

**CHINA AND ANGOLA: THE RISKS OF A STRATEGIC PARTNERSHIP**

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**Abstract**

*These days Africa is seen as a large market with high potential for development. Furthermore the resource-rich countries have received increasing attention from the major economic powers in the recent years. China became Africa's largest trading partner after massive investments in many countries' infrastructure. On the other hand these countries supply primary energy which is vital for China's fast-growing economy. This paper focuses on the partnership between China and Angola and follows the evolution of China's investment risk in Angola from 2000 to 2012. This analysis includes factors with impact on recouping China's investment in Angola. These factors are indicators for the economic, social and political situation of Angola and their evolution correlates with the crude oil export to China.*

**Keywords:** Investment Risk, Crude Oil Flow, Africa Rising, Weighting Factors, China, Angola

**JEL Classification:** C43, F14, I38, J71, O11

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## **1. Introduction**

China is one of the world's leading economies with an outstanding growth rate of 7.7% in 2013 underpinned by a huge population of 1.4 billion (account for over 20 percent of global population). China has experienced high economic growth rates for over two decades but often the huge energy consumption could not be covered by its own production. The consumption includes mainly coal followed by oil, hydroelectric power, natural gas and nuclear. China's oil demand also outstrips the production and the difference is reflected in the oil imports which has risen about 7% from 2011 level to 5.4 million bbl/d in 2012.

In September 2013 China overtakes US as world's largest oil importer. This situation is even more remarkable knowing that US has been the leader since the '70. China leader status as world's largest oil importer is seen as a weakness that increased pressure on China to import larger volumes of oil from a wide range of sources after Sudan, South Sudan and Iran production had been shut in because of political conflicts inside these African nations.

Thus China's rapidly growing economy is largely outward-oriented concerning imports, exports and long term investments. Lately in order to replace the share of oil lost from Sudan, South Sudan and Iran, China has signed deals with Nigeria, Angola and other Sub-Saharan countries. On the other hand the resource exports to China are paying for infrastructure. China plans include mainly infrastructure projects with heavy focus on the highway, railway, energy and water sectors.

Angola is one of the former Portuguese colonies. Angola gained its independence in 1975 but quickly plunged into a devastating civil war between the government, led by the MPLA, and two rebel movements: the National Front for the Liberation of Angola (FNLA) and the more important and enduring National Union for the Total Independence of Angola (UNITA).

The civil war ends only after 27 years in 2002 with MPLA victory led by José Eduardo dos Santos. Although president dos Santos confirmed that legislative elections would be held has never directly faced a democratic vote other than the first round of the presidential elections in 1992. Plans to hold the presidential election were postponed while a cross-party commission drew up a new Constitution to abolish presidential elections.

On the other hand, once peace established in 2002, a strategic partnership with China deepened to encourage rapid post-conflict infrastructural rehabilitation and development. Since then Angola has registered significant GDP growth.

Angola is the first source of oil for China after Saudi Arabia. In 2013 almost half of Angola's oil exports have gone to China which represented 14% of the total amount imported. This is how China's investment in Angola is recouping.

Taking into account that Angola's economy is based on oil export and its price, a decrease of price would strongly impact the government expenditures and the cost of living. While political instability is still present this situation may lead to social protests through Angolan people.

Despite the social unrest the risks of protests or conflicts in short term are minor but the threat will increase as the younger generation matures. This age group has no memory of the

horrors of the civil war and will be less inclined than their parents' generation to moderate their demands for better life opportunities. If the government fails to respond to their demands, the risks of instability will increase.

Although Angola is one of the resource-rich countries the living condition are around the poverty line: GDP per capita level is very low while subsistence agriculture is still the main activity (85% of Angolans). As reported by UNDP, Angola is on the 148th place in top 187 countries as concerns HDI with over 43% of population living below poverty line with less than 1.25 dollars per day.

In contrast, the capital of Angola, Luanda is the most expensive city in the world and overtakes capitals such as New York, Tokyo, Paris or Moscow. The high level of prices is war consequence. Subsistence agriculture is the way of living for most Angolans and half of goods are imported. Moreover only half of population has access to water and this is the reason for epidemic and low life expectancy at birth. Angola's contrasts are indicators of corruption. Out of 175 countries Angola is on the 153th spot which means it is one of the 25 most corrupt countries in the world.

## 2. Description of the analyzed variables

Investments take complex economic decisions. Any project of investment requires quantitative analysis of risk. In this case the risk comes from Angola's economic, social and political situation. In other words the evaluation of investment risk is the evaluation of the capital destination.

Starting with the three economic, social and political dimensions this paper goal is to calculate a composite index of risk that combined the most impacting factors to Angola situation. Taking into account the available data the following indicators were selected: **economic component** – GDP, inflation, imports of goods and services (% of GDP), exports of goods and services (% of GDP), exchange rate, labor force (% of total population); **social component** – access to improved water (% of total population), fertility rate, HDI, population 0-14 y.o. (% of total population); **governance component** – CPI (Corruption Perception Index), political stability and absence of violence/terrorism, government effectiveness, voice and accountability.

## 3. Methodology

After variables selection the next step is missing-data imputation. One of the most accurate methods of imputation uses a regression model based on completed registration of related variables which are explanatory:

$$\hat{y} = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_kx_k, \quad (1)$$

where:

y = dependent variable, the one with missing values which are going to be estimated using  $x_i$ ,  $i=1, 2, \dots, k$ ;

$x_i$ =explanatory/independent variable correlated with  $y$  (Niculescu-Aron, 2005).

For example the governance indicators for 2001 are missing. The political stability and absence of violence/terrorism correlates with the GDP and the inflation. In this case the 2001 result could be estimated using the two explanatory variables.

Next step in order to compute the composite risk index is **data normalization**. At this point data is rescaled between limits set in advance [0;1] or [0%; 100%] or other range. For consistent and accurate results the transformation must be done before variable aggregation. This normalization method is used when min and max values are known for all variables because the lowest score is replaced with 0, the highest with 1 while all intermediate values are transformed using the following formula:

$$v' = \frac{v - \min_A}{\max_A - \min_A}, \quad (2)$$

where:

$v'$ =scaled value of A indicator (after data normalization),

$v$  = unscaled value of A indicator (before data normalization),

$\min_A$ =minimum value of unscaled variable A,

$\max_A$  = maximum value of unscaled variable A.

After data normalization the next steps are weighting and aggregation.

**The analytic hierarchy process (AHP)** is a structured technique for organizing and analyzing complex decisions. It was developed by Thomas L. Saaty in the 1970s and has been extensively studied and refined since then. The aim of this technique is to determine the weighting of each factor with influence on the analyzed problem.

First step is to determine the relative importance of one criterion over another using pairwise comparison based on informed judgments. The analytic hierarchy process described in this paper is based on „The Economist”, BBC, CSIS (Center for Strategic & International Studies) experts’ research and other geopolitical publications.

	$C_1$	...	$C_n$
$C_1$	$c_1/c_1$	...	$c_1/c_n$
$\vdots$	$\vdots$	$\ddots$	$\vdots$
$C_n$	$c_n/c_1$	...	$c_n/c_n$

**Figure 1 – Pairwise Comparison Matrix**

In order to do the pairwise comparisons, Thomas L. Saaty (1980) proposed a scale to measure the relative importance: 1 equal, 3 moderate, 5 strong, 7 very strong, 9 extreme. Intermediate ratings can be also used if considered. Thus if  $C_n$  has a very strong importance compared with  $C_1$  ( $C_1/C_n=7$ ) the converse is true as well and  $C_1/C_n$  will be 1/7. The main diagonal will be always 1 because a criterion compared with itself is equally important. Once matrix is done, geometric mean is calculated for each row. Finally the geometric means are

normalized by dividing each of them to their total. The result is the weighting of each criterion on China's risk of investing in Angola and recouping the investment which is related also with Angolan crude oil export to China.

**Table 1 – Weighting of Economic Indicators**

Economic Indicators	GDP (mil \$)	exchange rate	imports (%GDP)	exports (%GDP)	labor force (%Pop)	inflation	geometric mean	weighting
GDP (mil \$)	1	5	5	6	6	7	4,30	49%
exchange rate	0,20	1	2	3	3	5	1,62	19%
imports (%GDP)	0,20	0,50	1	3	3	5	1,28	15%
exports (%GDP)	0,17	0,33	0,33	1	2	3	0,69	8%
labor force (%Pop)	0,17	0,33	0,33	0,50	1	3	0,55	6%
inflation	0,14	0,20	0,20	0,33	0,33	1	0,29	3%
TOTAL							8,74	100%

**Table 2 - Weighting of Social Indicators**

Social Indicators	access to improved water (%Pop)	fertility rate	HDI	population 0-14 y.o.(%Pop)	geometric mean	weighting
access to improved water (%Pop)	1	1	1	9	1,73	32%
fertility rate	1	1	1	9	1,73	32%
HDI	1	1	1	9	1,73	32%
population 0-14 y.o.(%Pop)	0,11	0,11	0,11	1	0,19	4%
TOTAL					5,39	100%

**Table 3 - Weighting of Governance Indicators**

Governance Indicators	Political Stability and Absence of Violence/Terrorism	Voice and Accountability	Government Effectiveness	CPI	geometric mean	weighting
Political Stability and Absence of Violence/Terrorism	1	3	5	6	3,08	56%
Voice and Accountability	0,33	1	3	5	1,50	27%
Government Effectiveness	0,20	0,33	1	2	0,60	11%
CPI	0,17	0,20	0,50	1	0,36	6%
TOTAL					5,54	100%

This process is iterated until all 14 indicators are aggregated into one composite index of risk.

**Table 4 – Weighting of each aggregate indicator (social, economic and for governance)**

Indicatori agregați	Social	Economic	Governance	geometric mean	weighting
Social	1	3	5	2,47	64%
Economic	0,33	1	3	1,00	26%
Governance	0,20	0,33	1	0,41	10%
TOTAL				3,87	100%

#### 4. China's risks of investing in Angola

According to Angola's Minister of Finance, by the end of 2011 China's Exim Bank had invested over 14.5 billion dollars in Angola. Nevertheless Chinese investments do not represent financial loans but infrastructure projects developed by Chinese companies with their employees in exchange for Angola's natural resources. Over 100 infrastructure projects were done with Angolan Government agreement to award Chinese companies licenses to extract crude oil. Figure 3 explains below China's model of investing and recouping the investment from Angola.

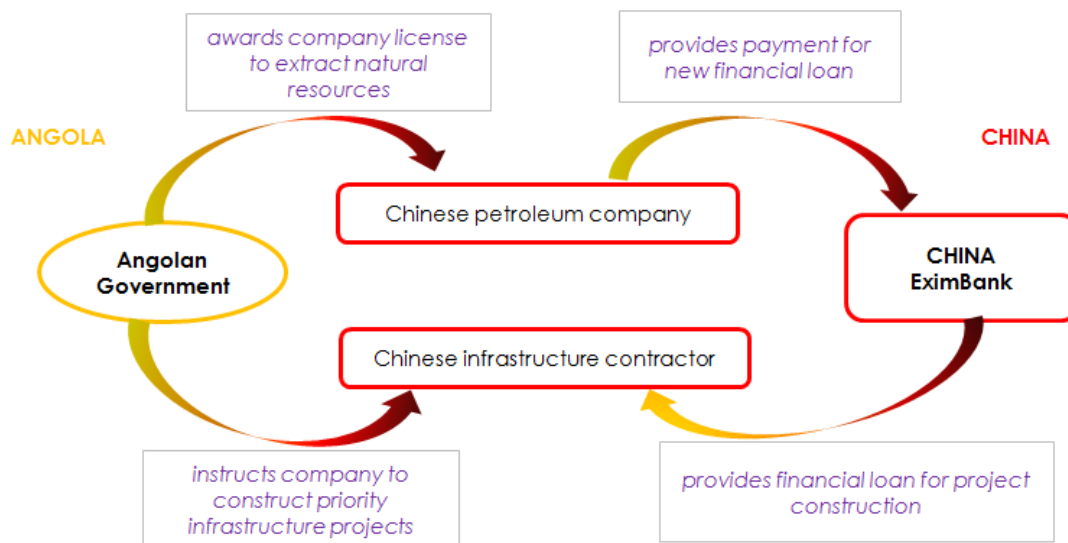


Figure 2 – China's model of investing in Angola

This model of investment does not respect the typical pattern and because of its complex flow it is difficult to convert the investment into numbers. China's risks of investing in Angola will be evaluated as a risk of decreasing the crude oil import from Angola.

Starting from this assumption Chinese investments are paid by Angola's crude oil and the threats are those who would decrease the crude oil export to China. These factors are related with Angola's economic, social and political situation. Correlations are displayed in Table 5 using Pearson correlation coefficient. This coefficient is between [-1;1] range: where a value equal to 1 means a perfect positive correlation and a value equal to -1 means a perfect negative correlation. The closer the value gets to 0 the weaker the correlation is.

**Table 5 – Correlation Table between Angola’s indicators and crude oil export to China**

INDICATORS	Crude oil export to China	RISK
<b>Economic Indicators</b>		
GDP (mil \$)	0,879	↓
exchange rate	0,734	↓
imports (%GDP)	-0,700	↑
exports (%GDP)	-0,671	↑
labor force (%Pop)	-0,639	↑
inflation	-0,608	↑
<b>Social Indicators</b>		
access to improved water (%Pop)	0,932	↓
fertility rate	-0,929	↑
HDI	0,916	↓
population 0-14 y.o.(%Pop)	0,210	↓
<b>Governance Indicators</b>		
Political Stability and Absence of Violence/Terrorism	0,822	↓
Voice and Accountability	0,715	↓
Government Effectiveness	0,568	↓
CPI	0,540	↓

If the correlation between a variable and the crude oil export to China is positive, the increase of the variable increases the crude oil export and so the risk reduces.

The correlation between Angola’s GDP and the crude oil export to China is very strong and positive. As Angola’s economy is based on oil this relation with the export is well known.

The rise of the exchange rate represents depreciation of the local currency compared with the benchmark currency. As a result the goods prices come down compared with the same goods produced in the benchmark country. The same situation happens with the crude oil export. If its price cheapened compared with U.S. level based on the increase of the exchange rate kwanza – dollar, the amount extracted from Angola would be more significant. Another reason is the fact that oil is the mean of payment for infrastructure loans. When the oil value diminished a bigger amount is needed to cover the current loan tranche to China.

On the other hand if imports weigh more in GDP crude oil diminished so the risk of investing in Angola increases. A significant percentage of imports in GDP is a warning sign which indicates a slowdown in production process and high dependence on foreign imports.

If exports weight more in GDP this could be a threat because China is not the only trade partner of Angola. Angola also exports crude oil to U.S.A. (13%), EU (11%), India (10%), Taiwan (7%), South Africa (4%), Indonesia (4%), Canada (3%).

The increase of labor force among population happens when economy is developing and creating new opportunities and jobs. Developing assumes resources which might impact the amount of crude oil for China by using it for its own needs and support for economy growth.

Thus the increase of labor force is a risk. In this context is good to mention that Chinese companies of constructors work only with their own nationals and don’t hire foreign employees. The arguments they brought for this policy are the lack of experience in the field, the time consuming trainings and most of all the problems which come with not knowing the language.



On the other hand, China Petrochemical Corporation known as Sinopec is the main Chinese petroleum company in Asia. Sinopec signed a deal with Angolan petroleum company Sonangol. A factor which might affect the activity of the companies is inflation. Inflation has a direct impact on production costs which include labor cost, raw materials and other expenditures. Because the inflation has a negative impact on crude oil export the rise of inflation is a risk.

The most important factor is the access to improved water. Only half of Angolans has access to improved water and this is a critical aspect of population's health which discourages any investments.

High fertility rates are specific to least developed countries and it is usually related with low levels of HDI. A very high fertility is also a negative aspect when describing a country profile for investments. In 2012 in Angola the fertility rate was 6 children born per women in their child-bearing years.

In Angola the Human Development Index has increased constantly in the recent years. The improvement of HDI is a positive aspect that reduces risk of investment.

In Angola the youth are the majority. Almost half of population (47.58% in 2012) is less than 14 years old. From the correlation table this has not a significant impact on crude oil export especially when Chinese companies don't hire foreign employees.

Although China doesn't interfere in the governance of any economic partner there is unrest through African countries former colonies because of trade constraint. Political stability and absence of violence in Angola are important in this case to keep the agreement with China. On the other hand, China has Sudan experience. Sudan had been one of the main oil suppliers for China until 2012 when oil exports dropped from 260 000 bbl/d in 2011 to 0 bbl/d in 2012 because of the political conflicts between Sudan and South Sudan.

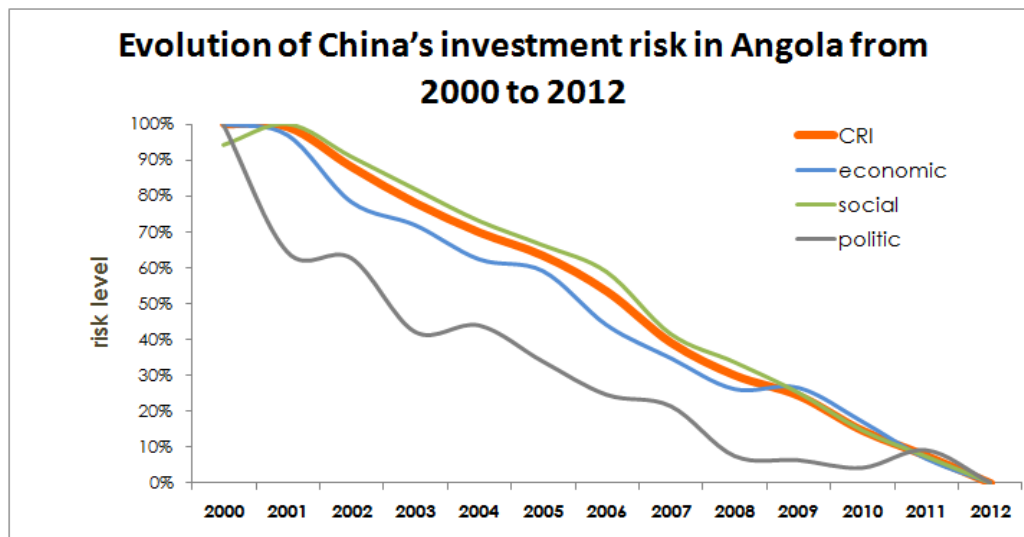


Figure 3 - Evolution of China's investment risk in Angola from 2000 to 2012

Therefore all aspects of Angola's governance correlates with the crude oil export to China and any political decision may lead to instability through population which is a major factor of risk. In Figure 4 is drawn the evolution of the Composite Risk Index and its components.



After peace was established the risk has decreased significantly, political tensions have smoothed down trying to encourage rapid post-conflict infrastructural investments. Many papers and publications describe this strategic partnership between China and Angola as a “marriage of convenience” (Power and Alves, 2012). China’s incentives are oil and primary commodities while Angola still needs aid for reconstruction of the country after the civil war. Yet, a serious debate surrounds whether investments and growth can assist development. Various economists argue that trade with China is hindering industrialization and lack jobs creation. Other economists are more positive arguing that growth often starts with primary sectors doing well and resource exports today are paying for infrastructure and human capital improvements that will sustain growth in the future.

## **5. Conclusion**

The strategic partnership between China and Angola is seen as a “marriage of convenience” or a bilateral “oil for infrastructure” agreement. In Africa, Angola is the second-largest crude oil supplier for China after Saudi Arabia. In 2013 almost half of Angola’s oil exports had China as destination which represented 14% of the total amount imported. The crude oil exported to China represents Angola’s way of payment for the Chinese investments in industry and infrastructure destroyed in 27 years of civil war. This is how China’s investment in Angola is recouping. Starting from this assumption Chinese investments are paid by Angola’s crude oil and the threats are those who would decrease the crude oil export to China. These factors are related with Angola’s economic, social and political situation.

The results of the analytic hierarchy process have shown that the social criterion weights the most when analyzing the risk of the investment (64%) followed by the economic (26%) and the governance criterion (10%).

Although HDI has increased constantly since 2000 the current level is still low compared with other African countries (in 2012 Angola’s HDI was 0.508 while Algeria’s 0.713). Furthermore the high fertility rate of 6 children per woman is often related with underdeveloped countries. But above all the most concerning social aspect is the access to improved water where only half of Angolans has access. This has a major impact on health and it is an investment risk especially when Chinese companies come with their own nationals.

As concerns GDP an increase of value translates into higher production and exports of crude oil. As oil is the way of payment the increase of GDP would reduce China’s risk of not recouping the investments in Angola’s infrastructure.

Surprisingly the governance doesn’t represent a major factor of investment risk. Despite the fact Angola is one of the most corrupt countries around the world (in top 25 highly corrupt countries) this status didn’t discourage Chinese investments. The explanation lies in China trade policy of not interfering in the governance of its economic partners. The World Bank and International Monetary Fund critique China for providing advantageous financial loans without any requirements from African countries as fighting corruption or respecting human rights.

Although China doesn't interfere in the governance of any economic partner there is unrest through African countries former colonies because of trade constraint. Political stability and absence of violence in Angola are important in this case to keep the agreement with China. Despite the social unrest the risks of protests or conflicts in short term are minor but the threat will increase as the younger generation matures. This age group has no memory of the horrors of the civil war and will be less inclined than their parents' generation to moderate their demands for better life opportunities. If the government fails to respond to their demands, the risks of instability will increase.

The main dynamics that could lead to instability in Angola were taken into account to create CRI (Composite Risk Index). From 2000 to 2012 CRI has had a descending trend which meant the risk have diminished constantly after the civil war. The "oil for infrastructure" relation between China and Angola strengthened and became a reliable strategic partnership but there always remain the challenges of dealing with the risks.

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