

A Comparative Study on Characteristics of ODA of China-Japan-Korea to Cambodia*

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Development assistance plays an important role in contributing to the development process of Cambodia. The top bilateral donors, China, Japan, and Korea provide ODA to Cambodia in different characteristics and from different perspectives. This study tries to pull out some implications for Cambodia as recipient and for donors in order to achieve the development of Cambodia's economy-effectively by using the ODA. As a viewpoint, ODA structure emphasizes the intention of donors, either for their self-interest and benefit or for achieving MDGs. China's ODA to Cambodia seems to distort the ODA allocation by other donors with unconditional loans or loans with conditionality focusing only on infrastructure. Cambodia benefits from the better infrastructure, but it has to pay the price set by China, even for concessional loans. The driving interests of Japan and Korea are more influenced by their national policy goals and the expected perceptions of their voters. The aid projects should at least catch the attention of national media or win obvious and unbiased support from the suffering people in the recipient countries.

Keywords: ODA, MDGs, characteristics and perspective of aid, loans, and grants
JEL Classification: F35, O10, O11

I. Introduction

Official development aid (ODA), especially bilateral one flown to Cambodia appears in two forms: grants and loans. Japan, China, and South Korea¹ are

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the top three donors of ODA to Cambodia. They provide both grants and loans in order to increase economic welfare and to alleviate poverty based on the Cambodian millennium development goals - CMDGs (Ky and Lee 2011). The disbursements rise perpetually about 3.5% per annum, and reached \$1,075 million in 2011 (Council for Development of Cambodia - CDC-1). The relative contribution of ODA to Cambodia's GDP is about 9.5% (Ministry of Economy and Finance - MEF, 2010).

Until 2010, the grant-support accounted for approximately two-thirds of the total disbursements. Japan was the top donor of grants, whereas China became the top provider of loan aid in 2011. Japan's total disbursements increased by 16% compared to those in 2010, while China's increased by just 38%. Furthermore, South Korea's disbursements contributed 4.1% of the total disbursements in 2011, which corresponded to USD 47.67 million. Its disbursements increased by 22% compared to the previous year (CDC-1).

The characteristics of ODA by non-DAC² member countries and DAC member countries are different. To see the differences we take the case of Cambodia, because according to Brant (2011), the best available country-specific data on China's ODA is the Cambodian ODA data. And we compare the ODA to Cambodia by Japan and Korea as DAC members and China as non DAC state. However, the kind of China's ODA is seen critically. For example, Naim (2007) states, "*non-democratic countries like China have begun to undermine development policy through their activist aid programs that seek only money, access to raw materials, and international politics*". Jin Sato et al. (2010) illustrate the term "international aid market" and show that the provision of aid is a type of investment. Lee et al. (2011) argue that Korea should increase its grants relative to concessional loans in order to change the focus on hard infrastructure such as road, streamline, schools to soft infrastructure such as education, training, and health care services. For the case of China, 80% (CDC-1) of its disbursements to Cambodia in 2011 were loans. The loans, provided at a reduced interest rate, were for the most part spent to improve the hard infrastructure. In fact, not only China (applies this form of ODA;) but also the USA uses this form of ODA (Naim 2007). What was different between the two is that a Chinese company implementing ODA projects uses Chinese workers, Chinese products, and Chinese equipment.

Japan's interest in ODA is three-folded: the recipient's national security,

¹ Korea is the top two in providing bilateral loans to Cambodia, but not for total disbursement.

² DAC: Development Assistance Committee.

economic development, and humanitarian contribution (Takahashi 2007). Therefore, the majority of the Japan's ODA is composed of grants most of which is spent for education, health, agriculture, transportation, government budget and balance of payments (Ky and Lee 2011).

The objective of Korea's ODA for Cambodia was unclear in the past. The question of which form of ODA should be preferred - either loans or grants - is still under discussion (Lee et al. 2011, and Chun et al. 2010). Since joining the DAC, Korea has provided more concessional loans than grants. In contrast to this ODA policy, Lee et al. (2011) recommend that Korea should provide more grants than loans. According to the Cambodian ODA database, the most of the Korea's ODA were loans to improve infrastructure and communication facilities.

The paper has two main aims: the first is to describe and compare the actual ODA of China, Japan and Korea; and the second aim is to rationalize China's ODA or its interpretation of South-South cooperation, while China emphasizes that its aid should be of mutual benefit for China and the recipients (State Council 2011).

The following sections are: section two - Literature review and methodology; section three - Characteristics of ODA to Cambodia; section four - ODA and its relation to trade and FDI, section five - ODA by sectors; section six - Model of development aid, section seven - Conclusion.

II. Literature review and Methodology

Cambodia is one of the developing countries where its GDP per capita is just around PPP-\$ 2,100 in 2010 (Hang 2011). It needs development aid to rehabilitate its economic system as well as the social and political system, because of the damage induced by the 30-year period of civil wars. Before investigating the details of the ODA for Cambodia, we should mention some general considerations for ODA.

Some authors argue that ODA flows from rich countries to poor countries are more in the donors' interests rather than in the recipients' interests (Doss 1996) or so to say it comes with string attached (Boyce 2003). The donors set conditions for the assistance to advance their goals via contracts, agreements, or policy. The recipient has a take-it-or-leave-it option regarding the conditions of the donor. Boyce (2003) mentions that "*bilateral donors often use conditionality for commercial purposes, as when aid is tied to purchases of*

goods and services from the donor country.” Others (Lum et al. 2009, Weston et al. 2011) argued that some donor countries use concessional loans for ODA to initiate investment projects in the recipient country under the condition that only the donor’s construction materials, equipment, technical expertise, and labor force are involved in the project. As long as the outcome of such a project is welfare-enhancing for the donor country, it can be called self-interest driven ODA (Mughanda 2011, and Nielsen 2003), and this kind of ODA is effective only from the view of the recipient country. That is, sometimes the outcomes of such projects are rather in the interest of the donor, for example, to extract non-renewable resources in the recipient country, which are demanded in the donor country. This kind of ODA is driven by the donors’ selfishness and ineffectiveness as well, so that it can even harm the recipient countries. According to the literature, the measure of effectiveness of foreign aid is in how far it promotes a self-sustained economic growth of the recipient country (Mikesell 1987).

Our analysis is not only based on desk reviews of the existing studies, but also employs quantitative approaches. For the purpose of analysis we use the data from the Cambodian ODA database of the CDC, KOICA, Exim Bank of Korea, JICA, and DAC statistics.

Due to irretrievable data for the 1990s, we limit the period of the study from the year 2002 to 2010. Further, the different definitions of ODA and technical cooperation (TC) by CDC and OECD/DAC pose a challenge to our research. On the other hand, we cannot access and get the data from Export-Import bank of China. Therefore, in this report, CDC data is mainly used for the analysis. It should be mentioned that CDC data are the best country-specific data available regarding to China’s ODA (Brant 2011).

III. The characteristics of ODA to Cambodia

The ODA flows to Cambodia by the three donors of China, Japan, and Korea show different characteristics as follows.

1. *China*

China’s aid has emerged as a model with its own characteristics for the purpose of promoting consolidated friendly relations and economic and trade cooperation with other developing countries. According to the White Paper by

China's state Council on 21st April, 2011, China's aid falls into the category of South-South cooperation which should result in mutual benefits for both donors and recipients. In the case of China cooperation means in general that aid is not subject to certain conditions for political issues and requirements.³ Nowadays, the country is deeply engaging in providing aid to Cambodia typically in the term of concessional loans.

However, one of the intentions of China is to build economic relationships with resource-rich countries. So China financed infrastructure and natural resource development projects, assisted in the execution of such projects, and backed China's state enterprises in many developing countries. Hence, providing ODA to countries like Cambodia. In accordance with CDC-1, (State Council, 2011) most of China's ODA to Cambodia was used for establishing infrastructure, especially for construction works of roads and irrigation systems in the areas with mine resources. This has happened also in other countries, as mentioned by Kim (2011). However, Brautigam (2010, 2011a, 2011b) notes that the amount of ODA is not correlated to the resource-richness of recipient countries.

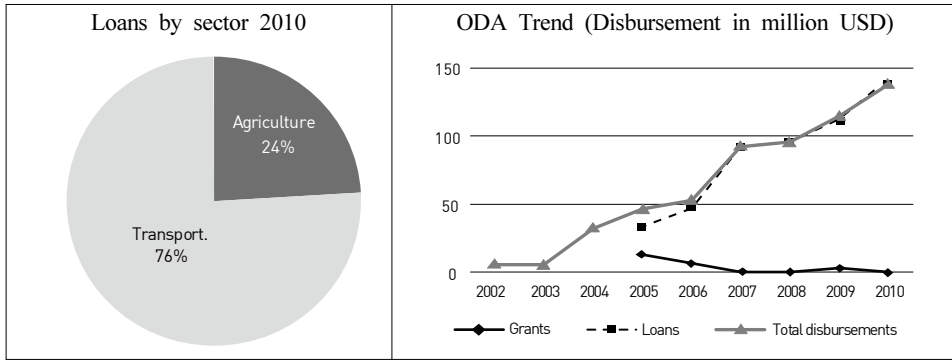
It is clear that China has particular interests in providing aid for the resource extraction and production rather than the other sectors, especially when this fits with the idea of mutual benefits. Regarding to China's economic assistance, it seems to be that there is "no strings attached" in the view of Cambodia. Many activities have an aid component secured by official bilateral agreements, promote development, and provide economic benefits to recipient countries that otherwise might not be made possible.

Vis-à-vis Cambodia, most of China's assistance takes the forms of concessional loan, technical assistance, and state-sponsored or subsidized investments, which is used to finance infrastructure development. However, the flow of loans to Cambodia are "... relate to longer term diplomatic or strategic objectives" (Lum 2009) as well as its economic interest. As China's foreign assistance grows it is likely that the Chinese government will be able to exert greater influence on developing nations, furthering China's strategic objectives (Weston et al. 2011).

As in figure 1, China's loans focused only on two sectors, transportation and agriculture.

³ There is one exception from this general point of view: Countries that recognize Taiwan as an independent and sovereign country can not receive or, if they can, only a small amount of development aid (Brautigam 2011b).

Figure 1. China’s ODA to Cambodia 2002-2010



Source: RGC (2011).

Source: RGC (2008), RGC (2010), and RGC (2011)

The volume of credits from China increases every year (figure 1). The total disbursement from China rose dramatically from 2003, and China became the most important donor in 2011. China’s total disbursements were USD 191 million in 2011. The share of the total loans which was distributed to transportation and agricultural sectors accounted to 99%.

Obviously, according to Cambodia’s National Strategic Development Plan (NSDP), there is a strong need for road construction, but the realized amount of constructions in 2010 exceeded the goal of the NSDP. Meanwhile, other important goals, like education or rural development were not reached (see figure 10). Given that the aid should be allocated to other sectors according to the NSDP rather than to only one or a few donor-interested sectors.

In general, China’s Foreign Aid (State Council 2011) was mainly used to conduct projects that support Chinese small and medium enterprises (SME) and Cambodia. By doing so, China got the opportunity to offer jobs for its labor force and to increase market access for Chinese products. Furthermore, with the construction works, the Chinese SMEs could take the opportunity to look for geological unexplored mineral deposits. These activities can be interpreted as intended but unrecognized benefits. In the meantime, Cambodia gains from the improved infrastructure and the opportunity to export goods to China.

In short, the ODA from China is beneficial for both countries. As for the donor, China could create many job opportunities for its population, and business opportunities for its own SMEs. In addition, the resource discovery and extraction is done by China. As for the recipient, Cambodia gets concessional loans and few grants unconditional from China.

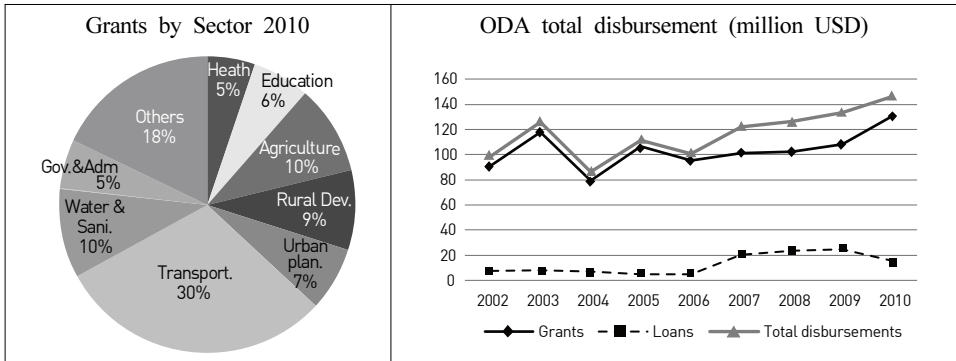
2. Japan

Japan was the largest source of ODA flow to Cambodia in terms of grant. Its financial assistance disbursed in 2010 was USD 146.021 million. Most of the disbursements are grants which represents 89.45% of the total amount of ODA From Japan to Cambodia (CDC-1). The main purpose of grants is to realize the MDGs. Although Japan's aid philosophy has changed significantly since the amendment Japan's ODA charter in 2003, the purpose of its ODA is still based on interests of the (western) international community in recipient countries rather than on its domestic economic interests.

According to figure 2 (below), Japan's ODA was allocated to all sectors of MDGs, but the transportation sector received the biggest share. In general, the 'Role of Development Cooperation' was set by Japan in order to provide effective aid to developing countries as well as to Cambodia. It has publicly supported the internationally accepted ODA strategies, including the results of the Tokyo Conference on the DAC's New Strategy in June 1998 and of the second Tokyo Conference on African Development in October 1998. In addition, in its 1999 "*Medium Term Policy on Official Development Assistance*," the Japanese government commits to "*manage its ODA in a manner consistent with its ODA Charter and with an eye to the goals of the DAC Development Partnership Strategy*" (Ministry of Foreign Affairs of Japan - MOFA Japan, 2002). In 2010, an ODA report entitled "Enhancing Enlightened National Interest" was released in order to live in harmony with the world and promoting peace and prosperity (MOFA Japan, 2010). As a consequence, providing grants is more important than providing concessional loans. The trend of total disbursement to Cambodia is upward sloping (figure 2).

The structure of Japan's financial support is totally different from that of China; regarding not only the form of disbursements but also the receiving sectors. In 2010, Japan supported the transportation sector with 30% of its total ODA volume. Japan realized most of its transportation projects in rural areas rather than in urban areas. The remaining 70% of the total disbursement was allocated proportionally to the other sectors such as rural development, urban planning, agriculture, education, health, water and sanitation, and governance and administration.

Figure 2. Japan's ODA to Cambodia



Source: RGC (2011)

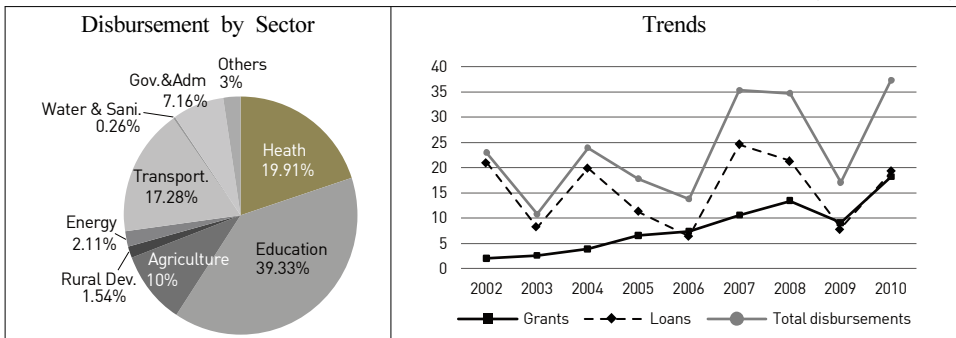
Source: 2002-2004: Ministry of Foreign Affairs Japan (www.mofa.go.jp/policy/oda/data/01ap_ea01.html/#C/AMBODIA)
 2005-2007: RGC (2008)
 2008-2010: RGC (2010), and RGC (2011)

3. Korea

Korea's ODA disbursements to Cambodia are only about 3.6% of its total. However, the Korea's grants to Cambodia is still growing even though the relative disbursement is small. In addition, the assistance is distributed to MDG sectors, such as education, health, agriculture, transportation, water and sanitation, and energy.

Figure 3. Korea's ODA to Cambodia 2002-2010

(million USD)



Source: RGC (2011).

Source: EDCF Annual Report 2003-2011

According to the annual report of the Economic Development Cooperation Fund (EDCF) in 2011, Korea provides assistance mostly as project funds. In 2010, the total disbursements accounted for USD 37.3 million, while the loans accounted for USD 19.1 million.

Most of Korean loans were disbursed to the agricultural and transportation sectors, and each sector received 37% and 57% of the total loans respectively in 2010.

IV. ODA and its Relation to Trade and FDI

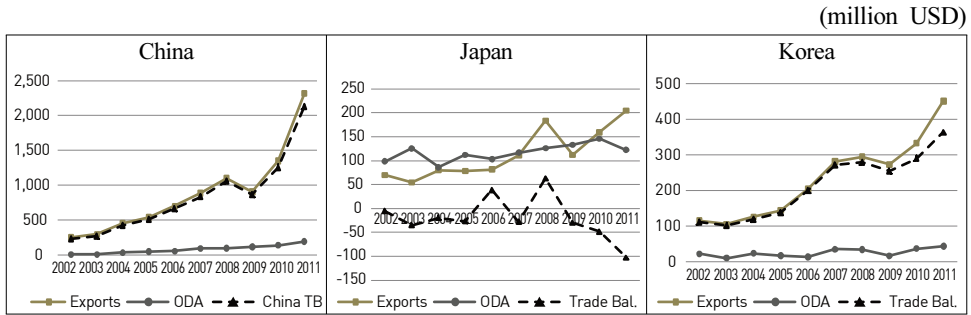
During the last decade Cambodia's trade balance deficit increased because of the over-proportional increase in imports. For instant, the trade balance deficit increased from USD -523 million in 2002 to USD -1,698 million in 2010 (Hang 2011). If we look at the trend of ODA (figure 4) disbursements and net exports, which are defined as exports minus imports, in Cambodia, it seems to be that there is no relationship between both variables at the country to country level. Maybe, it can be concluded that China's net exports and ODA to Cambodia are positively correlated. If the ODA for infrastructure has influenced the increase of Cambodia's imports is not clear, but it also cannot be excluded. Figure 4 below shows that the net exports of China to Cambodia were positive during the last decade and so were the net exports of Korea to Cambodia. The trade balance surplus between China and Cambodia increased dramatically from the year 2002 to 2011, while China's ODA disbursement increased in lower proportion. It cannot be excluded that this increase is partly caused by infrastructure improvements financed by China's ODA. The reason is, that a better infrastructure lowers the transportation costs and thereby lowers the prices of products. As a consequence China's net exports increase. Cambodia's exports to China increased only slightly, because the production costs of manufactured goods are too high relative to Chinese products and most of the agricultural goods are exported to Thailand and Vietnam.⁴ This conjecture coincides with China's intention expressed in its White paper. Of course, the conjecture is far away from being a proof.

Since Cambodia became a free-market-oriented economy in 1993, it is engaged in international trade and receives ODA. According to figure 5, there

⁴ The problem is that these exports are mostly not recorded because the sales of shipments are too small to be recorded, but the number of shipments is huge. This is caused by the possibility to avoid paying export tariffs. Small amounts of agricultural goods are tariff free.

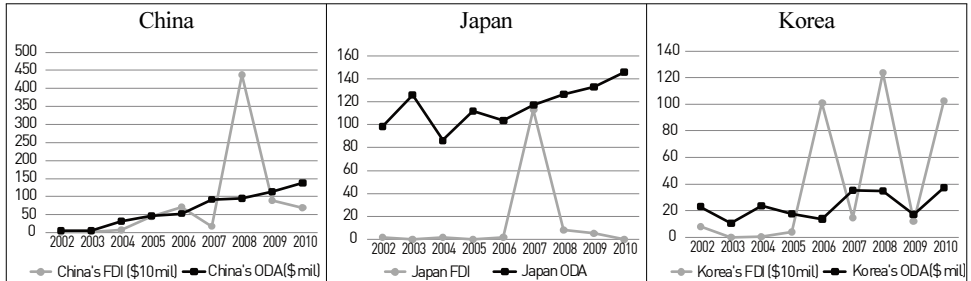
is no relationship between FDI and ODA disbursement. The biggest FDI source for Cambodia was China in 2008 and followed by Korea. However, in 2010, Korea was a leading source of FDI for Cambodia, while Japan did not make any direct investment in Cambodia.

Figure 4. The Exports and ODA 2002-2011



Source: Author's calculation from the data of Comtrade, based on export data (data: all commodities, classification: HS as reported- reporter of the data: China-Japan-Korea) in <http://comtrade.un.org/db/> (Accessed April 27, 2012)

Figure 5. The FDI and ODA 2002-2010



Source: 2002-2005: Chap (2010) and 2006-2010: CDC-2

V. ODA by Sector

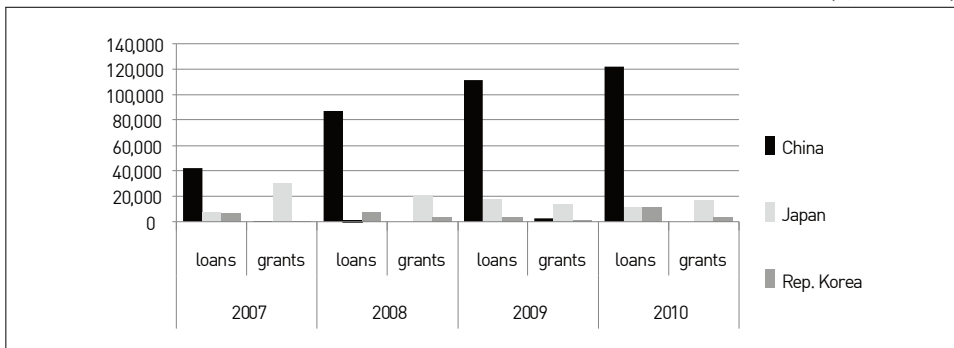
In this section, we would like to take into account five sectors: transportation, education, health, agriculture, and governance and administration. China provides concessional loans only to build highways and bridges. In contrast, Korea and Japan supported grants for constructing and repairing rural roads and bridges.

China prefers to give loans for road construction to realize a win-win situation, from which Cambodia benefits out of a better interconnectivity with Laos, Vietnam and China. China benefits due to better market access to Cambodia for their export products and additionally by the direct creation of demand for Chinese products. The latter effect of demand creation is guaranteed, because the loans were given under the condition that Chinese companies with Chinese workers and equipment undertake the road construction. The former effect is also guaranteed, because the projects were concentrated on important main road facilities (e.g. national road N° 8, national road N° 6, Preak Tamak bridge.)

Contrary to China, Japan and Korea favor the construction and improvements of rural roads and bridges in order to fulfill the MDGs rather than to benefit for their own economic sake.

Figure 6. China-Japan-Korea's ODA to Transportation Sector 2007-2010

(1,000 USD)



Source: RGC (2011), RGC (2010), and RGC (2008)

According to CDC-1, China has no interest in giving loans or grants for the educational and health sector, despite the fact that these sectors are very important for sustainable economic growth. A cynical interpretation would be that China is not interested in the sectors that do not create benefits for the donor.

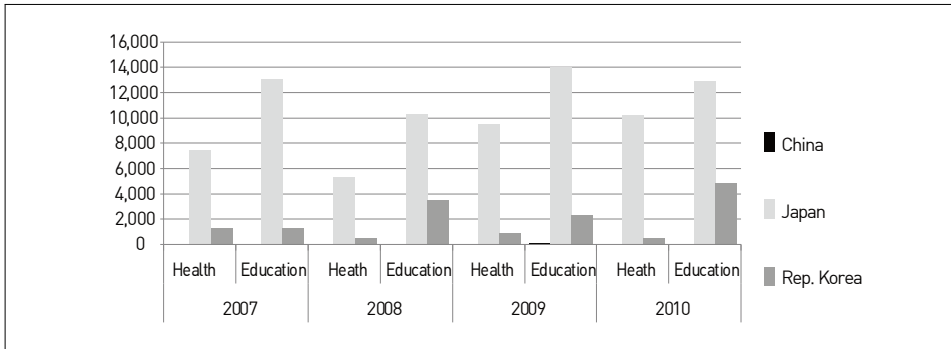
On the contrary, Japan and Korea pay strong attention on the educational and health sector in order to enhance the Cambodian productivity in the long run.

Japan remains as the main financial supporter in developing and improving the educational sector of Cambodia, and its total disbursements to this sector

was USD 12.961 million in 2010. Also Korea’s grants for the educational sector grew by 107.4% between 2009 and 2010. It is well-known in the field of development economics that the state of public health is a prerequisite for sustainable growth, and therefore Japan and Korea granted support for the improvement of the public health in Cambodia. Japan spent USD 10.22 million in 2010 for this purpose, and Korea disbursed USD 0.53 million (see figure 7).

Figure 7. Grants to Education and Health Sector

(1,000 USD)



Source: RGC (2011), RGC (2010), and RCG (2008)

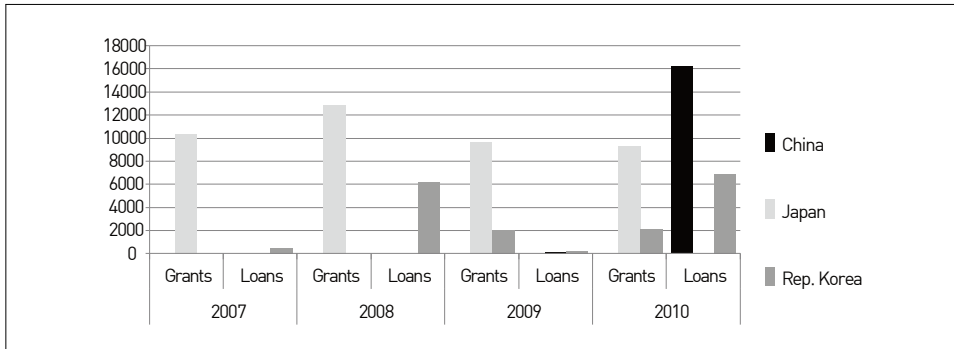
Figure 7 shows that Japan’s grants to the education sector and the health sector are three-fifth and two-fifth of its total grants, respectively. As for Korea, more grants were provided for the educational sector than for the health sector, while China provided only USD 81,000 grants for education in 2009. Maybe in the view of China, these sectors could not contribute enough to China’s business and economic activities.

China’s ODA also did not play an important role in Cambodia’s agricultural sector. As illustrated in figure 8, China provided loans to agricultural sector only in 2010, where the loans amounted to USD 16.183 million. In general, Japan’s disbursements to this sector exceed that of Korea.

Now let us investigate into the disbursements for the governance and administration sector. Japan provided a lot more grants to this sector than China and Korea did. Japan’s grants equals on average USD 8 million per year between 2007 and 2010 (see figure 9). However, China’s grant for governance and administration was USD 14.75 million in 2007. It decreased by almost 50% in 2008 and was cut off in 2009. Inversely, Korea started taking into account this sector in 2010 by disbursing USD 2.044 million.

Figure 8. ODA to Agricultural Sector

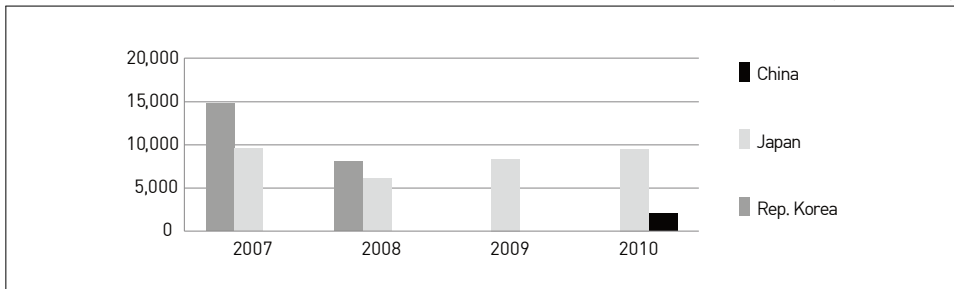
(1,000 USD)



Source: RGC (2011), RGC (2010), and RCG (2008)

Figure 9. Grants to Governance & Administration Sector

(1,000 USD)

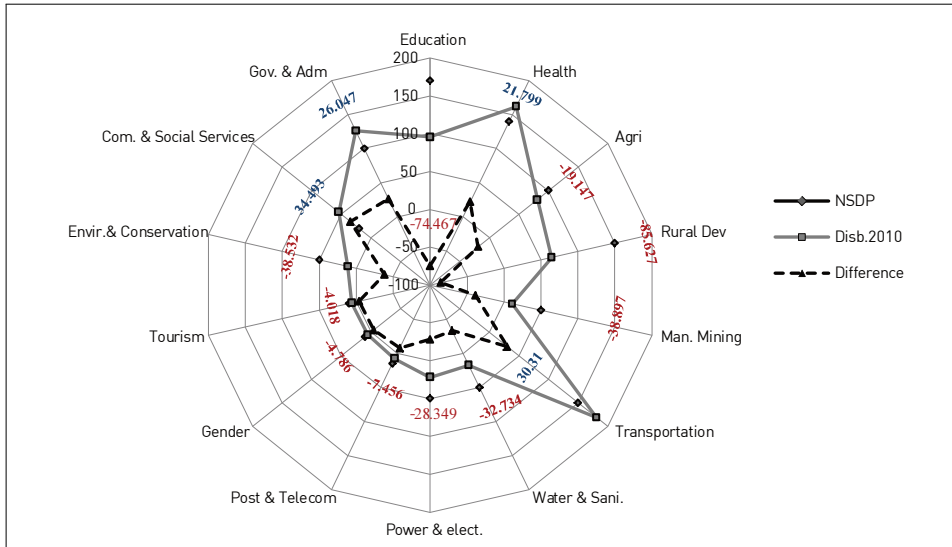


Source: RGC (2011), RGC (2010), and RCG (2008)

Let us now compare the actual ODA disbursements with the NSDP. In some naïve sense the NSDP can be interpreted as a kind of revealed preference or welfare function of the Cambodian society. To do this we look at the radar chart of figure 10. The interpretation of the radar chart is as follows. Each of the fourteen aid sectors is represented by a spoke. Connecting the spokes result in a tetradecagon or in a polygon of 14 equal sides and angles. The middle-point represents a value of USD -100 million. If we move along a straight line outward the values increase up to USD 200 million on the most outer tetradecagon. The distance between two neighboring tetradecagons represents a difference of USD 50 million. For example, the distance from the middle-point to most inner tetradecagon is USD 50 million. With figure 10 we see three star plots. The star plot resulting from the line with the diamond markers represents the planned expenditures from the NSDP by sectors. The

star plot resulting from the line with rectangular markers represents the actual total disbursements of all donors by sectors. The plot resulting from the line with the triangle markers represents the difference between planned expenditures from the NSDP and the actual disbursements by sectors. A positive number on a spoke means that the actual disbursements of ODA exceed the planned expenditures from the NSDP for one sector. For example, on the spoke health sector, the number 21.799 means that the actual disbursements of ODA exceed the planned expenditures from the NSDP by USD 21.799 million for health sector. By contrast, the negative numbers represent sectors, where the planned expenditures from the NSDP exceed the actual disbursements of ODA.

Figure 10. Comparison between total disbursement 2010 and NSDP by Sector (mil \$)



Source: RGC (2009) and RGC (2011)

According to figure 10, the disbursements for education, rural development, environment and conservation, and manufacturing and mining are below the expenditures from the NSDP. On the other hand, the other sectors received more disbursements than desired. This situation can be interpreted as an imbalance between the desires of the government and the society of recipient country and the actual disbursements. From this view point more coordination of the donor countries seems to be desirable.

Most of the multilateral donors and NGOs disbursed grants for the sectors

such as governance and administration, community and social services, and health rather than the others. This results in higher disbursements to these sectors than the plan. Furthermore, transportation is one of the sectors where the disbursements are higher than planned. This sector received USD 30.31 million more than the government desired. It can be concluded that a misallocation of ODA is taken place.

Moreover, from the comparison of the disbursements by Japan and Korea, the DAC countries and the disbursements by the non-DAC country China to the different sectors, we can illustrate that there are huge differences. While the Korea and Japan focus their disbursements on the sectors that are relevant to MDGs, China concentrates its disbursements on the infrastructure. Since the characteristics and motives of Korea and Japan seem to follow the DAC regulations, a theoretical foundation - besides the official statements - behind the Chinese ODA's characteristics and motives is missing. In the next section, we try to develop such a theoretical foundation. Of course, because of the non-transparency of China's ODA, it is impossible to test the theory on what would be desirable.

VI. Model of Development Aid

Here we will consider how we can rationalize the reason why a huge share of China's ODA is used for transportation infrastructure construction. How does this make sense? The problem is that China is less transparent regarding its ODA than the DAC countries. According to its White Paper (State Council 2011), the aid is provided in three forms: grants, interest-free and concessional loans managed by the EXIM bank. Further, China and the DAC countries account distinct expenditures as ODA. However, that means, in principle, that what China defines as ODA is different from what OECD countries mean with the term of ODA. Even that China does not publish any detailed information about its aid programs; it explains officially that its aid should be of the mutual benefit for the recipients and China. Consequently, the critical view of Western countries' that China's aid is supporting China more than its aid recipients is somehow insubstantial, because if the China's objective differs from the objectives of the DAC countries such as Japan and Korea, then it makes no sense to compare ODA with China's aid. In the same way, also the DAC countries do not grant anything exclusively in the interest of developing countries, even that western policy-makers announce this in the public interest.

At least, only difference is that, the DAC countries have developed a code of good conduct regarding how much developing countries should gain from ODA. In some respect that can be called a progress compared to the times of the Cold War. If China deviates from this code, the problem is comparable to a prisoner's dilemma. In the extreme all the DAC members will deviate from the code of good conduct in the future.

Further, does China's provision of easily accessible loans with fewer conditionality lead to a new round of indebtedness for developing countries? Apart from these questions, DAC countries argue that China's aid programs are focused on technical or production-based projects instead of supporting the MDGs.

If we begin with the last point, which is not very convincing, why is it better to invest in hospitals than in the transportation infrastructure? Both kinds of investments can enhance economic growth, and that is not discussed in the economic development literature. Of course, the construction of sport stadiums can be taken into question, because it is difficult to find an argument, how the existence sport stadiums can contribute to development. Why infrastructure projects are preferred by China will be explained below, but in principle, it is difficult to argue against such projects.

Let us now come to the second question raised by the DAC countries, regarding the indebtedness of developing countries. That seems to be a serious problem from a paternalistic view and from the view of the DAC countries that have lent money to developing countries without any security. However, that can also become a problem for China, because if a heavily indebted country defaults China will lose money. So this argument is as well far away from a convincing argument against China in general. Below we will explain, why this could be a serious problem in specific cases.

Anyway, now we come to the remaining main question: what is the reason that 40% of China's aid is given for completing projects, most of which are related to infrastructure. Because of the lack of transparent data, we propose to develop a model, which can explain China's revealed preferences.

Let us assume that there are three countries: a developing country which we call country *R*; and two possible donors, which we call country *D1* and *D2*. The intention of country *R* is to receive grants, interest-free loans and concessional loans as much as possible with a minimum of conditions regarding good governance. The interests of the possible donors are different; they have an interest to get easy access to resources of the recipient, easy access to the

import market of the recipient for domestic companies, geo-political interests. How these interests are weighted by the donors differs from receiving country to receiving country. Additionally, which projects or aid activities are preferred depends also on the political system of the donor country. The more democratic the donor country's political system is, the more the responsible ministry has to justify aid projects in general, the form of aid, and to take care that the voters in the donor country assume that the projects are useful and are corresponding with the preferences of the voters. If a donor country is not so much dependent on the opinions of its people, the government can more easily pursue goals like geo-political objectives, profit interests of preferred companies and so on. Such governments are less compelled to justify their decisions.

Let us further assume $D1$ is not much interested in conditions for the recipient, but is taking care by itself that its aid is protected against corruption as much as possible. With respect to country $D2$ we assume that it tries to follow the rules of the DAC. Consequently, country $D2$ is a DAC country and $D1$ not. Now, country R is asking for aid to construct a infrastructure project, and $D1$ and $D2$ make proposals how they would realize this infrastructure project, by informing about the costs and the conditions which have to be fulfilled by the recipient. Country $D2$ will calculate the costs based on the market prices of national companies who are involved internationally in construction, because at least the project should be conducted under the leadership of a national company. The national company is then responsible to hire local workers, to procure the relevant machines and necessary materials. Of course, regarding the hiring process and procurement of machines and materials the usual western procedures of tender must be fulfilled. To guarantee the required and agreed quality of the infrastructure, a second independent national company has to assess if the quality standards are fulfilled by the operating company. After calculation $D2$ will present the probable costs and will offer a loan which covers all costs and will require the statement of country R that it will do everything to avoid that corruption will take place. For example, that it is not possible that a public officer from R will only give his quality approval for construction work against cash payments or that materials or machines will be withhold at the customs service, if not a cash payment will take place. Let us assume that the resulting costs and the aggregate loan will result in the amount of L . Let us assume that the relevant world market interest rate would be i and country $D2$ offers the loan at an interest rate of id , where the factor $d \in \left[\frac{-1}{i}, 1 \right]$. From the view of country R the total costs of the infrastructure project CP^{D2}

accomplished by country D2 is then, given that the country R has to pay back the loan in t years:

$$CP^{D2} = L(1 + di)^t. \quad (1)$$

The value of d defines now, the form of country D2's ODA. If d is in the range between zero and one ($d \in]0, 1[$); the ODA is a concessional loan, because the interest rate di is lower than the world market interest rate i . If $d=1$, then the loan of country D2 is no ODA, but a non-concessional loan, because in this case the interest rate of the loan equals the world market interest rate; $i = di$.

If $d=0$, the loan is an interest-free loan. And if $d = \frac{-1}{i}$, then the loan of country D2 is not a loan, but a grant, because CP^{D2} becomes zero. Therefore, we can interpret all forms of development aid as loans, which are received at different interest rates. Consequently, a grant is a loan given at an interest rate of -100%.

Let us repeat the special cases, to clarify the statements from above:

$$L(1 + di)^t = \begin{cases} L(1 + i)^t, & \text{if } d = 1 \text{ (non - concessional loan)} \\ L, & \text{if } d = 0 \text{ (interest - free loan)} \\ 0, & \text{if } d = \frac{-1}{i} \text{ (grant)} \end{cases} \quad (1')$$

Let us assume that also country D1 has an interest to make an offer to realize the project. Let us further assume, that this country will execute the project under the condition, that the whole project will be executed by companies of the donor country. If this country has given the orders to state-governed companies, it is free to decide about the price of the whole project and it can determine the quality of the outcome of the project. Under these conditions, it is easy for country D1 to underprice the offer of country D2, even if it promises to fulfill the same quality standards as country D2. Let us assume that it offers a loan of L/x , where $x > 1$. Additionally, it can offer a lower interest than the one offered by country D2, as long as country D2 is not granting the project. How is it possible that country D1 can undercut every positive price? If we take China as an example, then it can finance the whole project by printing its own currency, and it can expect to get returned either valuable goods like natural resources or the loan and interest payments in a convertible currency. This is possible because China does not need to spend one unit of a convertible currency and as long as there is no full employment in China it is a profitable

offer to accomplish such projects.

Further, the costs of the project can be lowered by decreasing the quality of the roads, railways and so on, because neutral and independent quality controls are not provided. For instant, The Economist (2011) states about China's aid, "*Suspect above all is the type of transfer that China offers to African countries. Most loans and payments are "tied"—ie, the recipient must spend the money with Chinese companies. However, tied aid leads to shoddy work. With no competition, favoured firms get away with delivering bad roads and overpriced hospitals. Creditors and donors often set the wrong priorities.*" However, there is only one infrastructure project operated by a state-owned Chinese company (COVEC)⁵, where we can get a little insight into the bidding behavior of Chinese companies and their business model (Areddy 2012). Even if public officers of the recipient country control the quality, it is easy to bribe them and corruption is omnipresent in China. In principle, the dating of the disbursement of the aid is not known for the recipient country, because no Yuan must leave the country. All disbursements will take place in China. Additionally, transportation infrastructure projects reduce automatically transportation costs for Chinese products. On the other hand, the government of the recipient country receives apparently the same infrastructure at lower costs. If it will become obvious in the future that the quality of roads or railways is bad, the government can argue that it did not had any influence on the quality. This type of offer can only be made, if all expenditures for the project will induce only money flows inside China and if no parts for such projects must be imported from third countries. The same holds if China would provide domestic products or services which otherwise can be sold on the world market or are scarce in China. However, infrastructure projects are labor intensive, and Chinese companies hire much more workers from China than Japanese and Korean companies would hire from their home countries. Especially, Japanese and Korean companies would never hire low-skilled workers from their home countries, because this kind of labor force can be easily hired at lower wages in the recipient country. Therefore, we can conclude, that China prefers transportation infrastructure projects, because:

- China can undercut more or less all offers of Japan and Korea or other DAC countries, without the risk to lose money by adjusting the quality of the project's outcome,

⁵ COVEC (Chinese Overseas Engineering Company) especially China's Shanghai Construction (Group) General Company which constructed many projects in Cambodia (Prek Tamak Bridge).

- the improvement of the transportation infrastructure sector makes it easier to get access to resources in developing countries,
- the improvement of the transportation sector decreases the costs to get access to the markets of the recipient's import market,
- the hiring of low-skilled Chinese workers lowers the pressure on the Chinese labor market and increases the demand for Chinese products directly.

The last argument is a consequence of the fact that despite its high growth rates, unemployment is still prevalent in China.

Of course, the results here depend on the assumption that Chinese construction work is on average worse than the construction work of DAC countries' companies and that the prices of Chinese companies are below-market prices. There exists no data about this, but there are some indications that the assumption is probable correct.⁶

From the considerations above, the donor country $D1$ can expect a higher profit from getting the project than the donor country $D2$. As explained above from a national welfare view $D1$ retains the whole wage payments, the value added of the intermediate industry, which delivers the construction machines and materials, because in the extreme no cent is leaving the domestic economy of $D1$. Without any doubt, then its value added from a project exceeds the value added, which can be realized by country $D2$. The reason is that the company from $D2$ would hire foreign workers from the recipient country and pay them, would buy many materials in the recipient country, and partly it also would buy machines in the recipient country. In contrast, the company from country $D1$ would not hire any workers from the recipient, would not buy materials or machines in the recipient country. This company would import all materials and machines from home. Therefore, let us denote the gross welfare gain of $D1$ generated by the project as Π_{D1} and the gross welfare gain of $D2$ as Π_{D2} . Following our considerations above inequality (2) strictly holds:

$$\Pi_{D1} > \Pi_{D2}. \quad (2)$$

To realize these gross benefits, it is necessary to convince the recipient country, that the project should be conducted by either $D1$ or $D2$. For this reason, both countries offer part of the benefits to the recipient country. Let us denote

⁶ See The Economist (2011) or Areddy (2012).

these incentives as G_{D1} and G_{D2} respectively. These incentives could be direct briberies (illegal for DAC countries), lower interest rates for the loan, lower announced costs of a given project, life of a loan, years of grace and so on. This situation can be interpreted as a Cournot-contest with two agents; country $D1$ and country $D2$, who are competing for getting a well-defined infrastructure project. The expected benefit P_{D1} of country $D1$ from getting the project is given by:

$$P_{D1} = p(G_{D1}, G_{D2})\Pi_{D1} - G_{D1}. \tag{3}$$

The CSF (contest success function) $p(G_{D1}, G_{D2})$ reflects the probability of country $D1$ to win the contest. Here we use the CSF which is mostly used in the literature.⁷

$$p(G_{D1}, G_{D2}) = \frac{G_{D1}}{G_{D1} + G_{D2}}. \tag{4}$$

Equation (3) represents the probability of country $D1$ to get the project $p(G_{D1}, G_{D2})$ times its gross welfare gain Π_{D1} minus its incentive G_{D1} .

Consequently, the expected net benefit of country $D2$ is then:

$$P_{D2} = [1 - p(G_{D1}, G_{D2})]\Pi_{D2} - G_{D2}. \tag{5}$$

To find a Cournot-Nash equilibrium of the contest, we apply the usual procedures to solve a Cournot competition.

At first, we have to determine the best reaction functions of both countries. Country $D1$ maximizes (3) with respect to G_{D1} . The resulting first order condition is then:

$$\frac{\Pi_{D1}}{G_{D1} + G_{D2}} - \frac{G_{D1} \Pi_{D1}}{(G_{D1} + G_{D2})^2} - 1 = 0. \tag{6}$$

In contrast, country $D2$ maximizes (5) with respect to G_{D2} . This results in the first order condition:

⁷ See for example Hirshleifer (1988).

$$\frac{\Pi_{D2}}{G_{D1} + G_{D2}} - \frac{G_{D2} \Pi_{D2}}{(G_{D1} + G_{D2})^2} - 1 = 0 \quad (7)$$

Now we solve (6) for G_{D1} and get as the best reaction function of country $D1$:

$$G_{D1}(G_{D2}) = -G_{D2} + \sqrt{G_{D2} \Pi_{D1}}. \quad (8)$$

Solving (7) leads to the best reaction function of $D2$:

$$G_{D2}(G_{D1}) = -G_{D1} + \sqrt{G_{D1} \Pi_{D2}}. \quad (9)$$

To determine the Cournot-Nash equilibrium of this contest, we substitute (8) into (9) and solve for G_{D2} and get the optimal incentive of country $D2$:

$$G_{D2}^* = \frac{\Pi_{D2}^2 \Pi_{D1}}{(\Pi_{D1} + \Pi_{D2})^2}. \quad (10)$$

Using (10) and substituting the value in (8) gives the optimal incentive of country $D1$:

$$G_{D1}^* = \frac{\Pi_{D1}^2 \Pi_{D2}}{(\Pi_{D1} + \Pi_{D2})^2}. \quad (11)$$

By comparing (10) and (11), we will see that $G_{D1}^* > G_{D2}^*$ always holds, if $\Pi_{D1} > \Pi_{D2}$ is fulfilled. The resulting equilibrium probability of $D1$ to win the contest is then:

$$p(G_{D1}^*, G_{D2}^*) = \frac{\Pi_{D1}}{\Pi_{D2} + \Pi_{D1}}. \quad (12)$$

And the corresponding probability of country $D2$:

$$1 - p(G_{D1}^*, G_{D2}^*) = \frac{\Pi_{D2}}{\Pi_{D2} + \Pi_{D1}}. \quad (13)$$

Not surprisingly, the chance that China wins the contest is higher than the probability of a DAC country. The probabilities to win the contest depend directly on the ratio between the net benefits of the contesting countries. The resulting expected net benefits of both countries will become to:

$$P_{D1}^* = \frac{\Pi_{D1}^3}{(\Pi_{D2} + \Pi_{D1})^2}. \quad (14)$$

$$P_{D2}^* = \frac{\Pi_{D2}^3}{(\Pi_{D2} + \Pi_{D1})^2}. \quad (15)$$

However, if the country with the higher probability wins the contest, which is China in this case, it can -after the project has started- breach the original contract as in the case of Poland (Areddy 2012) and dictate new conditions, because the recipient country, is other than Poland locked-in and has to accept all new conditions. The only reason, that China will not overplay this option is that the reputation of China will suffer too much and that it will not get any contract in the future. In Europe one breach of a contract has cost more than the possible loss of COVEC, because now it will become impossible for all Chinese construction companies to get any project in Europe in the next 10-20 years.

VII. Conclusion

With comparison of the development assistance by China, Japan, and Korea, each donor has different characteristics in financing Cambodia regarding to the terms of business, target area, and purposes of disbursements.

China's ODA loans are a capital injection into the transportation sector in Cambodia much more than on other areas. In some cases, this kind of assistance causes an imbalance between the development sectors. The investments in the transportation sector contribute to the Cambodian economy in the short run, especially to improve the rural and agricultural development. Yet in the long run, if education is not supported and environmental issues are ignored, the sustainable development could not be guaranteed. On the one hand, the loans from China can distort the other ODA, even with their financing without political strings attached, which makes the Cambodian government happy. That is

because the loans are unconditionally given to the country, so that the government has no incentive to improve its governance structure. Then why is China distorting the ODA from the DAC member countries? The ODA regulations are an outcome of intensive discussions and a compromise of the donor countries to restrict themselves in the use of self-interest driven ODA. This is of course in favor of developing countries. The problem is if one country like China is ignoring the rules, it will be better off at the cost of the DAC members. It must be feared that the DAC members could follow China's way. In principle, the situation described is a typical prisoner's dilemma.

From China's ODA, Cambodia gains benefits from the better infrastructure, but it has to pay for it, even for the concessional loan. If China set a higher price than competitive ones for roads, the advantage of concessional loans can be easily overcompensated to the disadvantage of Cambodia. In the end, China is the big winner and Cambodia the great loser in the game. And in the case of ODA it is much easier to decoy LDC governments into the trap, because policy-makers are not liable for the loans.

According to our analysis it is clear that the selection criteria with respect to aid projects for the DAC countries and that for China are different. China has a huge interest in infrastructure projects, because such projects make it possible for it to offer jobs to unskilled Chinese workers and reduces the pressure in its domestic labor market. The pressure of China's labor market is evident as at minimum 4.2% of its labor force or 9.11 million workers are unemployed (China.org.cn 2012). Because of the fact that China's economic growth is export-led, the country has a strong interest in good transportation infrastructure. Additionally, China has a strong interest in importing natural resources, which again makes good transportation infrastructure necessary. Only good transportation infrastructure guarantees low transportation costs, which will lead to higher exports and lower import prices. At least, because of the structure of the aid it could be assumed that China can also make profits even with the conditions that look very preferable from an ex-ante view of the recipient country. However, one should notice that this assessment could be totally wrong from an ex post view. It is still unclear if the Chinese government intends to get this outcome, or if it is only caused by some opportunistic Chinese companies taking advantage of the non-transparency policy of Chinese policy-makers and companies. Even though the Chinese government sometimes invites tenders, as only Chinese companies are eligible to participate, it is unclear how efficient and fair the tendering procedures are.

The driving interests of Japan and Korea are more influenced by their national policy goals and the expected perceptions of the voters. The aid projects should at least catch the attention of national media or win obvious and unbiased support from the suffering people in the recipient countries. In the meantime probably most of ODA and Chinese aid is given to serve the donor country's interest or their policymaker's interest. Therefore, in some sense the aid of China and ODA from the DAC countries are complementary. Still, the Chinese aid becomes problematic with the opportunistic behavior of Chinese companies in developing countries. In such cases unfortunately that developing countries are being exploited by Chinese aid. Their behavior will result in that the developing countries should pay too much for bad quality infrastructure. However, we do not know to which extent this happens quantitatively, because neither the Chinese side nor the recipient side has any interest in revealing such disasters. Yet experiences from African countries show that it happens.

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