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Economic, social and environmental impact of Chinese trade and investments in the Global South

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ABSTRACT

The purpose of this study is to examine Chinese trade and investment in the Global South, particularly Africa, analyzing economic, social, and environmental implications from 1992 to 2023. The research employs a comprehensive quantitative methodology using secondary data from MOFCOM, CARI, and IMF databases, analyzing FDI patterns through temporal, geographic, and sectoral frameworks with descriptive statistics and growth rate calculations. The findings reveal three distinct phases of Chinese FDI evolution: Rapid Growth (2003-2010) with 59.3% average annual growth, Expansion (2011-2018) at 16.1% growth, and Consolidation (2019-2022) showing a 2.9% decline. Chinese investment grew from US$0.49 billion in 2003 to US$40.89 billion in 2022, concentrating in the construction (33.3%) and mining (23.8%) sectors. Geographic distribution shows Southern Africa as the leading destination (27.5% of total FDI), while sectoral analysis indicates a shift from resource extraction toward infrastructure development. Trade analysis demonstrates remarkable growth from US$1.26 billion in 1992 to US$172.45 billion in 2023 for exports, though persistent imbalances remain. Comparative analysis with US FDI reveals greater stability in Chinese investments, maintaining consistent positive flows despite global economic challenges. The practical implications suggest that Chinese engagement offers more stable, long-term development partnerships compared to traditional Western approaches, though African policymakers must develop stronger regulatory frameworks to maximize benefits while addressing social and environmental challenges inherent in resource-focused investments.

Contribution/ Originality: This study contributes to the existing literature by providing the first comprehensive analysis comparing Chinese and US FDI stability patterns in Africa over three decades. It employs a novel temporal-sectoral methodology to examine the evolution of investments through distinct phases. The primary contribution of the paper is the finding that Chinese investments demonstrate greater long-term consistency than Western approaches.

1. INTRODUCTION

China's emergence as a global economic power has fundamentally transformed its relationship with the Global South, encompassing Latin America, Asia, Africa, and Oceania. These regions share historical experiences of colonialism and economic marginalization (Dados & Connell, 2012). Over the past two decades, this relationship has deepened considerably through expanding foreign direct investment (FDI), enhanced trade partnerships, and

comprehensive development cooperation initiatives. Chinese FDI in Africa experienced remarkable growth, increasing from US$3 billion in 1995 to US$55 billion in 2006, with projections indicating continued expansion beyond US$100 billion later in the decade (Taylor, 2006). The operational presence of Chinese enterprises in Africa expanded to over 800 firms in 2006, including approximately 100 state-owned enterprises (Xinhua, 2007).

China's investment approach centers on the "Beijing Consensus," which prioritizes mutual economic benefits over political conditionalities. This methodology diverges significantly from Western development models (Sautman & Hairong, 2007). The "no strings attached" policy framework has established China as a preferred partner, particularly among resource-abundant nations. Infrastructure development projects are frequently structured as resource-for-investment exchanges, creating alignment between economic objectives and foreign policy priorities (Alden & Davies, 2006). Chinese enterprises operate across diverse economic sectors, including petroleum extraction in Angola and Sudan, transportation infrastructure development in Ethiopia, electricity generation projects in Kenya, and tourism sector investments in Sierra Leone (Kaplinsky, McCormick, & Morris, 2007).

The measurable impact of Chinese FDI demonstrates significant economic effects: empirical evidence indicates that a 1% increase in China's FDI stock in Africa correlates with a 0.607% increase in African GDP growth (Doku, Akuma, & Owusu-Afriyie, 2017). However, the outcomes present a complex picture. Chinese imports have enhanced access to affordable consumer goods while simultaneously challenging local manufacturing industries. Notable examples include South Africa's textile sector, which experienced job losses ranging from 23,000 to 85,000 positions, and Ghana's experience of local business closures attributed to Chinese market competition (Ademola, Bankole, & Adewuyi, 2009; Tull, 2006). Labor relations have occasionally become strained, particularly regarding employment practices and working hour expectations within Chinese-operated enterprises (Anshan, 2007).

China's engagement with the Global South reflects broader strategic and diplomatic objectives. The approach prioritizes multilateralism, consensus-building, and peaceful coexistence, contrasting with the democracy and governance-focused Washington Consensus (Wenping, 2007). Investment decisions are influenced by both economic requirements and geopolitical considerations, particularly in resource-secure regions (Zweig & Jianhai, 2005). While China's historical presence in Africa spans centuries, contemporary relations have experienced rapid development through three identifiable phases: the "coolie trade" period (1850–1950), the political solidarity era (1960–1980), and the current economic engagement phase (1990–present) (Mohan & Kale, 2007).

The scope of Chinese investments has expanded beyond traditional raw material extraction. Chinese enterprises have diversified into mobile telecommunications infrastructure in Kenya and Nigeria (Kaplinsky et al., 2007). This comprehensive involvement has generated substantial academic and policy debate regarding sustainability implications. While some scholars interpret China's model as a beneficial alternative to conventional Western development assistance (Alden, 2005), others characterize it as a reproduction of neo-colonial dynamics (De Lorenzo, 2007). The rise of BRIC nations and Asia's industrial advancement has restructured traditional North-South relations, although global financial influence remains concentrated among established powers (Dados & Connell, 2012).

China's infrastructure development initiatives in the Global South receive institutional support from key organizations, including the Export-Import Bank of China and China Development Bank. These institutions provide financing for exports and FDI across sectors, including energy, transportation, and telecommunications (Wang, 2007). In Sub-Saharan Africa, Chinese FDI increased from US$70.14 million in 2003 (representing 2.5% of total outward FDI) to exceed US$2 billion in 2010 (Doku et al., 2017). The region maintained GDP growth above 5.5% until the 2008 financial crisis. Bilateral trade between China and Africa expanded from US$10 billion to US$55 billion between 2000 and 2006 (Taylor, 2006), facilitating increased access to consumer goods, vehicles, and industrial equipment (Ademola et al., 2009; Renard, 2011).

FDI distribution patterns reveal strategic motivations: North Africa, particularly Algeria, attracts investment due to petroleum reserves and political stability (Buckley et al., 2007). Zambia and Zimbabwe dominate Southern

African investment flows, while Nigeria attracts attention in West Africa primarily for its oil resources (Doku et al., 2017).

This study examines the effects of Chinese trade and investment on the Global South, with particular focus on Africa, to evaluate economic, social, and environmental outcomes while contributing to the understanding of South-South cooperation in the 21st century.

2. LITERATURE REVIEW

2.1. The Global South: Concept and Impact of Chinese Trade and Investment

The concept of the "Global South" encompasses regions of Latin America, Asia, Africa, and Oceania that share common historical experiences of colonial governance and continued economic marginalization (Dados & Connell, 2012). The theoretical foundation draws from Gramsci's analysis of economic colonization and Prebisch's "core-periphery" framework. Development progression spans three historical periods: colonial "coolie trade" (1850-1950), Cold War political solidarity (1960-1980), and contemporary economic engagement (1990-present) (Mohan & Kale, 2007). The emergence of BRIC nations has fundamentally altered international relations, with China-Africa engagement exemplifying South-South cooperation through multilateral approaches that distinguish themselves from Western methodologies (Sautman & Hairong, 2007; Wenping, 2007).

Chinese engagement serves multiple strategic economic interests: securing raw material supplies, expanding market access, and globalizing China's industrial capabilities (Mawdsley, 2012; O'Brien, 2019). China's resource consumption reached significant global proportions in 2004, accounting for 31% of coal, 30% of iron ore, and 40% of cement consumption (Baah & Jauch, 2009). Trade volumes with Africa increased dramatically from $12 billion in 2000 to over $200 billion in 2018 (O'Brien, 2019), though patterns maintain asymmetrical characteristics. Infrastructure investments span multiple sectors (Pan, 2007) while concerns persist regarding debt dependency (Keet, 2007) and labor practices, with Chinese companies typically offering below-market wages (Baah & Jauch, 2009; Jenkins & Edwards, 2006). Environmental impacts range from mining-related degradation (Forster, Butterfield, Chen, & Pushak, 2008) to renewable energy investments (Tawiah, Asare, & Boateng, 2021). Enhanced regulatory frameworks are necessary for sustainable development outcomes (Kaplinsky, Morris, & McCormick, 2006; Tjønneland, Brandtzæg, Kolås, & Le Pere, 2006).

2.2. Economic, Social and Environmental Impacts of Chinese Trade and Investments

Chinese FDI operates through multiple channels: government, state-owned enterprises (SOEs), private corporations, and individual entrepreneurs (Kaplinsky & Morris, 2009). The "Angola mode" represents an integrated approach combining aid, trade, and investment through Export-Import Bank credit facilities secured by commodity exports. Research demonstrates positive growth effects: a 1% increase in Chinese FDI stock generated a 0.607% increase in Africa's GDP from 2003 to 2012 (Doku et al., 2017). Investment patterns evolved from manufacturing sector dominance (46%) during 1979-2000 to increased focus on resource extraction (28%) and services (18%), though trade imbalances persist (Aisien & Adesuwa, 2019). While SOEs utilize low-cost capital for major infrastructure projects, private enterprises increasingly participate in manufacturing and service sectors. Sectoral impacts vary significantly: construction and mining sectors benefit from Chinese capital availability, while local manufacturers face competitive pressure from imports (Aisien & Adesuwa, 2019).

These investments generate complex social transformations. Demographic changes are observable across Africa and Asia (Po & Heng, 2019; Zhang, Alon, & Chen, 2014). Employment benefits exhibit unequal distribution, with Chinese-speaking workers typically receiving higher compensation than local employees (Aisien & Adesuwa, 2019; Po & Heng, 2019). Cultural integration remains challenging as Chinese investors often maintain distinct social communities (Kaplinsky & Morris, 2009). Community-level impacts include increased crime rates (Po & Heng, 2019) and housing affordability challenges (Zhang et al., 2014). Insufficient management of social disruption may contribute

to anti-foreign sentiment (Tang & Shen, 2020), highlighting the importance of balanced policy approaches (Aisien & Adesuwa, 2019).

Environmental impacts manifest through carbon emissions, resource extraction activities, and technology transfer processes. While China's domestic policies have reduced emissions nationally, African construction activities demonstrate a strong correlation with increased CO2 emissions (Qi, Cheng, & Cui, 2021). Chinese investment frequently results in intensive extraction practices affecting biodiversity, particularly in regions with weak regulatory frameworks (Tawiah et al., 2021). Technology transfer outcomes vary: non-resource sectors benefit from cleaner technology adoption, while resource-intensive industries often continue environmentally harmful practices (Shapiro, 2012). Chinese FDI in green technology offers potential environmental benefits, though these may be offset by degradation in other sectors (Tawiah, Zakari, & Khan, 2021). Environmental impacts vary regionally based on governance capacity (Shapiro, 2012).

2.3. Chinese Trade and Investment in Africa and Ghana

China's "Going Global" strategy has fundamentally reshaped Africa's economic landscape through FDI, infrastructure development, and technology transfer initiatives (Besada, Wang, & Whalley, 2011; Wei, 2013). SOEs concentrate on infrastructure and resource projects, while private enterprises target manufacturing and service sectors (Zhang, Wei, & Liu, 2013). Trade volumes increased from $12 billion in 2000 to over $200 billion in 2018, although the relationship maintains asymmetrical characteristics (Adekunle & Gitau, 2013). Technology transfer effectiveness varies across countries: Ghana experiences limited benefits (Ackah, Fole, Görg, & Merchan, 2024) while Ethiopia demonstrates stronger outcomes, highlighting the importance of national policy frameworks (Javorcik, 2004). Chinese companies supply over 60% of Africa's imported capital goods (Munemo, 2013).

Labor practices remain contentious, with Chinese firms typically offering below-market wages. Zambian copper mining operations provide compensation 30% below Western counterparts (Jenkins & Edwards, 2006). Environmental impacts range from deforestation to renewable energy investments (Tawiah et al., 2021). Success requires strengthened governance structures, particularly in regulating mining activities such as Ghana's galamsey operations (Ackah et al., 2024; Aidoo, 2016).

The China-Ghana economic relationship, formally established in 1960, evolved significantly following Ghana's 1980s economic reforms (Frimpong & Nubuor, 2013). Chinese project implementation increased from 34 initiatives in 2009 to 82 in 2011 (Abodakpi, 2015; Frimpong & Nubuor, 2013). Early investment phases grew from US$3.09 million during 2002-2004 to US$17.87 million in 2005 (Frimpong, 2012). Investment patterns diversified from pre-2009 concentration in general trade (56%) and manufacturing (26%) to include services and construction sectors in 2011 (Frimpong & Nubuor, 2013). China's assistance includes diverse financing mechanisms, with major projects including the US$562 million Bui Dam (Frimpong & Nubuor, 2013). Despite investment growth facilitated through the Ghana Investment Promotion Centre, trade imbalances persist.

2.4. Theoretical Underpinnings

This study employs four complementary theoretical frameworks. Competitive Advantage Theory explains organizational attributes that enable market outperformance through monopoly, Ricardian, and Schumpeterian rents (Peteraf, 1993; Powell, 2001). While Porter (1980) and Porter (1985) Market-Based View prioritizes industry factors, Prahalad and Hamel (1990) emphasize resources and capabilities. Contemporary success requires balancing both perspectives (Wang, 2014).

Vernon (1966) Product Life-Cycle Theory describes international market evolution through introduction, growth, maturity, and decline stages, with production shifting from high-income to lower-cost economies as products mature (Katsioloudes & Hadjidakis, 2007). This framework explains how innovation, standardization, and cost

considerations influence trade patterns, though modern applications must consider trade agreements and government incentives.

The Heckscher-Ohlin Model (Heckscher, 1919; Ohlin, 1933) explains trade patterns through countries' factor endowments, with key theoretical developments including Factor-Price Equalization (Samuelson, 1948) and the Stolper and Samuelson (1941). Modern extensions incorporate human capital considerations (Baldwin, 1971) and productivity differences (Trefler, 1995).

Ricardo (1817) Comparative Advantage Theory demonstrates how nations benefit from trade specialization even when one nation holds absolute advantages across all sectors (Krugman & Obstfeld, 2009). Recent research links comparative advantage to macroeconomic variables and sector-specific advantages (Do, Levchenko, & Raddatz, 2016). Despite challenges from technology-driven changes and global supply chains (Guarascio & Stöllinger, 2022) the theory remains fundamental to trade policy analysis.

3. METHODS

3.1. Data Collection and Sources

This study utilizes comprehensive secondary data from multiple authoritative sources spanning the period 1992 to 2023. Primary data sources include the Chinese Ministry of Commerce (MOFCOM), specifically its Statistical Bulletin of China's Outward Foreign Direct Investment, which provides detailed information on Chinese FDI stock and flows to African nations. This foundation is supplemented with data from the Johns Hopkins University SAIS China-Africa Research Initiative (CARI), which maintains specialized datasets on Chinese investments in Africa, encompassing sectoral distributions and trade statistics. For comparative analysis, the U.S. Bureau of Economic Analysis (BEA) provides historical trends and statistical data on U.S. FDI in Africa. Additional data validation and global context are obtained from the United Nations Conference on Trade and Development (UNCTAD) investment reports and the International Monetary Fund's (IMF) Direction of Trade Statistics. Country-specific information for Ghana is sourced from the Ghana Investment Promotion Council, the Ministry of Trade and Industry, and the Chinese Embassy in Ghana. The study encompasses two distinct temporal frameworks: a 20-year period (2003-2022) for examining foreign direct investment patterns and an extended 31-year period (1992-2023) for analyzing trade relationships. This comprehensive temporal scope facilitates a thorough examination of long-term trends and evolutionary patterns in China-Africa economic relations.

3.2. Analytical Framework

This study employs a structured analytical framework for exploring China-Africa economic relations, comprising three integrated components: temporal analysis, geographic distribution analysis, and sectoral analysis. The temporal analysis examines investment and trade patterns over time, identifying distinct growth phases and developmental trends. This involves calculating year-on-year growth rates, analyzing long-term trajectories, and identifying key turning points in China-Africa economic relations. Particular attention focuses on FDI stock and flow evolution from 2003 to 2022 and trade pattern development from 1992 to 2023. Geographic distribution analysis investigates spatial patterns of Chinese investments and trade across African regions and countries. This includes evaluating investment concentration patterns, regional distribution of trade flows, and comparative analysis of investment preferences across various African markets. Special attention addresses variations in investment patterns among regions and factors influencing these distributions. Sectoral analysis examines Chinese investment allocation across different economic sectors in Africa. This component investigates temporal changes in sectoral allocation, identifies dominant sectors for Chinese investment, and analyzes the evolution of sector-specific investment patterns in key areas including construction, mining, manufacturing, financial services, and technological services. Integration of these three components provides a comprehensive understanding of patterns, trends, and characteristics of China-Africa

economic relations through systematic examination of both aggregate trends and specific aspects of this economic relationship.

3.3. Statistical Methods

This analysis employs fundamental statistical techniques to examine patterns and trends in China-Africa economic relations. Descriptive statistics serve as the primary analytical tool, focusing on year-on-year growth rates of FDI stock and flows, percentage distributions of investments across sectors and regions, and compound annual growth rates to understand long-term development trajectories. For investment analysis, market shares are computed to determine the relative significance of different countries and regions, complemented by investment concentration ratios to assess geographic distribution patterns and sectoral distribution percentages to track the evolution of investment priorities. These calculations identify dominant trends and structural changes in investment patterns over time. Trade analysis employs comparable statistical methods, including computation of trade volumes, growth rates, and market shares. Comparative metrics, including trade intensity indices and relative market share calculations, analyze bilateral trade relationships, evaluate the changing nature of China-Africa trade relations, and identify significant patterns in trade development. Performance indicators, including investment-to-GDP ratios, sectoral concentration indices, and regional distribution coefficients, assess the relative significance of various investment and trade relationships. Collectively, these statistical methods facilitate systematic analysis of complex patterns in China-Africa economic relations while ensuring analytical quality and reliability.

3.4. Data Analysis Tools

Microsoft Excel serves as the primary tool for systematically analyzing China-Africa investment and trade data. The software organizes data and computes basic statistics, growth rates, market shares, and other key metrics. Excel's spreadsheet capabilities efficiently handle large datasets spanning multiple years and countries. The study leverages Excel's statistical functions to compute descriptive statistics, including growth rates, percentages, and compound annual growth rates (CAGR). Graphing and charting tools create visual representations of trends in FDI flows, trade patterns, and sectoral distributions. Pivot tables analyze cross-sectional data and identify patterns across different dimensions of the dataset. For data validation and cross-checking, Excel's data validation tools and formula auditing features ensure calculation accuracy and consistency in analysis across time periods and categories. Together, these tools enable a comprehensive analysis of quantitative aspects of China-Africa economic relations while maintaining precision and reliability.

3.5. Validation Methods

To ensure data reliability and accuracy, the study implements several validation procedures. Cross-referencing different data sources, particularly MOFCOM statistics and CARI databases, verifies the consistency of FDI and trade figures. Discrepancies are resolved through consultation with additional sources, including UNCTAD reports and IMF statistics, to determine the most reliable figures. Investment data validation involves comparing reported FDI stocks and flows with calculated cumulative values for consistency. Trade statistics undergo cross-checking against both Chinese and African country reports to identify and reconcile significant discrepancies. This bilateral verification approach maintains data accuracy and reliability.

Time series validation examines data pattern consistency across different periods. Unusual variations or outliers are investigated through reference to historical events, policy changes, or economic conditions that might explain them. This temporal validation ensures that identified trends reflect genuine patterns rather than data anomalies. Through these validation procedures, the study maintains high standards of data quality and analytical reliability, ensuring findings accurately represent patterns and trends in China-Africa economic relations.

4. ANALYSIS AND DISCUSSION

4.1. Analysis of Chinese FDI Stock in Africa (2003-2022)

4.1.1. Investment Growth and Geographic Distribution Patterns

Analysis of Chinese FDI in Africa from 2003 to 2022 reveals three distinct developmental phases. The Rapid Growth Phase (2003-2010) witnessed investment expansion from US$0.49 billion to US$13.04 billion, achieving an average annual growth rate of 59.3%. The Expansion Phase (2011-2018) reflected a more mature investment strategy, with growth from US$16.24 billion to a peak of US$46.10 billion at a 16.1% average annual rate. The Consolidation Phase (2019-2022) experienced a decline from US$44.39 billion to US$40.90 billion, averaging a 2.9% annual decrease, indicating a more cautious approach likely influenced by global economic conditions.

Table 1. Evolution of Chinese FDI Stock in Africa (2003-2022).

Year	FDI stock (US$ billion)	Year-on-year growth (%)
2003	0.49	-
2004	0.90	83.2
2005	1.60	77.8
2006	2.56	60.0
2007	4.46	74.2
2008	7.80	74.9
2009	9.33	19.6
2010	13.04	39.8
2011	16.24	24.5
2012	21.73	33.8
2013	26.19	20.5
2014	32.35	23.5
2015	34.69	7.2
2016	39.88	15.0
2017	43.30	8.6
2018	46.10	6.5
2019	44.39	-3.7
2020	43.40	-2.2
2021	44.19	1.8
2022	40.90	-7.4

Source: Chinese Ministry of Commerce (MOFCOM) Statistical Bulletin of China's Outward (2024).

The geographic distribution of Chinese FDI in Africa demonstrates pronounced investment concentration and clear regional preferences. The top five recipient countries account for 37.87% of total FDI, while the top fifteen countries represent 71.02% of total investments (Table 2). Investment levels varied significantly, ranging from US$5.74 billion to as low as US$0.51 million, suggesting selective and strategic investment decisions based on specific country attributes and opportunities.

Regional preferences identify Southern Africa as the leading destination, commanding 27.5% of total FDI stock (Table 3). West Africa and East Africa attracted comparable investments, accounting for 20.6% and 18.7%, respectively. Island nations, despite their limited size, maintain strategic significance for China, representing 4.9% of total investments as financial and trading hubs.

Four key determinants drive this investment distribution pattern. First, resource endowment has attracted significant investments to countries, including the Democratic Republic of the Congo and Zambia, particularly in mining sectors (Table 2). Second, market size influences investment decisions, with larger economies, including South Africa and Egypt, receiving substantial FDI allocations (Table 2).

Third, strategic geographic locations, particularly Kenya and Ethiopia, function as regional economic hubs (Table 2). Fourth, financial centers including Mauritius and Seychelles attract considerable Chinese investment, serving as platforms for broader African operations (Table 2).

Table 2. Top 15 recipients of Chinese FDI stock in Africa (2022).

Rank	Country	FDI stock (US$ million)	Share of total (%)
1	South Africa	5,741.69	14.04
2	DR Congo	4,129.83	10.10
3	Zambia	1,979.57	4.84
4	Niger	1,853.56	4.53
5	Kenya	1,782.42	4.36
6	Mauritius	1,515.66	3.71
7	Tanzania	1,440.82	3.52
8	Egypt	1,203.37	2.94
9	Mozambique	1,180.35	2.89
10	Ghana	1,058.26	2.59
11	Mali	478.03	1.17
12	Seychelles	486.14	1.19
13	Angola	1,946.17	4.76
14	Ethiopia	2,620.32	6.41
15	Algeria	1,621.92	3.97

Source: Chinese Ministry of Commerce (MOFCOM) Statistical Bulletin (2022).

Table 3. Regional Distribution of Chinese FDI Stock (2022).

Region	Total FDI Stock (US$ billion)	Share (%)	Key Countries
Southern Africa	11.26	27.5	South Africa, Zambia, Zimbabwe
East Africa	7.65	18.7	Kenya, Tanzania, Ethiopia
West Africa	8.42	20.6	Ghana, Niger, Nigeria
Central Africa	4.91	12.0	DR Congo, Cameroon
North Africa	4.85	11.9	Egypt, Algeria, Tunisia
Island Nations	2.00	4.9	Mauritius, Seychelles

Source: Computed from MOFCOM Statistical Bulletin data (2022).

4.2. Analysis of Chinese FDI Flows to Africa (2003-2022)

4.2.1. FDI Flow Patterns

Analysis of Chinese FDI flows to Africa from 2003 to 2022 reveals a volatile investment landscape characterized by significant fluctuations. Annual flows varied dramatically, ranging from US$0.07 billion in 2003 to peaks of US$5.49 billion in 2008 and US$5.39 billion in 2018 (Table 4). This volatility reflects the sensitivity of Chinese investments to global economic conditions and bilateral relations with African nations. Despite intermittent fluctuations, a general upward trend in investment scale is evident. The average annual flow during 2013-2022 reached US$3.52 billion, compared to US$1.75 billion during 2003-2012 (Table 4). Distinct cycles of expansion and contraction are observable, with pronounced growth during 2007-2008 and 2017-2018, followed by sharp declines (Table 4).

Table 4. Chinese annual FDI flows to Africa (2003-2022).

Year	FDI flow (US$ billion)	Year-on-year change (%)
2003	0.07	-
2004	0.32	357.7
2005	0.39	21.8
2006	0.52	33.3
2007	1.57	201.9
2008	5.49	249.7
2009	1.44	-73.8
2010	2.11	46.5
2011	3.17	50.2
2012	2.52	-20.5
2013	3.37	33.7
2014	3.20	-5.0
2015	2.98	-6.9
2016	2.40	-19.5

Year	FDI flow (US$ billion)	Year-on-year change (%)
2017	4.10	70.8
2018	5.39	31.5
2019	2.70	-49.9
2020	4.23	56.7
2021	4.99	18.0
2022	1.81	-63.7

Source: Chinese Ministry of Commerce (MOFCOM) Statistical Bulletin of China's Outward (2024).

4.2.2. Geographic Distribution of FDI Flows

Data from 2022 highlight notable patterns in the geographic distribution of Chinese FDI flows in Africa. Investments concentrate in a limited number of key countries, with significant variations. South Africa emerged as the largest recipient, attracting US$683.09 million, representing 37.7% of total flows (Table 5). Niger was followed by the US$567.06 million (31.3%), while the Democratic Republic of the Congo received US$391.11 million (21.6%) (Table 5). Conversely, countries including Kenya (negative US$322.84 million), Angola (negative US$315.00 million), and Ethiopia (negative US$139.17 million) experienced significant divestments, indicating strategic shifts in investment priorities. Investment diversification across sectors continues, with resource-rich countries maintaining substantial flow attraction while manufacturing, services, and infrastructure projects gain momentum.

Table 5. Top 10 recipients of Chinese FDI flows in 2022.

Rank	Country	FDI flow (US$ million)	Share of total (%)
1	South Africa	683.09	37.7
2	Niger	567.06	31.3
3	DR Congo	391.11	21.6
4	Egypt	229.79	12.7
5	Côte d'Ivoire	223.16	12.3
6	Zambia	191.46	10.6
7	Ethiopia	-139.17	-7.7
8	Kenya	-322.84	-17.8
9	Angola	-315.00	-17.4
10	Senegal	-211.22	-11.7

Source: Chinese Ministry of Commerce (MOFCOM) Statistical Bulletin (2022).

4.3. Sectoral Analysis of Evolution of Chinese FDI Stock in Africa (2013-2022)

Analysis of Chinese FDI by sector (2013-2022) from Table 6 reveals significant investment patterns and structural transformations. The construction sector experienced substantial growth from US$6.84 billion (26.1%) in 2013 to a peak of US$16.34 billion (37.0%) in 2021, before declining slightly to US$13.62 billion (33.3%) in 2022, maintaining its position as the leading sector. The mining sector displayed relatively stable investment patterns, ranging from US$6.92 billion (26.4%) in 2013 to US$9.72 billion (23.8%) in 2022, with a peak of US$11.02 billion (24.8%) in 2019. Its relative importance gradually declined while maintaining its position as the second-largest recipient sector.

The manufacturing sector demonstrated steady growth from US$3.51 billion (13.4%) in 2013 to US$6.13 billion (14.1%) in 2020, before declining to US$5.06 billion (12.4%) in 2022, maintaining a consistent average share of 13.2%. Financial intermediation exhibited more volatile patterns, reaching a peak of US$5.71 billion (13.2%) in 2017, with its share declining from 14.0% in 2013 to 10.7% in 2022. The scientific research and technological services sector, while representing the smallest among major sectors, demonstrated consistent growth from US$1.34 billion (5.1%) in 2013 to a peak of US$2.97 billion (6.4%) in 2018, subsequently stabilizing around 5%.

The evolution of Chinese FDI in Africa over the past decade demonstrates significant structural transformations, characterized by a notable shift from resource-focused investments toward infrastructure-led development. Investment priorities have evolved, with infrastructure development emerging as the predominant focus, evidenced by the construction sector's growing dominance from 26.1% in 2013 to 33.3% in 2022. Simultaneously, reduced

dependence on extractive industries is observable, although mining remains significant at approximately 23.8% of total investments in 2022. The steady commitment to manufacturing (consistent 13.2% share), combined with strategic maintenance of financial services presence, indicates a more balanced and mature investment approach. The investment portfolio demonstrates increasing sophistication in sector selection and greater alignment with African development priorities.

Table 6. Chinese FDI Stock in Africa by Major Sectors (2013-2022) in US$ billion.

Year	Construction	Mining	Manufacturing	Financial intermediation	Scientific research & tech	Other	Total
2013	6.84 (26.1%)	6.92 (26.4%)	3.51 (13.4%)	3.67 (14.0%)	1.34 (5.1%)	3.30 (0.15%)	26.20
2014	7.99 (24.7%)	7.93 (24.5%)	4.40 (13.6%)	5.31 (16.4%)	1.36 (4.2%)	5.71 (16.6%)	32.35
2015	9.51 (27.4%)	9.54 (27.5%)	4.63 (13.3%)	3.42 (9.9%)	1.46 (4.2%)	6.14 (17.7%)	34.70
2016	11.30 (28.3%)	10.41 (26.1%)	5.09 (12.8%)	4.56 (11.4%)	1.91 (4.8%)	6.62 (16.6%)	39.89
2017	12.88 (29.8%)	9.76 (22.5%)	6.08 (14.0%)	5.71 (13.2%)	2.31 (5.3%)	6.59 (15.2%)	43.33
2018	14.76 (32.0%)	10.48 (22.7%)	5.97 (13.0%)	5.07 (11.0%)	2.97 (6.4%)	6.87 (14.9%)	46.12
2019	13.59 (30.6%)	11.02 (24.8%)	5.59 (12.6%)	5.24 (11.8%)	2.49 (5.6%)	6.48 (14.6%)	44.41
2020	15.15 (34.9%)	8.94 (20.6%)	6.13 (14.1%)	4.14 (9.6%)	2.35 (5.4%)	6.68 (15.4%)	43.39
2021	16.34 (37.0%)	9.99 (22.6%)	5.93 (13.4%)	4.20 (9.5%)	2.04 (4.6%)	5.70 (12.9%)	44.20
2022	13.62 (33.3%)	9.72 (23.8%)	5.06 (12.4%)	4.40 (10.7%)	2.16 (5.3%)	5.90 (14.5%)	40.89

Source: MOFCOM Statistical Bulletin and China-Africa Research Initiative (CARI) (2024).

4.4. Chinese Global FDI Patterns (2002-2022)

China's global FDI stock has exhibited exceptional growth over the period 2002-2022, expanding from US$29.90 billion to US$2,754.81 billion, as demonstrated in Table 7. This phenomenal growth trajectory divides into three distinct phases. The first phase (2002-2008) demonstrated rapid expansion with a 36.4% average annual growth rate, increasing from US$29.90 billion to US$183.97 billion, marking China's initial aggressive global investment expansion. The second phase (2009-2016) sustained strong growth at more moderate rates, with the stock growing from US$245.76 billion to US$1,357.39 billion (27.8% average annual growth), reflecting increasing maturity in global investment strategies. The third phase (2017-2022) demonstrates maturation with more modest growth rates and greater selectivity, increasing from US$1,809.04 billion to US$2,754.81 billion (13.0% average annual growth), with 2022 marking the first negative growth year (1.1% decline).

Chinese global FDI flows present a more volatile pattern than stock figures, increasing dramatically from US$2.70 billion in 2002 to a peak of US$196.15 billion in 2016, before moderating to US$163.12 billion in 2022. The early period (2002-2008) exhibited explosive growth, increasing from US$2.70 billion to US$55.91 billion, with several years achieving triple-digit growth rates (122.9% in 2005, 110.9% in 2008). The middle period (2009-2016) maintained strong but more stable growth, rising steadily from US$56.53 billion to US$196.15 billion. The recent period (2017-2022) has demonstrated increased volatility and general moderation, with flows fluctuating between US$136.91 billion and US$178.82 billion, suggesting a more selective approach to new investments and greater sensitivity to global economic conditions.

Table 7. Chinese Global FDI stock and flow (2002-2022).

Year	Stock (US$ billion)	Growth rate (%)	Flow (US$ billion)	Growth rate (%)
2002	29.90	-	2.70	-
2003	33.20	11.0	2.85	5.6
2004	44.80	35.0	5.50	93.0
2005	57.20	27.7	12.26	122.9
2006	90.63	58.4	21.16	72.6
2007	117.91	30.1	26.51	25.3
2008	183.97	56.0	55.91	110.9
2009	245.76	33.6	56.53	1.1
2010	317.21	29.1	68.81	21.7
2011	424.78	33.9	74.65	8.5
2012	531.94	25.2	87.80	17.6
2013	660.48	24.2	107.84	22.8
2014	882.64	33.6	123.12	14.2
2015	1097.86	24.4	145.67	18.3
2016	1357.39	23.6	196.15	34.7
2017	1809.04	33.3	158.29	-19.3
2018	1982.27	9.6	143.04	-9.6
2019	2198.88	10.9	136.91	-4.3
2020	2580.66	17.4	153.71	12.3
2021	2785.15	7.9	178.82	16.3
2022	2754.81	-1.1	163.12	-8.8

Source: UNCTAD World Investment Report and MOFCOM Statistical Bulletin (2002-2022).

4.4.1. Global-African Investment Comparison

Comparative analysis of China's global and African investment patterns reveals several significant trends. As demonstrated in Table 7 and Table 1, while Africa represents a relatively modest portion of China's total FDI (approximately 1.5% of global stock), the growth rate of Chinese FDI in Africa has frequently exceeded global averages. This phenomenon is particularly evident during the 2010-2015 period, indicating Africa's growing strategic importance in China's global investment portfolio. Examination of Table 6 in comparison with global patterns reflected in Table 7 reveals distinct sectoral distribution patterns between global and African investments. While global investments demonstrate greater diversification across sectors, African investments exhibit higher concentration in construction and mining, reflecting the continent's specific development requirements and resource endowments. This suggests a tailored investment strategy that aligns with both African development priorities and China's strategic interests.

4.5. Chinese Global FDI Stock Distribution (2003-2022)

The geographic distribution of China's global FDI stock from 2003 to 2022 demonstrates a concentrated yet evolving pattern. According to Table 8, Hong Kong maintained its position as the primary destination, with its share increasing from US$24.63 billion (74.1%) in 2003 to US$1,588.67 billion (57.7%) in 2022. The most notable expansion occurred between 2014 and 2020, when investment grew from US$509.92 billion to US$1,438.53 billion, reinforcing Hong Kong's role as a gateway for Chinese outbound investment.

Offshore financial centers, including the Cayman Islands and British Virgin Islands, experienced substantial growth. The Cayman Islands' share increased from US$3.69 billion (11.1%) in 2003 to a peak of US$457.03 billion in 2020, before declining to US$211.51 billion (7.7%) in 2022. Similarly, the British Virgin Islands expanded from US$0.53 billion (1.6%) in 2003 to US$367.28 billion (13.3%) in 2022, with rapid acceleration post-2015, reflecting increasing financial sophistication in China's global investment mechanisms.

Chinese investment in Africa demonstrated consistent but modest growth, increasing from US$0.49 billion (1.5%) in 2003 to US$46.10 billion in 2018, before adjusting to US$40.89 billion (1.5%) in 2022. This trajectory reveals three phases: early rapid expansion (2003–2008), sustained growth (2009–2015), and stabilization (2016–2022), indicating China's evolving, long-term strategic interest in African economies.

The 'Others' category experienced substantial growth from US$3.88 billion (11.7%) in 2003 to US$546.46 billion (19.8%) in 2022, particularly between 2013 and 2017, when it tripled from US$138.65 billion to US$412.73 billion. This growth indicates China's active diversification beyond traditional markets.

Table 8 illustrates China's global investment strategy progression through three phases: (1) concentration in Hong Kong (2003–2009); (2) diversification through offshore centers (2010–2016); and (3) balanced global distribution (2017–2022). While Hong Kong remains fundamental, its relative dominance has diminished. The strategic utilization of offshore financial hubs and increasing engagement with emerging markets, including Africa and the 'Others' category, indicate a maturing investment strategy. This reflects China's balanced approach, leveraging established financial centers while steadily expanding its global presence to align with broader economic and geopolitical objectives.

Table 8. Distribution of Chinese Global FDI stock by major destinations (2003-2022) in US$ billion.

Year	Africa	Hong Kong	Cayman Islands	British Virgin Islands	Others	Total
2003	0.49	24.63	3.69	0.53	3.88	33.22
2004	0.90	30.39	6.66	1.09	5.74	44.78
2005	1.60	36.51	8.94	1.98	8.18	57.21
2006	2.56	42.27	14.21	4.75	26.84	90.63
2007	4.46	68.78	16.81	6.63	21.23	117.91
2008	7.80	115.85	20.33	10.48	29.52	183.97
2009	9.33	164.50	13.58	15.06	43.29	245.76
2010	13.04	199.06	17.26	23.24	64.61	317.21
2011	16.24	261.52	21.69	29.26	96.06	424.78
2012	21.73	306.37	30.07	30.85	142.92	531.94
2013	26.19	377.09	42.32	33.90	138.65	660.48
2014	32.35	509.92	44.24	49.32	202.58	882.64
2015	34.69	686.86	62.40	51.67	199.84	1097.86
2016	39.88	780.74	104.21	88.77	343.79	1357.39
2017	43.30	981.27	249.68	122.06	412.73	1809.04
2018	46.10	1100.39	259.20	130.50	446.07	1982.26
2019	44.40	1275.36	276.15	141.88	461.09	2198.88
2020	43.40	1438.53	457.03	155.64	486.06	2580.66
2021	44.19	1549.66	229.53	447.45	514.33	2785.15
2022	40.89	1588.67	211.51	367.28	546.46	2754.81

Source: Chinese Ministry of Commerce (MOFCOM) Statistical Bulletin and UNCTAD (2003-2022).

4.6. Comparative Analysis of US FDI Stock in Africa (1982-2022)

Table 9 presents the evolution of US FDI stock and flows in Africa across selected years, revealing distinct investment phases and volatility patterns in American engagement with the continent. The data demonstrates an early decline period (1982-1990), a recovery phase (1991-2010), and recent volatility (2015-2022).

US FDI stock in Africa from 1982 to 2022 reveals distinct developmental phases. The early period (1982-1990) experienced a decline from US$6.49 billion to US$3.65 billion, characterized by consistent negative flows due to challenging economic and political environments. From 1991 to 2010, recovery occurred, with FDI stock increasing to US$54.82 billion in 2010, representing a growth rate of 361.1%. Peak investment reached US$69.03 billion in 2014.

During the recent period (2015-2022), US FDI stock declined from US$52.00 billion in 2015 to US$46.17 billion in 2022, characterized by volatility and negative flows in 2016 (negative US$2.70 billion) and 2019 (negative US$3.30 billion). This reflects a recalibration of US investment strategy, with a 15.8% negative growth rate in 2020 followed by a modest recovery of 5.4% in 2022.

Comparative analysis of US and Chinese FDI trends reveals distinct patterns. The US maintains a longer historical presence but demonstrates slower growth rates, while Chinese FDI expanded from US$0.49 billion in 2003 to US$40.89 billion in 2022. Although US FDI stock was historically higher, the gap has narrowed recently, indicating shifting investment dynamics. US investments exhibit volatility with distinct cycles of expansion and

contraction, contrasting with China's stable positive trajectory. From 2015 to 2022, US FDI stock decreased by 11.2%, while Chinese FDI grew by 17.9%. This convergence suggests significant shifts in foreign investment patterns in Africa, with China emerging as a more consistent investor, while US patterns indicate selective engagement.

Table 9. Evolution of US FDI stock and flows in Africa (Selected years).

Year	Stock (US$ bn)	Growth rate (%)	Flow (US$ bn)
1982	6.49	-	0.67
1990	3.65	-43.8	-0.45
2000	11.89	225.8	0.72
2010	54.82	361.1	7.44
2015	52.00	-5.1	0.83
2020	43.81	-15.8	1.82
2022	46.17	5.4	1.34

Source: U.S. Bureau of Economic Analysis (BEA), Direct Investment Position Data (1982-2022).

4.7. The Comparative Analysis of Chinese and US FDI Flows to Africa

Table 10 presents comparative Chinese and US FDI flows to Africa from 2003-2022, illustrating the diverging investment strategies between the two major powers. The analysis reveals how Chinese flows maintained relative stability while US flows became increasingly volatile after 2012.

Comparative analysis of Chinese and US FDI flows to Africa (2003-2022) reveals distinctive investment patterns and strategic approaches. During the early years (2003-2007), US flows consistently exceeded Chinese flows, with US investments averaging US$3.32 billion annually compared to China's US$0.57 billion. This pattern shifted in 2008 when Chinese flows first surpassed US flows (US$5.49 billion versus US$3.80 billion). The period 2009-2012 demonstrated high volatility in US flows, including a peak of US$10.40 billion in 2009, while Chinese flows exhibited more moderate but steady growth. After 2012, clear divergence emerged, with Chinese flows maintaining relative stability and positive growth, while US flows became increasingly volatile and frequently negative. This divergence was particularly evident during 2016-2021, when US flows were negative in four out of six years, while Chinese flows remained consistently positive.

Table 10. Chinese and US FDI Flows to Africa (2003-2022) in US$ billion.

Year	Chinese flow	US flow	Flow difference
2003	0.07	2.70	-2.63
2004	0.32	1.60	-1.28
2005	0.39	2.60	-2.21
2006	0.52	5.20	-4.68
2007	1.57	4.50	-2.93
2008	5.49	3.80	1.69
2009	1.44	10.40	-8.96
2010	2.11	7.40	-5.29
2011	3.17	5.30	-2.13
2012	2.52	2.60	-0.08
2013	3.37	1.50	1.87
2014	3.20	2.40	0.80
2015	2.98	0.80	2.18
2016	2.40	-2.70	5.10
2017	4.10	0.50	3.60
2018	5.39	-1.20	6.59
2019	2.70	-3.30	6.00
2020	4.23	1.80	2.43
2021	4.99	-0.10	5.09
2022	1.81	1.34	0.47

Source: Compiled from MOFCOM Statistical Bulletin and U.S. Bureau of Economic Analysis Data (2003-2022).

Investment stability metrics highlight significant contrasts between the two nations. Chinese FDI flows exhibit greater consistency throughout the period, with a standard deviation of 1.52, substantially lower than the US figure

of 3.47. While overall average flows appear comparable (China averaging US$2.66 billion annually compared to the US average of US$2.31 billion), the Chinese coefficient of variation of 0.57, compared to the US's 1.50, indicates significantly greater stability and predictability in Chinese investments.

The period from 2016 to 2022 marks a significant divergence in investment strategies. China maintained a strong positive investment presence, with flows averaging US$3.66 billion annually, consistently remaining positive. US investment flows during this period averaged negative US$0.38 billion annually, characterized by frequent negative values. Chinese investment flows, despite year-to-year fluctuations, maintained an overall upward trajectory, while US flows demonstrated increased volatility coupled with clear downward trends. These patterns suggest ongoing shifts in relative investment influence in Africa, with China demonstrating long-term strategic commitment through consistent positive flows, while US patterns reflect more selective and cautious approaches, possibly influenced by shorter-term considerations and specific market conditions.

Figure 1 illustrates the comparative trends between Chinese and US Foreign Direct Investment flows to Africa from 2003-2022, highlighting the diverging investment strategies and stability patterns between the two major powers. The visualization demonstrates how Chinese investments maintained more consistent positive flows, while US investments exhibited greater volatility.

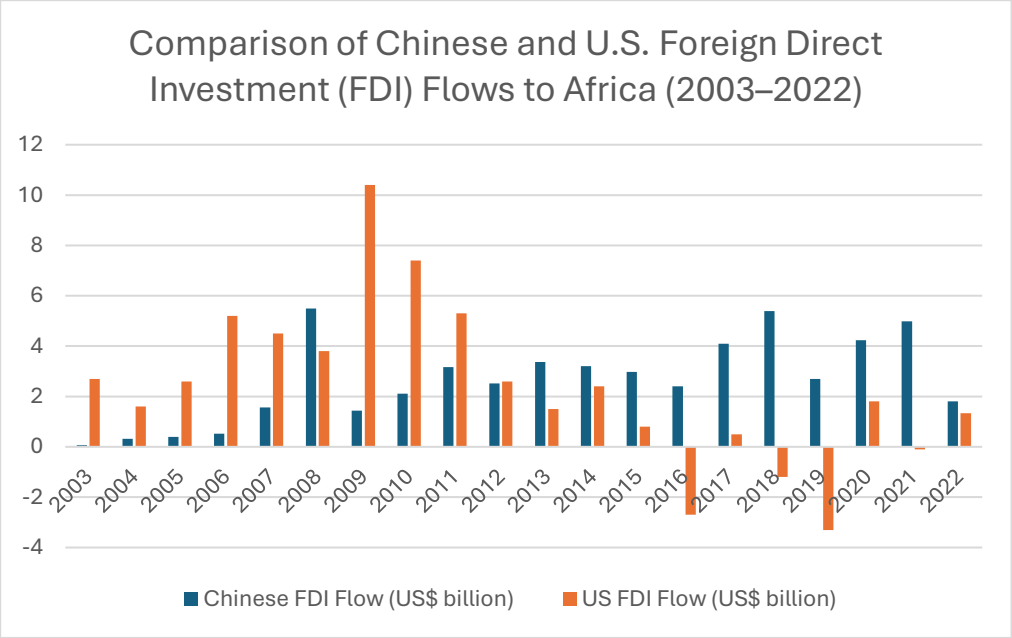

Figure 1. Comparison of Chinese and U.S. Foreign Direct Investment (FDI) Flows to Africa (2003–2022).
Source: The Statistical Bulletin of China's Outward Foreign Direct Investment, China-Africa Research Initiative, and Johns Hopkins School of Advanced International Studies (2024).

4.8. Analysis of Chinese Exports to Africa and Ghana (1992-2023)

Chinese exports to Africa have demonstrated exceptional growth over three decades, increasing from US$1.26 billion in 1992 to US$172.45 billion in 2023, representing a 137-fold increase (Table 11). This growth occurred through three distinct phases: moderate growth from 1992-2000 (reaching US$5.01 billion, 175.3% growth); explosive expansion from 2001-2015 (peaking at US$155.70 billion); and a more volatile but upward trend from 2016-2023, reaching US$172.45 billion with 51.3% growth.

Export patterns evolved significantly in both scale and consistency. The 1992-2000 period demonstrated modest annual growth rates, averaging 18.9%, while 2001-2015 experienced dramatic acceleration, with rates frequently exceeding 25%, particularly during 2005-2008, when 2005 achieved a 271.3% increase (Table 11). Chinese exports demonstrated remarkable resilience during global economic downturns; despite temporary declines such as the 26.8%

drop in 2020, recoveries were typically swift, as evidenced by 51.3% growth in 2023. Post-2016 trade relations exhibited greater maturity with more stable growth patterns despite global challenges.

Ghana's case illustrates broader China-Africa trade dynamics. From 1992 to 2023, Ghana's imports from China grew from US$1.91 million to US$9,226.91 million, with Ghana's share of total Chinese exports to Africa increasing from 3.92% in 1995 to 5.35% in 2023 (Table 11). This evolution occurred through three phases: gradual growth from 1992-2000 (US$1.91 million to US$105.93 million); rapid expansion from 2005-2015 (US$672.42 million to US$5,308.88 million) driven by infrastructure development and expanding consumer markets; and consolidated growth from 2016-2023, reaching US$9,226.91 million with enhanced stability and resilience to market fluctuations. Ghana's experience reflects the evolution from simple trade relationships to complex economic ties, highlighting China's expanding role in African consumer markets and infrastructure development.

Table 11. Evolution of Chinese Exports to Africa (Selected Years).

Year	Total exports (US$ bn)	Growth rate (%)	Ghana exports (US$ mn)	Ghana's share (%)
1992	1.26	-23.96	1.91	-
1995	1.82	44.47	1.42	3.92
2000	5.01	175.3	105.93	2.11
2005	18.60	271.3	672.42	3.62
2010	59.81	221.6	1,932.87	3.23
2015	155.70	160.3	5,308.88	3.41
2020	113.96	-26.8	6,756.06	5.93
2023	172.45	51.3	9,226.91	5.35

Source: China Customs Statistics and IMF Direction of Trade Statistics (1992-2023)

Figure 2 illustrates China-Africa trade volume trends from 2005-2023, showcasing the dramatic expansion in bilateral trade relationships. The chart demonstrates consistent growth in both Chinese exports to Africa and imports from Africa, reflecting deepening economic integration.

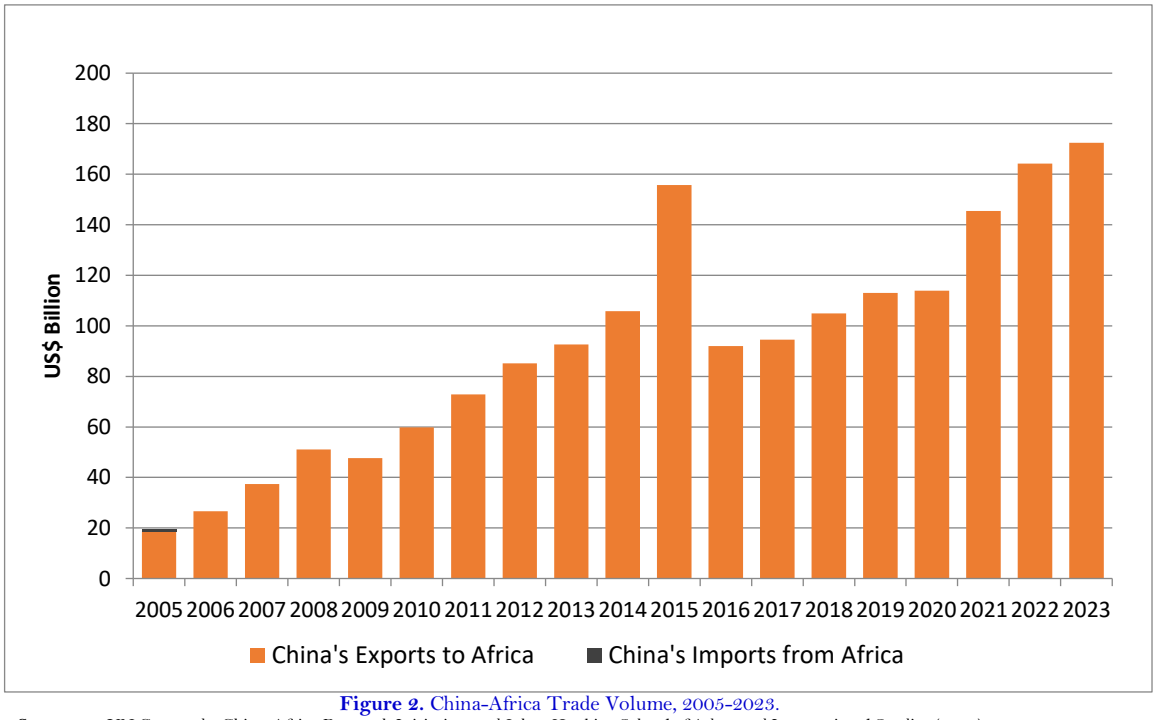

Figure 2. China-Africa Trade Volume, 2005-2023.

Source: UN Comtrade, China-Africa Research Initiative, and Johns Hopkins School of Advanced International Studies (2024).

Figure 3 illustrates the evolution of Chinese exports to Africa and Ghana specifically from 1992-2023, demonstrating the remarkable growth trajectory in bilateral trade relationships. The visualization shows Ghana's increasing integration into Chinese trade networks as a representative case study.

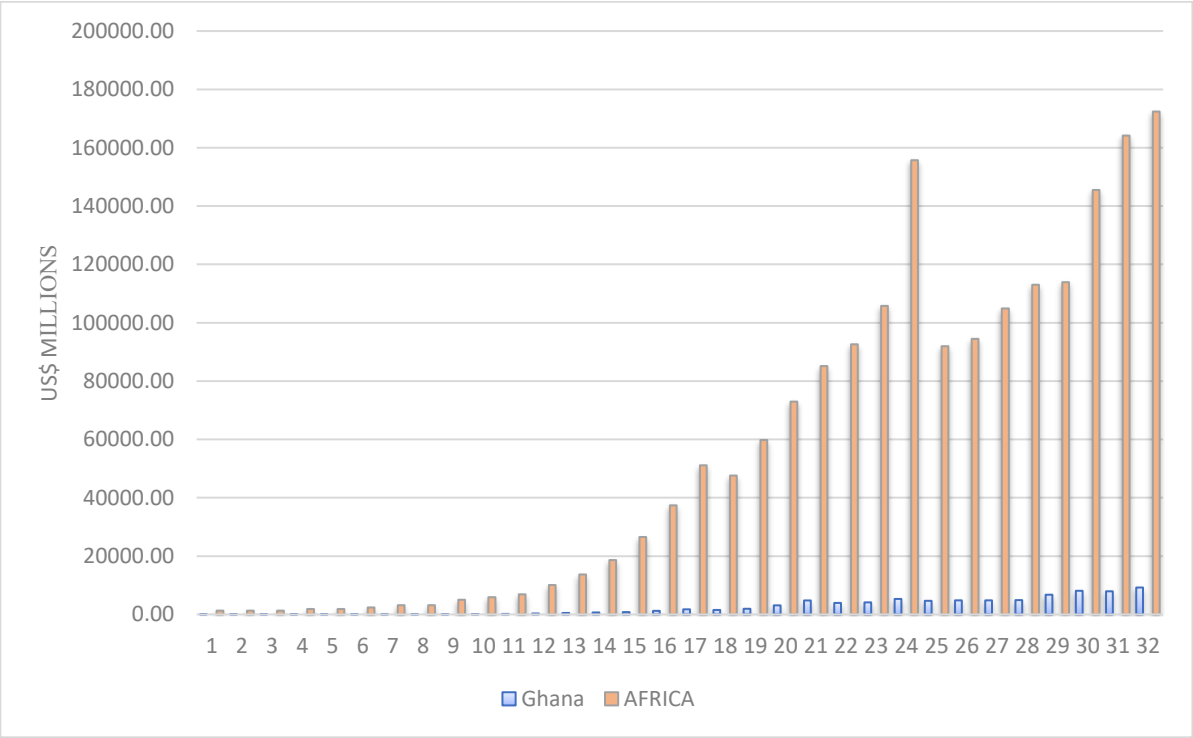

Figure 3. Chinese Exports to Africa and Ghana (1992-2023).
Source: UN Comtrade, China-Africa Research Initiative, and Johns Hopkins School of Advanced International Studies (2024).

4.9. Analysis of Chinese Imports from Africa and Ghana (1992-2023)

Chinese imports from Africa have demonstrated remarkable growth over three decades, increasing from US$491.27 million in 1992 to US$97,766.00 million in 2023, representing nearly a 200-fold increase that reflects deepening economic ties (Table 12). This growth trajectory features distinct phases of rapid expansion, consolidation, and occasional contraction. Particularly notable was the dramatic acceleration between 2000 and 2010, when imports surged from US$4,852.66 million to US$60,265.67 million, with exceptional growth rates of 221.2% in 2000 and 85.5% in 2004 (Table 12).

The evolution of Chinese imports from Africa reveals complex transformation patterns. The early period (1992-2000) demonstrated modest but steady growth, with annual import values below US$5 billion, though with significant volatility (growth rates ranging from negative 53.4% to 221.2%). This was followed by explosive growth (2001-2010), when annual imports increased more than twelvefold from US$4,081.15 million to US$60,265.67 million (Table 12). The post-2010 period demonstrates greater maturity in trade relations, with more moderate growth rates and increased stability, despite fluctuations responding to global economic conditions and commodity prices. Import patterns have been influenced by China's rapid industrialization, growing demand for African raw materials, and increasingly sophisticated trade relationships.

The data reveal particular sensitivity to global economic conditions, evidenced by significant variations during uncertainty periods, including the 21.0% decline in 2009 during the financial crisis and a 40.5% drop in 2015 during the commodity downturn (Table 12).

Table 12. Evolution of Chinese Imports from Africa and Ghana.

Year	Africa imports (US$ mn)	Growth rate (%)	Ghana imports (US$ mn)	Ghana's share (%)
1992	491.27	-	5.31	1.08
1993	583.15	18.7	6.00	1.03
1994	353.10	-39.4	25.00	7.08
1995	733.27	107.7	5.00	0.68
1996	792.38	8.1	3.00	0.38
1997	1,667.08	110.4	2.53	0.15
1998	777.66	-53.4	8.52	1.10
1999	1,510.59	94.2	4.81	0.32
2000	4,852.66	221.2	14.99	0.31
2001	4,081.15	-15.9	36.60	0.90
2002	4,608.57	12.9	30.15	0.65
2003	7,409.09	60.8	34.31	0.46
2004	13,740.25	85.5	80.38	0.58
2005	18,987.40	38.2	96.01	0.51
2006	26,794.39	41.1	79.68	0.30
2007	33,911.46	26.6	53.52	0.16
2008	51,041.51	50.5	93.40	0.18
2009	40,306.93	-21.0	79.62	0.20
2010	60,265.67	49.5	123.38	0.20
2011	73,634.16	22.2	363.18	0.49
2012	78,911.07	7.2	643.55	0.82
2013	81,113.19	2.8	1,203.33	1.48
2014	79,858.53	-1.5	1,452.60	1.82
2015	47,526.79	-40.5	1,296.44	2.73
2016	41,273.03	-13.2	1,309.61	3.17
2017	60,210.01	45.9	1,852.94	3.08
2018	80,336.63	33.4	2,426.18	3.02
2019	78,683.32	-2.1	2,543.92	3.23
2020	61,948.53	-21.3	1,740.92	2.81
2021	86,359.98	39.4	1,466.78	1.70
2022	96,660.74	11.9	2,344.01	2.42
2023	97,766.00	1.1	1,820.34	1.86

Source: China Customs Statistics, IMF Direction of Trade Statistics, and Ghana Statistical Service (1992-2023).

Ghana's export performance to China provides an illuminating case study within this broader relationship. Beginning from US$5.31 million in 1992, Ghana's exports to China grew to US$1,820.34 million in 2023, demonstrating a remarkable transformation (Table 12). This growth occurred through three distinct phases: modest growth from 1992-2003 with exports generally below US$35 million; significant expansion from 2004-2014, growing from US$80.38 million to US$1,452.60 million as Ghana increasingly integrated into Chinese supply chains; and a more mature but volatile phase from 2015-2023, with exports ranging between US$1,296.44 million and US$2,543.92 million (Table 12). Ghana's share of total African exports to China has fluctuated significantly, from as low as 0.15% in 1997 to as high as 7.08% in 1994, reflecting both changes in Ghana's export composition and the broader evolution of China-Africa trade relations. The country's export performance has been particularly influenced by developments in mining, agricultural exports, and diversification of its export base to China.

4.10. Discussion

Chinese trade and investment patterns in Africa (2003–2022) reflect transformative shifts consistent with existing academic literature. Three phases of Chinese FDI are identifiable: Rapid Growth (2003–2010), Expansion (2011–2018), and Consolidation (2019–2022), aligning with Mohan and Kale (2007)'s historical framework on China-Africa relations. Geographic distribution demonstrates strategic concentration, with the top five recipient countries absorbing 37.87% of total FDI stock, supporting Kaplinsky and Morris' (2009) analysis of the aid-trade-investment

nexus. Southern Africa emerged as the primary destination (27.5%), reinforcing the region's role in China's resource-seeking strategy. Sectorally, Chinese investment has shifted from resource extraction toward infrastructure, with construction growing from 26.1% in 2013 to 37.0% in 2021, reflecting Wei (2013) insights into China's evolving strategy. This trend also supports Ackah et al. (2024) findings on increased focus on value-added sectors. Comparison with US FDI highlights China's stable and positive flows, averaging US$2.66 billion annually, contrasting with the volatility of US investments, especially post-2015, further validating (Kaplinsky & Morris, 2009) distinction between the two approaches. China-Africa trade expanded significantly, with exports rising from US$1.26 billion in 1992 to US$172.45 billion in 2023, reflecting intensifying ties (Po & Heng, 2019). However, persistent trade imbalances (African raw material exports versus manufactured imports) echo (Aisien & Adesuwa, 2019) concerns about asymmetry.

Overall, Chinese FDI and trade reflect a mature strategy exemplified by the "Angola mode" (Kaplinsky & Morris, 2009), combining investment in construction (33.3%) and mining (23.8%) to support long-term strategic goals in Africa.

5. CONCLUSION

This study examined Chinese trade and investments in the Global South, particularly Africa, revealing significant changes in economic engagement from 2003 to 2022. The evolution through three distinct phases (Rapid Growth, Expansion, and Consolidation) demonstrates China's increasingly mature investment approach, with FDI stock rising from US$0.49 billion in 2003 to US$40.89 billion in 2022. The geographic distribution of these investments demonstrates strategic focus on resource-rich areas and economic hubs, with Southern Africa emerging as the primary destination. Sectoral analysis indicates a notable shift from resource extraction to infrastructure development and manufacturing, although resource-based sectors remain vital. These trends reflect a maturing investment strategy that aligns with both China's economic goals and Africa's development needs. A comparative analysis of Chinese and US FDI reveals China's more stable investment approach, sustaining positive flows even amid global economic challenges. Despite remarkable trade growth, persistent imbalances pose challenges for sustainable development. These findings enhance understanding of South-South economic cooperation, highlighting opportunities and challenges in China-Africa relations. While infrastructure development and increased trade have yielded significant benefits, maximizing these relationships requires improved policy frameworks, enhanced local capacity, and greater focus on social and environmental sustainability.

5.1. Implications

5.1.1. Theoretical Implications

This study contributes to international investment and South-South cooperation frameworks through an analysis of Chinese investment and trade patterns in Africa. First, Chinese investment evolution supports (Wang, 2014) competitive advantage theory, demonstrating progression from opportunistic resource-seeking to strategic market-seeking behavior. This shift illustrates how market positioning and resource capabilities interact to shape investment patterns in international markets. Second, investment transformation from resource-focused to diversified sectors aligns with Vernon's (1966) product life-cycle theory. This demonstrates the classic progression from basic resource extraction to sophisticated economic engagement, including manufacturing and technology transfer, reflecting China's maturing investment strategy. Third, investment geographic distribution confirms the Heckscher-Ohlin model's predictions on factor endowment-based trade patterns, with concentration in resource-rich regions. However, findings suggest the model requires expansion to incorporate institutional factors and strategic considerations beyond pure factor endowments. Finally, this study extends South-South cooperation frameworks by challenging traditional dependency theories. While power asymmetries exist, data reveal greater stability and long-term commitment in

Chinese investments compared to Western approaches, indicating the need for new theoretical frameworks to understand these evolving relationships.

5.1.2. Practical Implications

The findings offer practical implications for stakeholders in Africa-China economic relations. *African policymakers*: results highlight the importance of developing comprehensive policy frameworks to maximize benefits from Chinese investments. Countries with stronger regulatory environments have attracted more diversified investments beyond traditional resource sectors. The stability of Chinese investment flows during economic challenges enables long-term planning rather than opportunistic approaches. Business leaders: the sectoral evolution patterns identify emerging opportunities beyond traditional resource sectors. Growing Chinese investment in manufacturing (12.4% of FDI stock) and construction (33.3%) indicates promising areas for partnerships and value chain integration. Businesses should develop strategies aligned with China's evolving priorities in technology transfer and infrastructure development. *Development practitioners*: comparison between Chinese and US investment approaches provides insights for more effective cooperation frameworks. Complementary approaches combining Chinese infrastructure investments with Western institutional capacity-building might yield optimal outcomes. Environmental challenges from resource-focused investments necessitate stronger safeguards in development cooperation. *Financial institutions*: investment patterns reveal opportunities for specialized financial products facilitating Africa-China engagement. The stability of Chinese investments suggests potential for longer-term financing models aligned with infrastructure development timeframes, addressing critical gaps in Africa's development financing.

5.2. Limitations and Future Research Directions

This study has several limitations that provide avenues for future research. Data availability and reliability present primary challenges, particularly regarding sector-specific investments in earlier periods. Official FDI statistics may not capture investments channeled through third-party countries or special purpose vehicles. Future research could employ primary data collection through surveys and interviews to supplement official statistics and provide deeper insights into investment motivations and impacts. The temporal scope limits full assessment of long-term impacts, particularly for recent investments in technology and service sectors. Longitudinal studies tracking specific investments over extended periods would enhance understanding of developmental outcomes and sustainability impacts. Environmental and social impacts remain challenging to quantify due to their complex nature. Future research employing mixed-methods approaches and standardized measurement frameworks would strengthen the understanding of these dimensions. Research incorporating primary data from Chinese investors would provide valuable perspectives currently underrepresented in the literature. Future research should examine how digital transformation and green transition initiatives are shaping new patterns in China-Africa economic relations. Additionally, comparative studies examining Chinese investment approaches across different global regions would enhance understanding of how contextual factors shape investment outcomes.

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