Do Chinese Government Foreign Student Scholarships Target Natural Resources in Africa?

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Introduction

As China-Africa trade and investment have experienced exponential growth in recent years, numerous Western and African politicians including Hillary Clinton and Rex Tillerson have warned Africa that China is practicing "a new form of colonialism" there, whereby it utilizes its foreign aid to gain access to Africa's rich natural resources. However, these accusations are vehemently denied by the Chinese side.

Research Focus:

This paper intends to provide solid empirical evidence to this heated debate by examining the relationship between the number of foreign student scholarships given by the Chinese government to African countries and the amount of natural resources they have. The Chinese government's foreign student scholarships has been an increasingly important form of China's foreign assistance, repeatedly emphasized and expanded by the Plans of Action of the Forum on China-Africa Cooperation from 2006 till 2015.
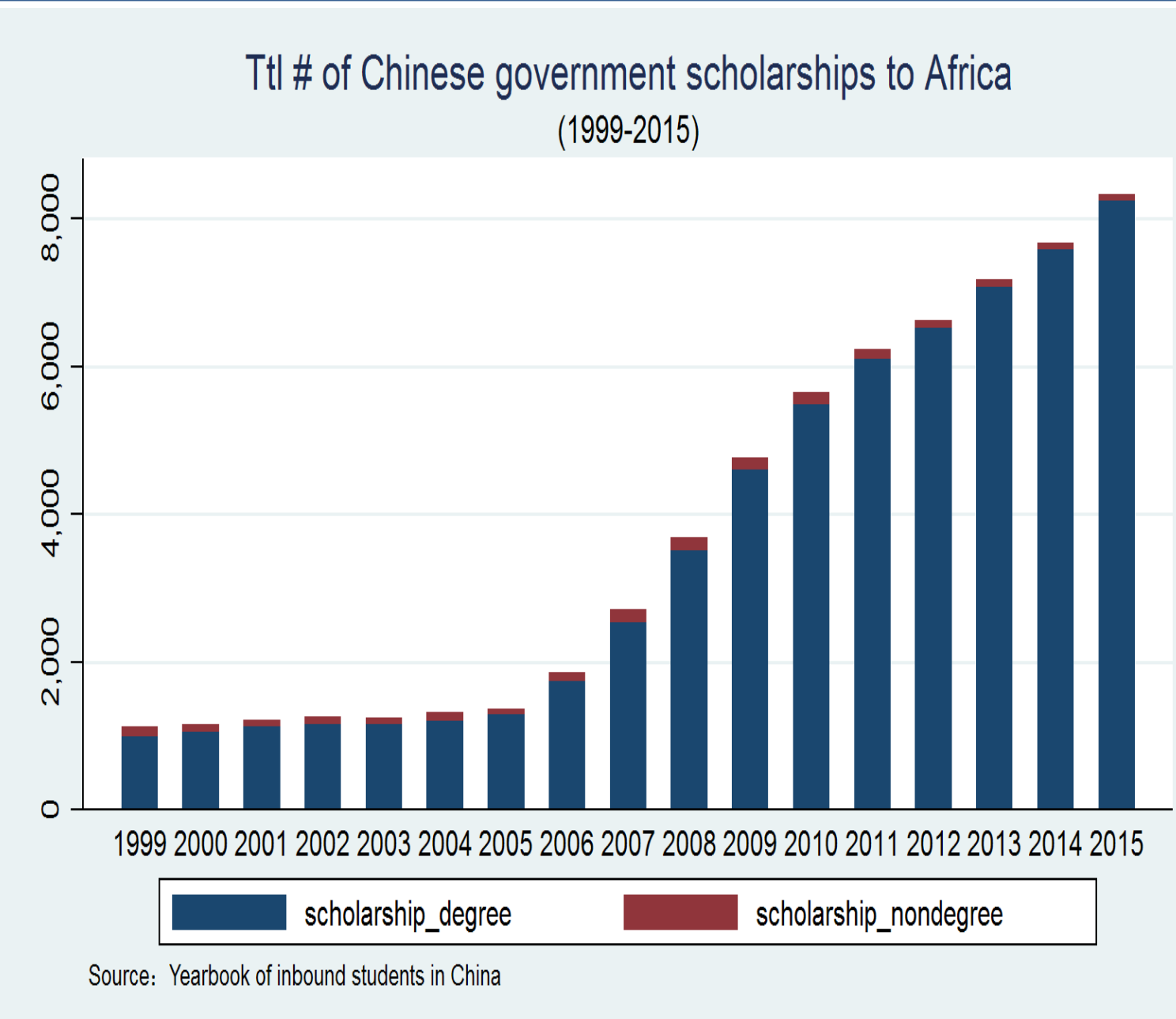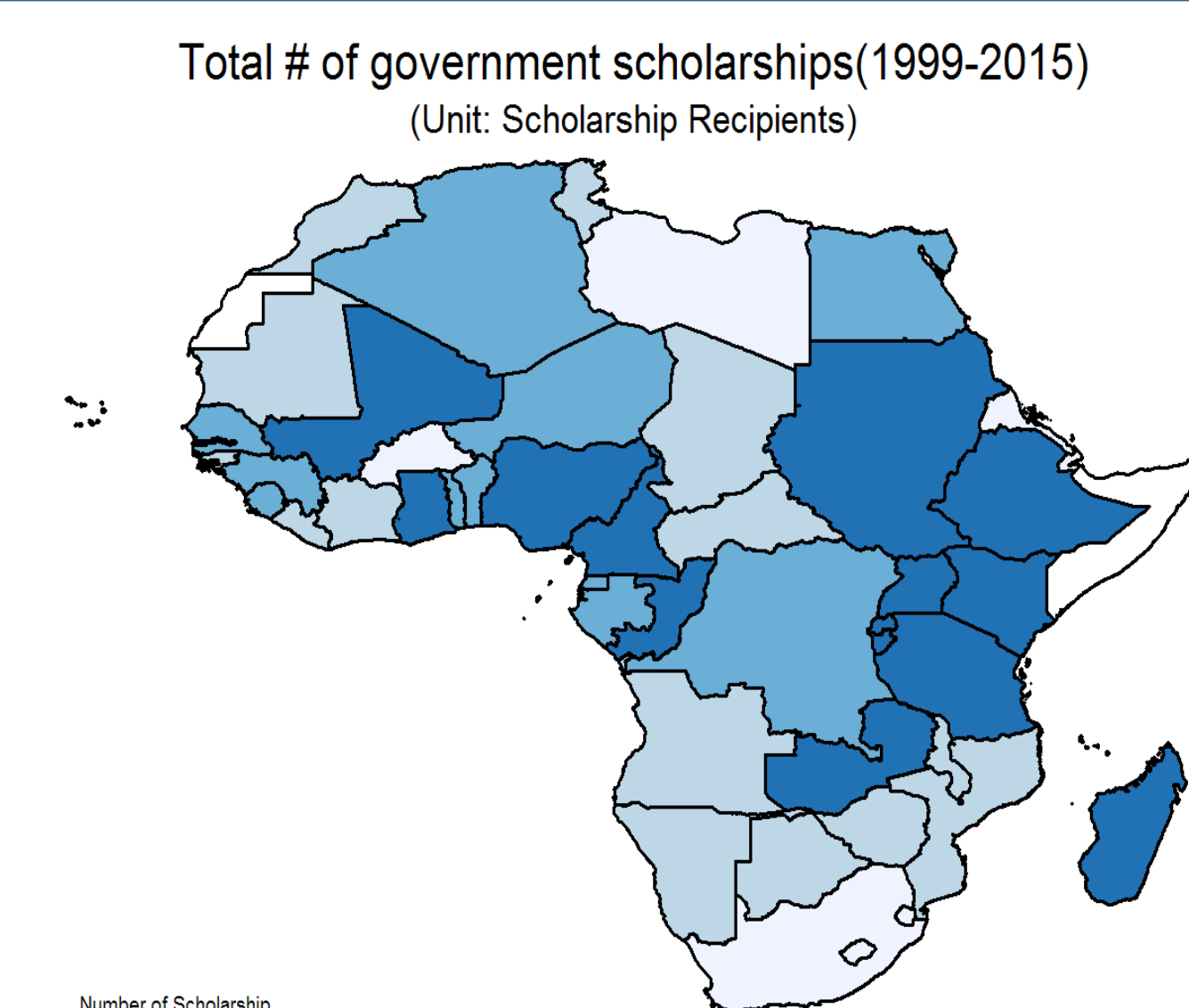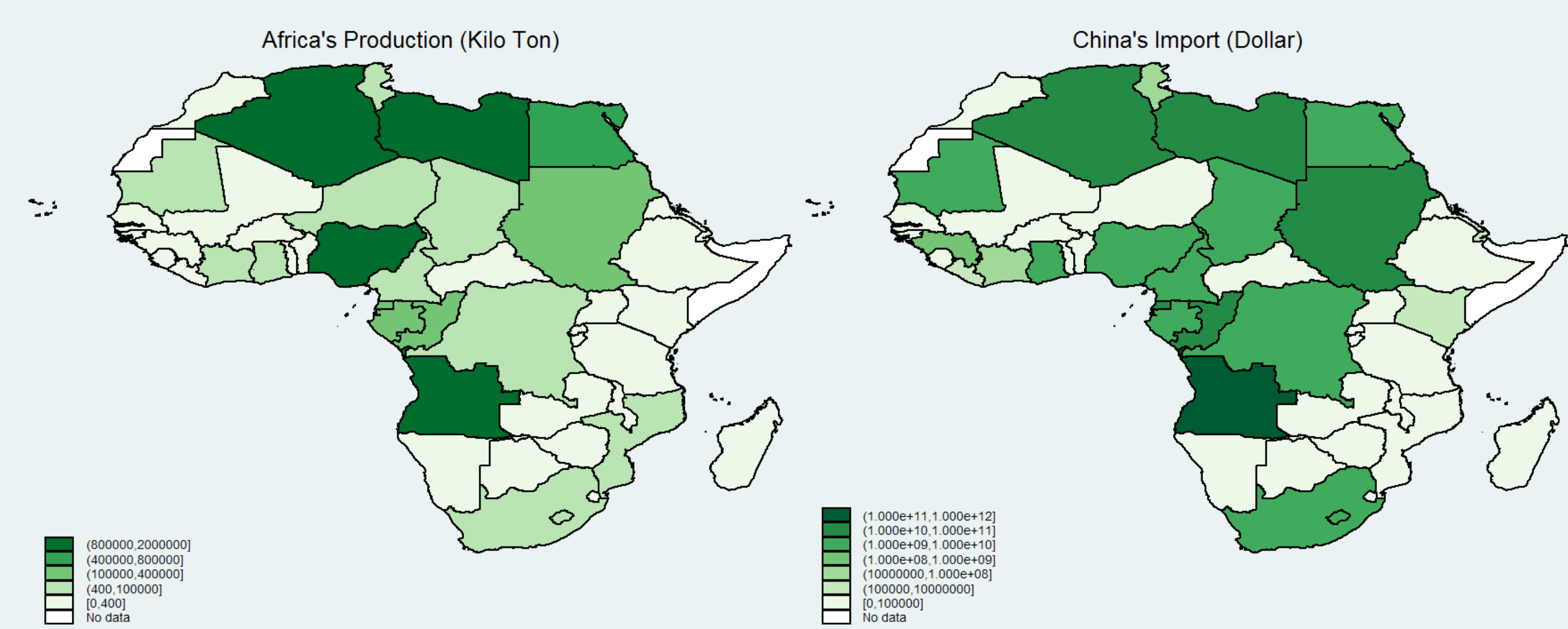

Fig. 1

Fig.2

Fig.3

Descriptive statistics

Fig.1 demonstrates that there were three stages to China's total number of government scholarships. To illustrate, a sharp increase in scholarships was caused by the FOCAC Beijing summit in 2006. And as a result of the financial crisis of 2008, the rate of scholarship increase slowed down.

Fig.2 shows that China's government scholarships mainly focused on East Africa and West Africa. Thus, are such regional characteristics of the scholarships guided by natural resources? And Fig.3 shows the oil production and China's imports from Africa.

Data & Methods

Fixed-effect Model

We used different measures of Chinese access to natural resources in Africa, including the amount of production, the value of Chinese imports, and African shares of China's imports as dependent variables.

$$lnY_{it} = \beta_0 + \beta_1 \times lnOil_{it} + \beta_2 \times lnGas_{it} + \beta_3 \times lnMin_{it} + \gamma \times X_{it} + \eta_t + \mu_i + \varepsilon_{it}$$
$$lnY_{it} = \beta_0 + \beta_1 \times lnImOil_{it} + \beta_2 \times lnImGas_{it} + \beta_3 \times lnImMin_{it} + \gamma \times X_{it} + \eta_t + \mu_i + \varepsilon_{it}$$
$$lnY_{it} = \beta_0 + \beta_1 \times \frac{ImOil_{it}}{\Sigma ImOil_{it}} + \beta_2 \times \frac{ImGas_{it}}{\Sigma ImGas_{it}} + \beta_3 \times \frac{ImMin_{it}}{\Sigma ImMin_{it}} + \gamma \times X_{it} + \eta_t + \mu_i + \varepsilon_{it}$$

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Data & Methods

Instrumental Variable Model

Further, we used new discoveries of oil, gas and mineral fields in an African country, which are reasonably exogenous, to instrument for the quantity of natural resources in a 2SLS setup. Instrumental variables neatly eliminate the endogenous problems that prevailed in previous studies. The instrumental variable model is:

$$\begin{cases} lnIVOil_{it} = \omega \times X + \delta \times OilDis\theta + \eta_t + \mu_i + \varepsilon_{it} \\ Y_{it} = \beta_0 + \beta_1 \times lnIVOil_{it} + \gamma \times X_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{cases}$$

$$\begin{cases} lnIVGAS_{it} = \omega \times X + \delta \times GASDis\theta + \eta_t + \mu_i + \varepsilon_{it} \\ Y_{it} = \beta_0 + \beta_1 \times lnIVGAS_{it} + \gamma \times X_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{cases}$$

$$\begin{cases} lnIVMIN_{it} = \omega \times X + \delta \times MINDis\theta + \eta_t + \mu_i + \varepsilon_{it} \\ Y_{it} = \beta_0 + \beta_1 \times lnIVMIN_{it} + \gamma \times X_{it} + \eta_t + \mu_i + \varepsilon_{it} \end{cases}$$

Results & Conclusions

Table 1 & 2 report estimates from the fixed-effect model, and table 3 illustrates results from the instrument variable model. Table 4 reports estimates from the placebo test.

Table 1. Estimated productions & China's total import effects on distribution of scholarship

	(1) Log of Scholarship Total	(2) Log of Scholarship Degree		(3) Log of Scholarship Total	(4) Log of Scholarship Degree
Main effect					
Log of Oil Production(Million Ton)	0.53*** [0.19]	0.62*** [0.21]	Log of China's Ttl. Oil Import (billion $)	-0.08 [0.14]	-0.08 [0.16]
Log of Natural Gas Production (Kilo Peta Joule)	-1.23* [0.64]	-0.95 [0.70]	Log of China's Ttl. Natual Gas Import (billion $)	-0.25 [0.52]	-0.2 [0.51]
Log of Mineral Rents (Hundred Million $)	-0.03 [0.08]	0.02 [0.09]	Log of China's Ttl. Mineral Import (billion $)	0.26 [0.37]	0.27 [0.42]
Control variables					
Log of GDP per capita (Thousand $)	-0.35 [0.37]	-0.582 [0.41]		-0.09 [0.41]	-0.25 [0.45]
Log of Population (Million persons)	-0.04 [1.16]	-0.64 [1.29]		0.55 [1.3]	0.02 [1.4]
Log of Ttl. Bilateral Trade (Billion $)	0.18 [0.22]	0.17 [0.22]		0.06 [0.21]	0.09 [0.22]
Diplomatic relation lasting years (year)	0.06* [0.03]	0.07*** [0.03]		0.07** [0.03]	0.08** [0.03]
Seat in Security Council	0.14* [0.08]	0.12 [0.09]		0.11 [0.09]	0.08 [0.10]
Log of Outbound mobility Students (Thousand Persons)	-0.15 [0.22]	-0.15 [0.23]		-0.2 [0.23]	-0.17 [0.24]
Year FE	Yes	Yes		Yes	Yes
Country FE	Yes	Yes		Yes	Yes
Observations	867	867		867	867
Adjusted R Square	0.75	0.76		0.74	0.74

Table 2. Estimated Chinese Imports of Resources Accounted for the Local Share (%) effects on distribution of scholarship

	(3) Log of Scholarship Total	(4) Log of Scholarship Degree
Oil Imports from Africa Account for Chinese Total Imports (%)	0.04 [0.04]	0.05 [0.04]
Natural Gas Imports from Africa Account for Chinese Total Imports (%)	-0.00 [0.04]	-0.00 [0.04]
Mineral Imports from Africa Account for Chinese Total Imports (%)	-0.35*** [0.12]	-0.28** [0.11]
Control variables		
log of GDP per capita (Thousand $)	-0.12 [0.42]	-0.29 [0.46]
Log of Population (Million persons)	0.56 [1.3]	0.01 [1.4]
Log of Ttl. Bilateral Trade (Billion $)	0.01 [0.22]	0.05 [0.23]
Diplomatic relation lasting years (year)	0.07** [0.03]	0.08** [0.03]
Seat in Security Council	0.13 [0.08]	0.1 [0.09]
Log of Outbound mobility Students (Thousand Persons)	-0.24 [0.24]	-0.21 [0.25]
Year FE	Yes	Yes
Country FE	Yes	Yes
Observations	867	867
Adjusted R Square	0.74	0.75

Table 3. Estimated Productions and Rents on distribution of scholarship (Using Resources' Discovery As Instrument Variable)

	(1) Log of Scholarship Total	(2) Log of Scholarship Total		(3) Log of Scholarship Total
Main effect				
Log of Oil Production (Million Ton)	0.45* [0.25]	Log of Natural Gas Production (Kilo PetaJoule)	-2.30** [0.97]	Log of Mineral Rents (Hundred Million $)	0.27 [0.19]
Control variables				
Log of GDP per capita (Thousand $)	-0.33 [0.2]	0.06 [0.17]		-0.12 [0.18]
Log of Population (Million persons)	1.34*** [0.4]	1.39*** [0.39]		1.42*** [0.40]
Log of Ttl. Bilateral Trade (Billion $)	0.09 [0.09]	0.19* [0.10]		-0.11 [0.16]
Diplomatic relation lasting years (year)	0.11*** [0.01]	0.10*** [0.01]		0.10*** [0.01]
Seat in Security Council	0.11** [0.06]	0.14** [0.06]		0.10 [0.06]
Log of Outbound mobility Students (Thousand Persons)	-0.12 [0.11]	-0.00 [0.12]		-0.19 [0.12]
Year FE	Yes	Yes		Yes
Country FE	Yes	Yes		Yes
Observations	867	867		867
Cragg-Donald Wald F statistic	186.897	121.452		32.851
Kleibergen-Paap Wald rk F statistic	46.843	23.842		23.574
Stock-Yogo weak ID test critical values (10% maximal IV size)	16.38	16.38		16.38
Control Variables & Fixed Effect	Yes	Yes		Yes

Table 4. Estimated productions effects on distribution of non-scholarship (Utilizing Resources' Discovery As Instrument Variable) (Placebo Test)

	(1) Log of NonScholarship Total	(2) Log of NonScholarship Total		(3) Log of NonScholarship Total
Main effect				
Log of Oil Production(Hundred Million Ton)	0.28 [0.28]	Log of Natural Gas Production(Kilo PetaJoule)	-1.01 [1.19]	Log of Mineral Rents (Hundred Million $)	-0.01 [0.16]
Control variables				
log of GDP per capita (Thousand $)	0.03 [0.24]	0.24 [0.20]		0.19 [0.19]
Log of Population (Million persons)	4.17*** [0.55]	4.22*** [0.53]		4.28*** [0.54]
Log of Ttl. Bilateral Trade (Billion $)	0.28*** [0.07]	0.32*** [0.09]		0.27*** [0.13]
Diplomatic relation lasting years (year)	0.20*** [0.02]	0.19*** [0.02]		0.19*** [0.02]
Seat in Security Council	-0.13 [0.08]	-0.12 [0.08]		-0.13* [0.08]
Log of Outbound mobility Students (Thousand Persons)	-0.03 [0.13]	0.02 [0.14]		-0.04 [0.14]
Year FE	Yes	Yes		Yes
Country FE	Yes	Yes		Yes
Observations	867	867		867

Conclusions

Therefore, according to data of African scholarship students studying in China, except for the oil, the amount of African countries' resources do not influence the amount of education aid that China provides to Africa. However, we are reminded that Hanson and Hentz(1999) once proposed that the concept of neocolonialism is often used as a pretext for mutual condemnation and alienation. Rao(2000) also suggests from the perspective of discourse analysis that many people intentionally or unintentionally confuse the discourse on globalization with the discourse on neocolonialism. As a result, there have been accusations that China's aid is neocolonialist, and sometimes China's actions to protect its national interests is seen as neocolonialism. However, such behaviors also can be found in USAID and in Australian educational aid in the South Pacific.