting, other significant Economic and Trade Zone or Industrial Parks have been launched recently by Chinese investors in countries such as Mauritius, Algeria and Botswana. Although they are of a comparable nature, these projects do not necessarily belong to the strategy established by the Chinese government to promote African industrialisation.

In Mauritius, China has plans to create an industrial zone outside Port Louis, the Tianli Economic and Trade Cooperation Zone, that would involve investment for US$ 625 million and would create 34 000 jobs. Like the Lekki Free Trade Zone in Nigeria, it is conceived as a new model city. The Tianli project plans to attract about 40 Chinese companies involved in industry and services and will serve as a service hub for Chinese companies investing in Africa. Manufacturing companies will enjoy import duty free for their imported inputs. Its construction began in April 2008.

In Algeria, the launch of an Economic and Trade Zone in Mostaganem has been announced end of 2008. This project, led by Jianling Motor, is expected to attract investment in the automotive industry, in construction materials, electronic industry and textiles. The project,

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[10] Source Xinhua News Agency, April 19, 2009.

backed by Jangxi Province of China, will cost about US$ 550 million and will involve about hundred companies.

In Botswana, an Industrial Park project, the Phalalane Industrial Park, has been launched in 2009, funded by two Chinese companies, for US$ 52 million. It is expected that this industrial park will attract 66 companies from all over the world and 8 000 jobs.

All these projects are still in the making, and it is still too early to know whether they will deliver all their promises. Nevertheless, they are meaningful and of rather large size by African standards. If they succeed they will have a significant positive impact on diversification in countries where they are located.

5- <u>Conclusion and the way forward: China engagement in Africa and the global financial crisis</u>

We have studied in this paper the consequences of China engagement in Africa for African country economic development. Due to lack of good information, we have attempted to find out what has been the recent pattern of this engagement using indirect methods. Given the fact that Chinese assistance to Africa is essentially tied, we propose to interpret the fast growing imports from China and turnover of economic cooperation with China as relevant signals of this engagement. By doing so, we cannot disentangle the effect of true aid flows (in the sense of DAC definitions) from the effect of other financial flows, but in any case no data source provides accurate data on aid flows that would be more or less compatible with the DAC definition.

The usual suspicion is that China provides assistance to a few natural resource rich countries and does not pay attention to criteria advocated by the DAC donor community, notably good governance.

Our findings suggest that the core of the Chinese financial engagement in Africa is either in countries with which it has good political relation, notably its "all weather friends" such as Egypt, Ethiopia, Mali and Tanzania, or in countries that represent strategic interest for the Chinese economy due to their oil and mineral resources, such as Algeria, Angola, Congo, the Democratic Republic of Congo, Nigeria, Sudan and Zambia. To some extent, this justifies interpreting the Chinese engagement in Africa as targeting its own interests. This includes access to natural resources, but the definition of Chinese self-interests in Africa cannot be reduced to this singular factor. Furthermore, the fact that the Chinese aid is decided based on self-interest grounds is a criticism that applies also, to a significant extent, to other bilateral donors.

However, in recent years, China has been more and more engaged in a broader cooperation with Africa, covering most countries in the continent, and stretching from natural resource industry to light manufacturing and services. Clear examples are projects of China in Mauritius or Botswana. China is also significantly involved in some countries that are "aid darlings" of the international donor community, such as Ghana.

In addition, China development assistance policy has also had from its very beginning an orientation towards poverty reduction, with significant cooperation and technical assistance in the health sector or agriculture. In recent years, we observe also, insofar as data permit, some

influence of poverty on Chinese geographical aid allocation. Recently, China financial engagement in Africa has also played a useful role in providing finance in support of sectors that have been so far under-financed by the international donor community, notably in infrastructure sectors. This is an area in which there is room for cooperation between China and multilateral financial institutions such as the World Bank and the African Development Bank, although progresses of such cooperation have been so far only timid. It should also be noted that so far such Chinese financing, including loans, have not had adverse effect on the process of reduction of African over-indebtedness initiated by the HIPC initiative, although a risk of excessive debt still exists for the future in some countries. Mitigating this risk requires also cooperation between China and multilateral financial institutions.

On balance, these trends are promising for Africa. China engagement in Africa can be beneficial both to China and to African countries. In the context of the current global financial crisis, this engagement of China in Africa is meaningful and can contribute to mitigate the effects of the crisis. Since the end of 2008, Chinese leaders have repeated that the crisis will not affect their assistance to Africa. This is a question of utmost importance for the years to come, and the way China will behave in this context will be a good test of whether it is truly engaged to assist African development on a sustained basis.

The principal adverse consequence of the global financial crisis on China is not in the financial sector, given that the Chinese financial sector is relatively insulated from international financial markets and that China is a net creditor of the World economy. Hence, even though China's investment in US Treasury Bills may appear in the future as risky investment, this does not put at risk the development of the Chinese economy. The main concern for China is the sharp decline of its export to the World markets since October 2008. The highest decline so far has been registered in February 2009, 25.7% below February 2008. In March 2009, there has been a slight recovery, still at 17.1% below the March 2008 level.

Hence it is vital for China to sustain its economy. It is doing so through its US$ 586 billion two-year recovery plan launched in November 2008. Of course, African export markets, as dynamic as they may be, are small compared to this figure. Nevertheless, maintaining dynamic exports to Africa will contribute to export recovery. For China, this justifies maintaining dynamic engagement in Africa, through investment, development assistance and lending. It is true that lending to African countries is, financially speaking, a riskier investment than lending to the US Treasury. But such lending is in RMB, and the RMB is probably going to appreciate against the US dollar in the future, as it has done since 2005, hence lending to resource-rich African countries in RMB may not be bad investment after all.

Finally, the global financial crisis gives China an opportunity to consolidate its role in Africa as a major partner, and hence strengthen its diplomatic ties with a continent that will become in future decades an increasingly significant player in the global economy due to its demographic trends and its natural resource endowment. Continued assistance to Africa will be for China a good investment for the future, as it will serve well its long term strategic and political interests.

On the African side, one main problem that governments have to solve in the context of the global financial crisis is to secure finance that they needs for their development. Hence, if China maintains its cooperation policy at the same speed as before, it will definitely help Africa mitigating the adverse consequences of the global financial crisis.

Of course, China engagement will not solve all the problems faced by African countries that are or are not consequences of the global financial crisis. There is some anecdotal evidence of a recent slowdown of China engagement in some African countries, such as Guinea and the Democratic Republic of Congo. This evolution may be related to the plunge of prices of commodities in global markets, but it may be also a mere signal that China does not want to continue taking inconsiderate risks by pouring billions of US dollars in countries where political instability and government mismanagement are too high.  The fact that China becomes somewhat more selective in choosing the partner countries where it increases its engagement may be bad news for the governments of countries where it adopts a more cautious attitude, but this may be good news for the development of the African continent as a whole.

Regarding trade and FDI flows, the surge of the Chinese engagement in Africa is very impressive, with exponential growth of trade and investment flows. The pattern of such flows is still characterised by exports of African raw materials to China, and import of Chinese manufactured goods in Africa, and this pattern is to some extent reinforced by significant FDI flows in natural resource industries. This pattern is not different from the pattern of trade and investment relations of Africa with developed market economies and it merely corresponds to the current comparative advantages of Africa. The assumption that there would be a specific "Dutch disease" effect of growing trade with China does not make much sense, given the similarity of Chinese and non-Chinese imports of African commodities. Two more interesting questions are 1/ whether trade with China leads to a trade diversion effect and 2/  whether the growing trade and investment relations between Africa and China will help or otherwise hinder  the necessary diversification of African economies outside of a purely resource based structure.

Our answer to the first question is definitely negative. The impressive growth of imports of Chinese products in Africa corresponds to a trade creation rather than a trade diversion effect. This trade creation may be related to growing financial assistance given by China to Africa, which can be interpreted as the equivalent of an export subsidy. The absence if a trade diversion effect support the conclusion that such new trade flows are welfare improving for African countries.

The answer to the second question can be only forward-looking: so far, the Chinese engagement in Africa, whatever the variables considered to define it, has not had any impact on African economic diversification. However, we have some good reasons to believe that China could help some African countries diversify their economies in the future. First, the numerous SEZs projects that have been initiated in the past few years in several African countries will promote diversification, if they succeed. Possibly, not all of them will succeed, for the same reasons as EPZs schemes have not promoted diversification policies successfully everywhere. Countries where there are still factors hindering development, such as issues in institutional governance or shortage of basic infrastructure, are not good candidates for successful development of SEZs. Second, trade liberalisation measures granted by China to a number of its African trade partners, involving tariff cuts for some manufactured goods, with relatively flexible rules of origin, could help at least a few African countries where there is some potential for developing manufacturing production integrate in the global decomposition of the value chain, in the same way as AGOA has been beneficial for a few African countries.

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