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The impact of China's outward foreign direct investment on its export similarity with belt and road countries

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ABSTRACT

This study investigates the impact of China's outward foreign direct investment (OFDI) on the export similarity (EXSI) between China and the countries along the Belt and Road by using an unbalanced panel dataset involving 64 Belt and Road countries (BRCs) from 2003 to 2018. The empirical analysis indicates that China's OFDI has a positive impact on the EXSIs of commodities as a whole. Specifically, it finds that Chinese OFDI has a positive impact on the EXSI of primary products but has a negative impact on the EXSIs of resource-based manufactures, low-technology manufactures, and medium-skill/high-skill and technology-intensive manufactures. Furthermore, by classifying the BRCs into resource-rich, low-income, and high-income groups, we find that China's OFDI reduces the EXSIs of resource-intensive manufactures in resource-rich BRCs, low-technology manufacturesin low-income BRCs, and high-skill and technology-intensive manufactures in high-income BRCs. This finding is generally consistent with the resource endowments and comparative advantages of China and the BRCs. In addition, we find that since the launch of the Belt and Road Initiative, China's OFDI has not only increasingly fostered the export dissimilarity (specialisation) of resource-intensive manufactures and labour-intensive manufactures between China and BRCs but also promoted the export upgrading of BRCs.

KEYWORDS Export similarity; foreign direct investment; China; belt and road countries

JEL CLASSIFICATIONS F19, F1, F, D92, D9, D, P45, P4, P

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1. Introduction

As foreign direct investment (FDI) is arguably an engine of globalisation (Singh 2005), it has been a predominant driving force by which economies integrate into global value chains (GVC) and foster international divisions of labour; hence, FDI changes export patterns and shapes a diverse range of modes of trade cooperation between home and host economies. China has been playing a progressively more dominant role in global FDI and trade since the beginning of the twenty-first century. Despite the shrinking

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global OFDI and the spread of the COVID-19 pandemic, OFDI from China continued to rise, ranking first for the first time worldwide in 2021. At the same time, China became the world's largest exporter and the second largest importer in 2009, thus shaping diverse trading cooperation between China and its trading partners.

Export similarity (EXSI) is widely used to reflect 'commodity overlap' between or among economies, thereby indicating the specialisation or competition of exports as supplies for a third market as well as their potential for intra- or inter-industry trade. In fact, the change in EXSIs is closely related to variations in their positions in RVCs or GVCs and divisions of labour between or among economies (Nguyen, Pham, and Vallée 2017). For example, the high EXSI in intra-European trade was due to the large proportion of intra-industry specialisation accompanying the process of European integration (Finger and Kreinin 1979), while economies organised through vertical linkages of a global division of labour were unlikely to specialise in the same product and hence showed low EXSI (Nguyen, Pham, and Vallée 2017). Additionally, EXSIs are often determined by comparative advantages. Nguyen, Pham, and Vallée (2017), employing the national-level data of ASEAN + 3 (i.e. Association of South-East Asian Nations plus China, Korea and Japan) from 1990 to 2014, noted that the EXSI of a commodity between a member and the rest of ASEAN + 3 was positively defined by the member's own comparative advantage but was negatively defined by the comparative advantages of other members.

The empirical analyses of the impact of FDI on EXSIs find different results. For instance, Wang and Wei (2008) discovered that FDI flows into China improved the EXSI between China and the G-3 developed countries (the US, Japan and the EU), and the effect varied depending on the geographic locations and levels of economic development of diverse regions of China. Nevertheless, Harding and Javorcik (2012) suggested that FDI flows into developing economies had no statistically significant effect on the similarity of export compositions between developing and developed countries. As changes in EXSI are the result of simultaneous alterations of relative positions in the RVCs or GVCs of home and host economies, the above studies only analyse the influences of FDI on changes in the export patterns of receiving economies but ignore the impacts of OFDI on the export compositions of home countries.

In 2013, the Belt and Road Initiative (BRI) was proposed by China, which aimed to promote an open and win-win regional development through five cooperative priorities: policy coordination, facility connectivity, unimpeded trade, financial integration, and deepening of social and cultural bonds.[1] Since the launch of the BRI, the countries along the Belt and Road (BRCs)[2] have witnessed soaring growth of inward foreign direct investment (IFDI) flows from China. Namely, Chinese outward foreign direct investment (OFDI) flows into the BRCs rose from US$85.71 billion in 2014 (constant 2010 US$) to US$150.16 billion in 2018 (constant 2010 US$) at a 15.05 percent average annual rate of growth[3] (see Figure 1).

From the regional perspective, the BRI consists of two parts, i.e. the 'Silk Road Economic Belt' and the '21st Century Maritime Silk Road'. The former is principally land based and is supposed to link China's hinterland with Western Europe through Central Asia, Russia, the Middle East, and Eastern Europe, while the latter is mainly maritime based and connects China's southern coast with Europe through Southeast Asia, South Asia, Africa, and the Mediterranean (Wu and Chen 2021; Villafuerte, Corong, and Zhuang 2016).

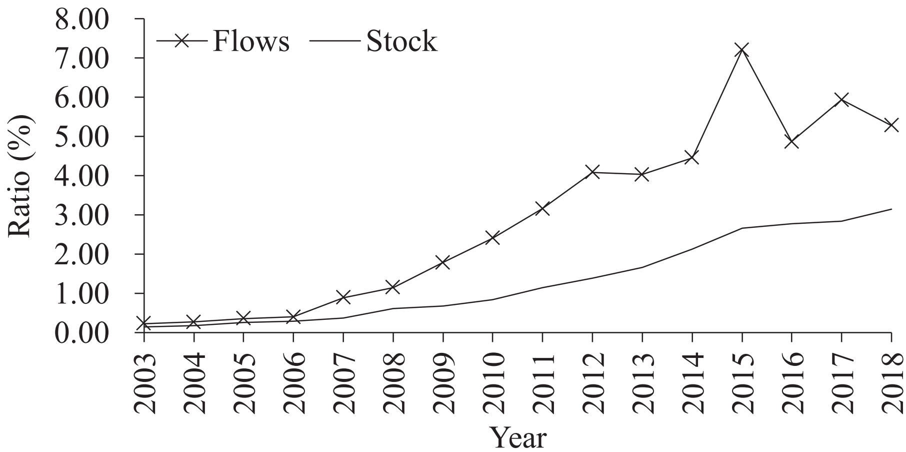

Figure 1. Chinese OFDI to BRCs as a ratio of the total IFDI of BRCs. Source: *Statistical Bulletin of Chinese Outward Foreign Direct Investment*, Ministry of Commerce of People's Republic of China; UNCTADSTAT.

Since the 64 BRCs are at distinct levels of development and endowed with various resources, China-BRCs are supposed to form diversified international divisions of labour and display huge potential for economic and trade cooperation. A country's specialisation matters not only for its economic growth but also for the shaping of its comparative advantages (Hausmann, Hwang, and Rodrik 2007). The fast growth of Chinese OFDI flows into BRCs is designed to contribute to the integration of BRCs into the global economy, especially in cooperation with China.

Under the proposal of the BRI, leveraging the considerable OFDI from China offers a crucial opportunity for BRC development and integration into the RVCs and GVCs. Chinese OFDI has strengthened the trade intensity (i.e. bidirectional trade relations) between China and BRCs, especially since the rise of the BRI (Wu and Chen 2021). Therefore, it aims to affect the export specialisations of both China and BRCs as well as their linkages in the regional value chains (RVCs) and potential for trade. However, how China's soaring OFDI flows into BRCs changes their positions in the RVCs and GVCs, as well as the divisions of labour between China and BRCs and, thus, specialisations or competition in the exports of the two parts, have been far less discussed.

To fill the abovementioned research gap, this study relates Chinese OFDI flows into BRCs to the EXSIs between China and BRCs to investigate the impact of Chinese OFDI on the EXSIs between the two sides. Using panel data on exports at the Standard International Trade Classification (SITC) 3-digit level of classification involving 64 BRCs over 2003–2018 and employing a dynamic-system generalised method of moments (GMM) model with the 'real interest rate' as an extra instrumental variable, this study discovers that Chinese OFDI positively affects the EXSIs of commodities between China and BRCs as a whole. Specifically, it has a positive impact on the EXSI of primary products but negatively affects the EXSIs of resource-based manufactures, low-technology manufactures, medium-skill/high-skill and technology-intensive manufactures. By categorising the BRCs into resource-rich, low-income, and high-income groups, we find that Chinese OFDI decreases the EXSIs of resource-intensive manufactures in resource-rich BRCs, low-technology manufactures in low-income BRCs, and high-technology or high-skill and technology-intensive manufactures in high-income BRCs. This finding is consistent with the resource endowments and comparative advantages of China and BRCs. Finally, we notice that since the launch of the BRI, Chinese OFDI has not only progressively enhanced the export dissimilarity (specialisation) of resource-intensive manufactures and labour-intensive manufactures between China and the BRCs but has also promoted the export upgrading of the BRCs.

The contributions of this paper are threefold. First, different from vast literature focusing on the effect of FDI on the export pattern of either a home country or a host country, this study investigates the influence of FDI on the alteration of EXSIs between source and receiving economies, which directly reveals the role of FDI flows in changing their relative positions in the RVCs or GVCs and export specialisations (international division of labour) of both home and host economies. Second, with the implementation of the BRI, expanding studies focus on the impact of Chinese OFDI on the export patterns of China or its trading partners (e.g. Wu and Chen 2021; Zhang and Chen 2020); however, this is the first study to extend insight into the influence of Chinese OFDI on the changes of compositions and specialisations of exports of both China and the BRCs and thereby investigates its impact on the potential trade between China and the BRCs. Third, to obtain a more robust result, a GMM method with an instrumental variable is adopted to address the potential endogeneity issue.

2. Literature review and hypotheses development

2.1. Regional characteristics of China and its belt and road countries

As EXSIs can reflect divisions of labour and trade relations between economies in a region, factors such as geographic distance, history relation, and cultural communication are capable of shaping EXSIs. The regional cooperation with the Road countries should mainly focus on the removal of business barriers and financial barriers (Mahalik, Mallick, and Pal 2022). According to the gravity models of trade and FDI, reducing geographical distance, enhancing transportation facilitation, promoting cultural proximity, and intensifying policy communication are supposed to benefit economic collaboration, trade expansion, and FDI flows (Xu, Liu, and Liu 2022), which are the main aims of the construction of the BRI. Actually, the BRI is based on the 'Ancient Silk Road' before around 2000 years ago and hence shapes the geographic and cultural proximities between China and the countries along the 'Ancient Silk Road'. And the BRI is a sustainable continuation of the long tradition of institutional, economic, and cultural convergence with BRCs, instead of a temporary shock of policy (Kang et al. 2018).

First, concerning historical and cultural associations, the BRI is rooted in the 'Ancient Silk Road' about 2000 years ago, which is an ancient route for trade and cultural communication. The 'Ancient Silk Road' spatial reach extended and covered most countries of Eurasia and even some parts of Africa, and the symbolic traded commodities along the road include silk, China, and tea, which generate far-reaching impacts on the socio-economic development of Eurasia (Liu and Dunford 2016).

Second, from geographical proximity perspective, BRCs include two routes, one is the 'Silk Road Economic Belt' that connects China with Western Europe through the Middle East, and another one is the 'twenty-first Century Maritime Silk Road' that links China with Europe through the Mediterranean (as shown in the Introduction). Furthermore, thirteen of China's fourteen land-based neighbours are along the 'Silk Road Economic

Belt', and five of China's six maritime-based neighbours[4] of China are along the 'twenty-first Century Maritime Silk Road'. The geographic proximity between China and BRCs enjoy stimulates the trade scale, economic collaboration, and FDI flows between China and its BRCs.

Third, the implementation of the BRI further arguments FDI flows and trade facilitation and hence deepens the regional integration of BRCs. To be more specific, the BRI promotes unimpeded trade, investment, cultural exchanges, governmental communication, transport connectivity, and finance cooperation (OECD 2018). Moreover, the BRI actively constructs six international economic corridors, namely China – Mongolia – Russia, China – Central and West Asia, China – Indochina Peninsula, China – Pakistan, China – Kazakhstan – Russia (New Eurasian Land Bridge), and Bangladesh – China – India – Myanmar by channels such as promoting infrastructure connectivity, enhancing trade facilitation, and establishing economic cooperation zones. In such circumstances, BRCs have been prioritised in China's foreign economic cooperation.

Enlarging empirical studies look into how the proposal of the BRI affects the economic and trade cooperation and thus fosters the RVCs between China and BRCs. For instance, Wu and Chen (2021) pointed out that after the BRI, Chinese OFDI stimulated both the import and export relations (bidirectional trade) between China and BRCs. After investigating the development in soft (effective trade facilitation via border administration and employ of information and communication technology) and hard (physical connection through high quality transportation systems) infrastructures in the six international economic corridors. Liu, Lu, and Wang (2020) suggested that the implementation of the BRI did lower the inhibiting impact of cultural distance on the bilateral trade between China and BRCs. Yu et al. (2020) discovered that the BRI stimulated the export potential from China to BRCs, particularly for the exports of capital-intensive products. Moreover, this positive influence was substantially stronger for those BRCs in West Asia and the Association of Southeast Asian Nations. China could leverage its capital to help BRCs get wealthier, thus enhancing BRC import of Chinese products. The intuitive channels were as follows. First, the BRI strengthened intergovernmental collaboration and policy exchange significantly and diminished the uncertainty and risk of trade between China and BRCs, intensifying the scale of bilateral trade. Second, the improving infrastructure under the BRI lowered the trade cost and hence facilitated the trade scale between China and BRCs. Third, China's augmenting OFDI in BRCs contributed to BRC economic growth and indirectly enlarged BRC need for imports of commodities from China.

For these reasons, the EXSIs between China and BRCs have been strongly affected. For instance, during 2010–2016, China's exports to BRCs as a share of total Chinese exports rose from 19% to 34%, while for OECD, it dropped from 61% to 34% in the same period (OECD 2018). Accordingly, the soaring Chinese OFDI is capable of shaping the EXSIs between China and BRCs.

2.2. *Effects of FDI on exports of home and host countries*

Earlier studies have revealed the direct impact of FDI on EXSI between home and host countries. For instance, vertical FDI theory suggests that FDI will strengthen vertical linkages in RVCs, improve production specialisations, and hence reduces EXSI between home and host economies. Specifically, vertical MNCs usually fragment processes of production geographically and locate different stages of production in foreign affiliates that provide a better cost advantage for the production of a particular stage (Helpman 1984). Two typical theories of vertical FDI are the product life cycle theory (Vernon 1966) and the theory of transfer of comparative advantage (Kojima 1978). For vertical FDI, an innovator or home economy imports lower-technology goods that have been previously produced by itself from less-developed countries; in turn, less-developed economies are prone to import higher-technology commodities, such as parts and components required for the products, from innovators (Kojima 1978; Vernon 1966). Consequently, vertical OFDI often improves the specialisation of vertical trade (i.e. export dissimilarity) and thereby strengthens the potential of interindustry trade between country pairs of FDI.

When the world's income grows and economies are becoming increasingly similar in size and relative endowments (Markusen and Venables 1998), MNCs will expand overseas to avoid trade costs. In general, a broader potential market of host economies, smaller fixed costs of plants (i.e. smaller plant-level scale economies), and higher trade costs favour horizontal FDI. In the case of horizontal FDI, MNCs produce the same or similar goods and services in host countries as they do in home countries and centre on a trade-off between plant-level trade costs and fixed costs. Therefore, horizontal FDI replaces intraindustry trade and plays a more significant role than trade (Markusen and Venables 1998). For this reason, horizontal FDI potentially promotes regional competition and raise production specialisations and diversifications of intraindustry trade between home and host countries. Accordingly, the EXSI of intraindustry trade will be decreased.

As EXSI between countries mirrors export patterns of both home and host economies and their relative positions in the RVCs and GVCs, we are required to look into those separate analyses on the impact of FDI on the exports of home or host countries. For home economies, OFDI may affect specialisation and upgrading of exports of home economies via spillovers. First, the personnel interchanges between the head offices and the subsidiaries generate the exchange of technology and knowledge. Second, as the source country arranges its RVCs or GVCs by MNCs, the MNCs and the subsidies can increasingly specialise in the production of certain parts of a commodity and trade intermediate products or final products internally. Then, the MNCs are capable of acquiring technology and knowledge to improve productivity for the commodity. At the same time, by establishing R&D centres in advanced countries, the research outcome is shared internally (Zhang and Chen 2020; Li et al. 2016).

For example, Zhang and Chen (2020) stated that Chinese OFDI had a positive effect on the export sophistication of the advanced coastal region of China, thus promoting the export upgrading of China. Li, Zhou, and Hou (2021) discovered that OFDI generated a positive influence on the GVC upgrading of home countries by encouraging technological progress and increasing network status of trade, and the influence of OFDI flowing into emerging countries tended to be more substantial than that in advanced countries. Moreover, compared to low and middle-technology sectors, Chinese OFDI of high-technology sectors induced a stronger effect on China's GVC upgrading. Li et al. (2016) found that Chinese OFDI had a statistically positive impact on domestic innovation.

For receiving economies, it is acknowledged that FDI is able to promote the production and exports of host countries by enlarging their domestic capital, boosting employment, enhancing managerial proficiency, and helping host countries access new international marketplaces (Iwamoto and Nabeshima 2012). It also stimulates host countries' productivities and specialisations by approaching advanced technologies, producing new goods for export, learning-by-doing, supporting superior management operations, and encouraging knowledge spillovers (Tekin 2012).

In particular, the technology spillovers of FDI on the productivity of host economies include vertical spillovers and horizontal spillovers. The vertical spillovers of multinational corporations (MNCs) take place by providing backward linkages and forward linkages in host countries. The former refers to MNCs collaborating with local upstream firms to obtain intermediates from local firms and supply technical guidance and training for local suppliers, thus minimising the operational costs of the MNCs. The latter refers to the link between MNCs and local downstream companies. Explicitly, local customers directly benefit from knowledge diffusions embodied in goods and processing. Furthermore, MNCs are capable of providing after-sale technical services to local consumers or downstream firms (Iwamoto and Nabeshima 2012). Horizontal spillovers occur primarily via the demonstrating effect, competition effect, and the mobility of local employees from MNCs to local firms or local employees setting up their own companies in host countries (Iwamoto and Nabeshima 2012).

As BRCs have attracted substantial OFDI from China, the locally established MNCs have forged supply chain links with BRC firms. At the same time, the BRC enterprises partner extensively with the MNCs from China through marketing agreements, joint ventures, and contract manufacturing, and engage in international trade. These various forms of RVCs participation influence productions and export patterns of both China and BRCs. Accordingly, the first hypothesis is proposed:

Hypothesis 1

Chinese OFDI has a significant impact on the export similarity between China and BRCs.

2.3. Effects of Chinese heterogeneous motivated OFDI on its EXSIs with BRCs

2.3.1. Natural resource-motivated OFDI from China

The effects of FDI flows on RVCs and EXSIs vary based on the different natures of FDI. How does OFDI from China affect EXSIs between China and its host countries? According to the 'OIL' paradigm, FDI tend to flow into those sectors with comparative advantage (Sun et al., 2021). Furthermore, different motivated-OFDI leads to various influences on RVCs and export specialisations and the subsequent EXSIs between China and its host countries.

In particular, resource-seeking OFDI accounts for a large proportion of OFDI from China to seek natural resources from host countries. Resource-seeking OFDI generally flows into host economies to access raw materials, low-cost skilled and semi-skilled workforces, and managerial and technical capabilities. As a matter of fact, resource-seeking OFDI is vertical and hence intensifies the vertical production division of labours and inter-industry trade between home and host countries. In this process, the potential production of natural resource-based commodities will be strengthened while home countries is able to produce more capital and technology-intensive commodities. As a consequence, the natural resource-based OFDI is expected to exploit the abundant natural resources and improves the potential comparative advantage in the resource-based products of host economies (Sun et al., 2021) while promote the export upgrading of home economies. Therefore, the EXSI of home and host economies is reduced.

For example, Chinese enterprises invest in regions (e.g. Africa, Latin America, Australia, and Canada) overflowing with oil energy, natural gas products, and mineral reserves. Meanwhile, parent MNCs produce and export advanced machines and equipment (most are capital-intensive products and intermediate products) to host countries and import resource-intensive products from the host countries, thus generating backward linkages with these host nations. This process is supposed to bring about specialisations and exports of the resource-intensive production of these host nations.

Chinese MNCs provide capital, production equipment, technology, and labour to develop and process local resources with indigenous enterprises. An increase in exporting those raw materials from host economies often requires importing technology-intensive machinery from parent companies, stimulating the export of production equipment, technology, and other supporting equipment from the parent company. In this case, the resource-seeking investment boosts the export upgrading of China and the resource-based comparative advantage of the host nations, leading to vertical international and regional divisions of labour and decreasing EXSIs between China and its resource-rich host economies.

The resource-seeking motivation of Chinese OFDI is strong (Ren and Yang 2020), and the natural resource endowments are BRC largest comparative advantages (Sun et al., 2021). For example, Iraq and Azerbaijan are abundant in energy reserves and raw material deposits, and Kazakhstan and Russian Federation are well supplied with agricultural resources. Resource-seeking OFDI is vertical OFDI and thus causes vertical RVCs between home and host economies (Beugelsdijk, Smeets, and Zwinkels 2008). As a result, Chinese resource-seeking OFDI not only fosters BRC specialisation in resource-intensive products but also promote the production upgrading of China (Zhang and Chen 2020). Accordingly, the following hypothesis is proposed:

Hypothesis 2

Chinese OFDI negatively affects the EXSIs of resource-intensive products between China and resource-intensive BRCs.

2.3.2. Efficiency motivated OFDI from China

Efficiency seekers arrange product segments in various nations to access low-cost inputs such as labour force, raw material, and resources, therefore achieving the scale of the economy. In other words, these efficiency-motivated MNCs rationally carry out resource-oriented or market-oriented OFDI to make more profits from the geographically dispersed activities. As a result, efficiency-seeking OFDI typically promotes the export scale of labour-intensive/low-technology products from host countries (Kurtishi-Kastrati, 2013).

Technical progress makes China geographically disperse and fragment its production and integrate into GVCs. In fact, with the diminishing demographic dividend in China (Cai and Lu 2016), China actively expands its efficiency-seeking OFDI to strengthen its vertical cooperation with labour resource-intensive BRCs, which aims to lower the location costs, such as labour costs, raw materials, technical cooperation, knowledge, and experience of management to realise scale economy and expansion of scope (Beugelsdijk, Smeets, and Zwinkels 2008).

Chinese efficiency-seeking MNCs can invest abroad in two modes. First, they conduct a horizontal OFDI to transfer entire production overseas. This type of investment decreases China's labour-intensive exports but expands the labour-intensive exports of these labour-based BRCs, thus reducing China's EXSI with the labour-intensive BRCs. Second, Chinese MNCs make a vertical OFDI, moving the labour-intensive segments (downstream stage of production) abroad by employing host countries as a platform of exports to produce and export assembled and processed commodities to global markets while maintaining the intermediate and upstream stages of production at home (Helpman 1984). Consequently, this kind of OFDI boosts China's exports of intermediate inputs, thereby lowering the EXSI between China and the labour rich-BRCs.

In the case of vertical efficiency-seeking OFDI, parent economies will export some capital and technology products (e.g. machines and equipment) to host countries and import low labour-cost products from host economies, thus fostering the host countries' specialisations in labour-intensive products and improving the home countries' export upgrading (Zhang and Chen 2020). Consequently, Chinese OFDI contributes to a vertical linkage in GVCs and division of labour between China and developing BRCs. Thus, the third hypothesis is as below:

Hypothesis 3

Chinese OFDI negatively affects the EXSIs of labour-intensive products between China and BRCs.

2.3.3. Market-seeking and strategic asset-seeking OFDI from China

Market seekers supply commodities and services to new markets to expand their distribution networks or enlarge exports to those markets previously serving via export (Zhang and Chen 2020; Li et al. 2016). Market-seeking OFDI is another primary motivation for Chinese MNCs to invest overseas (Wu and Chen 2021). This type of OFDI largely flows to those high-income BRCs whose income level is higher than the average for BRCs apart from the resource-intensive BRCs.

Moreover, market seekers are horizontal OFDI that export final products for host economies' consumption (Beugelsdijk, Smeets, and Zwinkels 2008). Horizontal OFDI usually generates horizontal spillovers and strong competition effects between home and host economies, thereby stimulating the innovations and specialisations of intraindustry trade between economies to occupy a larger market share in international competition. Yu et al. (2020) confirmed a promoting influence of OFDI from China on China's export potential to BRCs after the launch of BRI, especially for exports of capital and technology-intensive commodities.

Strategic asset-oriented MNCs are principally concentrated in developed regions to obtain cutting-edge technologies and well-known brands. Hence, home countries will set up production plants and R&D centres to capture spillovers from global R&D. For this reason, home countries will be more capital and technology-intensive and achieve export upgrading. For instance, Huawei has set up 14 R&D centres overseas covering Germany, Russia, the United Kingdom, the United States, and France. Actually, through hiring more localisation talent and high-skilled personnel, the overall technology level in Huawei remains at the forefront of the world, and a series of innovative commodities have been produced. OFDI, especially strategic asset-seeking OFDI, is capable of upgrading the exports of home economies through reverse spillovers.

As China demonstrates a heightening comparative advantage in the production of capital (both physical and human capital) and technology-intensive commodities that advanced economies are principally specialised in, its expanding market-seeking and strategic asset-seeking OFDI is expected to strengthen the competition between China and BRCs and thus makes them enhance the product qualities and varieties (Xing 2007) to satisfy the demand of China, BRCs, and other global markets. As a result, Chinese

OFDI promotes the specialisation of capital and technology-intensive commodities and deepens the potential for intraindustry trade between China and BRCs. Therefore, the fourth hypothesis is:

Hypothesis 4

Chinese OFDI negatively affects the EXSIs of capital and technology-intensive manufactures between China and advanced BRCs.

2.4. Effects of FDI on export upgrading of host countries

Recent studies note that IFDI may promote export upgrading of host countries, especially for developing economies. For example, Harding and Javorcik (2012) found that attracting IFDI improved the unit value of exports in developing economies via two channels. First, knowledge spillovers generated by MNCs encouraged production upgrading of homogeneous and supplying sectors of local firms. Second, host countries were employed as a platform of exports via MNCs, which could help receiving countries become involved in the production of more sophisticated and upgraded commodities than were previously exported. However, the findings for high-income countries have been ambiguous. Similarly, Iwamoto and Nabeshima (2012) found that MNCs contributed to both the export diversification and export sophistication of developing countries.

China is transferring from a labour-intensive producer to advanced capital and technology-intensive producer. The diminishing labour dividend requires China to gradually transfer its labour-intensive production to low-income economies with lower labour cost via the efficiency-seeking OFDI, which possibly enhances the productivity of host economies and stimulates their export upgrading in developing BRCs. Moreover, Chinese OFDI will strengthen BRC technical efficiency, institutional quality, and human capital stock with lags of five, eight, and nine years (Zhang, Cheng, and He 2019), thus enhancing the technological absorptive capacity and upgrading the production structure of BRCs. Additionally, plenty of Chinese OFDI in BRCs is large-scale projects in infrastructure construction, especially for those developing and less-developed BRCs with low technology and financial support (Liu et al. 2017). The improving infrastructures can increase BRC productivities, achieve the scale of economy, improve transport efficiency to both domestic and international markets, and boost the absorptive capacity of technology spillovers of Chinese OFDI, thereby fostering the process of export upgrading.

Nonetheless, the low technological absorption capacity of the low-income BRCs possibly impairs the positive spillovers of OFDI from China. For instance, Razzaq, An, and Delpachitra (2021) employing a panel of developing and less-developed BRCs for the period 2003–2016 argued that though Chinese OFDI stimulated the host countries' TFPs through technology spillovers, the productivity spillovers were relatively low. Furthermore, the productivity spillovers from Chinese OFDI declined with the rising technology gap induced by the lagged socioeconomic situation, such as low-skilled labour, poor institutional quality, and less R&D investment, of these less-developed BRCs, and the impact became negative after a certain threshold.

Most BRCs are developing and even less-developed nations (Appendix 1) whose absorbance capacities of spillovers are generally low due to limited R&D expenditures (Sánchez-Sellero, Rosell-Martínez, and García-Vázquez 2014), which may decrease the imitation spillovers of Chinese OFDI and hinder BRC export upgrading (Banga 2022). However, as discussed in Section 2.1, the BRI significantly fosters the economic and trading cooperation between China and BRCs. Moreover, the accumulation of Chinese OFDI stock in BRCs has achieved rapid growth only in recent years, especially after the BRI (Liu et al. 2017). In addition, Chinese OFDI is supposed to have a time lag before it is able to foster BRC export upgrading. In this way, the export upgrading effect of Chinese OFDI on the whole BRCs occurs principally after the launch of the BRI. Therefore, the fifth hypothesis is put forward:

Hypothesis 5

After the implementation of the BRI, Chinese OFDI has increased the EXSIs of capital – and technology-intensive manufactures between China and BRCs. However, the effect is absent before the launch of the BRI.

3. Methodology

3.1. Model

This article employs a national-level unbalanced panel dataset for the 64 BRCs between 2003 and 2018. To examine the effect of Chinese OFDI on EXSI between China and BRCs, we construct an empirical model based upon the following considerations. First, the EXSI between China and the BRCs is influenced by FDI, level of economic development, resource endowments, geographic distance, and cultural and historical proximity. Second, the export pattern of a nation is hard to change in short period of time, and thus the current EXSI is often affected by the past EXSI, a dynamic panel estimator is employed in the empirical estimation. Accordingly, the estimated model equation is as follows:

$$\begin{aligned} EXSI_{c,i,t} = {} & \beta_0 + \beta_1 EXSI_{c,i,t-1} + \ldots + \beta_2 lnOFDI\_CHI_{c,i,t} + \beta_3 lnOFDI\_OTH_{c,i,t} \\ & + \beta_4 lnGDPPdiff_{c,i,t} + \beta_5 lnPOPdiff_{c,i,t} \\ & + \beta_6 lnCLRdiff_{c,i,t} + \beta_7 lnMEANdiff_{c,i,t} \\ & + \beta_7 lnDIST_{c,i} + \beta_8 lnCOLO_{c,i} + \beta_9 lnLEOR_{c,i} + \theta_{c,i} + u_{c,i,t} \end{aligned} \tag{1}$$

where βs represents the parameters to be evaluated; $EXSI_{i,t}$ represents the EXSI between China and BRC country i ($i = 1, 2, \ldots, 64$) in year t ($t = 2003, \ldots, 2018$); and $EXSI_{i,t-1}$ is the one-year lagged dependent variable. Actually, the number of lagged EXSIs is potentially determined by the dynamic panel estimator. Total FDI flows into the BRCs are divided into Chinese OFDI and non-Chinese OFDI. *OFDI_CHI* refers to the real Chinese OFDI stock and *OFDI_OTH* is other economies' real FDI stock in country i; *GDPPdiff* refers to the absolute difference in the real GDP per capita between China and country i; *POPdiff* denotes the absolute difference in population; *CLRdiff* is the absolute difference in capital-to-labour ratio; *MEAYdiff* is the absolute difference in average education level; *DIST* means the geographical distance between China and country i; *COLO* is a dummy variable that equals 1 if a colony-coloniser relationship exists between China and country i, otherwise zero; *LEOR* is another dummy variable that takes the value of 1 if China and country i have the common legal origin, otherwise zero; θ_i captures the national-specific that is fairly stable and cannot change over time, such as geography, basic institutions, and culture; and u_{it} is a random disturbance term; Natural log transformations are conducted on some variables to linearise relations and eliminate heteroscedasticity.

3.2. Variables selection

3.2.1. Dependent variable

3.2.1.1. Measurement of export similarity. The commodity similarity index created by Finger and Kreinin (1979) is extensively applied to compare the similarity of export patterns across categories of goods between economies in a third market or in the global market (e.g. Zhang and Chen 2020; Nguyen, Pham, and Vallée 2017). Based on that, the export similarity index (EXSII) between China and the BRCs is given as follows:

$$\mathrm{EXSIIc,\,i} = \left\{ \sum_{k=1}^{n} min\left(\frac{x_{cw}^{k}}{X_{cw}}, \frac{x_{iw}^{k}}{X_{iw}} \right) \right\} * 100$$

where x_{cw}^{k} (X_{cw}) is China's amount of export of good k (China's total value of exports) to the world; and x_{iw}^{k} (X_{iw}) is country i's amount of export of good k (total value exports) to the world.

The value of EXSII varies from 0 to 100. Concretely, if these two countries have no common exports, the value of EXSII is 0, whereas if their exports are identical, the value is 100. If the index value rises during a period, it reveals a merging export trend of the good between the two economies. Meanwhile, a greater EXSII connotes a fiercer competition relationship between them in the marketplace. Conversely, a drop in the EXSII implies an upward trend of the degree of specialisation and complementary relationship of trade between two economies.

In this study, to obtain a more robust and comprehensive analysis, we employ two methods to classify trading commodities according to factor proportions, i.e. products by technological categories (Lall, 2000) and manufactured goods by degree of manufacturing from the United Nations Conference on Trade and Development (UNCTADSTAT). Furthermore, data on trade flows using the aggregate SITC 3-digit level of categorisation are adopted for the calculation of the EXSII of the diversified sectors. In addition, the various SITC 3-digit designations for commodities can be categorised into resource-intensive industries, labour-intensive industries, and capital and technology-intensive industries according to the factor proportions (Yu et al. 2020). Accordingly, Appendices B1 and B2 list the more specific commodity categories included in each product category involved in the present paper.

3.2.1.2. EXSI trend in BRCs. Figures 2–11 depict the changing trends of natural log transformation of the EXSI values of all commodity categories in the study. For the total commodities, the EXSI value of the whole BRCs declined before the proposal of the BRI (i.e. during 2003-2012), but it rose after the BRI (i.e. after 2013) (as shown in Figure 2). This trend is generally consistent with the changes in the EXSI values of total commodities of resource-rich BRCs, low-income BRCs, and high-income BRCs. Moreover, as most BRCs are developing low-income BRCs (as shown in Appendix 1), the fluctuations of EXSI values of the whole BRCs and the low-income BRCs are highly accordant.

From the perspective of diverse commodities, first, from Figures 3, 4, and 8, we can see that the EXSI values of the resource-intensive commodities of those resource-rich BRCs fall notably before the BRI. However, after the BRI, the values display a rising trend.

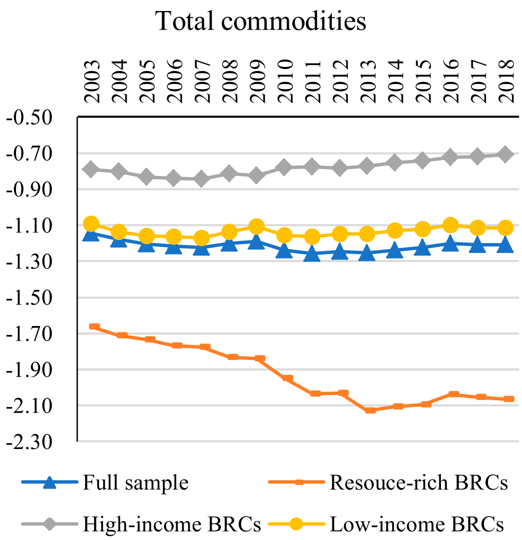

Figure 2. EXSI of total commodities.

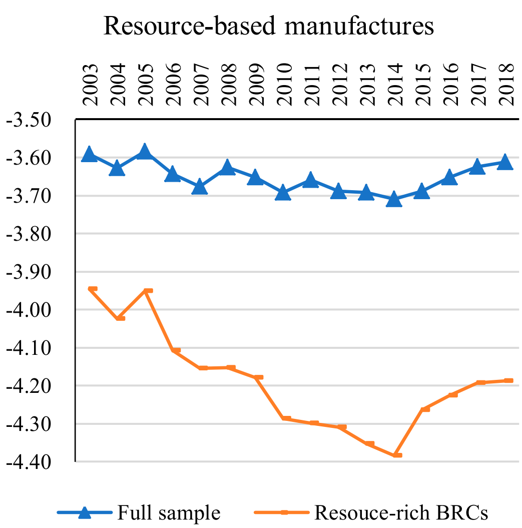

Figure 3. EXSI of resource-based manufactures.

As the tendency of export patterns of the whole BRC resource-intensive commodities principally depends on the export of resource-rich BRCs, the changes of the EXSI values between those resource-intensive products and the whole BRCs manifest consistent inclination.

Second, as depicted in Figures 5 and 9, since low-income BRCs are the main exporters of the labour-resource manufactures, the trends of EXSI values of the low technology manufactures (classified by technology intensity) and the low-skill and technology-intensive manufactures (classified by the degree of manufacturing) in low-income BRCs are generally compatible with that of the whole BRCs.

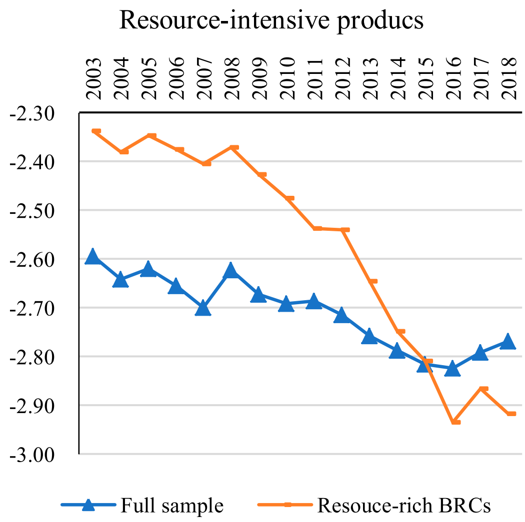

Figure 4. EXSI of resource-intensive products.

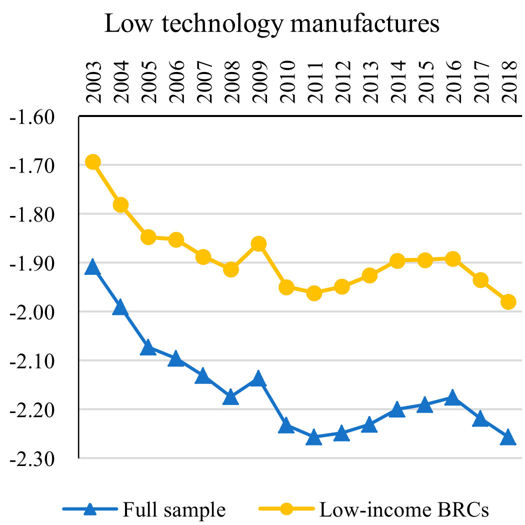

Figure 5. EXSI of low technology manufactures.

Third, as described in Figures 6, 7, 10, and 11, the changes in the EXSI values of the capital and technology-intensive manufactures of high-income BRCs generally reveal an increasing tendency.

Fourth, in Figures 6, 7, 10, and 11, it is found that the EXSI values of the capital and technology manufactures of both the resource-rich and high-income BRCs enhanced significantly after the proposal of the BRI.

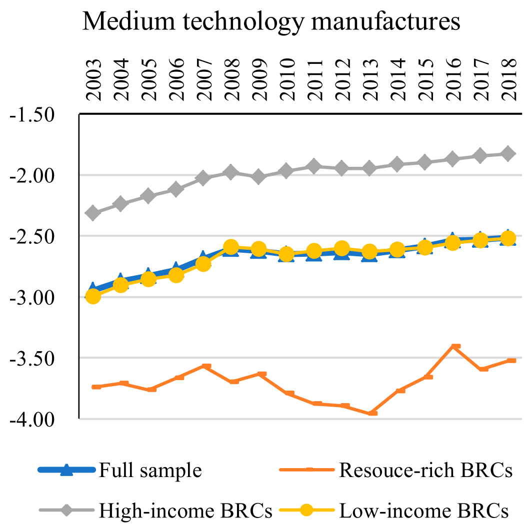

Figure 6. EXSI of medium technology manufactures.

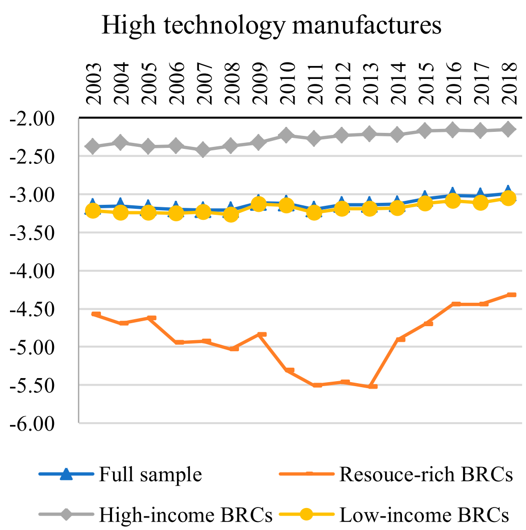

Figure 7. EXSI of high technology manufactures.

3.2.2. Control variables

The EXSI is determined by the control variables, including economic proximity, historical and cultural links, geographic distance, resource endowments, and domestic market. In addition, we follow studies such as Liu, Lu, and Wang (2020), Wu and Chen (2021), and Egger and Pfaffermayr (2004) to employ logarithm terms of absolute difference to investigate international trade.

The economic vicinity between countries comprehensively reflects the overall EXSI between economies, which is often measured by cultural proximity and geographic distance. Cultural proximity means that the similarity of trade structures between countries

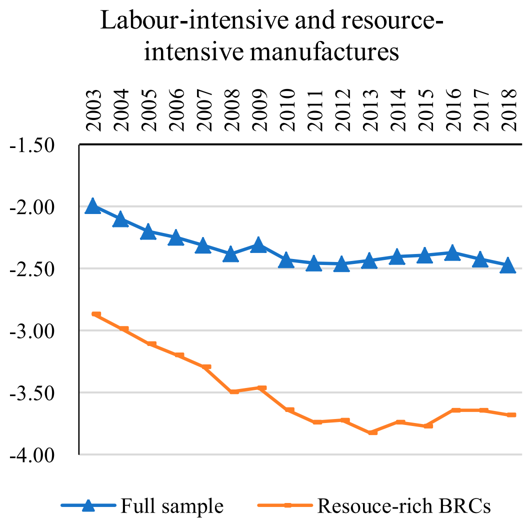

Figure 8. EXSI of labour-intensive and resource-intensive manufactures.

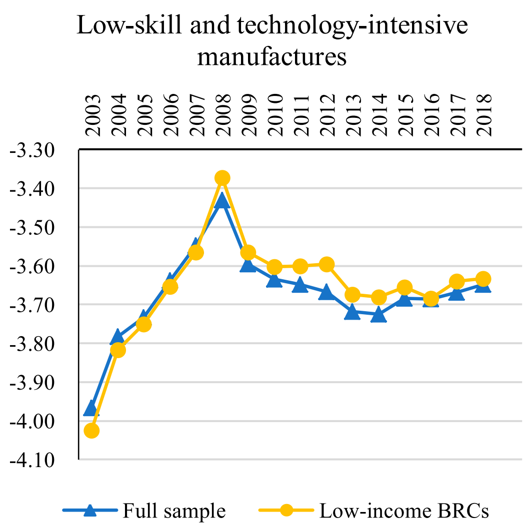

Figure 9. EXSI of low-skill and technology – intensive.

is sensitive to historical and cultural relationships. Hence, the colonial history and common legal origin in the pair are selected as a control of the EXSI between China and the BRCs (Hannan 2017). Physical distance can negatively affect trade flows between countries (Wu and Chen 2021), so the variable of the capital cities' distance between China and the BRCs is used as another control variable.

The export pattern of a country is highly in line with its level of economic development; therefore, we deem the gap in GDP per capita between China and the BRCs a vital determinant of the EXSI. Specifically, countries with similar economic development

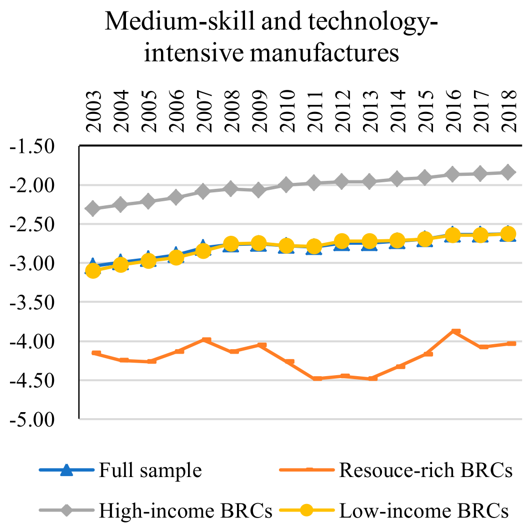

Figure 10. EXSI of medium-skill and technology-intensive manufactures.

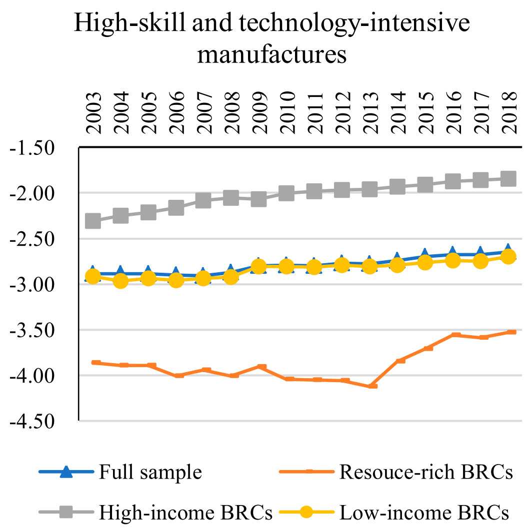

Figure 11. EXSI of high-skill and technology – intensive.

tend to reveal similar export patterns than those countries with large divergency in their income levels (Wu and Chen 2021; Harding and Javorcik 2012).

According to the theory of comparative advantage, resource endowments are the determinants of export patterns. A country with a lower capital-labour ratio than the world average can potentially produce labour-intensive commodities and import capital-intensive commodities (Shirotori, Tumurchudur, and Cadot 2010). Additionally, the capital stock of a country is calculated by the perpetual inventory method following the literature, such as Zhang and Chen (2020) and Berlemann and Wesselhöft (2014).

Another important resource for a country's export upgrading is the level of human capital stock. The higher the human capital stock the country has, the stronger the innovation capability the country has. Therefore, we use the human capital level as another control variable of the EXSI, which is proxied by the mean years of schooling (Yue 2022; Shirotori, Tumurchudur, and Cadot 2010).

A country's population mirrors not only its domestic market size but also the potential labour endowment to some extent. The disparity of the market sizes between China and the BRCs is projected to be negatively related to the EXSI (Harding and Javorcik 2012).

3.3. Dealing with endogeneity issues

There is potential endogeneity in the empirical model, which may cause inconsistent estimations. Specifically, the model may omit some variables affecting EXSI that relate to FDI flows. Moreover, some factors, such as macroeconomic policy across the BRI, can influence FDI flows and economic development simultaneously (Yu, Qian, and Liu 2019). In addition, there could be a potential bidirectional causality between trade and FDI flows (Wu and Chen 2021).

In such circumstances, both the IV estimator and the GMM estimator are extensively employed (Han and Phillips 2010). However, GMM estimator has some advantages over conventional IV method (2SLS). The GMM technique is designed for short time dimension and relatively large cross sections (Roodman 2009), which generally suits our case. Moreover, in the presence of heteroscedasticity, the conventional IV technique is inefficient. The GMM estimator can exploit the orthogonality conditions to achieve efficient regression, which can be tested by the dynamic GMM Arellano-Bond linear panel technique (Arellano and Bond 1991).

Hence, the two-step[5] systematic dynamic GMM technique with robust standard deviations is employed in the empirical regression. By using the lagged value of explained variables and endogenous variables as instruments, the systematic dynamic GMM technique can mitigate three sources of endogeneity issues, including dynamic endogeneity, unobserved heterogeneity, and simultaneity, to some extent (Wu and Chen 2021; Arellano and Bond 1991). Additionally, explanatory variables that do not vary with time, such as distance, can be estimated using the systematic GMM approach (Wu and Chen 2021).

To further solve the endogeneity issue, we adopted 'the real interest rate' as an additional instrumental variable for FDI inflows in the GMM method on the following grounds. The principle of the selection of an instrumental variable is that it is required to be highly related to inward FDI flows but not correlated with EXSIs. The real interest rate mirrors host countries' market attractiveness for FDI inflows. A higher real interest rate heightens the costs of physical capital availability for MNCs and hence decreases inward FDI flows (Musyoka and Ocharo 2018). However, the 'real interest rate' of BRCs cannot directly affect EXSIs as EXSI is often shaped by resource endowments and trade cost of a nation.

Accordingly, the GMM technique, the 2SLS technique, and the GMM technique with the instrumental variable (GMM-IV) are adopted. The GMM technique is a benchmark test, the 2SLS is a compared test, and the GMM-IV technique can further handle the potential endogeneity issue to obtain a more accurate estimated result. Additionally, the explanations chiefly rely on the estimations of GMM-IV since it is more reliable and precise.

Table 1. Descriptive statistics: 2003–2018.

Variables	Unit	Mean	Std. dev.	Min.	Max.
Dependent variables					
Ln EXSI of total products		3.07	1.14	−7.13	4.56
Ln EXSI of primary products		1.03	0.95	−10.16	4.54
Ln EXSI resource-based manufactures		−3.93	1.11	−14.66	−2.82
Ln EXSI low technology manufactures		−2.71	1.48	−12.53	−1.11
Ln EXSI medium technology manufactures		−3.08	1.11	−9.07	−1.62
Ln EXSI high technology manufactures		−4.05	1.53	−9.40	−1.33
Ln EXSI labour-intensive and resource-intensive manufactures		1.64	1.55	−6.43	3.43
Ln EXSI low-skill and technology-intensive manufactures		0.46	1.23	−5.39	2.1
Ln EXSI medium-skill and technology-intensive manufactures		1.24	1.34	−5.37	3.09
Ln EXSI high-skill and technology-intensive manufactures		1.29	1.11	−2.61	3.41
Independent variables					
Ln OFDI from China	constant 2010 US$	17.82	2.91	9.34	24.5
Ln Non-Chinese OFDI	constant 2010 US$	23.22	1.95	16.17	27.85
Ln Distance	kilometers	8.55	0.38	7.07	8.95
Ln Absolute value of difference in the GDP per capita	constant 2010 US$	8.13	1.47	1.02	11.08
Ln Absolute value of difference in the population		20.95	0.34	17.51	21.05
Ln Absolute value of difference in capital labour ratio	constant 2010 US$ per employment	9.56	1.24	3.33	11.84
Ln Absolute value of difference in mean years of schooling	years	0.82	0.84	−2.3	1.72
LEOR		0.5	0.5	0	1
COLO		0.02	0.12	0	1

Source: Compiled by authors.

3.4. Data

In order to examine the impact of Chinese OFDI on the EXSI with BRCs, this study utilises regression analysis to investigate the national-level unbalanced[6] panel dataset of 64 BRCs during 2003-2018. Most of the dataset comes from the World Bank database apart from those data otherwise specified. The data on Chinese OFDI in the BRCs were from the *Statistical Bulletin of China's Outward Foreign Direct Investment.* The data on non-Chinese OFDI in the BRCs were derived from the *World Investment Report* of the United Nations Conference on Trade and Development (UNCTAD). The data on the mean years of schooling were obtained from *Human Development Reports* of United Nations Development Programme. The data on geographical distance, colonial relationships, and common legal origin were retrieved from the CEPII database. In addition, disaggregated, 3-digit SITC export data were collected from the UN Commodity Trade Statistics Database (UN Comtrade) (Table 1).

4. Regression results and explanations

Tables 2–7 show the estimations of Model (1) by the two-step systematic panel GMM method. In addition, 2SLS and GMM are used for robustness. Since the estimation results of 2SLS and GMM are basically consistent, we only show the estimation results of 2SLS for the full sample due to limited space.

Table 2. Impact of Chinese OFDI on EXSIs of industries by technological categories: full sample.

	Total Commodities			Resource-intensive industries					
				Primary products			Resource-based manufactures		
Variables	2SLS (1)	GMM (2)	GMM-IV (3)	2SLS (4)	GMM (5)	GMM-IV (6)	2SLS (7)	GMM (8)	GMM-IV (9)
Lag of Ln EXSI		1.1320***	1.0601***		0.8481***	0.7113***		0.5214***	0.4782***
		(0.0874)	(0.1070)		(0.1144)	(0.1322)		(0.1743)	(0.1839)
Ln OFDI_CHI	−0.0833	0.0308**	0.0250*	−0.0031	0.0725***	0.0467**	−0.0316**	−0.0339**	−0.0289**
	(0.0132)	(0.0132)	(0.0147)	(0.0076)	(0.0250)	(0.0209)	(0.0138)	(0.0165)	(0.0146)
Ln OFDI_OTH	0.3134***	−0.0374	−0.0336	−0.1746***	−0.1614**	−0.0620	0.2972***	0.1395*	0.1798***
	(0.0214)	(0.0265)	(0.0392)	(0.0117)	(0.0699)	(0.0426)	(0.0242)	(0.0772)	(0.0574)
Ln GDPPdiff	−0.0457	−0.0263	−0.0067	−0.0737***	0.0158	−0.0064	−0.0308	−0.0577**	−0.0461
	(0.0404)	(0.0308)	(0.0124)	(0.0242)	(0.0313)	(0.0338)	(0.0336)	(0.0250)	(0.0513)
Ln DIST	−0.5439	0.1895	0.4515**	0.2580***	2.1376***	1.3330***	0.2087**	−0.3237	−0.4619*
	(0.0946)	(0.1437)	(0.2161)	(0.0586)	(0.8010)	(0.5049)	(0.1028)	(0.1991)	(0.2626)
Ln CLRdiff	−0.1031	0.0199	0.0127	−0.0352	−0.0220	−0.0024	−0.0857***	0.0143	−0.0251
	(0.0393)	(0.0204)	(0.0132)	(0.0217)	(0.0208)	(0.0150)	(0.0315)	(0.0229)	(0.0347)
Ln MEANdiff	0.0343	0.0095	−0.0230	−0.0244*	−0.0466***	−0.0706***	−0.0372*	0.0077	0.0107
	(0.0274)	(0.0182)	(0.0171)	(0.0136)	(0.0157)	(0.0193)	(0.0203)	(0.0386)	(0.0228)
Ln POPdiff	−0.0373*	0.0094	−0.0510*	−0.1159***	−0.3983***	−0.2411**	−0.1277***	−0.0037	0.0230
	(0.0198)	(0.0253)	(0.0283)	(0.0124)	(0.1610)	(0.0983)	(0.0195)	(0.0775)	(0.0210)
LEOR	0.2913***	−0.0384	−0.0850	−0.1752***	−0.3003**	−0.1896**	0.3195***	0.1532*	0.2815**
	(0.0615)	(0.0504)	(0.0647)	(0.0353)	(0.1397)	(0.0747)	(0.0512)	(0.0847)	(0.1353)
COLO	2.0736***	0.6426	1.8307*	0.2107**	11.3896***	5.6712***	−0.9050***	−3.6769*	−3.0885**
	(0.1309)	(0.8572)	(0.9724)	(0.0919)	(3.9680)	(1.9807)	(0.1746)	(1.9786)	(1.5360)
Constant	3.9307***	−1.8887**	−2.7139**	−5.9101***	−7.1214***	−5.2853***	−8.4163***	−1.3535	−1.7079*
	(0.8374)	(0.9482)	(1.1154)	(0.4922)	(2.3569)	(1.8118)	(0.7576)	(2.1192)	(0.9538)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)		−3.14	−3.13		−4.21	−3.64		−2.55	−2.34
		[0.002]	[0.002]		[0.000]	[0.000]		[0.011]	[0.019]
AR(2)		−0.18	−0.39		0.32	0.14		0.63	−0.05
		[0.854]	[0.696]		[0.750]	[0.888]		[0.530]	[0.959]

(*continued*).

Table 2. Continued.

	Total Commodities			Resource-intensive industries					
				Primary products			Resource-based manufactures		
Variables	2SLS (1)	GMM (2)	GMM-IV (3)	2SLS (4)	GMM (5)	GMM-IV (6)	2SLS (7)	GMM (8)	GMM-IV (9)
Hansen test	0.33	2.02	1.51	0.273	10.07	6.16	0.185	18.96	11.24
	[0.569]	[0.568]	[0.679]	[0.601]	[0.122]	[0.405]	[0.667]	[0.190]	[0.260]
Number of instruments		15	14		16	13		16	14
R-squared	0.3849			0.5445			0.5117		
F-statistics	60.25			128.13			882.39		
Observations	537	755	543	537	755	543	537	755	543

	Labour-intensive industries			Capital and technology-intensive industries					
	Low technology manufactures			Medium technology manufactures			High technology manufactures		
Variables	2SLS (10)	GMM (11)	GMM-IV (12)	2SLS (13)	GMM (14)	GMM-IV (15)	2SLS (16)	GMM (17)	GMM-IV (18)
Lag of Ln EXSI		0.9717***	0.6608***		0.6090***	0.5897***		0.8322***	0.7029***
		(0.0243)	(0.1911)		(0.2175)	(0.1967)		(0.1155)	(0.2159)
Ln OFDI_CHI	−0.1366***	0.0210*	−0.0475*	−0.0782***	−0.0354*	0.0112	−0.0782	0.0419	0.0437
	(0.0287)	(0.0126)	(0.0336)	(0.0197)	(0.0206)	(0.0342)	(0.0197)	(0.0259)	(0.0595)
Ln OFDI_OTH	0.2459***	0.0046	0.0943	0.4064***	0.2087**	0.1392*	0.4064***	−0.0105	0.1095
	(0.0440)	(0.0142)	(0.0580)	(0.0312)	(0.0883)	(0.0790)	(0.0312)	(0.1067)	(0.1704)
Ln GDPPdiff	−0.0087	−0.0237	0.0459	0.0274	0.0038	−0.0015	0.0274	−0.0988*	−0.1634**
	(0.0860)	(0.0267)	(0.0306)	(0.0561)	(0.0358)	(0.0425)	(0.0561)	(0.0598)	(0.0687)
Ln DIST	−1.0067***	−0.1072	−0.4992	0.1977	−0.1559	0.2859	0.1977	0.9624	0.6677
	(0.2061)	(0.1197)	(0.3584)	(0.1473)	(0.6061)	(0.2424)	(0.1473)	(0.8955)	(0.9067)
Ln CLRdiff	−0.2245***	0.0153	−0.0779*	−0.1454***	−0.0182	−0.0528**	0.1454***	0.0909*	0.0960*
	(0.0820)	(0.0209)	(0.0398)	(0.0497)	(0.0203)	(0.0239)	(0.0497)	(0.0508)	(0.0526)
Ln MEANdiff	−0.0109	0.0094	−0.0048	−0.0350	0.0130	−0.0195	−0.0350	0.0139	−0.0120
	(0.0563)	(0.0135)	(0.0404)	(0.0316)	(0.0289)	(0.0762)	(0.0316)	(0.0555)	(0.0900)

(*continued*).

Table 2. Continued.

	Labour-intensive industries			Capital and technology-intensive industries					
	Low technology manufactures			Medium technology manufactures			High technology manufactures		
	2SLS	GMM	GMM-IV	2SLS	GMM	GMM-IV	2SLS	GMM	GMM-IV
Variables	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Ln POPdiff	−0.2968***	0.0184	−0.0569	−0.1194***	0.0360	−0.0676	−0.1194***	−0.1645	−0.0314
	(0.0360)	(0.0203)	(0.0631)	(0.0274)	(0.0999)	(0.0454)	(0.0274)	(0.1642)	(0.1816)
LEOR	0.5942***	0.0628*	0.2355*	0.3472***	0.1682	0.1368	0.3472***	−0.0804	−0.0110
	(0.1197)	(0.0360)	(0.1301)	(0.0840)	(0.1814)	(0.1185)	(0.0840)	(0.2082)	(0.2400)
COLO	−2.8210***	1.4176**	−2.1534*	−1.6684***	−2.1178	−0.6228	−1.6684***	5.0318	2.5086
	(0.2561)	(0.6585)	(1.2757)	(0.2479)	(4.1982)	(0.4313)	(0.2479)	(5.1701)	(3.6487)
Constant	10.8668***	−0.0264	3.4770	−9.3337***	−4.7609***	−5.3042**	−9.3337***	−6.0274**	−9.2401**
	(1.5557)	(0.5982)	(2.9114)	(1.1055)	(1.7151)	(2.2032)	(1.1055)	(2.9486)	(3.7632)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)		−3.19	−2.47		−2.37	−1.74		−3.03	−2.28
		[0.001]	[0.013]		[0.018]	[0.082]		[0.002]	[0.023]
AR(2)		1.00	1.56		0.18	−0.64		0.44	0.74
		[0.319]	[0.118]		[0.854]	[0.520]		[0.660]	[0.462]
Hansen test	0.292	5.46	8.84	0.435	4.58	9.20	0.435	4.32	5.87
	[0.589]	[0.243]	[0.356]	[0.805]	[0.598]	[0.419]	[0.805]	[0.634]	[0.438]
Number of instruments		13	12		14	12		13	12
R-squared	0.2226			0.4674			0.3745		
F-statistics	108.57			109.37			109.37		
Observations	537	755	543	506	755	543	506	755	543

Note: Standard errors (p-values) in parentheses (brackets) and p$* < 0.10$, $** p < 0.05$, $*** p < 0.01$.

Table 3. Impact of Chinese OFDI on EXSI of manufactured industries by degree of manufacturing: full sample.

	Resource-intensive industries			Labour-intensive industries			Capital and technology-intensive industries					
	Labour-intensive and resource-intensive manufactures			Low-skill and technology-intensive manufactures			Medium-skill and technology-intensive manufactures			High-skill and technology-intensive manufactures		
Variables	2SLS (19)	GMM (20)	GMM-IV (21)	2SLS (22)	GMM (23)	GMM-IV (24)	2SLS (25)	GMM (26)	GMM-IV (27)	2SLS (28)	GMM (29)	GMM-IV (30)
Lag of Ln EXSI		0.9298***	0.9817***	−0.1350***	0.4724***	0.5660***		1.6297***	0.4530**		0.6049***	0.4499***
		(0.0730)	(0.1049)	(0.0233)	(0.0949)	(0.1063)		(0.4244)	(0.1950)		(0.1422)	(0.1593)
Ln OFDI_CHI	−0.1260	0.0242*	0.0064	0.4686	−0.0333*	−0.0343	−0.1198***	−0.2580*	−0.0615*	−0.1670***	−0.0537***	−0.0747**
	(0.0314)	(0.0135)	(0.0213)	(0.0354)	(0.0194)	(0.0279)	(0.0250)	(0.1564)	(0.0341)	(0.0288)	(0.0196)	(0.0337)
Ln OFDI_OTH	0.1598***	−0.0395	0.0384	0.0454	0.1485***	0.1898***	0.4732***	0.8138	0.3211**	0.7172***	0.2902***	0.3682***
	(0.0501)	(0.0336)	(0.0291)	(0.0736)	(0.0550)	(0.0507)	(0.0401)	(0.5178)	(0.1365)	(0.0468)	(0.0935)	(0.1292)
Ln GDPPdiff	−0.0202	−0.0010	−0.0282***	−0.1830	0.0222	−0.0286	0.0093	−0.2592*	−0.0469	0.0123	0.0309	0.0102
	(0.0923)	(0.0244)	(0.0101)	(0.1619)	(0.0515)	(0.0548)	(0.0709)	(0.1329)	(0.0489)	(0.0740)	(0.0320)	(0.0327)
Ln DIST	0.9637***	0.5004*	−0.4472	−0.1862***	0.2256	0.0230	−0.1073	−13.6681	−1.3167	−1.4612***	−0.5118	−0.3891
	(0.2260)	(0.2634)	(0.2752)	(0.0594)	(0.2073)	(0.2002)	(0.1979)	(8.8464)	(1.0743)	(0.2254)	(0.6929)	(0.3551)
Ln CLRdiff	−0.2121**	−0.0108	−0.0045	−0.0485	−0.0342	−0.0445	−0.1739**	0.2572	−0.0353	−0.0647	−0.0171	−0.0373
	(0.0893)	(0.0181)	(0.0152)	(0.0353)	(0.0428)	(0.0407)	(0.0679)	(0.1728)	(0.0323)	(0.0737)	(0.0326)	(0.0368)
Ln MEANdiff	−0.0801	−0.0151	0.0319	−0.2883***	−0.0199	−0.0256	0.0181	0.3721	0.0823	0.1450**	0.0590	0.0264
	(0.0614)	(0.0299)	(0.0340)	(0.0284)	(0.0520)	(0.0332)	(0.0442)	(0.2417)	(0.0841)	(0.0564)	(0.0476)	(0.0547)
Ln POPdiff	−0.3891***	−0.1089	0.0948	−0.5425***	−0.2251***	−0.1246***	−0.0526	2.6075	0.2106	0.3582***	0.1687	0.1590
	(0.0393)	(0.0667)	(0.0655)	(0.0922)	(0.0597)	(0.0451)	(0.0396)	(1.6876)	(0.1695)	(0.0521)	(0.1229)	(0.1179)
LEOR	0.6237***	−0.0152	0.0983**	−2.3004***	0.2181*	0.2270**	0.4894***	1.9212	0.5410*	0.5232***	0.0870	0.0781
	(0.1308)	(0.0422)	(0.0437)	(0.2361)	(0.1319)	(0.1017)	(0.1146)	(1.2845)	(0.3060)	(0.1329)	(0.1686)	(0.1577)
COLO	−2.5201***	2.4419*	−2.6072**	0.6909	−0.9199***	−0.9713***	−1.8345***	−76.3096	−7.6702	−3.7387***	−2.7275	−1.7798***
	(0.2750)	(1.4129)	(1.1385)	(1.0862)	(0.3034)	(0.3018)	(0.3349)	(50.2091)	(5.1611)	(0.3273)	(3.7730)	(0.6435)
Constant	18.6505***	−1.3093	1.0253	−0.1350***	0.2709	−0.6711	−4.3069***	46.1959	1.6420	−12.6657***	−4.6268	−6.3546**
	(1.6623)	(1.1854)	(2.1119)	(0.0233)	(1.5852)	(1.3262)	(1.5668)	(29.6390)	(4.0984)	(1.9607)	(3.0149)	(2.5054)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)		−2.75	−2.87		−3.24	−2.89		−1.54	−1.36		−3.41	−2.60
		[0.006]	[0.004]		[0.001]	[0.004]		[0.023]	[0.074]		[0.001]	[0.009]

(continued).

Table 3. Continued.

	Resource-intensive industries			Labour-intensive industries			Capital and technology-intensive industries					
	Labour-intensive and resource-intensive manufactures			Low-skill and technology-intensive manufactures			Medium-skill and technology-intensive manufactures			High-skill and technology-intensive manufactures		
Variables	2SLS (19)	GMM (20)	GMM-IV (21)	2SLS (22)	GMM (23)	GMM-IV (24)	2SLS (25)	GMM (26)	GMM-IV (27)	2SLS (28)	GMM (29)	GMM-IV (30)
AR(2)		1.05 [0.292]	1.39 [0.164]		1.48 [0.140]	0.89 [0.375]		−1.02 [0.305]	−1.67 [0.295]		−0.03 [0.976]	−0.79 [0.431]
Hansen test	0.904 [0.637]	6.26 [0.181]	4.78 [0.572]	1.461 [0.482]	20.47 [0.155]	10.92 [0.206]	1.145 [0.564]	1.03 [0.597]	4.65 [0.590]	1.659 [0.436]	3.16 [0.789]	8.32 [0.215]
Number of instruments		16	14		15	13		15	13		15	13
R-squared	0.1915			0.5059			0.3311			0.3745		
F-statistics	107.47			164.32			51.63			95.59		
Observations	506	755	543	506	755	543	506	755	543	506	755	543

Note: See note in Table 2.

Table 4. Impact of Chinese OFDI on EXSI of industries by technological categories: by groups.

	Resource-rich BRCs				Low-income BRCs		High-income BRCs			
	Resource-intensive industries				Labour-intensive industries		Capital and technology-intensive industries			
	Primary products		Resource-based manufactures		Low technology manufactures		Medium technology manufactures		High technology manufactures	
Variables	GMM (31)	GMM-IV (32)	GMM (33)	GMM-IV (34)	GMM (35)	GMM-IV (36)	GMM (37)	GMM-IV (38)	GMM (39)	GMM-IV (40)
Lag of Ln EXSI	0.8039***	0.6336***	0.7981**	1.1140**	0.6806***	0.6250***	0.7966***	0.4963*	0.6944***	0.3360***
	(0.1363)	(0.1570)	(0.3685)	(0.5089)	(0.1671)	(0.1080)	(0.0991)	(0.2554)	(0.1252)	(0.0949)
Ln OFDI_CHI	0.0339**	0.0002	−0.1158*	−0.0475**	−0.0505***	−0.0434**	−0.0016	−0.0120	−0.0525**	−0.0556*
	(0.0151)	(0.0094)	(0.0679)	(0.0215)	(0.0189)	(0.0184)	(0.0077)	(0.0175)	(0.0236)	(0.0286)
Ln OFDI_OTH	−0.0089	0.0726**	0.5169**	0.2583	0.0960**	0.1175*	0.0271*	0.0477	0.2307***	0.4662***
	(0.0156)	(0.0355)	(0.2589)	(0.2408)	(0.0387)	(0.0713)	(0.0143)	(0.0605)	(0.0847)	(0.0966)
Ln GDPPdiff	0.0090	−0.0115	−0.0426	−0.0368	0.0032	0.0124	0.0413	0.0817	−0.1414	−0.1392
	(0.0097)	(0.0206)	(0.0622)	(0.0460)	(0.0124)	(0.0274)	(0.0265)	(0.0686)	(0.1196)	(0.2130)
Ln DIST	0.1687*	−0.0285	−2.5160*	−1.6768	−0.2574**	−0.1139	0.0066	−0.4834**	0.0811	−0.5926
	(0.1015)	(0.1589)	(1.4750)	(1.3185)	(0.1303)	(0.1272)	(0.0373)	(0.2336)	(0.2806)	(0.5713)
Ln CLRdiff	−0.0097	−0.0127	−0.0139	−0.0177	0.0191	−0.0118	−0.0215	−0.1402***	0.1986	−0.5535***
	(0.0138)	(0.0183)	(0.0629)	(0.0841)	(0.0246)	(0.0347)	(0.0198)	(0.0261)	(0.1527)	(0.1351)
Ln MEANdiff	0.0130	0.0038	−0.1884	−0.1061	0.0364	−0.0227	−0.0350*	0.1962*	0.1244	1.0979***
	(0.0238)	(0.0296)	(0.2276)	(0.0909)	(0.0424)	(0.0240)	(0.0186)	(0.1188)	(0.1075)	(0.2598)
Ln POPdiff	−0.0500	0.5260	1.4071	0.4898**	0.0204	0.0506	−0.3001	1.9639	2.4037	−2.4029
	(0.4292)	(0.6313)	(3.5988)	(0.2441)	(0.0432)	(0.1038)	(0.2916)	(1.9398)	(1.6756)	(2.0136)
LEOR	0.0329	0.0582	−0.4733	−0.2886*	0.0937	0.0643	0.1663**	0.4064***	0.1068	0.1227
	(0.0566)	(0.0841)	(0.4849)	(0.1519)	(0.1034)	(0.1051)	(0.0747)	(0.1366)	(0.0999)	(0.1347)
COLO	0.1322	−0.0964	−3.2039	−2.2109						
	(0.1187)	(0.2139)	(2.2577)	(2.4942)						
Constant	−0.6461	−11.9730	−18.1495	−0.0834	−0.4379	−2.8231	4.9841	−38.8023	−57.7755	49.3182
	(8.6920)	(12.8684)	(78.2130)	(3.0673)	(1.5608)	(3.0717)	(6.5651)	(40.2922)	(37.7219)	(39.5375)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)	−3.23	−2.89	−1.53	−1.45	−1.81	−1.75	−1.34	−1.66	−1.83	−1.53
	[0.001]	[0.004]	[0.026]	[0.047]	[0.070]	[0.080]	[0.011]	[0.043]	[0.067]	[0.025]

(continued).

Table 4. Continued.

	Resource-rich BRCs				Low-income BRCs		High-income BRCs			
	Resource-intensive industries				Labour-intensive industries		Capital and technology-intensive industries			
	Primary products		Resource-based manufactures		Low technology manufactures		Medium technology manufactures		High technology manufactures	
Variables	GMM (31)	GMM-IV (32)	GMM (33)	GMM-IV (34)	GMM (35)	GMM-IV (36)	GMM (37)	GMM-IV (38)	GMM (39)	GMM-IV (40)
AR(2)	−1.52	−1.43	0.39	−0.75	0.16	0.38	0.35	0.05	−0.78	−0.87
	[0.128]	[0.154]	[0.697]	[0.450]	[0.874]	[0.703]	[0.728]	[0.957]	[0.433]	[0.386]
Hansen test	2.40	2.35	8.86	0.00	12.12	13.08	0.53	0.00	2.87	0.00
	[0.880]	[0.126]	[0.354]	[0.498]	[0.277]	[0.596]	[0.468]	[0.388]	[0.580]	[0.470]
Number of instruments	14	12	13	12	15	14	12	12	12	12
Observations	194	122	194	122	370	339	191	82	191	82

Note: See note in Table 2.

Table 5. Impact of Chinese OFDI on EXSIs of manufactured industries by degree of manufacturing: by groups.

	Resource-rich BRCs		Low-income BRCs		High-income BRCs			
	Resource-intensive industries		Labour-intensive industries		Capital and technology-intensive industries			
	Labour-intensive and resource-intensive manufactures		Low-skill and technology-intensive manufactures		Medium-skill and technology-intensive manufactures		High-skill and technology-intensive manufactures	
Variables	GMM (41)	GMM-IV (42)	GMM (43)	GMM-IV (44)	GMM (45)	GMM-IV (46)	GMM (47)	GMM-IV (48)
Lag of Ln EXSI	0.8357***	0.9354***	0.6411***	0.5306***	0.8471***	1.3924**	0.8741***	0.5764***
	(0.1187)	(0.0445)	(0.1489)	(0.2019)	(0.0580)	(0.6161)	(0.1675)	(0.2190)
Ln OFDI_CHI	−0.0224	0.0028	0.0135	−0.0300	0.0048	0.0055	−0.0287**	−0.0128***
	(0.0269)	(0.0142)	(0.0295)	(0.0402)	(0.0097)	(0.0179)	(0.0141)	(0.0021)
Ln OFDI_OTH	0.0413	0.0628***	0.0384	0.1652**	0.0165	−0.0711	0.0864*	0.2721***
	(0.0684)	(0.0211)	(0.0654)	(0.0840)	(0.0281)	(0.1155)	(0.0458)	(0.0845)
Ln GDPPdiff	−0.0897	−0.0439	−0.0402*	−0.0629	0.0496**	0.0458	−0.0535	−0.0037
	(0.1251)	(0.0305)	(0.0242)	(0.0598)	(0.0205)	(0.0590)	(0.0791)	(0.0857)
Ln DIST	−0.4705	−0.1669	0.1008	0.0179	0.1104	0.0358	−0.0848	0.3410
	(0.4051)	(0.3375)	(0.1551)	(0.1742)	(0.0854)	(0.3563)	(0.0801)	(0.2707)
Ln CLRdiff	0.0676**	0.0309**	−0.0373	−0.0248	−0.0031	−0.0511	0.0418	−0.3231**
	(0.0297)	(0.0126)	(0.0430)	(0.0303)	(0.0251)	(0.0727)	(0.0828)	(0.1573)
Ln MEANdiff	0.0603	−0.0093	−0.0654	−0.0401	−0.0352***	−0.1802	0.0205	0.2642
	(0.0569)	(0.0251)	(0.0543)	(0.0456)	(0.0131)	(0.1607)	(0.0821)	(0.2192)
Ln POPdiff	0.0901	0.4086	−0.1256**	−0.1220*	−0.5664	−1.1044**	1.6821*	−2.2280
	(0.9117)	(0.9422)	(0.0563)	(0.0631)	(0.4318)	(0.5241)	(0.9741)	(1.3972)
LEOR	−0.1381	−0.0294	0.0340	0.2443**	0.1796***	−0.2868	−0.0021	−0.0780
	(0.2628)	(0.0822)	(0.1078)	(0.1091)	(0.0596)	(0.4971)	(0.0595)	(0.0830)
COLO	−0.5901	−0.3235						
	(0.5207)	(0.4394)						
Constant	1.7046	−8.6575	1.5805	0.0750	10.3246	24.1619**	−35.8749*	41.5828
	(20.7109)	(20.8703)	(1.6967)	(1.1931)	(9.5130)	(10.3347)	(21.2392)	(28.3582)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(*continued*).

Table 5. Continued.

	Resource-rich BRCs		Low-income BRCs		High-income BRCs			
	Resource-intensive industries		Labour-intensive industries		Capital and technology-intensive industries			
	Labour-intensive and resource-intensive manufactures		Low-skill and technology-intensive manufactures		Medium-skill and technology-intensive manufactures		High-skill and technology-intensive manufactures	
Variables	GMM (41)	GMM-IV (42)	GMM (43)	GMM-IV (44)	GMM (45)	GMM-IV (46)	GMM (47)	GMM-IV (48)
AR(1)	−2.02	−2.09	−2.31	−1.96	−1.41	−1.04	−1.46	−1.40
	[0.044]	[0.037]	[0.021]	[0.051]	[0.059]	[0.027]	[0.043]	[0.061]
AR(2)	1.02	1.33	0.00	−0.39	1.20	1.13	0.35	0.40
	[0.307]	[0.185]	[1.000]	[0.696]	[0.232]	[0.257]	[0.724]	[0.688]
Hansen test	3.07	0.00	7.59	2.69	5.72	0.00	2.98	0.00
	[0.381]	[0.356]	[0.270]	[0.442]	[0.455]	[0.292]	[0.561]	[0.578]
Number of instruments	13	13	14	13	12	12	12	12
Observations	194	122	370	339	191	82	191	82

Note: See note in Table 2.

Table 6. Impact of Chinese OFDI on EXSIs of industries by technological categories: by period (GMM-IV).

	Total Commodities		Resource-intensive industries				Labour intensive industries		Capital and technology-intensive industries			
			Primary products		Resource-based manufactures		Low technology manufactures		Medium technology manufactures		High technology manufactures	
Variables	2006–2012 (49)	2013–2018 (50)	2006–2012 (51)	2013–2018 (52)	2006–2012 (53)	2013–2018 (54)	2006–2012 (55)	2013–2018 (56)	2006–2012 (57)	2013–2018 (58)	2006–2012 (59)	2013–2018 (60)
Lag of Ln EXSI	0.9668***	0.9969***	0.7699***	0.8404***	0.5532***	0.7999***	0.9755***	1.3134***	0.9303***	0.9468***	0.7109***	0.8758***
	(0.0303)	(0.0314)	(0.0740)	(0.0688)	(0.1846)	(0.1522)	(0.0332)	(0.3172)	(0.0644)	(0.3094)	(0.0948)	(0.0488)
Ln OFDI_CHI	−0.0242**	0.0134**	−0.0199*	0.0197*	−0.0685**	−0.0299	−0.0089	−0.1211*	−0.0615***	0.0446*	−0.0021	−0.0135
	(0.0120)	(0.0056)	(0.0115)	(0.0120)	(0.0321)	(0.0485)	(0.0190)	(0.0649)	(0.0235)	(0.0242)	(0.0561)	(0.0170)
Ln OFDI_OTH	0.0411**	0.0041	0.0446***	−0.0211	0.1473***	0.3558***	0.0359*	0.0538	0.1081***	−0.0297	0.1924**	0.0911**
	(0.0169)	(0.0118)	(0.0161)	(0.0188)	(0.0489)	(0.1062)	(0.0213)	(0.0631)	(0.0393)	(0.0988)	(0.0915)	(0.0373)
Ln GDPPdiff	−0.0008	−0.0174	−0.0366**	−0.0062	0.1758**	−0.0086	−0.0168	0.1437	−0.0155	0.0287*	0.0178	0.0516**
	(0.0092)	(0.0170)	(0.0162)	(0.0162)	(0.0725)	(0.0416)	(0.0259)	(0.1229)	(0.0228)	(0.0161)	(0.0869)	(0.0240)
Ln DIST	−0.0871	0.0428	−0.0631	0.1055*	−0.0759	−0.2264	−0.0259	0.2139	−0.2781*	1.1328**	−0.2194	−0.0004
	(0.0809)	(0.0608)	(0.0905)	(0.0584)	(0.9096)	(0.2866)	(0.1409)	(1.7612)	(0.1608)	(0.5379)	(0.3639)	(0.0991)
Ln CLRdiff	−0.0010	0.0153	0.0237*	−0.0083	−0.1175*	−0.0489	−0.0056	−0.0602	−0.0155	0.0257	−0.0376	−0.0409**
	(0.0141)	(0.0116)	(0.0138)	(0.0119)	(0.0658)	(0.0484)	(0.0510)	(0.1026)	(0.0235)	(0.0597)	(0.0808)	(0.0202)
Ln MEANdiff	0.0008	−0.0008	0.0104	−0.0141	−0.0721	0.1146	−0.0040	0.0372	0.0071	−0.1091**	0.0739	−0.0575**
	(0.0106)	(0.0164)	(0.0178)	(0.0189)	(0.0548)	(0.0795)	(0.0180)	(0.1267)	(0.0345)	(0.0540)	(0.1622)	(0.0229)
Ln POPdiff	0.0113	0.0067	0.0016	−0.0381**	−0.0656	0.1762**	0.0175	0.0787	0.0624	−0.1217**	0.0723	0.0516*
	(0.0106)	(0.0081)	(0.0177)	(0.0161)	(0.1698)	(0.0765)	(0.0262)	(0.1400)	(0.0415)	(0.0610)	(0.0897)	(0.0275)
LEOR	0.0114	0.0242	−0.0258	0.0100	0.2277	0.2335	−0.0204	−0.3564	−0.0057	−0.0808	0.1784	0.0760
	(0.0385)	(0.0230)	(0.0479)	(0.0325)	(0.1841)	(0.1726)	(0.0446)	(0.5117)	(0.0730)	(0.1274)	(0.1928)	(0.0728)
COLO	−0.1518	−0.0687	−0.1328	0.1067	−0.3994	−0.5204	−0.1621	2.6810	−0.5880	3.3158**	−0.9531*	−0.2843
	(0.1310)	(0.2494)	(0.3325)	(0.0989)	(4.4958)	(0.3287)	(0.2973)	(7.5369)	(0.5863)	(1.6874)	(0.5289)	(0.3303)
Constant	0.0491	−0.8809**	0.1338	0.3583	−2.2770	−10.1665**	−0.7714	−2.1967	−0.3221	−7.8821	−5.2655**	−3.4537**
	(0.6234)	(0.4479)	(0.6437)	(0.7253)	(4.9326)	(5.0445)	(1.1956)	(10.3531)	(1.0289)	(4.8233)	(2.1958)	(1.4436)

(*continued*).

Table 6. Continued.

Variables	Total Commodities		Resource-intensive industries				Labour intensive industries		Capital and technology-intensive industries			
			Primary products		Resource-based manufactures		Low technology manufactures		Medium technology manufactures		High technology manufactures	
	2006–2012 (49)	2013–2018 (50)	2006–2012 (51)	2013–2018 (52)	2006–2012 (53)	2013–2018 (54)	2006–2012 (55)	2013–2018 (56)	2006–2012 (57)	2013–2018 (58)	2006–2012 (59)	2013–2018 (60)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR(1)	−2.19	−2.39	−2.50	−2.32	−2.46	−1.35	−2.48	−2.24	−1.73	−1.75	−2.09	−1.39
	[0.029]	[0.017]	[0.013]	[0.020]	[0.014]	[0.078]	[0.013]	[0.025]	[0.083]	[0.081]	[0.036]	[0.064]
AR(2)	0.46	1.27	0.82	1.44	−1.08	0.55	1.50	0.49	−0.33	−0.40	1.19	1.14
	[0.643]	[0.202]	[0.412]	[0.149]	[0.278]	[0.585]	[0.133]	[0.622]	[0.744]	[0.693]	[0.233]	[0.253]
Hansen test	33.52	18.39	34.65	35.60	8.77	11.51	30.20	1.58	23.04	2.03	7.29	28.11
	[0.217]	[0.497]	[0.180]	[0.124]	[0.362]	[0.646]	[0.217]	[0.664]	[0.236]	[0.730]	[0.607]	[0.406]
Number of instruments	13	13	14	12	13	12	13	12	14	13	13	12
Observations	223	189	223	189	223	189	223	189	223	189	223	189

Note: See note in Table 2.

Table 7. Impact of Chinese OFDI on EXSI of manufactured industries by degree of manufacturing: by period (GMM-IV).

	Resource-intensive industries		Labour intensive industries		Capital and technology-intensive industries			
	Labour-intensive and resource-intensive manufactures		Low-skill and technology-intensive manufactures		Medium-skill and technology-intensive manufactures		High-skill and technology-intensive manufactures	
Variables	2006–2012 (61)	2013–2018 (62)	2006–2012 (63)	2013–2018 (64)	2006–2012 (65)	2013–2018 (66)	2006–2012 (67)	2013–2018 (68)
Lag of Ln EXSI	0.9682**	1.0351***	0.6758***	0.4681**	0.7296***	0.8069***	0.8227***	0.5753***
	(0.0743)	(0.0613)	(0.1807)	(0.2387)	(0.0696)	(0.1868)	(0.0865)	(0.1906)
Ln OFDI_CHI	0.0461*	−0.0250*	−0.2037***	−0.0129	−0.1020*	0.0853*	−0.0600*	0.0854*
	(0.0266)	(0.0130)	(0.0626)	(0.0446)	(0.0614)	(0.0438)	(0.0360)	(0.0515)
Ln OFDI_OTH	0.0044	0.0292**	0.3030***	0.1790*	0.2516***	−0.0065	0.1406***	0.1574*
	(0.0389)	(0.0134)	(0.0833)	(0.0968)	(0.0806)	(0.0678)	(0.0530)	(0.0954)
Ln GDPPdiff	0.0090	0.0145*	−0.0176	0.0737	−0.0165	−0.0038	0.0158	0.0588
	(0.0465)	(0.0086)	(0.0286)	(0.1026)	(0.0404)	(0.0473)	(0.0262)	(0.0379)
Ln DIST	0.4227	−0.0395	−0.9086**	0.1104	−0.7010*	1.9847**	−0.2634	0.3194
	(0.3589)	(0.0571)	(0.3733)	(0.3146)	(0.4028)	(0.8320)	(0.1953)	(0.2785)
Ln CLRdiff	−0.0574**	0.0217	−0.0207	−0.1335	−0.0295	0.0335	−0.0081	−0.0993**
	(0.0274)	(0.0210)	(0.0449)	(0.1434)	(0.0546)	(0.0431)	(0.0251)	(0.0457)
Ln MEANdiff	−0.0144	0.0184	0.0339	−0.0834	0.0474	−0.1558**	0.0019	−0.0562
	(0.0371)	(0.0182)	(0.0574)	(0.0643)	(0.0573)	(0.0777)	(0.0227)	(0.0725)
Ln POPdiff	−0.0512	0.0256	0.0029	−0.1476*	0.1300**	−0.2073**	0.0346	0.0709
	(0.0446)	(0.0278)	(0.0904)	(0.0767)	(0.0552)	(0.0896)	(0.0320)	(0.0556)
LEOR	0.0382	−0.0058	0.1368	0.2754*	0.2612*	−0.1260	0.0382	0.1170
	(0.1136)	(0.0573)	(0.1345)	(0.1569)	(0.1436)	(0.1190)	(0.0561)	(0.1293)
COLO	1.0058	0.0413	−1.4557***	−0.9181	−2.5998*	5.5800**	−0.6894**	−0.9395*
	(1.4751)	(0.1437)	(0.4395)	(0.5821)	(1.3634)	(2.6288)	(0.3197)	(0.5570)
Constant	−3.0874	−0.8376	4.5904*	−0.9523	−0.2272	−14.1307**	−0.5430	−8.5564**
	(2.2308)	(0.9325)	(2.5580)	(2.6060)	(2.6857)	(5.6939)	(1.6568)	(3.7755)
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(*continued*).

Table 7. Continued.

	Resource-intensive industries		Labour intensive industries		Capital and technology-intensive industries			
	Labour-intensive and resource-intensive manufactures		Low-skill and technology-intensive manufactures		Medium-skill and technology-intensive manufactures		High-skill and technology-intensive manufactures	
Variables	2006–2012 (61)	2013–2018 (62)	2006–2012 (63)	2013–2018 (64)	2006–2012 (65)	2013–2018 (66)	2006–2012 (67)	2013–2018 (68)
AR(1)	−2.61	−1.73	−1.63	−2.80	−0.88	−2.22	−2.81	−2.03
	[0.009]	[0.084]	[0.003]	[0.005]	[0.037]	[0.026]	[0.005]	[0.043]
AR(2)	1.21	−0.56	0.89	1.97	0.66	−0.96	−0.18	1.18
	[0.226]	[0.575]	[0.373]	[0.149]	[0.512]	[0.338]	[0.856]	[0.240]
Hansen test	9.22	21.00	21.27	8.82	22.32	0.10	26.72	6.01
	[0.161]	[0.102]	[0.168]	[0.454]	[0.269]	[0.392]	[0.268]	[0.198]
Number of instruments	14	13	14	13	14	13	13	13
Observations	223	189	223	189	223	189	223	189

Note: See note in Table 2.

GMM estimation has both an autocorrelation test and an overidentification test. The former generally refers to the first-order (AR(1)) and second-order (AR(2)) autocorrelation with the residual term by using the Arellano-Bond test. The null hypothesis is that there is no serial correlation for the explained variables. The latter is the overidentification test for the validity of instruments. The null hypothesis is that the instruments do not correlate with the residual and are jointly valid by employing the Hansen test.[7]

The estimations show that due to the lagged explained variable, the first-order autocorrelation is supposed to be significant, per the p-value of AR(1). Nevertheless, a second-order serial correlation does not exist, as seen from the p-value of AR(2). Meanwhile, the instrumental variables are valid, as revealed by the p-value of the Hansen test. In short, all the estimations pass the serial correlation test of the random disturbance term and Hansen test of overidentifying restrictions (Labra and Torrecillas 2018).

4.1. Full samples

Table 2 shows that Chinese OFDI flows into BRCs have positively influenced the EXSIs of total goods (columns (2) and (3)) and primary products (columns (5) and (6)) between China and BRCs. Namely, a percent increase in Chinese OFDI flows into the BRCs gives rise to 2.50 and 4.67 percent increases in the EXSIs of total goods and primary products, respectively.

The result shows that by bringing capital, managerial experience, technology, and indirect spillovers, China's MNCs improve the production and exports of total commodities and primary products, thus enhancing the EXSIs of these products between China and the BRCs. Furthermore, the rising investment in infrastructure and transportation facilities in BRCs is not only conducive to BRC local production but also beneficial for a more efficient transport of commodities to the global market. Hence, Chinese OFDI enhances BRC export competitiveness and strengthens the export competition of the commodities between China and BRCs.

In contrast, Chinese OFDI flows into BRCs have a negative and statistically significant effect on the EXSIs of resource-based manufactures (columns (8) and (9) of Table 2), low-technology manufactures (columns (11) and (12) of Table 3), medium-skill and technology-intensive manufactures (columns (26) and (27) of Table 3), and high-skill and technology-intensive manufactures (columns (29) and (30) of Table 3). Furthermore, the coefficient of high-skill and technology-intensive manufactures is the largest, suggesting that Chinese OFDI makes China and BRCs increasingly specialised and complementary in the export of resource-intensive commodities, low-technology manufactures, and medium- and high-skill and technology-intensive manufactures, which support the Hypotheses 1–4.

Since China is transforming from a labour-intensive exporter to a capital and technology-intensive exporter (Caporale, Sova, and Sova 2015), a large number of Chinese MNCs investing in BRC are market seekers and strategic asset seekers and hence enhance China's innovation and productivity through horizontal spillovers (Wang and Zhao 2008) and reverse spillovers (Li et al. 2016). Furthermore, the competition effect makes both China and BRCs possess and gain core technologies and thus specialise more in the supply of medium-/high-skill and technology-intensive manufactures to meet the diversified demands of the international market. For this reason, Chinese OFDI intensifies the potential of intraindustry trade of capital and technology-intensive manufactures between China and BRCs. In the meantime, Chinese MNCs potentially help BRCs exploit and process resource-based manufactures and help them market and transport resource-intensive products to China and other international markets, which is conducive to BRCs gradually specialising in resource-intensive production. Consequently, Chinese OFDI enhances the export complementarity and trade potential between China and BRCs.

Tables 2 and 3 show that non-Chinese OFDI has a positive and statistically significant influence on the EXSIs of most manufactures. Chinese OFDI in BRCs has achieved fast growth only in recent years, and thus, the majority of BRC IFDI is from developed economies that possess plenty of capital and advanced technologies. Therefore, non-Chinese OFDI may promote comparative advantages of BRCs and intensify the export competition between BRCs and China.

For the control variables, as expected, Table 2 demonstrates that the difference in income level shows a negative impact on the EXSIs of the high-technology manufactures and the labour-intensive and resource-intensive manufactures. The difference in human capital negatively affects the EXSI of primary products. The difference in population reveals a negative impact on the EXSIs of total commodities, primary products, and low-skill and technology-intensive commodities between China and the BRCs.

The distance between China and BRCs is negatively related to the EXSI of resource-based manufactures. In contrast, it plays an unexpected positive role in the EXSIs of total commodities and primary products between China and the BRCs, signifying that higher transportation costs are harmful to export complementarity and thus reduce the trade potential of primary products between China and the BRCs.

The difference of capital-labour ratio has a negative and significant impact on the EXSIs of low – and medium-technology manufactures but has a positive and significant influence on the EXSI of high-technology manufactures, signifying that the lower capital-labour ratio of the BRCs increase their specialisation in the low- and medium-technology manufactures but reduce their specialisation in high-technology manufactures.

The common legal origin has enhanced the EXSIs of most industries. However, it has lowered the EXSI of primary products, indicating that the common legal origin facilitates China's import of primary products from the BRCs and hence enhances BRC specialisation in primary products.

The historical colonial relationship positively influences the EXSIs of total products and primary products while negatively affecting the EXSIs of most industries. Primary products are the principal trading commodities in history, and a historical colonial relationship generates a long-lasting cultural effect on the production structure. At the same time, the historical colonial relationship boosts the export complementarity and trade potential of most industries between China and the BRCs.

4.2. By group

As discussed in section 2, to further explain the impact of Chinese OFDI on the EXSI between China and BRCs, this study classifies all BRCs into three groups based on the resource endowments and levels of economic development. The first group includes the natural resource BRCs. If the natural resource rents are higher than the average value for all BRCs over the period of 2003–2018, the country is classified as a natural resource-intensive BRC. The second group includes the low-income BRCs, whose GDP per capita is lower than the average GDP per capita (constant 2010 US$) of all BRCs from

2003 to 2018 (excluding natural resource-intensive BRCs). The third group includes the high-income BRCs, including those countries whose income level is greater than the average income level (constant US$2010) of all BRCs from 2003 to 2018 (excluding natural resource-intensive BRCs) (see Appendix 1). The empirical results on the three BRC groups are shown in Tables 4 and 5.

In addition, based on the OIL paradigm of FDI, FDI tends to flow into host countries' sectors with comparative advantage, thus affecting the export similarity between home and host countries. Resource-rich BRCs have a strong comparative advantage in primary products (e.g. agricultural products, energy, mineral products) and resource-based manufactures. Low-income BRCs have relatively low-cost labour forces and hence have a great comparative advantage in low-skill and technology-intensive manufactures. High-income BRCs are rich in capital (both physical and human capital) and technology and hence possess high comparative advantage in medium and high-skill and technology-intensive manufactures. Accordingly, Tables B2 and B3 display each country group and its main industries and more specific commodity classifications we investigated in this study.

The estimations show that Chinese OFDI has a negative and statistically significant effect on the EXSIs of resource-based manufactures (columns (33) and (34) of Table 4) between China and resource-rich BRCs, low-technology manufactures (columns (35) and (36) of Table 4) between China and low-income BRCs, and high-technology manufactures/high-skill and technology-intensive manufactures (columns (39), (40), (47), and (48)) between China and high-income BRCs.

The explanation for these findings is that China takes advantage of excess production capacity to build massive transportation and infrastructure to connect BRCs with China as well as the world, which can not only assist resource-rich BRCs in developing and processing their resource-based products efficiently but also help transport these commodities to the global market. Furthermore, by bringing capital, technology, and spillovers, China's MNCs have escalated the production capacity of resource-rich BRCs. At the same time, as the largest consumption market, China is inclined to expand its import of resource-intensive manufactures from resource-rich BRCs. Accordingly, Chinese OFDI stimulates the vertical specialisation of resource-based manufactures between China and natural resource BRCs and thereby intensifies the complementarity and potential of interindustry trade between China and resource-rich BRCs. Therefore, we can verify the second hypothesis that Chinese OFDI has reduced the EXSIs of resource-intensive products between China and resource-intensive BRCs.

For low-income BRCs, as China is transitioning from being a labour-intensive exporter to a capital- and technology-intensive exporter, it is gradually relocating the labour-intensive segments to low-labour-cost BRCs through its vertical OFDI. On the other hand, China maintains R&D and core technologies in head offices and devotes more resources to elevating its innovative capacity and achieving export upgrading. Consequently, Chinese MNCs foster vertical specialisation in international trade between China and low-income BRCs and hence enlarge export specialisation in labour-intensive manufactures in low-income BRCs. At the same time, China enhances the import of products from low-labour-cost BRCs. As a result, FDI from China flows into low-income BRCs have deepened vertical specialisation and intensified the complementarity and potential of interindustry trade between China and low-income BRCs. The third hypothesis has been confirmed.

Chinese OFDI flows into high-income BRCs are prone to market-seeking OFDI and strategic asset-seeking OFDI. On the one hand, Chinese market-seeking OFDI is supposed to generate horizontal spillovers in high-income BRCs; therefore, competition spillovers make China and high-income BRCs possess more core technologies and accelerate innovations in high-technology manufactures, such as electronics and electrical manufactures. On the other hand, Chinese strategic asset-seeking MNCs in developed BRCs are projected to generate reverse knowledge spillovers in China and thereby acquire more distinctive ownership advantages of commodities such as electronics and electrical manufactures and foster the export upgrading of China (Li et al. 2016). Consequently, Chinese MNCs promote the export specialisation of capital and technology-intensive manufactures of China and high-income BRCs, enhancing the potential of intra-industry trade between them, which conforms with the law of the process of EU integration (Finger and Kreinin 1979). As a result, the fourth hypothesis that Chinese OFDI has decreased the EXSIs of capital and technology-intensive manufactures between China and advanced BRCs is supported.

The non-Chinese OFDI has a positive effect on the EXSIs of most sectors, which is generally in line with the full sample estimations. For the other control variables, distance has an expected negative effect on the EXSI of medium-technology manufactures. The difference in human capital has raised the EXSIs of medium – and high-technology-intensive manufactures between China and high-income BRCs, indicating that the lower human capital level of China diminishes its specialisation in capital and technology manufactures.

The difference in the capital-labour ratio shows a negative impact on the EXSIs of capital and technology manufactures. However, it reveals a positive effect on the EXSI of labour-intensive and resource-intensive manufactures between China and resource-rich BRCs. Since China specialises more in labour-intensive and resource-intensive goods than resource-rich BRCs, the increasing capital-labour ratio of China reduces its specialisation in labour-intensive and resource-intensive goods but improves its capital and technology-intensive production, enhancing the EXSI of labour-intensive and resource-intensive manufactures between China and resource-rich BRCs.

As expected, the difference in population negatively links to the EXSIs of low-skill and technology-intensive manufactures between China and low-income BRCs and medium-skill and technology-intensive manufactures between China and high-income BRCs. However, it positively relates to the EXSI of resource-based manufactures between China and resource-rich BRCs. One possible explanation is that the increasing population in China is conducive to the scale of economies and thus intensifies the export competition of resource-based manufactures between China and resource-rich BRCs.

The common legal origin can stimulate the EXSIs of medium-technology manufactures and low-skill and technology-intensive manufactures. Conversely, it decreases the EXSI of resource-based manufactures between China and resource-rich BRCs. Similarly, the colonial relationship also negatively affects the EXSI of resource-based manufactures between China and resource-rich BRCs, suggesting that the cultural relationship boosts the export specialisation, export complementarity, and trade potential of resource-based manufactures between China and resource-rich BRCs.

4.3. By period

Since the BRI was launched in 2013, Chinese OFDI flows into BRCs have increased dramatically (Figure 1). Does Chinese OFDI affect the EXSI of BRCs differently before and after the BRI? To answer this question, this study divides the panel data into two time periods, i.e. 2006[8]–2012 and 2013–2018.

Chinese OFDI has a negative and statistically significant effect on total commodities (column (49) of Table 6), primary products (column (51) of Table 6), medium-technology manufactures (columns (57) of Table 6), medium-skill and technology-intensive manufactures (column (65) of Table 7), and high-skill and technology-intensive manufactures (column (67) of Table 7) over the period from 2006 to 2012. However, the impact becomes positive during the period between 2013 and 2018, implying that after the launch of the BRI, the increasing Chinese OFDI flows into the BRCs contributed to the export upgrading of the BRCs, which certify our fifth hypothesis.

In contrast, Chinese OFDI positively links to the EXSI of labour-intensive and resource-intensive manufactures in the 2006–2012 period, but the effect is negative in the 2013–2018 period (columns (61) and (62) of Table 7). In addition, it has no significant influence on the EXSI of low-technology manufactures in 2006–2012, but the effect is negative and statistically significant in 2013–2018 (column (56) of Table 6). The results suggest that since the proposal of the BRI, Chinese OFDI has played a crucial role in fostering BRC specialisation in resource-intensive manufactures and labour-intensive manufactures and thus has improved exports complementary to the sectors between China and BRCs.

Non-Chinese OFDI, on average, has positively affected the EXSIs of most sectors, as shown in Tables 6 and 7. Among the control variables, the difference in income levels has a negative impact on the EXSI of primary products in 2006–2012. However, it has a positive impact on the EXSIs of resource-based manufactures in 2006–2012, labour-intensive and resource-intensive manufactures in 2013–2018, and medium- and high-technology manufactures in 2013–2018. The possible reason is that after the launch of the BRI, the faster economic development in China became beneficial for the BRCs in terms of improving their export competitiveness for resource-intensive manufactures and the capital and technology-intensive manufactures compared to China.

Distance negatively influences the EXSIs of medium-technology manufactures, low-skill and technology-intensive manufactures, and medium-skill and technology-intensive manufactures in the 2006–2012 period but positively influences the EXSIs of primary products, medium-technology manufactures, and medium-skill and technology-intensive manufactures over the 2013–2018 period. The main explanation is that the implementation of the BRI improves the geographic connectivity and technology cooperation between China and the BRCs, which enhances BRC specialisation in medium-skill and technology-intensive manufactures.

The difference in the capital-labour ratio positively influences the EXSI of primary products while negatively affecting the EXSIs of resource-based manufactures in 2006–2012, but the effects are insignificant in 2013–2018. In contrast, although the difference in the capital-labour ratio has no significant influence on the EXSIs of the high-skill and technology-intensive manufactures in 2006–2012, the effect is negative and statistically significant in 2013–2018. The reason may be that after the BRI was proposed, the increasing capital-labour ratio in the BRCs significantly improves the specialisation in high-technology manufactures between China and the BRCs.

The difference in human capital stock has a negative effect on the EXSIs of medium-technology manufactures, high-technology manufactures, and medium-skill and technology-intensive manufactures in 2013–2018.

The difference in population has a positive influence on the EXSI of the medium-skill and technology-intensive manufactures in 2006–2012, but the impact becomes negative in 2013–2018, indicating that since the rise of the BRI, having a larger population has played an important role in fostering the divisions of labour and shaping the specialisation of medium-skill and technology intensive manufactures between China and the BRCs.

A common legal origin positively affects the EXSIs of medium-skill and technology-intensive manufactures in 2006–2012 and low-skill and technology-intensive manufactures in 2013–2018. A colonial relationship has a negative impact on the EXSI of medium-skill and technology-intensive manufactures in the period of 2006–2012, but the influence becomes positive over the period of 2013–2018, signifying that since the rise of the BRI, the cultural relationship improves BRC export competitiveness and thus intensifies the BRC export competition of medium-technology manufactures with China.

5. Conclusion

This present study sets out to investigate the impact of Chinese OFDI on the export similarity between China and the BRCs. In addition, it compares the impacts of different BRC groups before and after the proposal of the BRI.

First, the empirical analysis of the full sample reveals that OFDI from China has a positive impact on the EXSI of primary products, implying that by bringing capital, management experience, technology, and spillovers, OFDI from China stimulates BRC comparative advantages and thus strengthens the export competition of total commodities and primary products between China and BRCs in their supply for the global market.

Second, the estimations of the full sample demonstrate that Chinese OFDI makes China and BRCs increasingly specialised and complementary in the production of resource-intensive commodities, low-technology manufactures, and medium- and high-skill and technology-intensive manufactures between China and BRCs.

Third, the estimations of BRC subgroups show that Chinese OFDI flows into resource-rich BRCs and low-income BRCs appear to be vertical. For resource-rich BRCs, Chinese OFDI brings capital, technology, and spillovers to help resource-rich BRCs exploit, process, and market resource-based manufactures. For low-income BRCs, since China is transforming from a labour-intensive producer to a capital- and technology-intensive producer, it gradually locates labour-intensive segments to low-labour-cost BRCs through vertical MNCs. By promoting capital accumulation, employment, management experience, technology, and vertical spillover, Chinese efficiency seekers boost the specialisation of labour-intensive manufactures in low-income BRCs. In addition, China takes advantage of the excess production capacity to improve the infrastructures and transportation facilities of the BRCs, which contribute to the transport of these products to China and other international markets. As a result, Chinese OFDI enhances export complementarity and the potential for interindustry trade between China and resource-rich and low-income BRCs.

For high-income BRCs, Chinese OFDI flows into advanced BRCs appears to be market seekers and strategic-asset seekers. First, to satisfy the varying demands of the BRCs and other global markets, the horizontal competition spillovers caused by Chinese MNCs make China and the high-income BRCs keep and gain more ownership advantages (e.g. core technology) of capital and technology-intensive manufactures. In addition, the reverse spillovers of MNCs from China have fostered China's innovations in high-technology products, such as those of electronic and electrical manufactures. Therefore, China and high-income BRCs are inclined to gradually specialise in high-skilled and technology-intensive manufactures, thus enhancing the potential of intraindustry trade between China and high-income BRCs.

Fourth, after the BRI was launched, Chinese OFDI not only fosters the specialisations and export complementarity of the resource-intensive manufactures and the labour-intensive manufactures between China and the BRCs but also promotes BRC export upgrading.

To conclude, the estimations are generally consistent with the hypotheses. Concretely, China is supposed to escalate its OFDI in natural-resource and low-income BRCs to exploit BRC resource endowments and comparative advantages, thus stimulating BRC potential comparative advantages and intensifying trade complementarity between China and BRCs. Furthermore, Chinese OFDI helps both China and high-income BRCs foster innovations and specialisations in high-technology manufactures and therefore boosts the potential of intraindustry trade between China and high-income BRCs and strengthens their specialisation in the supplies for the global market. In sum, Chinese OFDI helps China and BRCs deepen vertical and horizontal integration into global value chains and benefits BRC export expansion, export upgrading, and economic development.

Notes

1. Retrieved from the Belt and Road Chinese Government Portal, downloaded from https://eng.yidaiyilu.gov.cn/index.htm
2. The original BRI encompass 64 economies (excluding China) among the Belt and Road countries (BRCs) (OECD 2018).
3. *Statistical Bulletin of China's Outward Foreign Direct Investment,* Ministry of Commerce of the People's Republic of China, downloaded as a bulletin from China's Ministry of Commerce website: http://hzs.mofcom.gov.cn/article/date/201512/20151201223578.shtml
4. China has fourteen land-based neighbours: North Korea, Russia, Mongolia, Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan, India, Bhutan, Nepal, Myanmar, Laos, and Vietnam. It also has six maritime-based neighbours: Japan, the Philippines, South Korea, Malaysia, Indonesia, and Brunei.
5. The two-step system GMM estimator is more asymptotically efficient; thus, it is preferred to the one-step system GMM estimators and even to various GMM estimators (Renuka and Sun, 2020; Roodman 2009).
6. There are some lacking data in the sample; therefore, the sample used in the regression is an unbalanced panel dataset.
7. The Hansen test is also employed in the 2SLS test.
8. As evidenced from Figure 1, Chinese OFDI flows into the BRCs rose significantly after 2006.

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Appendix 1

Group of resource-rich BRCs (18 countries): Kuwait, Iraq, Timor-Leste, Saudi Arabia, Turkmenistan, Oman, Qatar, Azerbaijan, Mongolia, Brunei Darussalam, Iran, Islamic Rep., Syrian Arab Republic, Kazakhstan, Uzbekistan, Yemen, Rep., United Arab Emirates, Russian Federation, Lao PDR.

Group of low-income BRCs (33 countries):

Malaysia, Romania, Maldives, Bulgaria, Montenegro, Lebanon, Serbia, Belarus, Thailand, Bosnia and Herzegovina, North Macedonia, Albania, Jordan, Georgia, Armenia, Indonesia, Ukraine, Sri Lanka, Moldova, Egypt, Arab Rep., West Bank and Gaza, Philippines, Bhutan, India, Vietnam, Pakistan, Myanmar, Kyrgyz Republic, Cambodia, Bangladesh, Tajikistan, Nepal, Afghanistan.

Group of high-income BRCs (13 countries):

Singapore, Israel, Slovenia, Bahrain, Czech Republic, Slovak Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Poland, Turkey.

Appendix B1 Industries by technological categories: by groups.

Resource-rich BRCs	Resource-intensive industries	Primary products Resource-based manufactures
Low-income BRCs	Labour-intensive industries	Low technology manufactures
High-income BRCs	Capital and technology-intensive industries	Medium technology manufactures High technology manufactures

Appendix B2 Industries by degree of manufacturing: by groups.

Resource-rich BRCs	Resource-intensive industries	Labour-intensive and resource-intensive manufactures
Low-income BRCs	Labour-intensive industries	Low-skill and technology-intensive manufactures
High-income BRCs	Capital and technology-intensive industries	Medium-skill and technology-intensive manufactures High-skill and technology-intensive manufactures