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How Do China's OFDI Motivations Affect the Bilateral GVC Relationship and Sustainable Global Economy?

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Abstract

The purpose of this paper is to analyze how China's outward foreign direct investment (OFDI), driven by different motivations, affects the bilateral global value chain (GVC) relationship between the home country (China) and host countries, evaluating both bilateral GVC trade value and relative GVC positions. Employing the OECD Trade in Value Added (TiVA) database combined with Chinese listed firm data, we found the following results: (1) Strategic asset-seeking OFDI strengthens the GVC relationship between China and host countries while enhancing China's GVC position relative to host countries. (2) Efficiency-seeking OFDI increases the domestic value-added exported from host countries to China but does not improve China's relative GVC position. (3) Natural resource-seeking OFDI enhances bilateral GVC trade volumes but has no significant impact on the relative GVC positions of China and host countries. (4) China's OFDI, not driven by these motivations, generates a trade substitution effect between home and host countries. We also examined the heterogeneity of these effects. Our findings suggest that China's OFDI fosters equitable and sustainable international cooperation, supports mutually beneficial GVC trade and host-country economic growth, and therefore, progresses toward Sustainable Development Goal (SDG) 8.

Keywords: China's OFDI; strategic asset-seeking; efficiency-seeking; natural resource-seeking; bilateral GVC trade relation; SDG 8



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1. Introduction

This study investigates how China's outward foreign direct investment (OFDI), categorized by investment motivations, affects the bilateral global value chain (GVC) relationship between China and host countries. Since 2003, China's OFDI has grown rapidly, ranking among the top three global OFDI sources by 2023. According to the MOC et al. [1], China's OFDI has accounted for over 10% of the global OFDI share for eight consecutive years, spanning 18 industries, including manufacturing and services.

China's OFDI has strengthened economic cooperation and deepened industrial ties between China and other countries. However, China has primarily occupied the low-tech manufacturing segment of the GVC, serving as a hub in regional value chains due to its labor cost advantage [2]. To move beyond this position, both Chinese enterprises and the government have implemented policies aimed at upgrading industrial capabilities, with notable success [3,4].

Against the background of "slow globalization" [5], China's OFDI plays a crucial role in strengthening international cooperation with host countries' industrial and supply chains, while also promoting high-level opening-up and high-quality economic development.

One of the key motivations for China's OFDI is to acquire diverse resources from host countries. This study examines whether different types of resource-seeking OFDI from China have varying effects on (1) the promotion of GVC trade relations and (2) the relative GVC positions between China and host countries. Additionally, this study also examines the heterogeneity of these effects across different categories of host countries and factor-intensity industries.

Compared to previous research, our study contributes to both international business and GVC trade literature. In the field of international business, OFDI location choices have been extensively studied and are generally categorized into four motivations: market-seeking, strategic asset-seeking, efficiency-seeking, and natural resource-seeking [6]. This paradigm is also employed to analyze the location choice of China's OFDI [7–13]. In GVC trade research, existing studies examine the impact of OFDI (including China's OFDI) on the GVC participation or positioning of either home or host countries (for example, [14–17]. However, the influence of differently motivated OFDI on bilateral GVC trade between home and host countries remains underexplored, leaving a gap in understanding how OFDI motivations shape GVC trade dynamics. By addressing this issue—particularly the effects of strategic asset-, efficiency-, and natural resource-driven OFDI on GVC trade—our research provides deeper insights into the OFDI-GVC relationship and enriches both international business and GVC scholarship.

Early research has also demonstrated that different factor-intensive industries in China occupied distinct positions within GVC networks [18], suggesting heterogeneous GVC effects of China's OFDI across industries. Yet, existing studies have not explored this heterogeneity in depth. Our research extends the literature by examining how China's OFDI shapes GVC dynamics between home and host countries across industries with varying factor intensities.

Our findings indicate that China's OFDI fosters mutually beneficial trade relationships and promotes mutually advantageous outcomes in GVC trade, thereby supporting equitable and sustainable international cooperation. It also enhances the host countries' economic growth because it generates a trade substitution effect when it is not driven by motivations discussed in this research. Therefore, against the background of waning global GDP growth, these findings empirically position China's OFDI as a significant catalyst for global economic recovery and a meaningful contribution to sustainable global economic development, and we discuss its implications for sustainable development.

The rest of this paper is structured as follows: Section 2 reviews the relevant literature. Section 3 develops the theoretical framework. Section 4 presents the econometric model and data description, and Section 5 discusses the benchmark regression results, robustness checks, and heterogeneity analysis. Finally, Section 6 concludes the study.

2. Literature Review

This study engages with two key branches of literature: the international business research on motivations behind China's OFDI, and the international trade literature examining OFDI's effects on GVCs. This section reviews the relevant findings from both fields of research.

2.1. The Motivations for China's OFDI

The international business literature classifies OFDI into four types based on motivations: market-seeking OFDI, efficiency-seeking OFDI, strategic asset-seeking OFDI, and natural resource-seeking OFDI [6,18,19]. Extensive research has examined the motivations and location strategies of China's OFDI within this framework since the seminal work by Buckley et al. [7].

Early studies identified natural resource-seeking as the primary driver of China's OFDI [7,8,20]. Recent research reveals that this motivation persists regardless of institutional distance [21], geographic distance, economic distance, or information distance [22] between China and host countries. Moreover, it remains unaffected by the Belt and Road Initiative [23], host countries' financial institutions, or financial crises [24]. Although market-seeking motivation is unambiguous [7,8,25–27], its influence appears relatively weak [28].

However, the literature exhibits divergent views on the existence of strategic asset-seeking and efficiency-seeking OFDI from China. The pioneers of China's OFDI research generally denied the attractiveness of host countries' strategic assets for Chinese investors—e.g., Buckley et al. [7], Zhang et al. [29], Wang et al. [10], Wang et al. [11], and Hong et al. [30]. Further studies identified that the appeal of strategic assets in host countries was influenced by factors such as investor ownership [9], entry mode [31], and the technological capabilities of enterprises and industries [32]. Recent empirical analyses increasingly support the view that strategic asset-seeking has become a significant motivation for China's OFDI. Ramasamy and Yeung [27] find that Chinese OFDI in Eastern and Central Europe targets both market size and strategic assets, with private enterprises showing particular preference for strategic asset acquisition [33]. Liang et al. further examine the heterogeneity in strategic asset-seeking investment patterns across different industries and technological levels [34].

The extent to which China's OFDI is efficiency-seeking remains a subject of debate. Dunning and Lundan define efficiency-seeking investment as the pursuit of lower factor costs, as well as scale and scope economies in host countries [19]. While researchers often interpret "seeking lower factor costs" as seeking lower labor costs, findings on this matter vary. For instance, Buckley et al. find that China's OFDI did not prioritize labor cost advantages [7]. Conversely, Cheung and Qian and Ma et al. argue that the appeal of labor cost advantages depends on the characteristics of host countries and industries [8,12]. In contrast, conclusions are more consistent regarding scale and scope economy-seeking motives. Lu et al., as well as Ma et al., prove that the rivalry and business environments of host countries were significant attractions for China's OFDI [12,32]. Similarly, Zhao et al. identified that efficiency-seeking in China's banking sector is primarily driven by lower credit risk, higher profitability, and reduced market rivalry compared to labor costs [13].

2.2. The Effects of OFDI on GVC Trade

Seminal work by Koopman et al., Koopman et al., and Wang et al. laid the theoretical groundwork for analyzing GVC dynamics [35–37]. Building on these works, subsequent literature has investigated how multinational enterprises (MNEs) shape GVC trade through OFDI. Firstly, empirical studies demonstrate that OFDI promotes a home country's GVC participation [14,38]. Wang and Chen attribute this effect to OFDI-driven increases in host-country demand for home-produced intermediate goods [14]. Secondly, OFDI contributes to GVC upgrading via three primary mechanisms: industrial rationalization, technological advancement, and trade network expansion [15]. These channels enable home countries to reposition themselves into higher-value-added segments of GVCs, thereby improving their competitive position.

The GVC trade promotion effects of OFDI exhibit significant cross-country heterogeneity. For developed economies, OFDI strengthens GVC linkages with host countries by capitalizing on technological advantages [15], particularly via forward linkages in high-tech industries [39]. This contributes to an upward trajectory in the home country's GVC positioning [15]. In contrast, the impact of OFDI from developing countries on home-country GVC trade remains contested. While Li et al. [15] argue that developing economies can

improve their GVC participation and positioning by late-mover advantages and technology spillovers from advanced host countries, others suggest that such effects may be weak due to their comparative advantage in low-value-added GVC segments and lower embeddedness in global production networks [40,41]. Notwithstanding these challenges, firms from developing nations—particularly emerging economies—increasingly view OFDI as a strategic tool for international expansion and value chain control, positioning it as a critical driver of future growth [42,43].

The existing literature extensively examines the effects of China's OFDI on both host countries' and the home country's GVC participation. Empirical studies demonstrate that China's OFDI significantly enhances host countries' GVC participation [16,17]. Moreover, the impact on host countries' GVC positions is moderated by several factors, including infrastructure quality, institutional development, factor endowments, business environment, and R&D capabilities [16,17]. Simultaneously, China's OFDI reinforces GVC linkages between home and host countries by facilitating technology and knowledge flows, ultimately improving China's relative GVC position [44,45]. This effect occurs through multiple channels: technology spillovers, industrial structure upgrading, and export scale expansion [46–48].

In summary, the existing literature confirms that OFDI reinforces GVC linkages between home and host countries while promoting GVC participation for both. The empirical evidence reveals different effects by development level: developed countries leverage OFDI to consolidate and improve their GVC positions, whereas developing countries employ it as a strategic tool for international expansion through more active GVC trade participation.

In international business literature, OFDI is typically driven by four key factors: market size, efficiency, strategic assets, and natural resources. Existing studies have analyzed China's OFDI location choices within this framework and examined both the general effects of OFDI and the specific impacts of China's OFDI on GVC dynamics. However, existing literature lacks a systematic analysis of how OFDI driven by different motivations heterogeneously affects GVC outcomes. For instance, Wang and Chen investigate the spillover effects of OFDI on GVC participation [14], Li et al. examine GVCs' role in home-country upgrading [15], and Dai and Song analyze China's OFDI impact on GVC formation [45]. We address this critical gap by examining the effects of strategic asset-, efficiency-, and natural resource-driven OFDI of China on GVC trade, which constitute the primary contribution of our study.

Our analysis reveals that strategic assets, efficiency, and natural resources exhibit a more pronounced influence than market size in shaping GVC relations and relative GVC positions between China and host countries. We argue the following:

The dynamics of value-added creation can be systematically articulated through the Smile Curve framework, a seminal conceptualization of value distribution patterns within GVC. The curve demonstrates that the highest value-added activities occur in the upstream R&D stage (characterized by technology and patents) and in the downstream marketing and after-sales service stage (focused on branding and logistics). Conversely, relatively little value is created in the intermediate production stages involving raw material processing and assembly.

For firms positioned at the bottom of the Smile Curve seeking to upgrade their GVC position, strategic asset-seeking OFDI (targeting technology and brands) or efficiency-seeking OFDI (leveraging existing industrial agglomeration) represents viable pathways. Alternatively, firms may pursue natural resource-seeking OFDI to secure lower-cost inputs from foreign markets. Meanwhile, the market size has a limited impact on the value added of a final or intermediate product, and therefore, the market-seeking OFDI has a minimal effect on GVC trade relations.

Our key theoretical contribution lies in demonstrating how different China's OFDI motivations distinctly shape GVC relations: strategic asset-seeking OFDI facilitates value flow from home to host countries through technology transfer, while efficiency- and natural resource-seeking OFDI promotes reverse value flow through cost reduction. This subtle difference is overlooked in the existing literature, and our research fills this gap.

This study also extends the existing literature by examining how China's OFDI affects GVC dynamics across industries with varying factor intensities. Early research on Chinese GVC trade identified significant position differences among industries with distinct factor intensities [49], observable in both manufacturing and service sectors. These findings suggest potential heterogeneity in the GVC effects of China's OFDI across different industries. Recent studies have explored heterogeneity in the GVC effects of China's OFDI along several dimensions, including host country development levels, geographic location, technology, the home country's international economic strategy, and industrial structure [14,15,40–42,45]. However, existing research has overlooked a critical aspect: the OFDI of industries with varying factor intensities seeks divergent resources in host countries, and thus, OFDI with distinct motivations differentially affects bilateral GVC trade relationships in different industries. Our work fills this gap in the literature by examining how China's OFDI shapes GVC dynamics between home and host countries across industries with varying factor intensities, thereby making another contribution.

3. Hypothesis Development

3.1. Strategic Asset-Seeking OFDI and Bilateral GVC Trade

China's strategic asset-seeking OFDI affects bilateral GVC trade relations through two primary mechanisms. First, developed host countries typically possess superior technological capabilities and R&D infrastructure, enabling the production of higher-quality intermediate goods. Through strategic asset-seeking OFDI in these markets, Chinese firms gain access to these advanced inputs. Furthermore, Xu and Li prove that such investments generate learning and linkage effects that enhance the quality of imported goods [50]. This mechanism increases value-added exports from host countries to China.

Second, strategic asset-seeking OFDI facilitates reverse technology spillovers that strengthen China's domestic innovation capacity. As Mao and Xu document, these investments enhance the home-country enterprises' innovation capabilities [51]. Subsequent research by Du et al. confirms their positive impacts on domestic R&D performance while simultaneously upgrading export product quality through increased production complexity [52]. This mechanism increases value-added exports from China to host countries. Therefore, we propose the following:

Hypothesis 1. *China's strategic asset-seeking OFDI increases bilateral value-added trade flows with host countries and improves China's relative GVC position.*

3.2. Efficiency-Seeking OFDI and Bilateral GVC Trade

Efficiency-seeking OFDI aims to access lower-cost factors of production—particularly labor—as well as the scale and scope economies of host countries [19]. While prior research has extensively examined the former [7,53], this study focuses on how the pursuit of scale and scope economies influences bilateral GVC trade between China and its host countries.

Liu et al. found that external economies of scale and scope, stemming from industrial agglomeration, attract significant OFDI from China [54]. Within a more developed specialized production networks in the host country, firms experience higher productivity and innovation levels, reduced production costs, and consequently, increased marginal returns. From a GVC trade perspective, this implies that foreign investors capture greater

local value added due to the host country's higher industrial agglomeration. As a result, the host country's value embedded in the home country's exports increases.

Conversely, if other conditions remain unchanged, the host country's agglomeration does not necessarily affect the home country's value-added exports. Due to this effect, the industrial cluster level of the host country may not improve China's GVC position. Thus, we propose the following hypothesis:

Hypothesis 2. *China's efficiency-seeking OFDI increases value-added exports from the host country to the home country. However, its effect on value-added exports from the home country to the host country—and on the home country's GVC position relative to the host—remains indeterminate.*

3.3. Natural Resource-Seeking OFDI and Bilateral GVC Trade

As a country with high demand for natural resources, natural resource-seeking has long been a primary motivation for China's OFDI, supported by government policies [7,55]. This is particularly evident in China's OFDI flows to developing countries. These investments have boosted natural resource exports from host countries to China, thereby increasing the host country's value-added embedded in China's exports. Simultaneously, capital goods (e.g., production facilities) and related intermediate goods are exported to host countries [56], implying that China also exports domestic value-added to host economies.

However, the associated value-added from host countries tends to be utilized in China's production processes rather than being integrated into global production networks, as the primary objective of China's natural resource-seeking OFDI is to alleviate domestic resource scarcity. Consequently, China's GVC position relative to host countries is unlikely to improve through such OFDI and may even decline due to rising value-added imports from host economies. This leads us to propose Hypothesis 3:

Hypothesis 3. China's natural resource-seeking OFDI increases both value-added exports and imports between China and host countries. *However, it does not enhance China's GVC position relative to the host country, and may instead weaken it.*

4. Model and Variables

4.1. Variables and Data Description

4.1.1. Dependent Variables

We examine the bilateral GVC relationship between China and its partner countries along two dimensions: bilateral GVC trade value and relative GVC position. The bilateral trade value is measured by domestic value-added exports (dva_{ijt}) and foreign value-added imports (fv_{ijt}). The former (dva_{ijt}) refers to the value-added originating from China and absorbed by partner country j in industry i in year t, and the latter (fv_{ijt}) refers to the value-added originating from partner country j and embedded in China's exports in industry i in year t. Following Koopman et al. [35], we calculated the relative GVC position between China and partner country j in industry i and year t as

$$GVC_Posistion_{ijt} = \ln\left(1 + \frac{IV_{ijt}}{E_{ijt}}\right) - \ln\left(1 + \frac{fv_{ijt}}{E_{ijt}}\right)$$

where IV_{ijt} refers to the indirect value-added exported from China to partner j and then re-exported to third countries by j in industry i in year t. fv_{ijt} refers to foreign value-added imported from partner j and embedded in China's exports in industry i in year t. E_{ijt} is the total exports from China to partner j in industry i in year t. In this equation, a higher value

indicates China's upstream specialization relative to partner country *j*. All variables are obtained from the OECD-TiVA (2021) database [57].

4.1.2. Independent Variables

(1) China's OFDI at the host country–industry level (*ofdi*). We examine how China's OFDI affects GVC trade relations between China and host countries. Existing public databases, such as the *China Commerce Yearbook* and *Statistical Bulletin of China's Outward Foreign Direct Investment*, are insufficient for this analysis, as they only provide OFDI data at either the country or industry level, but not both simultaneously. In fact, most research on China's OFDI focused on the firm level and the national level, with few studies examining the industrial level. In firm-level studies, China's listed firms have frequently served as research subjects [58–61]. Therefore, we contend that the OFDI activities of Chinese listed firms can serve as a reliable proxy for China's overall OFDI, and that their aggregated OFDI at the industry level can effectively represent China's OFDI behavior in industry *i*. Following the approach of Ma and Teng in processing data from the *China Global Investment Tracker*, we aggregate stock OFDI data at the country-industry level using *the Overseas Direct Investment Database* (ODI) from CSMAR [62,63]. The ODI database comprehensively provides OFDI activities data of China's listed firms since 1999, including capital stock, invested industries, investment years, overseas subsidiaries, and subsidiary registration addresses. This approach allows us to construct a more granular dataset for analyzing OFDI impacts on GVC relations.

Another methodological challenge we address is the inconsistency in industry classification systems. ODI classifies Chinese listed companies by industry according to GB/T 4754-2011 [64], while the OECD-TiVA database uses ISIC Rev.4 for industry classification. To reconcile these classification schemes, we utilize two conversion tables from GB/T 4754-2017 [65]: (1) the *Comparison of New and Old Categories of Industrial Classification for National Economic Activities* and (2) the *Comparison of Industrial Classification for National Economic Activities and International Standard Industrial Classification of All Economic Activities* to merge the two databases. These standardized comparison tables enable systematic mapping between the two classification systems.

(2) Patent applications of residents (*pat*). The seminal work of Buckley et al. established that seeking human capital and knowledge capital—as reflected in residents' patent applications—constitutes a primary motivation for China's OFDI [8]. Recent research on China's GVC position has further demonstrated that innovation performance, proxied by patent activity, enhances the GVC positioning of Chinese enterprises [66]. Building on this established literature, we employ resident patent applications as our proxy for host countries' strategic assets, with data sourced from the World Development Indicators (WDI) database [67].

(3) Specialization (*RCA*). Following standard practice in the literature, we employ specialization patterns as a proxy for host countries' productive efficiency. The location quotient serves as the standard measure of national specialization, which can be constructed using output, value-added, or employment data. Given our focus on investment and trade relationships between China and partner countries, we calculate the location quotient using domestic value-added exports—specifically, we construct the revealed comparative advantage (RCA) index based on the value added. The RCA for industry *i* in country *j* at year *t* is specified as

$$RCA_{ijt} = \frac{dv_{ijt}}{\sum_{i=1}^{N} dv_{ijt}} \Big/ \frac{dv_{it}}{dv_t}$$

where dva_{ijt} is the domestic added value export of industry i in country j in year t, dv_{it} represents the total domestic value-added export worldwide in industry i in year t, and the dv_t is the total domestic value-added export worldwide in year t for all the industries.

(4) Natural resource endowment (*nat*). Two variables are commonly employed as proxies for natural resource endowment in the literature: the ratio of natural resource rents to GDP, and the ratio of primary natural resource exports to total merchandise exports. However, the latter measure may be distorted by entrepôt trade effects. Therefore, we adopt the first approach, specifically utilizing the ratio of aggregate rents from four key natural resources (petroleum, coal, natural gas, and minerals) to GDP as our measure of natural resource endowment. The data on natural resource rents are obtained from the WDI database [67].

4.1.3. Control Variables

We also incorporated several control variables at the country level to control the characteristics of host countries and at the industry level to control the industrial characteristics. We employ GDP per capita (*gdpca*) of the host country as a proxy for market size, as larger markets typically exhibit greater trade. To account for inflationary effects on trade flows, we incorporate the consumer price index (*cpi*) of the host country as a control variable, consistent with established macroeconomic trade models. A host country's trade openness (*open*), measured as the ratio of total trade (imports plus exports) to GDP, is included to control for its integration into global value chains. To capture scale economies in Chinese industries, we measure Chinese industry size (*k*) using capital per capita. All capital stock data and labor size data are sourced from the *China Industry Statistical Yearbook*, *China Labour Statistical Yearbook*, and the CSMAR Database. Net fixed assets data is sourced from the *China Industry Statistical Yearbook* and is deflated using investment price indices. Otherwise, we estimate it via the perpetual inventory method, applying a 9.6% depreciation rate. The definitions and data sources of all the variables we employed in this research, including dependent variables, independent variables and control variables are presented in Table 1.

Table 1. Variable definitions and data sources.

Category	Variable	Definition	Source	Unit	Remarks
Dependent Variables	dav_{ijt}	Domestic value-added exports from China to host country j in industry i *in* year t	OECD-TiVA [57]	Million USD	Deflated using GDP deflator
	fv_{ijt}	Foreign value-added imports from country j embedded in China's exports in industry i in year t	OECD-TiVA [57]		
	$post_{ijt}$	Relative GVC position between China and partner country j in industry i in year t	OECD-TiVA and author's calculation [57]		

Table 1. *Cont.*

Category	Variable	Definition	Source	Unit	Remarks
Independent Variables	$ofdi_{ijt}$	China's OFDI stock in partner country j in industry i in year t	CSMAR ODI Database [63]	Million USD	Deflated using GDP deflator
	pat_{jt}	Resident patent applications in host country j in year t	WDI [67]		
	RCA_{ijt}	*The specialization of industry i in host country j in year t*	calculated		
	nat_{jt}	Natural resource endowment (petroleum, coal, natural gas, and mineral rents as % of GDP) in host country j in year t	WDI [67]	%	
Control Variables	$gdpca_{jt}$	GDP per capita, host country j in year t	WDI [67]	constant 2015 USD	
	CPI_{jt}	CPI, host country j in year t	WDI [67]		2010 = 100
	$open_{jt}$	Trade openness (exports + imports)/GDP, host country j in industry i in year t	WDI [67]; calculated		
	k_{it}	*Capital per capita in industry i in year t of China*	*China Industry Statistical Yearbook, China Labour Statistical Yearbook, CSMAR* Database; calculated	USD per capita	Fixed capital stock in industry i in year t/ Number of Employed Persons in industry i in year t

4.2. The Model

To examine the hypothesized relationships, we estimate the following econometric model:

$$lny_{ijt} = \beta_0 + \beta_1 lnofdi_{ijt} + \beta_2 lnpat_{jt} + \beta_3 lnpat_{jt} \times lnofdi_{ijt} + \beta_4 RCA_{ijt} + \beta_5 RCA_{ijt} \times lnofdi_{ijt} + \beta_6 nat_{jt} + \beta_7 nat_{jt} \times lnofdi_{ijt} + \beta_8 lngdpca_{jt} + \beta_9 cpi_{jt} + \beta_{10} lnopen_{jt} + \beta_{11} lnk_t + \alpha_i + \gamma_j + \delta_t + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} represents the dependent variables (*dva*, *fv*, or *post*) in separate model specifications. Subscripts i, j and t denote industry, country, and year, respectively. Continuous variables (e.g., OFDI, patents, and GDP) are log-transformed to interpret coefficients as elasticities and reduce skewness. Ratio-based variables (*RCA*, *nat*, and *cpi*) remain in levels to retain their intuitive percentage or index interpretation. The model includes country fixed effects (α_i), industry fixed effects (γ_i), and year fixed effects (δ_t). Key interaction terms examine the interaction effect between OFDI and host-country's innovation capacity ($lnpat_{jt} \times lnofdi_{ijt}$) or strategic asset, OFDI, and host-country's specialization ($RCAijt \times \ln ofdi_{ijt}$) or efficiency and OFDI and natural resource endowment ($nat_{jt} \times \ln ofdi_{ijt}$). The parameters β_3, β_5, and β_7 capture our primary effects of interest, and the sign and significant level are used to test our hypothesis.

4.3. Data Analytical Strategies

We employ a high-dimensional fixed effects model to estimate Model (1). The advantages of this approach for our research are as follows: First, we utilize three-dimensional data (country-year-industry), which allows the model to control for time-invariant industrial and country characteristics. Second, our dataset is unbalanced, and the high-

dimensional fixed effects framework accommodates endogenous entry and exit of countries and industries—accounting for potential correlations with unobserved heterogeneity. We also control for the country-year-industry and country-industry fixed effect in the benchmark regression.

We use System-Generalized Method of Moments (GMM) estimation to address the potential endogeneity. Compared to two-stage least squares (2SLS), GMM demonstrates greater efficiency when disturbances exhibit heteroskedasticity or serial correlation. Another advantage of GMM is its capacity to eliminate individual fixed effects while simultaneously addressing endogeneity through the use of lagged explanatory variables and lagged dependent variables as instrumental variables. The sys-GMM estimator further enhances estimation efficiency by jointly exploiting information from both level and first-differenced equations, thereby incorporating a more comprehensive set of moment conditions than difference GMM.

5. Results

5.1. Benchmark Regression

After the conversion of industry codes and data merging, we constructed a three-dimensional country-industry-year panel covering OFDI data for 62 countries across 26 industries, along with China-host country GVC trade data from 1999 to 2018. Table 2 reports the benchmark estimation results based on Model (1).

Table 2. Benchmark regression.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	lndva		*lnfv*		*post*	
lnofdi	−0.082 ***	−0.052 **	−0.090 ***	−0.064 ***	−0.015 *	−0.014
	(0.023)	(0. 023)	(0.013)	(0.013)	(0.009)	(0.009)
lnpat	−0.064	−0.049	0.025	−0.023	−0.016	−0.004
	(0.066)	(0.069)	(0.034)	(0.031)	(0.023)	(0.025)
lnofdi × *lnpat*	0.010 ***	0.004 *	0.009 ***	0.005 ***	0.002 **	0.002 *
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
RCA	0.148 ***	0.151 ***	0.132 ***	0.129 ***	0.119 ***	0.120 ***
	(0.015)	(0.015)	(0.008)	(0.008)	(0.008)	(0.008)
RCA × *lnofdi*	0.002	0.002	0.006 ***	0.006 **	−0.000	−0.000
	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
nat	0.019 *	0.006	0.045 ***	0.023 ***	−0.005	−0.005
	(0.011)	(0.011)	(0.006)	(0.005)	(0.005)	(0.006)
nat × *lnofdi*	0.003 *	0.004 **	0.004 ***	0.004 ***	0.000	0.001
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Constant	−25.094 ***	−6.070 **	−10.664 ***	2.164	−0.839	0.577
	(2.050)	(2.420)	(1.078)	(1.393)	(0.638)	(0.792)
Control variables	Y	Y	Y	Y	Y	Y
Country fixed effect	Y	Y	Y	Y	Y	Y
Industry fixed effect	Y	Y	Y	Y	Y	Y
Year fixed effect	N	Y	N	Y	N	Y
No. of observations	4421	4421	4526	4526	4421	4421
R-squared	0.837	0.846	0.961	0.965	0.502	0.504
F	111.2	15.14	174.3	46.70	31.21	31.50

Notes: Heteroscedasticity-robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In Table 2, columns (1)–(2), (3)–(4), and (5)–(6) present the regression results using $lndva_{ijt}$, $lnfv_{ijt}$, and $post_{ijt}$ as the dependent variables, respectively. The coefficients of our

key independent variables remain consistent across different fixed effects specifications, indicating robust findings.

We examine whether China's strategic asset-seeking OFDI affects the GVC relationship between China and host countries by observing the coefficients of $lnpat_{jt} \times lnofdi_{ijt}$ all of which are significantly positive, as shown in Table 2. This implies that by leveraging host countries' technological advantages, China's OFDI enhances the home country's technological level, leading to higher domestic value-added exports. Additionally, it facilitates the import of higher-quality intermediate goods from host countries, increasing the embedded foreign value-added in China's exports. Furthermore, the significantly positive coefficients in columns (5)–(6) demonstrate that strategic asset-seeking OFDI strengthens China's GVC position relative to host countries. These findings support Hypothesis 1.

We also examine whether China's efficiency-seeking OFDI affects the GVC relationship between China and host countries. All coefficients of RCA in Table 2 are positive, indicating that host countries' specialization significantly strengthens GVC linkages between countries and enhances China's GVC position relative to host countries. The statistically insignificant coefficients of the interaction term $RCA_{ijt} \times lnofdi_{ijt}$ in columns (1)–(2) and (5)–(6) suggest that efficiency-seeking OFDI does not significantly promote domestic value-added exports or contribute to value chain upgrading. However, OFDI facilitates Chinese firms' integration into local production and R&D networks, enabling imports of higher-quality intermediate goods. As a result, more host countries' value-added is embedded in China's exports, as evidenced by the significant coefficients in columns (3)–(4). These findings support our Hypothesis 2.

We also analyzed the interaction effect between China's OFDI and host countries' natural resource endowments. The significantly positive coefficients of the interaction terms in columns (1)–(4) indicate that China's OFDI strengthens GVC linkages between the home and host countries by utilizing the host countries' natural resources. However, China's GVC position relative to host countries appears unaffected by natural resource factors for two key reasons: First, natural resources typically occupy lower value chain positions in the value chain, as they primarily serve as raw material inputs. Second, most imported natural resources are used to bridge domestic supply–demand gaps [68] rather than used for export purposes. These findings support Hypothesis 3.

Moreover, in columns (1)–(4), the coefficients of *lnofdi* are significantly negative, suggesting that China's OFDI, when not driven by seeking strategic asset, efficiency, and natural resources, exerts a substitution effect on both domestic value-added exports and indirect exports of foreign value-added during the sample period.

Our findings in the benchmark deviate from existing research in several key aspects. First, the volume of value-added trade between home and host countries has been overlooked in the existing literature on China's OFDI-GVC trade linkages. By examining how China's OFDI—driven by different resource-seeking motives—affects value-added trade, our study contributes to filling this gap. Second, while prior research (e.g., Li, Zhou and Hou [15] and Dai and Song [45]) concludes that China's OFDI enhances its relative GVC position, our results indicate that this effect only holds for strategic asset-seeking OFDI. When OFDI is motivated by other resource-seeking factors, the relative GVC position remains unchanged.

5.2. Robustness Tests

5.2.1. Alternative Independent Variables

To test the robustness of our benchmark regression, we employed alternative measures for the key independent variables. First, we substituted the patent counts with the ratio of

R&D expenditure to GDP (*rdexp*) as a proxy for the host countries' strategic assets. This comprehensive measure captures all research expenditures by governments, enterprises, and institutions across different R&D levels, effectively representing the host countries' research capabilities. Second, we replace the *RCA* with a value-added-based location quotient (*loc_add*) to measure the host countries' specialization. The location quotient is defined as

$$loc_add_{ijt} = \frac{val_{ijt}}{\sum_{j=1}^{N} val_{ijt}} \Big/ \frac{val_{it}}{val_t}$$

where val_{ijt} represents the value added of industry i in country j in year t, val_{it} denotes the global value added in industry i in year t, and val_t is the total global value added across all industries at year t.

Third, we use the ratio of fuel exports to total merchandise exports (fuel) as an alternative proxy for natural resource endowments, replacing the natural resource rents.

Table 3 presents the regression results using these alternative measures. The coefficients of our key variables remain largely consistent with those in Table 2, confirming the robustness of our benchmark results and supporting all hypotheses. After controlling for country-industry and/or country-year-industry fixed effects, we find that China's OFDI enhances domestic value-added exports to host countries and host countries' value-added embedded in China's exports by leveraging strategic assets of host countries, as evidenced by the significantly positive coefficient of *lnofdi* × *rdexp* in columns (2)–(4) of Table 3. The interaction effect of China's OFDI and strategic asset also improve China's position relative to host countries, as reported in columns (5) and (6).

Table 3. Robustness test: alternative independent variables.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	lndva		***lnfv***		***post***	
lnofdi	−0.032 **	−0.030 **	−0.064 ***	−0.072 ***	−0.001	0.002
	(0.014)	(0.014)	(0.012)	(0.011)	(0.005)	(0.004)
rd_exp	0.142 **	0.310 ***	0.069	0.107 **	−0.056 ***	−0.077 ***
	(0.065)	(0.081)	(0.046)	(0.045)	(0.009)	(0.007)
lnofdi × *rdexp*	0.006	0.012 **	0.016 ***	0.020 ***	0.002 *	0.003 **
	(0.004)	(0.005)	(0.003)	(0.004)	(0.001)	(0.001)
loc_val	0.147 ***	0.138 ***	0.131 ***	0.128 ***	0.205 ***	0.240 ***
	(0.034)	(0.032)	(0.014)	(0.015)	(0.013)	(0.016)
lnofdi × *loc_val*	0.003	0.003	0.014 ***	0.014 **	−0.008 *	−0.013 ***
	(0.010)	(0.010)	(0.004)	(0.005)	(0.004)	(0.003)
fuel	−0.000	0.016 **	0.008 **	0.021 ***	−0.001	0.001
	(0.004)	(0.006)	(0.003)	(0.002)	(0.001)	(0.001)
lnofdi × *fuel*	0.001 **	0.001 **	0.001 ***	0.001 ***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	−6.533 ***	−23.269 ***	2.374	−10.594 ***	−0.574 ***	−0.962 ***
	(1.413)	(1.243)	(1.616)	(1.171)	(0.112)	(0.109)
Control variables	Y	Y	Y	Y	Y	Y
Country fixed effect	Y	Y	Y	Y	N	N
Industry fixed effect	Y	Y	Y	Y	Y	N
Year fixed effect	Y	N	Y	N	Y	Y
No. of observations	4074	4074	4172	4172	4074	4074
R-squared	0.844	0.838	0.965	0.962	0.422	0.269
F	28.85	139.8	45.43	131.7	803.0	561.1

Notes: Heteroscedasticity-robust standard errors are shown in parentheses, except for year-clustered robust standard errors in column 1 and column 6; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Our results reveals that China's efficiency-seeking OFDI increases host countries' value-added embedded in China's exports while having no significant effect on China's value-added exports to host countries, even when specialization is measured by value added. This is shown by the insignificant coefficients of *lnofdi* × *loc_add* in columns (1)–(2) and significantly positive coefficients in columns (3)–(4). Interestingly, efficiency-seeking OFDI appears to lower China's GVC position relative to host countries, as indicated by the significantly negative coefficients in columns (5)–(6), which nevertheless supports our second hypothesis despite differing from the benchmark results.

Finally, we confirm that resource-seeking OFDI strengthens GVC trade linkages between China and host countries without affecting relative GVC positions, using the fuel export share as our natural resource proxy. These findings collectively validate the robustness of our core results.

5.2.2. GMM Estimation

Potential endogeneity concerns may arise from two sources: first, possible omitted variables in our model specification, and second, potential reverse causality between independent and dependent variables (since closer GVC relationships may attract more Chinese OFDI to partner countries). We employ system GMM (SYS-GMM) estimation to mitigate the second concern, whilst our benchmark regression addresses the first issue through country, industry, and year fixed effects. The results of SYS-GMM estimation are reported in Table 4.

The diagnostic tests confirm the validity of our GMM specification: all models show statistically significant first-order autocorrelation (AR (1) with $p < 0.01$) but insignificant second-order autocorrelation (AR (2) with $p > 0.05$), while the Hansen tests for overidentification ($p > 0.05$) support the appropriateness of our instrument set.

Table 4 shows that the coefficients of our focal interaction terms remain consistent with the benchmark estimates, confirming the robustness of our results after addressing potential endogeneity. As shown in column 1, the significantly positive coefficients of the lagged interaction terms (*L.lnofdi* × *lnpat* and *L.nat* × *lnofdi*) indicate that China's OFDI promotes domestic value-added exports to host countries in the long run through leveraging their strategic assets and natural resources. The contemporaneous terms' statistical insignificance suggest these effects operate with a temporal lag.

Judging from the coefficients of interaction terms in Column 2, we find that the interaction effects between China's OFDI and host countries' strategic assets and natural resources significantly increase host-country value-added embedded in China's exports in the short- and/or long-term run. We also find that while the contemporaneous interaction effect of OFDI and host-country strategic assets elevates China's relative GVC position, natural resource endowments exhibit no significant influence, as shown in column 3.

Regarding specialization effects, the predominantly negative coefficients for *RCA* × *lnofdi* (both current and lagged) imply that the interaction effect of China's OFDI and host countries' economies of scale and scope may actually suppress China's domestic value-added. However, the long-run interaction effects between OFDI and specialization increase foreign value-added in China's exports (Column 2), though without improving China's relative GVC position (Column 3). This differential pattern implies that while specialization facilitates production fragmentation, it fails to upgrade China's positional advantage in GVCs.

Table 4. Robustness test: GMM estimation.

VARIABLES	(1)	(2)	(3)
	lndva	***lnfv***	***post***
L.Y	0.843 ***	0.983 ***	0.724 ***
	(0.004)	(0.005)	(0.092)
lnofdi	0.017 ***	−0.006	−0.023
	(0.005)	(0.006)	(0.019)
L.lnofdi	0.002	−0.019 ***	−0.012
	(0.004)	(0.006)	(0.016)
lnpat	0.081 ***	0.250 ***	−0.296
	(0.023)	(0.042)	(0.241)
L.lnpat	−0.014	−0.257 ***	0.294
	(0.023)	(0.042)	(0.247)
lnofdi × *lnpat*	0.000	0.001 **	0.003 *
	(0.000)	(0.001)	(0.002)
l.lnofdi × *lnpat*	0.001 ***	0.001 *	0.001
	(0.000)	(0.001)	(0.002)
RCA_part	−0.215 ***	0.018	0.496 ***
	(0.017)	(0.022)	(0.098)
L.RCA_part	0.209 ***	−0.016	−0.466 ***
	(0.016)	(0.022)	(0.096)
RCA × *lnofdi*	−0.002 ***	−0.003 ***	−0.004 *
	(0.001)	(0.001)	(0.002)
L.RCA × *lnofdi*	−0.007 ***	0.001 ***	0.001
	(0.001)	(0.000)	(0.002)
nat	−0.043 ***	0.010 ***	0.026
	(0.002)	(0.003)	(0.032)
L.nat	0.036 ***	−0.011 ***	−0.029
	(0.002)	(0.003)	(0.037)
nat × *lnofdi*	−0.000	0.000	−0.001
	(0.000)	(0.000)	(0.001)
L. nat × *lnofdi*	0.002 ***	0.001 ***	−0.001
	(0.000)	(0.000)	(0.001)
Constant	0.898 ***	0.053	0.044
	(0.092)	(0.065)	(0.189)
Control variables	Y	Y	Y
Country fixed effect	Y	Y	Y
Industry fixed effect	Y	Y	Y
Year fixed effect	Y	Y	Y
No. of observations	3622	3701	3622
F	78950	9667	25.29
p value-AR(1)	0.006	0.000	0.003
p value-AR(2)	0.118	0.125	0.353
p value-Hansen	0.964	0.118	0.637

Notes: Standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.3. Heterogeneity Analysis

5.3.1. Industrial Heterogeneity

Recent industry-level studies prove that the impact of China's OFDI on manufacturing GVC trade varies significantly across different factor-intensive industries. Therefore, it is necessary to examine how different drivers of OFDI affect GVC trade patterns across various industrial sectors. We also extend existing literature by analyzing manufacturing industries and service industries, whereas prior research only concentrated on manufacturing industries (e.g., Ren et al., Yu and Peng, Zhang et al. [46–48]).

We classify the 26 industries into 2 categories: resource- and labor-intensive industries and technology- and capital-intensive industries, following Fan and Huang [49], Han and Qian [69], and Zhao and Yu [70]. Table 5 summarizes the classification details. Table 6 reports the estimation results for two types of industries based on Model (1).

Table 5. Classification of industries.

Resource- and Labor-Intensive Industries			**Capital- and Technology-Intensive Industries**	
Primary product industry	Manufacturing	Service	Manufacturing	Service
Agriculture, forestry and fishing	Food products, beverages, and tobacco	Construction	Coke and refined petroleum products	Electricity, gas, water supply, sewerage, waste and remediation services
Mining and quarrying	Textile, wearing apparel, leather, and related product	Wholesale and retail trade; accommodation and food services	Chemicals and pharmaceutical products	Transportation and storage
	Wood and products of wood and cork	Accommodation and food services	Rubber and plastic products	Publishing, audiovisual and broadcasting activities
	Paper products and printing		Basic metals	Telecommunication
	Other non-metallic mineral products		Fabricated metal products	IT and other information services
	Other manufacturing; repair and installation of machinery and equipment		Computer, electronic, and optical products	Financial and insurance services
			Electrical equipment	Real estate and activities
			Machinery and equipment, nec	Other business sector services
			Motor vehicles, trailers, and semi-trailers	Human health and social work
			Other transport equipment	Arts, entertainment, recreation, and other service activities

As shown in Table 6, China's strategic asset-seeking OFDI enhances its relative GVC position vis-à-vis host countries in two industries (see the significant positive coefficients of *lnofdi* × *lnpat* in Columns 5 and 6), which is consistent with the research focus on manufacturing industries [46–48]. It also increases the host-country value-added embedded in China's exports across all industries (Columns 3 and 4). The domestic value-added exports in technology- and capital-intensive industries also benefit from strategic asset-seeking OFDI.

Table 6. Industrial heterogeneity.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	lndva		*lnfv*		*post*	
	Resource- and Labor-Intensive Industries	Capital- and Technology-Intensive Industries	Resource- and Labor-Intensive Industries	Capital- and Technology-Intensive Industries	Resource- and Labor-Intensive Industries	Capital- and Technology-Intensive Industries
lnofdi	0.105 **	−0.121 ***	−0.092 ***	−0.071 ***	−0.047 **	−0.009
	(0.042)	(0.026)	(0.020)	(0.015)	(0.020)	(0.006)
lnpat	−0.229 **	0.015	−0.012	0.005	0.045	−0.005
	(0.103)	(0.074)	(0.060)	(0.036)	(0.060)	(0.016)
lnofdi × *lnpat*	−0.005	0.012 ***	0.006 ***	0.007 ***	0.006 ***	0.001 **
	(0.005)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)
RCA	−0.201 ***	0.260 ***	0.095 ***	0.135 ***	0.193 ***	0.080 ***
	(0.049)	(0.023)	(0.013)	(0.011)	(0.016)	(0.007)
RCA × *lnofdi*	−0.000	0.002	0.020 ***	0.001	0.004	−0.001
	(0.008)	(0.005)	(0.004)	(0.002)	(0.004)	(0.001)
nat	−0.057 ***	0.011	0.020 **	0.028 ***	0.015	−0.012 ***
	(0.015)	(0.012)	(0.009)	(0.006)	(0.011)	(0.003)
nat × *lnofdi*	−0.006 ***	0.005 ***	0.002 *	0.003 **	−0.002	−0.001 *
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Constant	0.477	−5.983 **	8.415 ***	0.515	−0.561	−0.759 *
	(3.707)	(2.735)	(2.417)	(1.595)	(2.001)	(0.424)
Control variables	Y	Y	Y	Y	Y	Y
Country fixed effect	Y	Y	Y	Y	Y	Y
Industry fixed effect	N	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	N
No. of observations	1332	3085	1336	3186	1332	3085
R-squared	0.604	0.851	0.957	0.971	0.643	0.488
F	15.80	21.55	18.27	31.85	17.25	278.1

Notes: Heteroscedasticity-robust standard errors are shown in parentheses, except for year-clustered robust standard errors in column 1; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The trade effects of China's efficiency-seeking OFDI on bilateral GVC linkages are evident in resource- and labor-intensive industries, as demonstrated by the results in Column 3. Notably, natural resource-seeking OFDI promotes domestic value-added exports in capital- and technology-intensive industries (see the significant positive coefficient of *nat* × *lnofdi* in Column 2) but not in resource- and labor-intensive sectors. This discrepancy may stem from the fact that natural resource-seeking OFDI frequently involves capital goods exports to host countries, thereby stimulating value-added exports in capital- and technology-intensive domestic industries. While natural resource-seeking OFDI elevates host-country value-added embedded in China's exports across both industry types, it fails to improve China's relative GVC position. The results in Table 6 prove that the positive effect of China's OFDI on the GVC position of the home country established by prior research [16,46] holds only when China's OFDI seeks strategic assets of host countries.

5.3.2. Country Heterogeneity

1. Country Heterogeneity: Different Income Levels

Following the classification in the *World Economic Situation and Prospects* 2022 (*WESP* 2022) [71], we divide our country sample into two groups: high-income countries and other countries (comprising upper-middle-income, lower-middle-income, and low-income countries). We examine the heterogeneous effects of China's OFDI on host countries at different income levels, with the results presented in Table 7. In this table, we find

that the key interaction terms are varied in two samples. China's strategic asset-seeking OFDI exhibits differential impacts—it only significantly enhances bilateral GVC linkages with high-income countries (Columns 1 and 3) while improving China's relative GVC position across all country groups (Columns 5 and 6). The GVC trade effects of China's efficiency-seeking OFDI increase value-added from high-income host countries embedded in China's exports (Column 3) while reducing domestic value-added exports to other host countries (Column 2). China's natural resource-seeking OFDI strengthens bilateral GVC trade relations with high-income host countries, although it shows no significant impact on relative GVC positioning between the home and host countries.

Table 7. Country heterogeneity: different income levels.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	lndva		*lnfv*		*post*	
	High-Income Countries	**Other Countries**	**High-Income Countries**	**Other Countries**	**High-Income Countries**	**Other Countries**
lnofdi	−0.090 ***	0.036	−0.025 **	0.046	−0.013	−0.049 ***
	(0.026)	(0.041)	(0.011)	(0.031)	(0.010)	(0.019)
lnpat	−0.332 ***	0.160 ***	−0.054	0.087 **	0.023	−0.047 *
	(0.097)	(0.061)	(0.062)	(0.043)	(0.037)	(0.026)
lnofdi × *lnpat*	0.010 ***	−0.006	0.002 *	−0.007 *	0.002 *	0.009 ***
	(0.003)	(0.006)	(0.001)	(0.004)	(0.001)	(0.003)
RCA	0.153 ***	0.116 ***	0.129 ***	0.123 ***	0.111 ***	0.138 ***
	(0.017)	(0.020)	(0.006)	(0.015)	(0.009)	(0.018)
RCA × *lnofdi*	0.000	−0.012 *	0.003 *	0.004	0.001	−0.008
	(0.005)	(0.007)	(0.002)	(0.006)	(0.002)	(0.005)
nat	−0.031 **	0.015	0.025 ***	0.015 **	−0.003	−0.012
	(0.015)	(0.016)	(0.009)	(0.008)	(0.007)	(0.009)
nat × *lnofdi*	0.005 **	0.005	0.005 ***	−0.000	0.000	−0.001
	(0.002)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)
Constant	−28.563 ***	−1.716	17.380 ***	−4.417 **	0.777	−0.403
	(3.345)	(2.596)	(2.371)	(1.727)	(1.077)	(0.977)
Control variables	Y	Y	Y	Y	Y	Y
Country fixed effect	Y	Y	Y	Y	Y	Y
Industry fixed effect	Y	Y	Y	Y	Y	Y
Year fixed effect	N	Y	Y	Y	N	Y
No. of observations	3030	1390	3113	1412	3030	1390
R-squared	0.852	0.890	0.967	0.970	0.468	0.636
F	70.49	7.984	699.6	21.71	20.79	9.247

Notes: Heteroscedasticity-robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Our results in Table 7 indirectly support the conclusion in the literature that developing country firms can control their value chains and provide future growth through OFDI [42,43]. At the same time, we have shown that this effect is even more pronounced when China's OFDI is seeking strategic assets.

2. Country Heterogeneity: Belt and Road Initiative Partner Countries

The Belt and Road Initiative (BRI), launched in 2013, has significantly deepened economic cooperation between China and participating nations. Following the official BRI documentation [72], we classified countries into two groups: BRI participants (those that have signed cooperation agreements with China) and non-participants. This classification enables us to examine the differential effects of China's OFDI on bilateral GVC trade and relative GVC positions across these country groups.

Table 8 presents our empirical findings. Notably, China's strategic asset-seeking OFDI strengthens GVC trade linkages with non-BRI countries (Columns 2 and 4) while simultaneously enhancing China's relative GVC position vis-à-vis this group (Column 6). In contrast, for BRI partner countries, such OFDI increases domestic value-added exports from China (Column 1) but shows no significant effect on either host-country value-added embedded in Chinese exports (Column 3) or China's relative GVC position (Column 5).

Table 8. Country heterogeneity: BRI partner countries versus non-BRI countries.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	lndva		*lnfv*		*post*	
	BRI Countries	**Non-BRI Countries**	**BRI Countries**	**Non-BRI Countries**	**BRI Countries**	**Non-BRI Countries**
lnofdi	−0.110 **	−0.034	−0.008	−0.068 ***	−0.015	−0.018 *
	(0.043)	(0.027)	(0.020)	(0.016)	(0.017)	(0.009)
lnpat	0.023	−0.340 ***	0.099 ***	−0.351 ***	0.023	−0.066 **
	(0.080)	(0.101)	(0.034)	(0.067)	(0.032)	(0.026)
lnofdi × *lnpat*	0.009 *	0.005 **	0.002	0.005 ***	0.002	0.002 ***
	(0.005)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)
RCA	0.169 ***	0.126 ***	0.143 ***	0.130 ***	0.151 ***	0.103 ***
	(0.028)	(0.014)	(0.011)	(0.010)	(0.014)	(0.007)
RCA × *lnofdi*	0.022 ***	−0.002	−0.006 *	0.007 ***	−0.009 ***	0.002
	(0.008)	(0.003)	(0.004)	(0.002)	(0.003)	(0.001)
nat	−0.002	0.014	0.017 ***	0.044 ***	−0.006	−0.000
	(0.013)	(0.019)	(0.006)	(0.014)	(0.007)	(0.007)
nat × *lnofdi*	0.005 **	−0.010 ***	−0.000	0.017 ***	0.001	−0.004 **
	(0.002)	(0.004)	(0.001)	(0.003)	(0.001)	(0.002)
Constant	−5.993 *	−4.308	−3.396 **	10.598 ***	1.487	0.574
	(3.577)	(3.889)	(1.699)	(2.526)	(1.358)	(0.788)
Control variables	Y	Y	Y	Y	Y	Y
Country fixed effect	Y	Y	Y	Y	Y	Y
Industry fixed effect	Y	Y	Y	Y	Y	Y
Year fixed effect	Y	Y	Y	Y	Y	Y
No. of observations	2000	2421	2061	2465	2000	2421
R-squared	0.838	0.870	0.975	0.960	0.501	0.570
F	10.53	13.24	28.57	40.00	17.61	83.06

Notes: Heteroscedasticity-robust standard errors are shown in parentheses, except for year-clustered robust standard errors in column 6; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Our analysis reveals distinct patterns regarding efficiency-seeking OFDI effects. As shown in Columns 1, 3, and 4, China's efficiency-seeking OFDI simultaneously (1) increases domestic value-added exports to BRI host countries and (2) enhances non-BRI host countries' value-added embedded in China's exports while (3) reducing BRI host countries' value-added in Chinese exports. However, the results in Columns 5 and 6 indicate that efficiency-seeking OFDI does not significantly improve China's relative GVC position with either country group. The results also indicate that the relative GVC position of BRI countries with China can be enhanced by China's efficiency-seeking OFDI, as evidenced by the significantly negative coefficient—a finding consistent with prior research [17]. Comparatively, our research proves that this GVC position effect for BRI countries materializes only when China's OFDI seeks efficiency in host countries. Otherwise, China's OFDI exhibits no statistically significant impact on the GVC position of BRI economies.

The natural resource-seeking OFDI analysis reveals further insights. Column 1 shows that China's OFDI toward the natural resources of BRI countries is accompanied by significant exports of Chinese capital goods and other manufactured goods, thereby boosting

China's domestic value-added exports. We did not find a similar impact for non-BRI countries. Meanwhile, China's natural resource-seeking OFDI toward non-BRI countries yields a larger value for the host country (see column 4) and reduces China's relative position vis-à-vis this group (as shown in column 6).

6. Conclusions, Implications, and Policy Recommendations

6.1. Conclusions

This study examines how China's OFDI, driven by distinct motivations, affects bilateral GVC relations with host countries through two dimensions: (1) GVC trade value and (2) relative GVC positioning. The conclusion on the trade effect of China's OFDI is not consistent. For example, Wang and Xiang and Gao et al. argue that China's OFDI creates trade [73,74], while Lin suggests that OFDI has no impact on trade, or even exerts a weak substitution effect when originating from developing countries [56]. Our research shows that OFDI not motivated by strategic asset-seeking, efficiency-seeking, or natural resource-seeking objectives does not generate trade-creation effects for China's GVC trade and may even lead to substitution effects, as shown by the statistically insignificant or significantly negative coefficients for *lnofdi* across both the full sample and most subsamples.

Our findings demonstrate that China's strategic asset-seeking OFDI significantly strengthens bilateral GVC trade relations while simultaneously improving China's relative GVC position vis-à-vis host countries. The latter finding supports the manufacturing-sector-specific conclusions by Li et al. regarding China and China's OFDI spillover effects documented by Dai and Song [15,45]. The analysis reveals, however, two important limitations: firstly, this type of OFDI does not significantly enhance China's domestic value-added exports to middle- and low-income host countries; secondly, it shows no measurable impact on exports from China's resource- and labor-intensive industries. Furthermore, we find no statistically significant effect on China's relative GVC position related to BRI countries.

Whether China's OFDI has been attracted by the host countries' specialization has been discussed in the existing literature [12,13,32], but it fails to analyze how China's OFDI seeking host countries' specialization affects the bilateral GVC relationship between China and its host. Our analysis reveals that the interaction effect of host countries' specialization and China's OFDI significantly increases the host country value added embedded in China's exports. This effect is particularly pronounced for three specific groups: resource- and labor-intensive industries, high-income countries, and non-BRI partner countries. However, we find no corresponding increase in China's domestic value-added exports to these host countries. On the contrary, our results demonstrate a significant reduction in value-added exports to middle- and low-income host countries. Consequently, efficiency-seeking OFDI appears ineffective in improving—and may actually weaken—China's relative position in GVCs.

Natural resource-seeking has been identified as a primary driver of China's OFDI in early research, and this finding has been reaffirmed in recent studies [7,8,20–24]. However, to the best of our knowledge, no existing research examines the trade effects of China's natural resources-seeking OFDI or its implications for GVC trade. Our findings indicate that China's natural resource-seeking OFDI significantly enhances bilateral GVC trade flows between China and its host countries. This effect is particularly pronounced in two specific contexts: capital- and technology-intensive industries and high-income countries. Furthermore, such OFDI increases China's domestic value-added exports to BRI partner countries. However, the analysis reveals that natural resource-seeking OFDI fails to improve—and may actually weaken—China's relative GVC position vis-à-vis host countries, particularly in the case of non-BRI countries.

6.2. Implications for Sustainable Development

Decent Work and Economic Growth is one of the 17 Sustainable Development Goals (SDG 8) [75,76]. However, global GDP growth has waned, and its recovery has been disrupted by the pandemic, posing significant risks to economic development. Against this background, our research demonstrates that China's OFDI generates mutual economic benefits for both China and host countries through GVC trade, thereby contributing to global economic stability and sustainable development.

Our research finds that China's OFDI—driven by strategic asset-seeking, efficiency-seeking, and natural resource-seeking motives—enhances value-added trade between China and host countries. Specifically, host countries increase their value-added exports to China, while China, in turn, expands its value-added exports to these economies. This reciprocal trade establishes a mutually beneficial economic relationship, mitigates trade tensions, and lays the groundwork for sustainable global economic development.

In GVC trade, national value acquisition is intrinsically linked to GVC positioning [5]. Our findings indicate that host countries' GVC interests are generally preserved under Chinese OFDI, as China's relative GVC position remains either statistically insignificant or even significantly negatively affected by its OFDI—except in cases of strategic asset-seeking OFDI. In some instances, China's OFDI enhances host economies' GVC positions, directly contributing to their economic development. Consequently, China's OFDI facilitates mutually beneficial outcomes in GVC trade, particularly by advancing host-country interests. This effect establishes a foundation for more equitable and sustainable international cooperation, thereby promoting global economic growth.

Our research also reveals that China's OFDI generates a trade substitution effect within GVCs when *not* driven by strategic asset-seeking, efficiency-seeking, or resource-seeking motivations. This effect implies that China's OFDI enhances local production of host economies, ultimately accelerating their economic growth—as has been proven by existing Chinese literature [77–80]. In the context of slowing global GDP growth, these results provide empirical evidence that China's OFDI serves as a driver of worldwide economic recovery, making direct contributions to achieving the growth targets outlined in SDG 8.

6.3. Policy Recommendations

Our policy implications follow directly from the conclusions and implications for sustainable development. Against the backdrop of slowing globalization—or even rising anti-globalization sentiment—global economic stability faces significant challenges from supply chain decoupling and fragmentation. Our findings demonstrate that China's OFDI, particularly when motivated by strategic asset-seeking, efficiency gains, and natural resource acquisition, strengthens economic linkages between home and host countries.

We propose bilateral policy recommendations. For the home country, the Chinese government should actively encourage firms to internationalize through OFDI, thereby building more resilient supply chains. For host countries, policymakers should facilitate the absorption of Chinese OFDI by aligning it with local factor endowments to develop complementary industrial chains. Consequently, fostering technical collaboration and global production capacity coordination between home and host countries would generate mutual economic benefits while simultaneously promoting local economic development and enhancing global economic stability.

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