Risk Assessment of Chinese Enterprises' Foreign Direct Investment in African Agriculture
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Abstract: The “going out” initiative of agriculture has brought opportunities for Chinese companies to invest directly in foreign agriculture, accompanied by varying degrees of risk. This paper uses factor analysis to empirically analyze the risks of Chinese enterprises' direct investment in African agriculture. The empirical results show that West Africa and South Africa have relatively low investment risks; East Africa has moderate investment risks; Central Africa and North Africa have higher investment risks. In the face of these foreign direct investment risks, enterprises should improve their risk prevention capabilities, and the government should increase policy support.

Keywords: Foreign direct investment, Investment risk, Factor analysis

INTRODUCTION
According to the “2017 China outward Foreign Direct Investment Statistics Bulletin” issued by the Ministry of Commerce and the National Bureau of Statistics, as of the end of 2017, China’s outward foreign direct investment flows accounted for 5.9% of the global outward foreign direct investment flows, down 2.4 percent from the previous year. Ranked third in the world. In 2017, China's outward foreign direct investment flows in agriculture, forestry, animal husbandry, and fishery were US$2.51 billion, down 23.7% from 2016 and accounting for 1.6% of outward foreign direct investment flows. By the end of 2017, China’s total outward foreign direct investment balance in agriculture, forestry, animal husbandry and fisheries was US$16.56 billion, accounting for 0.9% of the foreign direct investment stock.

In 2017, Chinese companies' investment flow to Africa was 4.1 billion US dollars, up 70.8 percent year-on-year, accounting for 2.6 percent of China's outward foreign investment flows and the fastest growing target market in the five continents. The stock of investment in Africa is 43.3 billion US dollars, accounting for 2.4% of China's outward foreign investment stock. China's outward investment in Africa involves 52 countries with a coverage rate of 87.6%. In 2017, China invested 150 million U.S. dollars in African agriculture. Due to the high political and natural risks in Africa, the investment volume is small, but the investment potential is large. Africa's economic growth rate in 2017 was 2.4%, significantly higher than the 1.3% growth rate in 2016. Internationally, it is generally believed that Africa will maintain or exceed the economic growth rate in 2017 in 2018. Therefore, it is necessary to assess the risk of agricultural foreign direct investment in African countries in order to increase the success rate of direct investment in agriculture in Africa.

LITERATURE REVIEW
Risks of enterprises' OFDI
At present, there is no unified standard for the types of outward foreign direct investment (OFDI) risks. Scholars have analyzed the risks of OFDI from different aspects. The analysis method of three-variable model is put forward and widely used in the world. It is proposed that the main risks faced by enterprises in OFDI are the macro risk, namely environmental risk, medium risk, namely industrial risk, and micro risk, namely firm-specific risk [Miller, et. al., 1996]. Trade links, economic development, political risk, and resource endowment are the main factors to be considered when an investor makes foreign investment [Thomas, et. al., 2001]. Took the telecommunications industry in Nigeria as an example to study the impact of political risk on OFDI, and the most significant impact of political risk on OFDI is government corruption [Ellis, et. al., 2015]. Through empirical analysis founded that, compared with other types of risks, political risk has a more significant impact on OFDI in the long run [Daniel, et. al., 2018]. China started to analyze the risks of OFDI relatively late. Changes in policies and laws, political situation and economic situation of the host country would bring financial losses to investment enterprises [Shen, et. al., 2003]. Qualitatively analyzing the risks of the outward foreign direct investment in enterprises from three aspects of politics, economy and business risk [Xie, et. al., 2007]. Enterprises are faced with risks caused by trade barriers and investme
nt barriers in their OFDI, and put forward risk prevent
ion measures from the legal level [Cui, et. al., 2010]. Used political stability, political democracy, governm
ent effectiveness, legal system perfection, corruption
control, and terrorism to quantitatively evaluate the p
olitical risk of the host country [Zhou, et. al., 2017]. Divided the OFDI risks of Chinese enterprises into co
mmon risks and industry-specific risks by analyzing r
isks encountered by Chinese enterprises during their i
vestment in Southeast Asia [Fan, et. al., 2017].

Risks of enterprises’ investment in African
agriculture
The main risks faced by China’s agricultural
vestment in Africa are: political instability, low
economic level, natural environment change, low
level of opening-up and low efficiency of relevant
departments, and put forward Suggestions from these
aspects [Han, et. al., 2003]. The main risks of Chinese
enterprises’ direct investment in African agriculture are political instability, imperfect policies and
systems, backward agricultural irrigation facilities, and restrictions on land resource development [Chen,
et. al., 2013]. Through questionnaire survey that political, legal, social and natural risk of various types
faced by Chinese enterprises in agricultural direct
vestment in Africa account for a large proportion
[Hong, et. al., 2014].

EMPIRICAL ANALYSIS
This paper surveyed 151 companies that invested
in agriculture in Africa, of which 20 were in a state of
suspension and 23 were in preparation. The questions
set in the survey included the most likely risks for
tprises in Africa. After sorting out the survey data, it
was found that political risks ranked first, account
for 51%, followed by economic risks accounting for 30%, natural risks accounting for 16%,
and other types of risks accounting for 3%. China’s
OFDI involves 52 countries in Africa, and factor
alysis is used to evaluate the risk of agricultural
direct investment in these 52 countries. Data of South
Sudan, Eritrea, and SAO Tome and Principe are seri
ously missing, so they are not included in this
alysis.

Indicator selection
1) Political stability
Political stability means that the political system of
the society maintains the order and continuity of
dynamics, and it means that there is no overall
political unrest and social unrest. The higher the
political stability of the host country is, the lower the
vestment risk is, and the greater the investment of
China in the country is [Song, et. al., 2018].

2) Government corruption control
Government corruption control reflects people’s
views on the extent to which public power is exer
ced for private benefit, including various forms
of corruption. Political corruption in the host country
would make it less attractive for investors to invest in
the country [Zhou, et. al., 2018].

3) Government effectiveness
Government effectiveness reflects public
perceptions of the quality of public services, the
quality of policy formulation and implementation, and
the credibility of government commitments to
such policies. The low efficiency of the government
will increase the investment risk and difficulty of
vestors, and further affect investors’ investment in
the host country [Huang, et. al., 2008].

4) Quality of government supervision
The quality of government regulation reflects the
government’s ability to formulate and implement
appropriate policies and regulations to permit and
promote private sector development. The higher the
regulatory quality of the host country, the lower the
risk of OFDI [Meng, et. al., 2014].

5) Ratio of net FDI inflows to GDP
The net inflow of foreign direct investment as a
percentage of GDP reflects the degree to which the
host country absorbs foreign investment. The higher
the value of this indicator is, the larger the amount of
foreign investment flows into the country is, which
reflects the country’s strong support for foreign
vestment and low economic risk [Liu, et. al., 2018].

6) Crop production index
The crop production index shows annual
agricultural production compared to the base period
2004-2006. It includes all crops except for feed crops.
Chinese enterprises’ OFDI faced infrastructure
risks[Mao, et. al., 2017]. In this paper, crop
production index is used to reflect the level of
infrastructure in the host country.

7) Imports of goods and services as a percentage
of GDP
Imports of goods and services as a percentage of
GDP represent the ratio of the value of all goods and
services received from the rest of the world to gross
national product. The ratio between the total import
and export of commodities and GDP reflects the level
of opening up of the host country, and adopts this
indicator to evaluate the economic risks of the host
country [Zhang, et. al., 2017].

8) Per capita cultivated the land
Per capital cultivated land represents the level of
land resources in the host country. Natural resource
endowment of the host country has a significant
impact on foreign direct investment through empirical
alysis [Liu, et. al., 2016].

Sample selection and data sources
The data of the eight indicators selected in this
paper are from the World Bank database, and the
average values of 2015, 2016 and 2017 are selected
as data sources.

Research methods
Factor analysis can find the hidden representative factors among many variables, classify variables with the same nature into one factor, reduce the number of variables, simplify complex problems, and test the hypothesis of the relationship between variables.

The mathematical representation matrix of factor analysis method is X = AF + B

Composite risk score = factor 1 score * variance contribution rate of factor 1 / cumulative variance contribution rate + factor 2 score * variance contribution rate of factor 2 / cumulative variance contribution rate +... Factor I score * variance contribution rate of factor I / cumulative variance contribution rate

Factor analysis process and results

SPSS22.0 was used to analyze the eight variables of risk assessment selected in this paper, and the following results were obtained after the standardized processing of the data. As shown in table 1 to table 3, the KMO and Bartlett test results showed that the null hypothesis of significant difference should be rejected. The KMO test result was 0.703, the Bartlett sphere test was 207.967, and the significance level was 0.000<0.1, indicating a strong correlation between the original variable and the principal component. The cumulative rate of variance of common factors reached 79.750%. The results of common factor variance show that the information loss of selected variables is all below 0.4. It indicates that the selected index is suitable for factor analysis.

By rotating the composition matrix (table 4), it can be found that the first factor represents the quality of government supervision, government corruption control, government efficiency, and government stability. Therefore, the first factor is named as the government governance level factor. The second factor represents the net inflow of foreign direct investment as a percentage of GDP and imports of goods and services as a percentage of GDP; from the perspective of these two variables, the second factor is named as the economic openness level factor. The third factor represents the crop production index and per capita cultivated land. From the characteristics of these two variables, the third factor is named as agricultural production level factor.

**Table 1. KMO and Bartlett tests**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>KMO sampling fitness measure</td>
<td>0.703</td>
</tr>
<tr>
<td>Bartlett Sphere test</td>
<td>207.967</td>
</tr>
<tr>
<td>Degrees of freedom</td>
<td>28</td>
</tr>
<tr>
<td>Significant</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 2. Explanation of total variance**

<table>
<thead>
<tr>
<th>Composition</th>
<th>Initial eigenvalue</th>
<th>Sum of squares of rotating loads</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Percentage Cumulative variance</td>
</tr>
<tr>
<td>1</td>
<td>3.405</td>
<td>42.558</td>
</tr>
<tr>
<td>3</td>
<td>1.27</td>
<td>15.873</td>
</tr>
<tr>
<td>4</td>
<td>0.65</td>
<td>8.13</td>
</tr>
<tr>
<td>5</td>
<td>0.402</td>
<td>5.019</td>
</tr>
<tr>
<td>6</td>
<td>0.315</td>
<td>3.932</td>
</tr>
<tr>
<td>7</td>
<td>0.152</td>
<td>1.905</td>
</tr>
<tr>
<td>8</td>
<td>0.101</td>
<td>1.265</td>
</tr>
</tbody>
</table>

Extraction method: principal component analysis

**Table 3. Common factor variance**

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>Extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of government regulation</td>
<td>1</td>
<td>0.874</td>
</tr>
<tr>
<td>Government corruption control</td>
<td>1</td>
<td>0.864</td>
</tr>
<tr>
<td>Government effectiveness</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Government stability</td>
<td>1</td>
<td>0.704</td>
</tr>
<tr>
<td>Net foreign investment inflows as a percentage of GDP</td>
<td>1</td>
<td>0.84</td>
</tr>
<tr>
<td>Imports of goods and services as a percentage of GDP</td>
<td>1</td>
<td>0.805</td>
</tr>
<tr>
<td>Index of the crop</td>
<td>1</td>
<td>0.743</td>
</tr>
<tr>
<td>Per capita cultivated land</td>
<td>1</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Extraction method: principal component analysis.

**Table 4. Composition matrix after rotation**

<table>
<thead>
<tr>
<th>Composition</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of government regulation</td>
<td>0.933</td>
<td>-0.046</td>
<td>-0.017</td>
</tr>
<tr>
<td>Government corruption control</td>
<td>0.921</td>
<td>0.098</td>
<td>-0.082</td>
</tr>
<tr>
<td>Government effectiveness</td>
<td>0.948</td>
<td>-0.036</td>
<td>0.005</td>
</tr>
<tr>
<td>Government stability</td>
<td>0.78</td>
<td>0.294</td>
<td>-0.091</td>
</tr>
<tr>
<td>Net foreign investment inflows as a percentage of GDP</td>
<td>-0.032</td>
<td>0.914</td>
<td>0.051</td>
</tr>
<tr>
<td>Imports of goods and services as a percentage of GDP</td>
<td>0.191</td>
<td>0.858</td>
<td>-0.181</td>
</tr>
<tr>
<td>Index of the crop</td>
<td>-0.067</td>
<td>0.096</td>
<td>0.854</td>
</tr>
<tr>
<td>Per capita cultivated land</td>
<td>-0.022</td>
<td>-0.212</td>
<td>0.778</td>
</tr>
</tbody>
</table>

Rotation method: Caesar normalizing maximum variance method.

**RESULT ANALYSIS**

**Overall ranking analysis of investment risk**

According to the results of the comprehensive ranking of countries (table 5), Seychelles has the lowest investment risk, while Sudan has the highest investment risk. Among the top 16 countries, Seychelles, Cape Verde and other countries have low investment risks. When making direct investment in African agriculture, priority can be given to investment projects based on their own characteristics and investment purposes. In the last 16 countries, Gambia, Cameroon, Chad, and other countries have high investment risks. According to the company’s preference for investment risks, its own risk tolerance, experience in foreign direct investment in agriculture...
Regional analysis of investment risks

From the perspective of regional distribution (figure 1), there are 6 countries in North Africa, ranking in the overall ranking of 19, 21, 32, 42, 44 and 49 respectively, with relatively high investment risks. There are 8 countries in East Africa, ranking 1, 12, 16, 25, 30, 37, 41 and 48, respectively, with medium overall ranking and medium investment risk. South Africa has 12 countries ranked in the top 3, 4, 5, 7, 10, 14, 23, 24, 29, 33, 39 and 43 respectively, with low investment risk. There are 16 countries in West Africa, ranking 2, 6, 8, 11, 13, 15, 17, 18, 19, 22, 26, 28, 31, 34, 40 and 47 respectively, ranking high overall, with low investment risk. There are 7 countries in Central Africa, ranking at the bottom of 9, 27, 35, 36, 38, 45 and 46 respectively, with high investment risks. Among them, Mauritius and Botswana have higher governance level, while Libya and Sudan have lower governance level. Republic of Congo and Liberia have higher levels of economic openness, while Nigeria and Sudan have lower levels. Agricultural production is higher in Angola and Niger and lower in Uganda. From the perspective of the overall regional level, the governance level of South Africa is generally strong, while that of Central Africa is the lowest. West Africa has a relatively high level of economic openness and overall agricultural production, while north Africa has a relatively low level of economic openness and agricultural production.

Table 5 Country Ranking

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seychelles</td>
<td>East</td>
<td>1</td>
</tr>
<tr>
<td>Cape Verde</td>
<td>West</td>
<td>2</td>
</tr>
<tr>
<td>Mauritius</td>
<td>South</td>
<td>3</td>
</tr>
<tr>
<td>Botswana</td>
<td>South</td>
<td>4</td>
</tr>
<tr>
<td>Namibia</td>
<td>South</td>
<td>5</td>
</tr>
<tr>
<td>Liberia</td>
<td>West</td>
<td>6</td>
</tr>
<tr>
<td>Mozambique</td>
<td>South</td>
<td>7</td>
</tr>
<tr>
<td>Mauritania</td>
<td>West</td>
<td>8</td>
</tr>
<tr>
<td>Republic of Congo</td>
<td>Africa</td>
<td>9</td>
</tr>
<tr>
<td>Lesotho</td>
<td>South</td>
<td>10</td>
</tr>
<tr>
<td>Guinea</td>
<td>West</td>
<td>11</td>
</tr>
<tr>
<td>Rwanda</td>
<td>East</td>
<td>12</td>
</tr>
<tr>
<td>Ghana</td>
<td>West</td>
<td>13</td>
</tr>
<tr>
<td>Zambia</td>
<td>South</td>
<td>14</td>
</tr>
<tr>
<td>Sierra</td>
<td>West</td>
<td>15</td>
</tr>
<tr>
<td>Djibouti</td>
<td>East</td>
<td>16</td>
</tr>
<tr>
<td>Senegal</td>
<td>West</td>
<td>17</td>
</tr>
<tr>
<td>Togo</td>
<td>West</td>
<td>18</td>
</tr>
<tr>
<td>Morocco</td>
<td>North</td>
<td>19</td>
</tr>
<tr>
<td>Niger</td>
<td>West</td>
<td>20</td>
</tr>
<tr>
<td>Tunisia</td>
<td>North</td>
<td>21</td>
</tr>
<tr>
<td>Benin</td>
<td>West</td>
<td>22</td>
</tr>
<tr>
<td>South African</td>
<td>South</td>
<td>23</td>
</tr>
<tr>
<td>Malawi</td>
<td>South</td>
<td>24</td>
</tr>
<tr>
<td>Tanzania</td>
<td>East</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 Regional risk distribution

ADVICE

The enterprise shall improve its risk assessment mechanism

From the aspects of the enterprise itself, due to a long period of political unrest in Africa, during the agricultural direct investment in Africa than in other regions investment and more attention to the political situation. Whether the political situation is stable, whether the degree of political corruption is serious, and whether the government's work efficiency is efficient, etc., comprehensively consider the level of government governance in the host country. Collect the information of the host country from multiple channels and aspects to understand the macro-political and economic environment of the host country as much as possible. At the same time, carry out a risk assessment before investment, and comprehensively consider the choice of investment region and project based on the conditions of the enterprise itself. For agricultural enterprises, the requirements for the natural environment are more stringent than for other enterprises. When making an agricultural investment, we should pay more attention to some preferential agricultural policies and natural environment of the investing countries. After the investment, we should not only pay attention to our own operation and profitability, but also consciously abide by the laws and regulations of the host country and respect the local culture and customs of the investment. In the business process of an enterprise, it is necessary to regularly carry out a risk assessment on the enterprise, so as to timely discover the risks in the business activities of the enterprise and take countermeasures.
Government increase policy support

From the perspective of the government, the local government should pay more attention to the enterprises that make direct investment in foreign agriculture, and on the other hand, improve the feedback mechanism. Enterprises that make direct investment in foreign agriculture can timely report their own risks to the government. Local governments can analyze and summarize these feedback and introduce more targeted policies. It can solve the problems faced by foreign investment enterprises more directly. The government should speed up the construction of an information sharing platform so that enterprises can obtain information more quickly and conveniently, and reduce the risk level of foreign investment. Preferential policies will be provided for enterprises investing in foreign countries. In terms of loan limits and interest rates, the capital problems of enterprises investing in foreign agriculture will be solved to a certain extent and more enterprises will be promoted to make direct investment in foreign agriculture.

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