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Public Diplomacy and Chinese OFDI: Empirical Evidence from the Africa

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ABSTRACT

Public diplomacy is a significant factor in promoting policy communication, people-to-people bonds, and the protection of foreign assets between two nations, but there is little research on the economic worth of public diplomacy. Python was used to crawl the daily search frequency of "China", "African countries", and related terms to construct the heat index of China-Africa public diplomacy during 2011-2019, and a two-way fixed effect model was developed to examine the impact of public diplomacy on China's outward foreign direct investment (OFDI) in Africa. The empirical results show that public diplomacy has a considerable favorable effect on China's OFDI in Africa, and after a series of robustness tests, the basic conclusion still holds. Heterogeneity tests show the investment promotion effect of public diplomacy is more pronounced in sub-Saharan Africa and that the promotion mechanism exhibits the characteristics of poverty alleviation and risk aversion. In addition, the promotion effect of public diplomacy on China's OFDI becomes greater as time goes on. In terms of impact mechanisms, public diplomacy may promote OFDI by enhancing financing capacity and improving national governance. The research conclusion has policy implications for promoting China-Africa public diplomacy and investment cooperation in the new era.

KEYWORDS

China-Africa relations; Public Diplomacy; Outward foreign direct investment

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1. Introduction

Public diplomacy is the behavioral process of expressing a country's image, beliefs, and policy goals to the foreign public using a variety of channels and techniques in order to promote international understanding, goodwill, and collaboration (Gilboa, 2008). While government and diplomatic agencies are active, more non-governmental organizations are involved. For instance, the primary responsibility of civil organizations, universities, research institutions, the media, religious organizations, and influential people at home and abroad is to communicate their own interests and policy rationale to specific targets abroad from a variety of perspectives and professional languages, under the organization and coordination of the government and with the assistance of their respective international exchanges (Qu, 2010). Public diplomacy plays a significant role in policy communication and intercultural contacts between the two nations. In recent years, public diplomacy has steadily become a new growth point and focal point of China's diplomatic effort, and its status and position within the broader diplomatic situation have been elevated and its significance has grown (Yang, 2014). In November 2012, the report of the 18th CPC National Congress suggested "steadily developing public diplomacy", implying that public diplomacy has been promoted to the highest level of national policy (Niu and Zhong, 2015). As a helpful adjunct to government diplomacy, public diplomacy is gaining importance as a means to influence the public opinion of other nations, increase national soft power, and expand worldwide influence (Wang, 2018).

Chinese outward foreign direct investment (OFDI) is an important part of China's high-quality open development, but the academic community has paid less attention to China's investment in Africa. Although the current scale of China's OFDI in Africa is small, the growth speed is rapid. In 2021, General Secretary Jinping Xi proposed at the 8th Ministerial Conference of FOCAC that China and Africa should jointly implement the "Nine Projects", among which the "Investment-driven Project" proposes that China will promote enterprises to invest a total of at least US\$10 billion in Africa in the next three years and set up a "China-Africa Private Investment Promotion Platform. Africa is the ballast of China's diplomatic system, and more importantly, its diplomatic behavior is closely related to economic cooperation, and the contribution of public diplomacy is indelible in the history of China-Africa relations and economic cooperation practices (Cheng et al., 2018). In particular, since President Xi put forward the diplomatic concept of "truth, reality, proximity, and sincerity" to Africa in 2013, the cooperation between China and Africa in terms of think tanks, media, civil society, and private enterprises has become increasingly close.

However, from a diplomatic point of view, China's research on China-Africa relations has been increasingly focused. However, relevant studies on the impact of China's outward FDI location choices from a diplomatic perspective have focused on considering government diplomatic acts such as head of state visits (Creuse & Lejour, 2013; Nitsch, 2007). Blechman (2004) introduced the concept of soft power in international studies: the influence and attractiveness of a country through its values and ideals. Based on this approach, public diplomacy is no longer limited to the practice of state officials, but enters the realm of NGOs, institutions and individuals (Gregory, 2008). A small number of studies have taken a public diplomacy perspective as a ubiquitous global communication practice of public diplomacy, which has contributed to China's international image and reputation building, cultural promotion, and political advocacy. Kurlantzick (2007) argues that public diplomacy is an important tool for China to enhance its international image. Gilboa (2008) analyzed the impact of public diplomacy on international relations, domestic politics, and national security, and explored the applications and future directions of public diplomacy. However, few studies have quantitatively assessed the economic value of public diplomacy in promoting overseas investment. Therefore, this paper aims to analyze the promotional effect of China-Africa public diplomacy on China's investment in Africa.

The possible marginal contributions of this paper lie in the following three aspects: first, in terms of research perspective, there is little literature to analyze the economic effects of diplomatic behavior from the perspective of

public diplomacy, and this paper aims to fill this research gap; second, in terms of research methodology, this paper innovatively uses Python to crawl web search daily degree data and further constructs public diplomacy heat index for quantitative analysis; third, in terms of research content, the current samples of international direct investment-related studies tend to be small or do not involve African countries, and this paper focuses on exploring the unique mechanism of public diplomacy to promote China's investment promotion in Africa.

The remainder of this article is organized as follows: The second part of this paper introduces the typical facts of China's direct investment in Africa and presents the research hypothesis; the third part introduces the sources and processing of the relevant data in this paper; the fourth part focuses on the analysis of the investment promotion effect of public diplomacy and the robustness test; the fifth part is a heterogeneity analysis; the sixth part empirically analyzes the specific mechanisms of public diplomacy in promoting OFDI; and the last part gives the conclusion and policy recommendations.

2. Characteristic facts and research hypothesis

2.1. Characteristics of China's investment in Africa

With the establishment of the Forum on China-Africa Cooperation (FOCAC) in 2000, China's OFDI in Africa has accelerated (Fig. 1). China's OFDI in Africa increased from 520 million dollars in 2006 to 1.574 billion dollars in 2007 and 5.491 billion dollars in 2008 after the 2006 FOCAC Beijing Conference. In 2013, President Xi made his first visit to Africa, ushering in a new era for the burgeoning strategic relationship between China and Africa. In the same year, the "Belt and Road" program expanded China-Africa commercial and trade connections even further. The "One Belt and One Road" program was created in the same year to support the future growth of China-Africa economic and commercial cooperation. China's investment in Africa climbed by 34 percent year-over-year to 3.37 billion dollars in 2013 and 5.39 billion dollars in 2018. In 2020, China's direct investment flow in Africa reached 4.2 billion US dollars, 56 times higher than in 2003. By the end of 2020, China will have invested over 43.4 billion dollars in Africa, making it the fourth-largest investor on the continent.

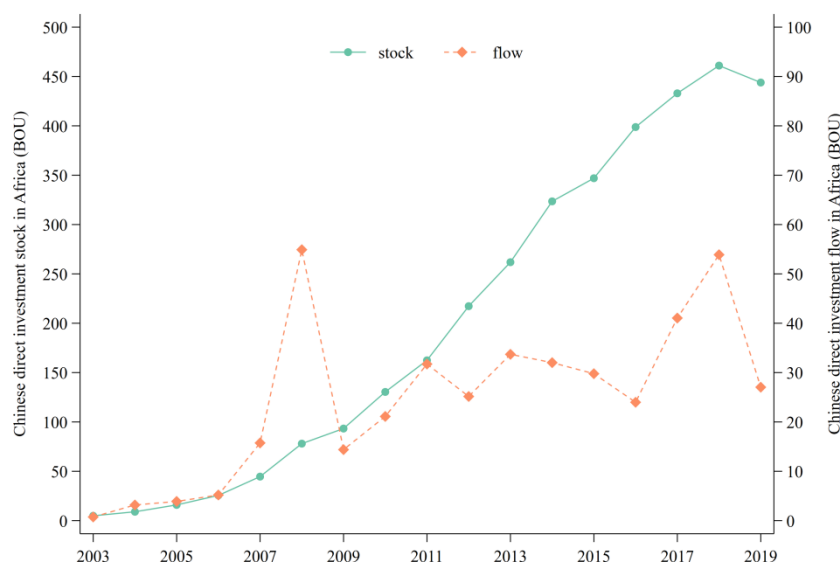


Figure 1. Trends in China's OFDI in Africa from 2013 to 2019.

Data source: the Statistical Bulletin of China's Outward Direct Investment

Second, from the perspective of the spatial distribution of China's direct investment stock in Africa (Fig. 2.),

Chinese domestic investors and overseas enterprises cover 52 African countries (regions) with a coverage rate of 86.7%, but "more in the south and less in the north" spatial characteristics are concentrated in terms of country distribution. South Africa is first with 6.15 billion dollars, followed by the Democratic Republic of the Congo (5.60 billion dollars), Angola (2.89 billion dollars), Zambia (2.86 billion dollars), and Ethiopia (2.86 billion dollars). China has invested 46.2% of its entire investment stock in Africa in these five African nations. All of these indicate that there is still a tremendous opportunity for China's direct investment in African countries, particularly in tiny and undeveloped African nations. But the main thing that limits the size of non-direct investment and causes the uneven distribution of investment space is that projects run by bilateral governments or state-owned enterprises are often high-value investments and the "cost performance ratio" of small investments is too low. On the other hand, countries with weak foundations can't provide the necessary support conditions for large project investments, which leads to the concentration of investments in a few countries.

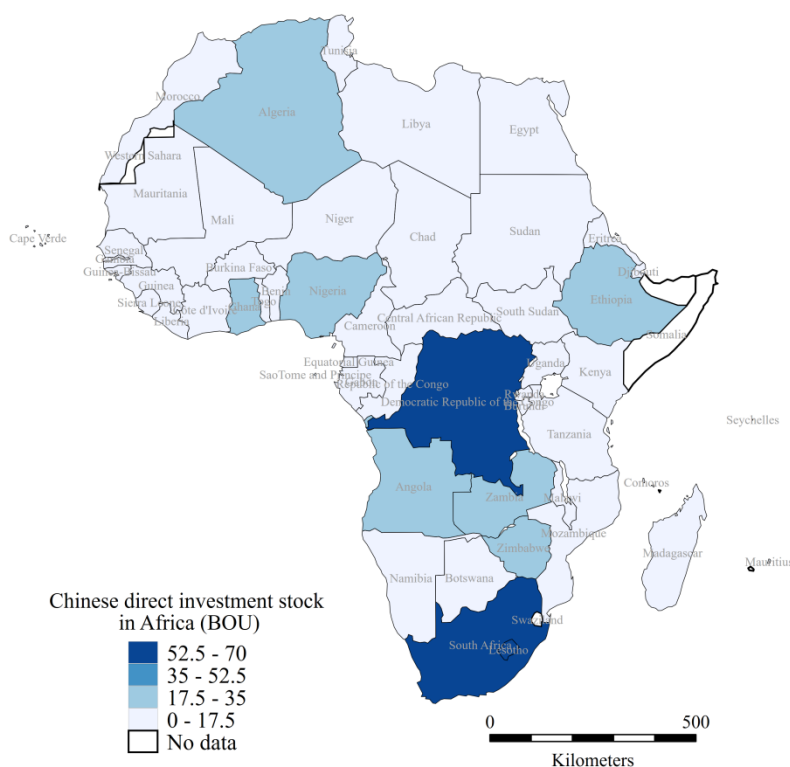


Figure 2. Geographical spatial distribution of China's OFDI stock in Africa.

Notes: The author sorted and plotted according to the Statistical Bulletin of China's Outward Direct Investment, with relevant data up to the end of 2019.

In particular, the study on Chinese corporations' investments in Africa says that "minimal attempts" have been made. Chinese private enterprises have developed from "going to Africa" to "settling in Africa" to "taking root in Africa" in order to become a significant force in China-Africa economic, trade, and investment ties. Almost 3,500 foreign companies have established themselves in Africa. It represents 7.9 percent of all foreign companies in China, of which more than 70 percent are private. According to the McKinsey study "A Dance of Dragons and Lions", there are more than 10,000 Chinese businesses on the African continent, with around 90 percent being privately owned. Numerous Chinese businesses have engaged in substantial business in Africa, including infrastructure construction, resource development, manufacturing, finance, telecommunications, and energy, therefore contributing to Africa's economic progress. For a long time in this environment, public diplomacy has been an essential means for

businesses to grasp and reach Africa. Public diplomacy may assist Chinese enterprises in developing a more comprehensive grasp of local political, economic, cultural, and social conditions, as well as in gathering local market information and capturing commercial possibilities. In addition, public diplomacy may facilitate the entry of Chinese enterprises into the African market by offering a platform and supporting them. It might be claimed that public diplomacy will play an increasingly crucial role in China's future economic engagement with Africa. Public diplomacy institutions may use their professional advantages to strengthen their interactions with companies, provide them full support, and help them explore the African market, creating a win-win situation.

2.2. Research hypotheses development

2.2.1. Public diplomacy and OFDI

Public diplomacy is a product of the socialization of inter-state diplomacy and is an important complementary force to government diplomacy. In public diplomacy with Africa, the core objective of our government is to enhance the understanding of the people of African countries about China, improve public opinion about China, and form a more friendly public opinion environment for international cooperation with Africa. The different channels of government diplomacy and public diplomacy can complement each other. Government diplomacy may lead directly to investment cooperation and policy concessions, for example, through high-level bilateral dialogue, and there is less uncertainty about economic policy when bilateral political relations are stable (Julio & Yook, 2012), while public diplomacy is useful in collecting and transmitting local information at the business and people level and helping to build information channels for companies to invest in Africa. Public-diplomacy organizations can improve local residents' knowledge and understanding of China through publicity and reporting, cultural exchanges, education and training, and provide support and security for companies doing business there (Zhao, 2019). In addition, public diplomacy has another important role to play in investment cooperation with Africa, which is to promote localization. As Chinese companies continue to expand in Africa, more and more of them are focusing on localization, building partnerships with local residents and governments, and strengthening local talent training and technology transfer (Darko et al., 2021). Public diplomacy institutions can promote the localization process of Chinese enterprises by promoting cultural exchanges and talent training, laying a solid foundation for the long-term development of China-Africa cooperation.

Public diplomacy also plays a special role in making sure that China's overseas Chinese and its assets in Africa are safe. Various social risks in African countries have been a big reason why companies have been hesitant to invest there (Manyuchi & Mugabe, 2017). Communication and coordination on a global scale are very expensive, and it may not be possible to make up for lost investments in time. Public diplomacy can create a social environment that is relatively favorable to the interests of Chinese enterprises and people in Africa by establishing emotional and interest ties with local communities and people, enhancing the goodwill of local enterprises and people towards Chinese investments, and protecting Chinese assets in the event of sudden changes in country risks (Huang & Yang, 2023). The social environment will be conducive to the interests of Chinese enterprises and people in Africa. Therefore, as shown in Fig. 3., at the theoretical level, this paper argues that China-Africa public diplomacy reduces information asymmetry in investment policies by strengthening bilateral informal dialogue and exchanges, and that a more diversified dialogue and cooperation platform further reduces the transaction costs of pre-investment consultations, while China-Africa public diplomacy will provide a certain degree of risk early warning and assist in protecting the assets of China's investments in Africa and improve the post-investment operation's. At the same time, China-Africa public diplomacy will play a role in providing early warning of risks and helping to protect China's assets in Africa, thus improving the viability of the latter part of the investment. Accordingly, this paper proposes the first research hypothesis.

Hypothesis 1: China-Africa public diplomacy can effectively contribute to the growth of China's FDI in Africa.

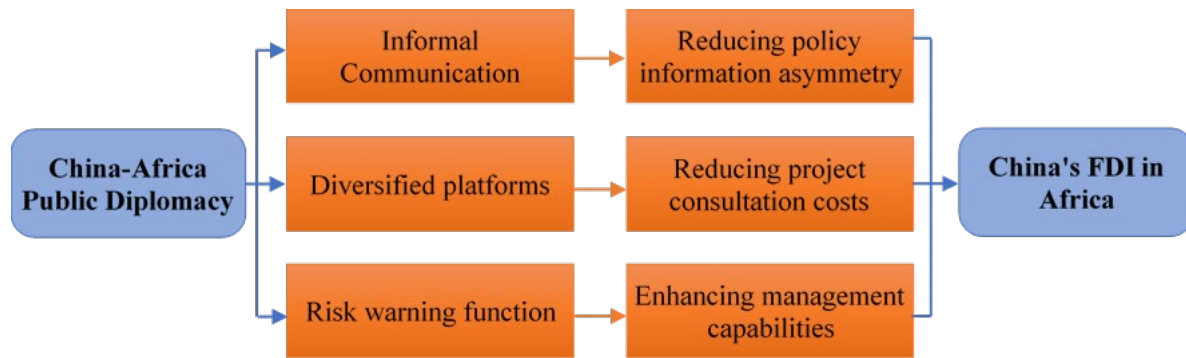


Figure 3. Theoretical mechanisms of public diplomacy for OFDI.

2.2.2. Public diplomacy, financing capacity, and OFDI

The financial system is an important guarantee for promoting international investment cooperation, and multi-channel and multi-modal financial services are the most important way to finance international investment cooperation, financial constraints have important impacts on firms' OFDI decisions (Yan et al., 2018). The fixed cost of enterprises engaged in FDI activities is relatively high, and the internal funds of enterprises are usually difficult to support, so external financing is needed to make up for the internal fund gap (Buch et al., 2014). However, the fact that African countries are currently suffering from backward and unbalanced regional financial development limits the ability of financial services to finance China's investment cooperation with Africa. China's loans to Africa have opened up new ways for China and Africa to work together on investments. These loans mostly come in the form of non-repayable aid and low-interest loans, loans with special terms (like preferential loans and export buyer's credits), and development finance based on equity investments (Mlambo, 2022). Since 2000, China has provided more than US\$153 billion in loans to Africa, most of which have been provided by Chinese policy banks. The number of lending institutions has risen from three in 2000 to more than 30 in 2019, but the costs of reporting, due diligence, and approval of project loans are still relatively high. China-Africa public diplomacy can improve the ability to finance projects by reducing information collection costs and information asymmetry. The paper proposes a second research hypothesis. Accordingly, this paper proposes research hypothesis 2.

Hypothesis 2: China-Africa public diplomacy can contribute to the growth of Chinese FDI in Africa by enhancing project financing capacity.

2.2.3. Public diplomacy, governance capacity, and OFDI

African countries generally have a low level of governance, poor national and regional governance capacity, and political instability and violent conflicts are particularly prominent (Alhassan & Kilishi, 2019), making it difficult to guarantee asset security and policy stability of investment projects, which is not only an important factor limiting China's direct investment in Africa but also a key issue restricting Africa's ability to enhance its independent development (Chen et al., 2020), while public diplomacy is conducive to a wider sharing and exchange of regional governance experiences between China and Africa bilaterally, this maybe pressures governments to provide a climate more hospitable to foreign corporations and alter patterns of domestic economic policy (Jensen, 2003), which can fundamentally improve the governance capacity of African countries, thereby enhancing the scale and quality of China-Africa investment cooperation. Accordingly, this paper proposes a third research hypothesis.

Hypothesis 3: The development of China-Africa public diplomacy can contribute to the growth of China's FDI in Africa by improving governance capacity.

3. Model Design and Data Sources

3.1. Model Design

Nevertheless, it should be emphasized that the aforementioned findings may be affected by the endogeneity issue of missing data and other influencing factors. In order to more accurately estimate the impact of China's public diplomacy with Africa on China's direct investment in Africa, this paper refers to Helpman et al. (2008) and adopts the investment gravity model with two-way fixed effects to further investigate the impact of public diplomacy on the scale of China's direct investment in Africa, which can largely solve the endogenous problem resulting from missing variables. The particular design is as follows:

$$ofdi_{it} = \alpha_i + \beta_0 public_{it} + \gamma_1 institution_{it} + \gamma_2 open_{it} + \gamma_3 degree_{it} + \gamma_4 light_{it} + \gamma_5 confucius_{it} + \lambda_t + \varepsilon_{it} \quad (1)$$

Among them, the subscript i represents the African host country, a total of 53 countries; t represents the year, and the sample interval is 2011-2019. $ofdi_{it}$ represents the scale of China's OFDI in Africa; $public_{it}$ represents the popularity of public diplomacy in China and Africa; β reflects the degree of influence of public diplomacy between China and Africa on the scale of China's investment in Africa. Control variables include the level of system ($institution_{it}$), the degree of openness ($open_{it}$), the level of bilateral partnership ($degree_{it}$), the level of economic development ($light_{it}$), the degree of cultural exchange ($confucius_{it}$). Adding individual fixed effects (α_i) to control for the inherent differences between African countries, such as ethnic, linguistic, religious and geographical factors, which do not change over time; Considering that there may be some common impacts that are difficult to measure and affect China's direct investment in different periods, this paper further introduces time fixed effect (λ_t) into the model. ε_{it} is the random error term.

3.2. Data Sources

3.2.1. Dependent variable

The Statistical Bulletin of China's OFDI, published jointly by the Ministry of Commerce, the National Bureau of Statistics, and the State Administration of Foreign Exchange, is one of the most credible data sources for the study of China's outward foreign direct investment. Depending on the data's dependability and accessibility. As samples, the panel data of China's outward investment stock in 53 African countries from 2011 to 2019 are selected, and the classical processing method is used to measure the annual scale of China's investment in African countries through the logarithm of China's OFDI stock in the past years.

3.2.2. Independent variable

Since it is difficult to obtain direct data on micro-events of public diplomacy in China and Africa, this paper draws on the new media technology characteristics of public diplomacy in the new era proposed by Zheng (2011) and Tan (2022) and seeks to cultivate a positive perception of China among the publics of other nations by involving non-governmental organizations and private companies. Media play an important role in mutual cognition and emotional interaction between people from different countries in the current information communication environment with increasingly active new media technologies (Wang, 2023), and the Internet has become an important channel for Chinese people and enterprises to understand Africa and communicate and exchange China's foreign policy towards Africa. Therefore, in this paper, the daily retrieval frequency of African countries and related keywords from 2011 to 2019 was obtained using Python, and the original data totaled more than 1.17 million pieces, which were further classified and summarized to the country-year level, and the logarithm value was used as a proxy index to measure the popularity of China-Africa public diplomacy. The greater the index value, the stronger the intensity of China's public diplomacy with that nation in the current year. Fig. 4. depicts the historical and

geographical evolution of public diplomacy between China and African nations. From a temporal perspective, the public diplomacy between China and African nations shows an upward tendency, although there are also clear variances across nations.

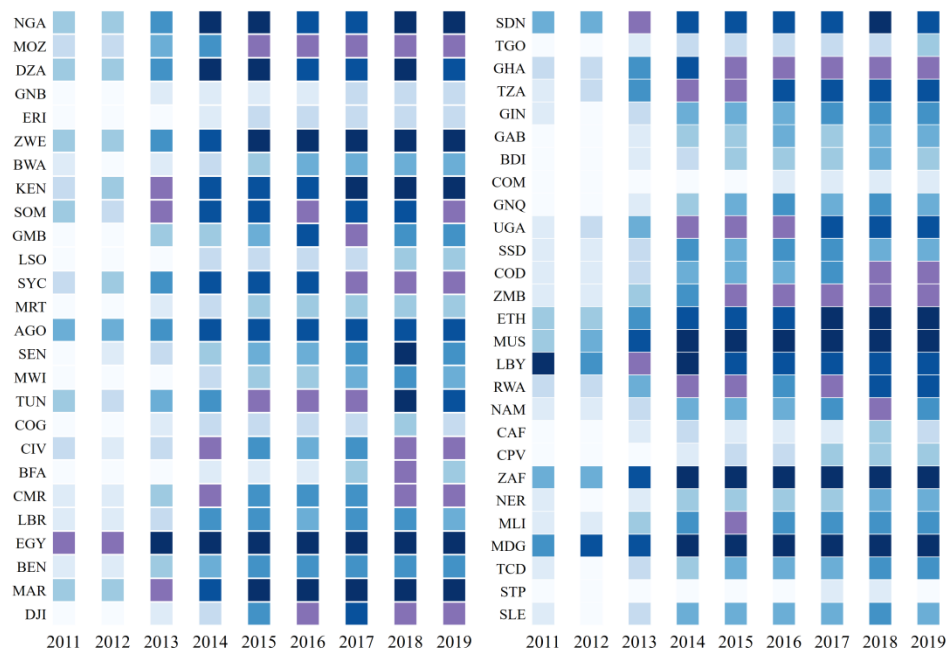


Figure 4. Temporal and spatial heat maps of China's public diplomacy to 53 African countries from 2011 to 2019.

3.2.3. Control variables

This paper combines classical studies on the factors influencing China's investment in Africa (Ramasamy et al., 2012; Wang et al., 2012) and comprehensively considers the influence of factors such as the economic development level, institutional level, bilateral political relationship, and cultural differences of African host countries on China's investment in Africa.

(1) Institutional environment level

Investors are more willing to invest in countries with relatively good institutional environment, as countries with democratic and fair institutions can frequently guarantee the legitimacy of the investment process and reduce the uncertainty in the investment negotiation process, whereas countries with poor institutions cannot. Yet, some academics argue that Chinese investors have expertise dealing with corruption at home and have a propensity to invest in nations with a weak institutional framework. Overall, Africa's institutional framework is somewhat underdeveloped, and the corruption issue is particularly significant (Isaksson & Kotsadam, 2018). Thus, it is necessary to investigate the impact of Africa's institutional environment on China's direct investment in Africa. The building approach of Feng et al. (2022) is utilized as a reference in this research. As a proxy index, the average of six sub-indicators was used to quantify the overall institutional environment level of African host nations. The source of the data was the Global Governance Index database (WGI).

(2) Economic openness degree

A greater degree of economic openness in the host country means fewer restrictions on international investment and foreign financial transactions, as well as more lax approval and management of foreign investment, investment scope, and foreign exchange control, which is more conducive to attracting foreign direct investment. The degree of economic openness of African nations is also strongly tied to their stance on foreign investment, which

has a direct impact on the success or failure of investments and the following management effect. Feng et al. (2022) discovered that the degree of economic openness of African nations influences the investment choices of Chinese companies in Africa. Thus, the index of economic openness is also incorporated into the model in order to regulate its effect. The source of the information is the Global Development Index Database (WDI).

(3) Bilateral political relations

China's diplomatic policy has long prioritized the formation of partnerships. China has been attempting to enhance its current ties while continually forming new ones. In recent years, contacts between China and Africa have tripled. China and Africa have consistently expanded and enhanced inter-governmental conversation, consultation, and cooperation channels, performed their coordinating roles to the fullest extent, and fostered the all-around growth of China-Africa trade and investment cooperation. By November 2021, China will have formed comprehensive strategic cooperation relationships with nine African nations, including three partnerships with three African nations, six partnerships with six African nations, and seven comprehensive cooperative partnerships. This paper draws on Zhang's (2021) treatment method, sorts out the diplomatic rhetoric of the Ministry of Foreign Affairs regarding the bilateral political relations of African countries, and assigns the annual partnership level between African host countries and China based on Table 1, which serves as a proxy index of the bilateral political relations between China and Africa.

Table 1. Criteria for Assigning Levels of Bilateral Partnerships between China and Africa.

Diplomatic rhetoric keywords	Assignment Score
No diplomatic relations/broken diplomatic relations	0
Diplomatic relations only	1
Friendly cooperation relationship	1.2
(Collaborative) Partnerships	1.5
Comprehensive (cooperative) partnerships	2
Strategic (cooperative) partnerships	2.5
Comprehensive strategic (cooperative) partnership	3

(4) Economic development level

The degree of economic growth of the host nation has a direct relationship with the size of the investment market and is a significant factor influencing firms' foreign direct investment. It is often assessed by a nation's gross domestic product (GDP) and other associated measures. Yet, since it is impossible to ensure the validity of Africa's economic growth metrics, such as GDP, the degree of regional economic development may be judged by the brightness of lights at night. The greater the degree of urbanization and economic development, the more night lighting is used. The raw data are satellite photos captured by numerous U.S. Air Force and NASA satellites. The National Geophysical Data Center has de-noised and transformed the raw data into standard yearly raster data for convenience of use. A higher value signifies more economic activity in the region throughout the year. Satellite night-light brightness is now commonly acknowledged as a viable data source in developing nations when there is a dearth of full and reliable region-level information (Donaldson & Storeygard, 2016; Xu and Zhang, 2021). This paper calculates the total number of night light intensity scores in African host countries, constructs the light intensity index by using the opposite value to measure the annual economic development level of the host country, and reduces the impact of endogenous problems caused by data measurement errors.

(5) Cultural identity degree

The Confucius Institute is an international cultural exchange organization established by the State Office of the Leading Group for Teaching Chinese as a Foreign Language to promote the Chinese language, Chinese culture, and sinology education. The primary mission of the Confucius Institute is to provide authorized and standardized contemporary Chinese teaching materials to Chinese language students across the globe. It is recognized as a key conduit for international communication and cultural interaction with China. Thus, this study manually sorted the

yearly cumulative number of Confucius Institutes in African host countries based on information provided on the official website of Confucius Institutes in order to determine the degree of cultural identification of the host nations toward China.

After matching and sorting the above data, panel data of 53 African countries from 2011 to 2019 are finally obtained. Descriptive statistics of the data used in this paper are shown in Table 2.

Table 2. Descriptive statistics of data.

VarName	Obs	Mean	SD	Median	Min	Max
ofdi	465	9.77	2.10	10.14	1.79	13.52
public	486	13.73	0.84	13.79	0.00	15.44
institution	486	-0.55	0.54	-0.54	-2.13	0.76
open	442	75.08	42.21	64.68	1.22	348.00
degree	513	1.12	0.70	1.00	0.00	3.00
light	513	9.68	2.32	9.74	1.81	14.85
confucius	513	0.90	1.27	1.00	0.00	9.00

4. Empirical results and analysis

4.1. Baseline regression result

In this paper, OLS regression method is used to preliminarily analyze the impact of China's public diplomacy with Africa on China's direct investment in Africa. The results are shown in columns (1) and (2) of Table 3. Before and after adding relevant control variables, the coefficients of public are significantly positive, which preliminarily verifies the hypothesis 1 of this paper, indicating that China's public diplomacy with Africa has a positive promoting effect on China's OFDI in Africa. In addition, the regression results show that the control variables, such as the level of economic development, the level of bilateral partnership and cultural exchange, also have different degrees of positive influence on China's direct investment in Africa, which is consistent with the conclusions of existing studies.

Based on the above model, this paper conducts further empirical analysis to investigate the impact of Sino-African public diplomacy on China's direct investment in Africa. Core explanatory variables, control variables, individual fixed effects and time fixed effects were added successively. The regression results were shown in columns (3) - (5) of Table 3, and the coefficients of core explanatory variables were always significantly positive. Therefore, the hypothesis in this paper has been further verified. From the perspective of statistical significance, if other conditions remain unchanged, a 1% increase in the popularity of public diplomacy between China and the host country will increase China's investment stock in Africa by about 0.059%, and China's public diplomacy with Africa is in a stage of rapid development. From 2011 to 2019, the overall growth rate of China's public diplomacy with Africa was as high as 106.25%, among which the annual average growth rate was about 13.28%. In other words, from the perspective of actual economic value, China's public diplomacy with Africa would promote the growth of China's investment stock in Africa by about 0.8% every year. Taking China's investment stock in Africa at the end of 2020 (\$47.35 billion) as an example indicates that public diplomacy significantly promotes the scale of China's direct investment in Africa.

4.2. robustness test

4.2.1. Replacing the dependent variable

Nowadays, in the practice of public diplomacy, bilateral governments serve primarily the purposes of policy communication and bilateral cooperation planning, while businesses are the objects of exchanges and dialogues

Table 3. Baseline empirical regression results.

	(1) OLS 1	(2) OLS 2	(3) FE 1	(4) FE 2	(5) FE 3
public	0.383** (0.045)	0.170*** (0.004)	0.371** (0.047)	0.152*** (0.001)	0.059*** (0.009)
institution		0.142 (0.691)		0.244 (0.621)	0.297 (0.605)
open		-0.007** (0.048)		-0.008* (0.056)	-0.006 (0.131)
degree		0.208* (0.052)		0.189 (0.115)	0.122 (0.233)
light		0.576*** (0.000)		0.703*** (0.000)	0.090 (0.665)
confucius		0.197** (0.035)		0.182* (0.059)	0.096 (0.341)
Individual FE	NO	NO	YES	YES	YES
Year_FE	NO	NO	NO	NO	YES
N	465	423	465	423	423
r2			0.157	0.345	0.393

Notes: The report in brackets is the clustering standard error adjusted at the major level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

between China and Africa. Public diplomacy between China and Africa often involves economic collaboration between Chinese and African businesses (Flores & Kreps, 2013). Specifically, the expansion of bilateral commercial cooperation and collaboration on contract projects is the crowning accomplishment of China-African interchange and cooperation. Thus, this article uses bilateral trade quotas and contract project value as alternative public diplomacy indices. The findings are displayed in columns (1) and (2) of Table 4, and both are statistically positive, demonstrating that the measuring technique of public diplomacy has no effect on the regression results.

4.2.2. Excluding the influence of extreme values

China has a particularly concentrated distribution of non-investment data, and the degree of polarization is severe (Anyanwu, 2012). While the impact of the logarithm is used as a robustness test to attenuate the influence of extreme values, this article employs tail-reduction treatment on explanatory variables at the 1% and 5% levels to further remove the effect of extreme values. The predicted findings are shown in Table 4's columns 3 and 4. The coefficients of the core explanatory variables are all positive and statistically significant at the 1% level of confidence, which is consistent with the results of the baseline regression, indicating that the existence of extreme values will have no impact on the central conclusions of this paper.

4.2.3. Controlling the fixed effects of the interaction between individuals and time

In this study, both the individual fixed effect and the time fixed effect of the African host country are controlled for in the baseline regression and the previous robustness test. Other host country characteristics, on the other hand, may change over time and influence China's investment behavior in Africa. By including the interactive fixed effect at the person and time levels into the model, this article further controls the effects of the time-varying host country's distinctive characteristics. The estimated findings are shown in Table 4's fifth column. The coefficient of the primary explanatory variable remains considerably positive at the 1% confidence level, and the paper's central conclusion remains true.

5. Heterogeneity analysis

5.1. North and South Africa and regional differences

Table 4. Robustness test results.

	(1) ofdi	(2) ofdi	(3) ofdi_w_1	(4) ofdi_w_5	(5) ofdi
public			0.063*** (0.003)	0.077*** (0.000)	0.089*** (0.000)
public_p	0.111* (0.097)				
public_t		0.286** (0.016)			
Controls	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES
Year_FE	YES	YES	YES	YES	YES
Individual & Year FE	NO	NO	NO	NO	YES
N	408	422	423	423	423
r2	0.475	0.451	0.428	0.521	0.683

Notes: The report in brackets is the clustering standard error adjusted at the major level; The control variables are the same as those of Table 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

As mentioned above, the geographical and spatial distribution of China's investment stock in Africa is relatively concentrated, and there are great differences among different African regions in terms of landform, resource endowment, ethnic distribution, geopolitics, religion and culture, etc. These geographical factors also have a certain influence on China's choice of public diplomacy in Africa. In other words, it may affect the promotion effect of public diplomacy on China's investment in Africa to varying degrees. Therefore, this paper further analyzes the regional differences in the impact of public diplomacy on China's investment in Africa, among which there may be some differences among organizations with different standards for the division of African regions and their subordinate countries. In this paper, the geographical regional division standards of the United Nations are adopted (Table 5).

Table 5. Criteria for geographical region division in Africa.

Regional divisions		Affiliated Countries
Northern part		Egypt, Libya, Tunisia, Algeria, Morocco, Sudan
Sub-Saharan Africa	Eastern	Eritrea, Ethiopia, South Sudan, Djibouti, Somalia, Kenya, Uganda, Rwanda, Burundi, Tanzania, Madagascar, Zambia, Zimbabwe, Malawi, Mozambique, Madagascar, Seychelles, Mauritius, Comoros
	Central	Angola, Congo (Brazzaville), Congo (Kinshasa), Equatorial Guinea, Gabon, Central African Republic, Chad, Cameroon, Sao Tome and Principe
	Western	Nigeria, Benin, Ghana, Togo, Côte d'Ivoire, Liberia, Sierra Leone, Guinea, Guinea-Bissau, Senegal, Gambia, Mauritania, Mali, Niger, Cape Verde, Burkina Faso
	Southern	Botswana, Namibia, South Africa, Swaziland, Lesotho

Table 6 displays the regression results, of which (1) and (2) indicate that the promotion effect of public diplomacy on China's investment in Africa is currently more significant in sub-Saharan Africa, possibly because China's investment in Africa primarily serves industrial transfer and infrastructure construction, whereas sub-Saharan Africa's development level is relatively low. There are few opportunities for direct dialogue, communication, and consultation between governments on investment and cooperation, so the complementary role of public diplomacy is more apparent, while the insignificant result of grouping regression in northern Africa may be attributable to its small sample size. Further analysis of regional differences within sub-Saharan Africa in (3)–(6) in Table 6 suggests that the promotion effect of public diplomacy on Chinese FDI in Africa is more pronounced in East and Central Africa, probably because the promotion effect of public diplomacy on investment cooperation is non-

linear and has a certain threshold effect, and that China's public diplomacy efforts in East and Central Africa have been carried out for a longer period of time and the political and social resources accumulated by public diplomacy are richer, while countries in West and South Africa may still need to further increase their public diplomacy efforts.

Table 6. Heterogeneity analysis - North-South and regional differences.

	(1) Northern	(2) Sub-Saharan	(3) Eastern	(4) Central	(5) Western	(6) Southern
public	0.243 (0.364)	0.157*** (0.001)	0.955*** (0.001)	0.125*** (0.003)	0.452 (0.246)	0.300 (0.146)
Controls	YES	YES	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES	YES	YES
Year_FE	YES	YES	YES	YES	YES	YES
N	44	379	84	63	132	99
r2	0.734	0.330	0.705	0.375	0.348	0.358

Notes: The report in brackets is the clustering standard error adjusted at the major level; The control variables are the same as those of Table 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.2. Difference of development level

African nations have vast disparities in economic growth, stages of development, and interest in accepting foreign investment. This article investigates the effect of public diplomacy on the heterogeneity of China's direct investment mechanism in Africa. This article begins with a discussion of the World Bank's criterion for national income level in 2021 and then classifies African nations into low-income and high-income groups based on their national income levels. The results of group regression are presented in columns (1) and (2) of Table 7. The results indicate that the effect of public diplomacy on China's investment in Africa is greater in relatively backward countries and regions. This could be due to the high proportion of infrastructure construction in China's current investment structure in Africa, or to the high crowding out effect of Western investment in China in high-development African countries. In order to exclude the effect of grouping criteria, the paper then divides the sample into two groups, low income and high income, using the average per capita disposable income of African countries as the boundary. "Since investment cooperation directly promoted by government diplomacy is often a large scale project requiring a certain degree of economic strength and industrial base in the host country, it is difficult to directly promote investment cooperation in African countries that are lagging behind, implying that Chinese public diplomacy in Africa can compensate for the limitations of Chinese government diplomacy in promoting investment cooperation in countries that are lagging behind, and to a certain extent, direct investment flows to Africa. This means that China's public diplomacy with Africa can compensate for the limitations of China's non-government diplomacy in promoting investment cooperation with countries that are lagging behind in terms of development, and to a certain extent direct investment in Africa to countries or regions that are lagging behind, so as to avoid the emergence of the Matthew effect and alleviate the development gap between African regions.

5.3. Risk level variance

There is a substantial disparity in the degree of danger across African nations, such as with regard to political upheaval and terrorist attacks. China's public diplomacy and direct investment choices in Africa are heavily influenced by the security of its people and property. Hence, this article uses the International Country Risk Guide's Country Risk Composite Index (ICRG). The database classifies risk degree categories based on index scores, with 0–10 representing low risk, 20 – 40 representing medium risk, and 40 – 50 representing high risk, and 50 - 100 is very

Table 7. Heterogeneity analysis - Differences in development level.

	(1) WB_H	(2) WB_L	(3) pgdp_H	(4) pgdp_L
public	0.002 (0.992)	0.149*** (0.002)	0.213 (0.287)	0.139*** (0.003)
Controls	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Year_FE	YES	YES	YES	YES
N	72	351	141	282
r2	0.347	0.351	0.405	0.338

Notes: The report in brackets is the clustering standard error adjusted at the major level; The control variables are the same as those of Table 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

high. This article categorized medium-low risk into the low-risk group and high-risk and ultra-high risk into the high-risk group based on the aforementioned criteria. The grouping regression results are displayed in results (1) and (2) of Table 8, and it is observed that the influence of public diplomacy on investment promotion is more significant for low-risk samples. In this article, the average national risk of the whole sample is used as the dividing line, and the samples are sorted into two groups based on relative criteria: high risk and low risk. In results (3) and (4) of Table 8, the group regression findings from the viewpoint of national risk difference are shown, indicating that public diplomacy should play a role in supporting China's investment in Africa on the basis of security. Furthermore, it emphasizes that the risk issue confronting African nations is a significant factor limiting the efficacy of public diplomacy in promoting investment.

Table 8. Heterogeneity analysis: differences in risk levels.

	(1) ICRG_H	(2) ICRG_L	(3) Risk_H	(4) Risk_L
public	0.174 (0.685)	0.078*** (0.002)	0.710 (0.133)	0.070*** (0.000)
Controls	YES	YES	YES	YES
Individual FE	YES	YES	YES	YES
Year_FE	YES	YES	YES	YES
N	333	90	238	185
r2	0.336	0.637	0.389	0.432

Notes: The report in brackets is the clustering standard error adjusted at the major level; The control variables are the same as those of Table 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.4. Sample subinterval estimation

In recent years, China's foreign policy and philosophy toward Africa have evolved, most notably with President Xi's first visit to Africa and his "true, practical, pro-peace, and sincere" diplomatic philosophy toward Africa, which has resulted in a warming of China-Africa relations and an unprecedented popularity of China-Africa private contacts. Table 9 displays the findings of this paper's analysis of the influence of the innovation of China's diplomatic philosophy toward Africa on the promotion of China's investment in Africa using a sub-interval group estimate. With the growth of China's diplomatic strategy toward Africa and China-Africa ties, the notions of "truthfulness, realism, closeness, and sincerity" have played a guiding role in the development of China's public diplomacy toward Africa, and the impact of public diplomacy between China and Africa on OFDI shows a gradual growth trend.

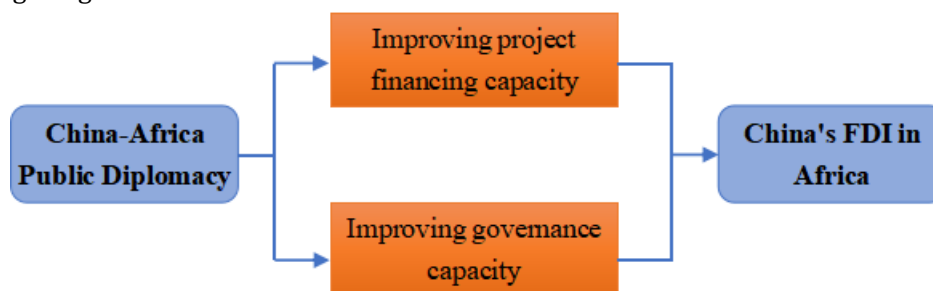
6. Mechanism test

Table 9. Heterogeneity analysis: subinterval estimation.

	(1) 2011-2014	(2) 2015-2019
public	0.106*** (0.004)	0.489** (0.044)
Controls	YES	YES
Individual FE	YES	YES
N	189	234
r2	0.306	0.136

7. Notes: The report in brackets is the clustering standard error adjusted at the major level; The control variables are the same as those of Table 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The previous study examined the impact of China-Africa public diplomacy on Chinese FDI in Africa more comprehensively and found that it can significantly contribute to the growth of Chinese FDI in Africa, but the channels through which it affects Chinese OFDI in Africa still need further analysis. Based on the previous theoretical analysis and research hypotheses, this paper attributes the promotional effect of China-Africa public diplomacy on Chinese OFDI in Africa to the improved project financing capacity and national governance capacity of the host country (Fig. 5.). Therefore, this paper will further examine the mechanism in terms of both this financial mechanism and a good governance mechanism.

**Figure 1.** Influence Mechanism of China-Africa Public Diplomacy for China's FDI in Africa.

6.1. Financial mechanism: Enhancing project financing capacity

This paper uses the logarithm of China's loans to African countries to measure the financing capacity (loan) of the country's investment cooperation projects, and adds the financing capacity and the interaction term with public diplomacy (public*loan) to the benchmark model. Both the core explanatory variables and the interaction term are significantly positive, confirming that raising the level of project financing is an important mechanism for China's public diplomacy with Africa to promote investment cooperation with Africa. Based on the above analysis, research hypothesis 2 was verified.

6.2. Governance mechanism: Improving national governance capacity

We adopt political stability and elimination of violence (gov) from the World Governance Indicators database published by the World Bank as a proxy variable to measure the level of governance in Africa, and adds the level of governance and the interaction term with public diplomacy (public*gov) to the benchmark model for testing this mechanism, and the results are shown in column (2) of Table 10, where both the core explanatory variables and the interaction term are significantly positive. suggesting that China's public diplomacy may promote China-Africa investment cooperation by enhancing national governance capacity. Based on the above analysis, research hypothesis 3 was verified.

Table 10. Mechanism test result.

	(1) Financing Capacity	(2) Governance Capacity
public	0.150*** (0.000)	0.116*** (0.001)
public*loan	0.045*** (0.010)	
loan	-0.628** (0.010)	
public*gov		0.442** (0.016)
gov		0.154 (0.419)
Controls	YES	YES
Individual FE	YES	YES
Year FE	YES	YES
N	423	423
r2	0.352	0.401

Notes: The report in brackets is the clustering standard error adjusted at the major level; The control variables are the same as those of Table 3. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

8. Conclusions and policy implications

This paper creates the heat index of China-Africa public diplomacy using Internet retrieval data and investigates the influence of public diplomacy on China's direct investment in Africa using a two-way fixed effect model. The examination of regional heterogeneity reveals that the influence of public diplomacy on investment promotion is particularly substantial in sub-Saharan Africa. The mechanism test further identified the enhancement of project financing capacity and national governance as the mechanisms at play to leverage the investment promotion effect of public diplomacy. So, in the new era, when China's cooperation with African countries is getting stronger, promoting the development of China-Africa public diplomacy is an important objective requirement for improving China's diplomatic work with Africa. It is also a crucial guarantee for advancing China's direct investment cooperation with Africa.

Based on the above findings, the research conclusions should be considered from the following aspects. First, we should use the complementarity between public diplomacy and government diplomacy to its fullest extent. The basis and assurance of public diplomacy are government diplomacy. Government agencies should continue to promote key policies and ideas about Africa, such as the Belt and Road Initiative, the China-Africa ties of honesty, sincerity, amity, and sincerity, and the China-Africa Community with a shared destiny. We should produce innovations that are as close as feasible to the thought patterns and cultural traits of the local population, and we should deliver more easily understood facts and tales. Second, it is vital to mobilize Chinese businesses in Africa, Chinese expatriates, and international students to engage in China-Africa public diplomacy. Particularly, it is necessary to encourage and support Chinese enterprises establishing themselves in Africa to gradually become the leaders of public diplomacy, cultivate a public diplomacy consciousness, assume their social responsibilities, and take the initiative to establish harmonious public relations with local societies in Africa. Lastly, it is necessary to strengthen the concept of "public diplomacy + Internet", make full use of the Internet, big data, artificial intelligence, and other new media technologies in the course of conducting public diplomacy work on Africa, establish a public opinion platform for China-Africa cooperation with African media organizations, strive to break the discourse hegemony of Western media, and create a favorable public opinion environment for Chinese enterprises to operate in Africa.

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Conflict of interest

All the authors claim that the manuscript is completely original. The authors also declare no conflict of interest.

Authorship contribution statement

Xinjian Ye: Conceptualization, Formal analysis, Funding acquisition, Project administration, Resources, Software, Supervision, Writing – review & editing. Zhuolin Wu: Conceptualization, Formal analysis, Data curation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. Shuocong Gu: Writing – review & editing. Shikuan Zhao: Writing – review & editing, Methodology. All authors read and approved the final manuscript, All authors contributed to the study conception and design, data collection, Formal analysis.

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