Research Article

Contribution of China’s OFDI to Economic Growth of Developed Host Countries and Its Mechanism

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Previous studies have shown that pathwise outward foreign direct investment can promote the long-term economic growth of developed economies and some developing countries with sufficient technology, human capital, and financial efficiency. However, the contribution of inverse outward foreign direct investment from developing countries, especially China, on the economic growth of developed economies has not yet been demonstrated. Based on the endogenous growth theory, this article uses panel data of China’s inverse outward foreign direct investment and economic growth indicators of 26 Organization for Economic Co-operation and Development countries from 2003 to 2017 to empirically study the contribution of China’s inverse outward foreign direct investment to the economic growth of developed economies and its mechanism, and furthermore to study the mediation effect of research and development capital and technological advances in the contribution. The empirical results show that China’s inverse outward foreign direct investment has a significant contribution to the economic growth of developed host countries, with a contribution rate of 3.01%. The contribution rate of the mediating effect is 24.3% when only considering technological advances and 54.34% when considering the multiple mediators of research and development capital and technological advances.

1. Introduction

The large-scale outward foreign direct investment (OFDI) started among the developed countries after World War II. The phenomenon that these OFDIs promote the rapid recovery of the European economy has gradually attracted the attention of many scholars. Some scholars’ research studies [1, 2] concluded that there is a significant positive correlation between OFDI from developed countries and the economic growth of developed host countries, and the conclusion was widely recognized. Subsequently, investments from developed countries promoted the development of emerging market countries, which changed the research focus from the influence of OFDI on developed countries to developing countries. Many scholars’ studies have concluded that OFDI from developed countries promotes the economic growth of developing host countries when they have sufficient absorption capacity of advanced technology [3–5]. With the continuous development of economy and technology in developing countries, enterprises in these countries, especially in China, have begun to integrate into the world economy through OFDI. According to data from the World Investment Report 2019, China’s OFDI in 2018 was US $129.83 billion, which was much lower than US $196.149 billion in 2016, but it was still ranked second in the world after Japan (the United States repatriated a lot of investment profits in 2018, and the net OFDI was negative). China’s OFDI has promoted the economic growth of the host country and achieved a win-win situation. Moreover, COVID-19 has had a comprehensive impact on countries around the world, especially on the environment [6] and economic growth. China’s experience of economic recovery after COVID-19 [7] will improve the contribution of China’s OFDI to the economic growth of host countries. In addition, according to the statistical bulletin of China’s outward foreign direct investment in 2018, except the British Virgin Islands, the Cayman Islands, Indonesia, Malaysia, Laos, Vietnam, and Cambodia, the rest of China’s top 20 destinations of OFDI in 2018 are all developed economies. It means that Chinese enterprises without technological advantages have made a large number of reverse
OFDI on those developed host countries with advanced technology. Generally, international investment mainly flows from regions with relatively advanced technology to regions with relatively backward technology. China’s massive investment in developed countries is contrary to the past experience of international investment. The rapid development of China’s OFDI has initiated a lot of related research studies. However, the focus of these research studies was on the inverse effects, size, location, and influencing factors of China’s OFDI. Little research was carried out on the impact of China’s OFDI on the economic growth of developed host countries. The win-win effect of China’s reverse investment in developed countries has not been taken seriously in academic research. The lack of such research led to the misunderstanding that China’s OFDI only brought a lot of resources and technologies to China, while it was unprofitable to developed countries. Thus, many of China’s OFDI to developed host countries, which could have been a win-win situation, were blocked. Therefore, it is of great theoretical and practical significance to study the contribution of China’s OFDI to the economic growth of developed host countries and its mechanism.

The rest of this study is organized as follows. Section 2 presents the review of the literature. Mechanism analysis and hypothesis presentation are presented in section 3. Section 4 presents the empirical model setting and data processing. Empirical results and analysis are presented in section 5. Section 6 presents the conclusions.

2. Review of the Literature

Most studies on the relationship between OFDI and the host country’s economic growth are based on the neoclassical growth theory [8–11] and the endogenous growth theory [12–14]. According to the neoclassical growth theory proposed by Solow, long-term economic growth can only come from exogenous technological advances and labor growth. Under the framework of this theory, OFDI, as the external source of capital accumulation of the host country, can increase the total output and the local investment of the host country. However, due to the continuous decline of the capital return rate, OFDI will only affect the short-term economic growth and cannot promote the long-term potential economic growth of the host country [15–17]. Lucas [13] and Romer [18], as representative figures of the endogenous growth theory, put forward and proved that technological advances and human capital are endogenous, and long-term economic growth is feasible, which makes up for the defects of the neoclassical growth theory, which cannot explain the long-term economic growth in reality. Therefore, OFDI, as a complex of capital stock, knowledge, and technology, can, on the one hand, improve the technical level of host country through the introduction of new technologies and new knowledge, and then promote the long-term economic growth of host country; on the other hand, it can also improve the technical level of host country through the spillover effect of technology and knowledge’s externality [12], and then promote the long-term economic growth of host country. In addition, the home country saves a lot of production resources and can develop more new technologies. After the host country absorbs advanced technologies, the production rate will be improved. The OFDI can benefit both the home country and the host country. The endogenous growth theory can better explain the real economic phenomenon than the neoclassical growth theory, so a lot of scholars adopted it to study the relationship between OFDI and the economic growth of host country.

Although there is a consensus in theory that OFDI can promote the economic growth of host country, the results of empirical studies are not uniform. Some studies believe that there is a positive correlation between OFDI and the economic growth of host country, some studies believe that this relationship is not significant, while some studies believe that OFDI may hinder host country’s economic growth.

In the empirical study of the relationship between OFDI from developed countries and the economic growth of developed host countries, scholars have come to the same conclusion that OFDI between developed countries has a significant positive effect on the economic growth of developed host countries. This positive effect has been confirmed in many studies such as the study of Caves [1] on Canadian and Australian manufacturing, the study of Glauberman [2] on Canadian manufacturing, the study of Barry and Bradley [19] on Ireland, the study of Liu, Siler, Wang, and Wei [20] on Britain, the study of Li and Liu [21] on 21 developed countries, the study of Schneider [22] on 19 developed countries, and the study of Keller and Yeaple [23] on American manufacturing enterprises.

In the empirical study of the relationship between OFDI from developed countries and the economic growth of developing host countries, scholars have come to different conclusions, both positive and negative.

A large number of empirical studies have come to the conclusion that OFDI from developed countries has a positive impact on the economic growth of host developing countries, but the conditions and mechanisms for OFDI to promote the economic growth in developing host countries are quite different. Some studies show that OFDI can promote the economic growth of high-income developing host countries, while it has no positive effect on the economic growth of low-income developing host countries [3]. Some studies show that OFDI can promote the economic growth of export-oriented developing host countries more than that of developing host countries that substitute for imports [4]. Some studies show that there was a threshold of human capital stock for OFDI to promote the economic growth of developing host countries, and only developing host countries with the ability to absorb advanced technology can promote economic growth by absorbing FDI [5]. Some studies show that the more developed the financial markets of developing host countries, the more they can promote economic growth through the technology diffusion effect of absorbed FDI [24, 25]. Some studies show that developing host countries can promote economic growth through the convergence effect of absorbed FDI after meeting the minimum threshold [26]. Some studies show that in addition to financial development, government size,
inflation, education level, and foreign aid will also have an impact on the economic growth effect of absorbed FDI of developing host countries.

Some empirical studies have come to the conclusion that OFDI from developed countries has no positive impact on the economic growth of host developing countries. Alschuler [27] and Bornschier et al. [28] found that OFDI would reduce the long-term economic growth of developing host countries based on the theory of foreign capital dependence. O’Hearn [29] pointed out that the crowding-out effect would lead to the negative impact of OFDI on the long-term economic growth of developing host countries. At the microlevel of research, Aitken and Harrison [30] found that OFDI did not produce a spillover effect or promote the economic growth of developing host countries by studying Venezuelan company data. Hanson [31] further found that the more FDI a region absorbs, the lower the productivity growth of local enterprises; thus, OFDI will hinder the economic growth of developing host countries instead of promoting it. Charkovic and Levine [32] pointed out that many studies concluded that OFDI promoted the economic growth of developing host countries due to the use of macrodata rather than microdata. By revising the data of Blomstrom, Lipsey, and Zejan [3] and improving the research methods, they concluded that OFDI did not promote the economic growth of developing host countries.

While China became one of the best countries that use absorbed FDI to promote the long-term economic growth, a large number of studies on the relationship between OFDI from developed countries and China’s economic growth have emerged and drawn positive correlation conclusions [33–35]. On the other hand, with the development of the Chinese economy, more and more Chinese companies began to integrate into the global production chain and accelerate foreign direct investment, which has a great impact on the world economy. However, scholars’ research studies on China’s OFDI focus on its influences to China itself, such as the reverse technology spillover effect of China’s OFDI and its influencing factors [36, 37] and the scale, and the location of China’s OFDI and its influencing factors [38]. There are only few research studies on the relationship between China’s OFDI and the economic growth of developing host countries [39, 40], and there is no research on the relationship between China’s OFDI and the economic growth of developed host countries. This is not in line with the reality of China’s massive investment in developed countries.

This paper argues that OFDI, as a complex of capital stock, knowledge, and technology, will have a great impact on the economic growth of host country whether the home country and host country are developing countries or developed countries. The purpose of this paper is to explore whether the impact is significant, positive, or negative, and its mechanism. Based on the endogenous growth theory, this paper empirically studies the contribution of China’s OFDI to the economic growth of developed host countries and its mechanism using panel data of China’s OFDI to 26 Organization for Economic Co-operation and Development (OECD) countries from 2003 to 2017 and the impact indicators of the economic growth of each sample country, and further studies the mediating effect of research and development (R&D) capital and technological advances in the contribution.

This paper may have the following two marginal contributions: first, taking China’s inverse OFDI as the object, this paper studies the relationship between OFDI from developing countries and the economic growth of developed host countries, enriching existing research on the relationship between OFDI and the economic growth of host countries based on the premise of inverse OFDI. Second, the mediating effects of R&D capital and technological advances in the relationship between OFDI and the economic growth of developed host countries are studied.

3. Mechanism Analysis and Hypothesis Presentation

The endogenous growth theory holds that an economy can achieve long-term growth because technological advances and human capital are endogenous. The technological advances of a country are affected by the accumulation of material capital, human capital, and the spillover effect of technology introduction [12, 18], while the human capital of a country is affected by education and learning by doing [13]. Many empirical studies based on the endogenous growth theory found that the economic growth effect of OFDI through technology diffusion is limited by some thresholds, including technology threshold, human capital threshold, financial threshold, and institutional efficiency threshold. Therefore, developed countries and some developing countries, with sufficient technology, human capital, financial depth, and institutional efficiency, can digest and absorb the advanced technology and knowledge brought by other countries’ OFDI, and improve their own technical level, so as to achieve long-term economic growth. Due to the defects of technology, human capital, financial depth, and institutional efficiency, some developing countries cannot absorb the advanced technology and knowledge brought by other countries’ OFDI, and their own technical level cannot be improved, so they cannot get the long-term growth effect of OFDI. Existing studies have shown that OFDI can promote the economic growth of host countries on the premise that OFDI is a pathwise OFDI that can bring advanced technology. Then, can China’s inverse OFDI without absolute technological advantage promote the long-term economic growth of developed host countries?

Learning from the theory of comparative advantage in international trade, this paper holds that China’s OFDI also has a comparative advantage in developed host countries. China’s investment in developed economies is mainly in manufacturing and related R&D in the middle- and low-end fields. These investments can enable China and developed host countries to focus on their own fields of comparative advantage, that is, China develops mid- and low-end technologies and products, while developed countries focus on high-end and leading technologies and products. In this way, both sides can benefit from their respective comparative advantages. It will also have a positive impact on the
global economy. Both Haier’s early investment and Fuyao’s recent investment in the United States are successful win-win cases. These investments show that China’s OFDI plays a positive role in promoting the economic growth of developed countries and China itself. Therefore, similar to the trade based on comparative advantage, China’s OFDI with comparative advantage contributes to the economic growth of the home country and the developed host country. On the basis of the above analysis, this paper presents the following assumption.

**Hypothesis 1.** China’s OFDI contributes to the economic growth of developed host countries.

Capital, labor, and technology are considered to be the most important factors affecting a country’s economic growth. The growth of capital and labor input growth of developed economies has entered a bottleneck period, and the main contribution to their economic growth comes from technological advances. China’s OFDI can contribute to the economic growth of developed host countries by promoting their technological advances. There are no countries that can keep ahead in all fields because of the complexity of modern science and technology. China’s enterprises investing in developed host countries also have their own technological characteristics. Although their technologies are not leading technologies, they can also enrich the accumulation of technology and knowledge in developed economies, which is conducive to the long-term technological advances of developed economies. In addition, China’s companies investing in developed host countries have to keep learning and catching up to survive in the local area, which will produce a competitive effect and promote the technological advances of domestic companies in developed economies. Therefore, China’s OFDI can promote the technological advances of developed host countries and then promote their economic growth. There is a mediating effect on economic growth by promoting technological advances. On the basis of the above analysis, this paper presents the following assumption.

**Hypothesis 2.** China’s OFDI can contribute to the economic growth of developed host countries through the mediating effect of technological advances.

Technological advances mainly come from the growth of R&D capital. By increasing R&D capital of developed host countries, China’s OFDI can also promote their technological advances and promote their economic growth. First of all, OFDI itself represents the inflow of capital to host country and can directly increase the capital stock of host country. China’s OFDI stock in developed economies is rapidly growing. At the end of 2017, the stock of China’s OFDI in the United States was $59,992 billion, accounting for 0.35% of its gross domestic product (GDP); the stock of China’s OFDI in Australia was $32,208 billion, accounting for 2.33% of its GDP; and the stock of China’s OFDI in the United Kingdom was $18,09 billion, accounting for 0.64% of its GDP. According to the endogenous growth theory, the increase in capital is conducive to the promotion of R&D capital in the host country, and part of China’s OFDI directly forms the investment in R&D capital. Second, most of China’s OFDI went to the fields with comparative advantages, focusing on application manufacturing. In this way, developed host countries can concentrate their capital to the fields and links with higher added value, such as R&D of new technologies, new products, design, and brand marketing. Therefore, China’s OFDI can gradually transfer the manufacturing capital of developed host countries to R&D capital, thus increasing the R&D capital of developed host countries. In summary, China’s OFDI can continuously increase the R&D capital of developed host countries, and the increase in R&D capital will inevitably bring about technological advances and thus promote economic growth. Therefore, there is a double-layer mediating effect to affect economic growth through increasing R&D capital and promoting technological advances. On the basis of the above analysis, this paper presents the following assumptions.

**Hypothesis 3.** China’s OFDI can contribute to the economic growth of developed host countries through the double-layer mediating effect of R&D capital and technological advances.

In conclusion, this paper argues that China’s OFDI has contributed to the economic growth of developed host countries through the mediating effect of technological advances and the double-layer mediating effect of R&D capital and technological advances. In addition, China’s OFDI can directly increase employment and indirectly increase human capital through its impact on capital and technology, which can produce a continuous impetus on the long-term economic growth of developed economies.

### 4. Empirical Model Setting and Data Processing

#### 4.1. Setting of Empirical Models

The core explanatory variables most commonly used in economic growth research include capital, labor, and human capital. Whether these inputs can play a role is also limited by government efficiency. Therefore, based on the model of Yao [35], the benchmark research model of this paper is established as follows:

\[
\ln P_{GDPIt} = a_0 + a_1 OFDI_{it} + a_2 \ln KS_{it} + a_3 \ln L_{it}
+ a_4 \ln H_{it} + a_5 \ln GE_{it} + \epsilon_{it} \quad \text{(ModelA)}.
\]

In model A, \( i \) stands for the host country, \( t \) stands for the year, \( P_{GDPIt} \) stands for GDP per capita of host country, \( OFDI_{it} \) stands for the proportion of China’s OFDI to host country’s GDP, \( KS_{it} \) stands for the ratio of host country’s capital stock to its GDP, \( L_{it} \) stands for the number of labor of host country, \( H_{it} \) stands for human capital of host country, \( GE_{it} \) stands for government efficiency of host country, \( a_0 \) stands for a constant term, and \( \epsilon_{it} \) stands for a random error term.

As mentioned above, the contribution of China’s OFDI to the economic growth of developed host countries has the mediating effect of technological advances and the double-layer mediating effect of R&D capital and technological advances. To test the mediating effect of technological advances and the double-layer mediating effect of R&D capital and technological advances.
4.2. Data Sources and Processing. This paper attempts to explore the contribution of China’s OFDI to the economic growth of developed host countries, so the sample countries are selected from OECD countries. According to technology, income, China’s OFDI scale, and data availability, 26 sample countries are selected, including Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, South Korea, the Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Britain, and the United States. Since China’s OFDI statistical bulletin only has complete OFDI data of various countries from 2003 and China’s OFDI has been greatly affected by political factors and fluctuated strongly since 2018, the data period of this paper is from 2003 to 2017.

(1) Explained variable: PGDP (GDP per capita of sample countries). Like most studies, this paper uses the logarithm of GDP per capita of each sample country as the indicator of economic growth because GDP per capita can better reflect the actual situation of a country’s economic growth. The data of GDP per capita of sample countries come from the OECD database, using PPP constant price 2010.

(2) Explanatory variable: OFDI (China’s OFDI to sample countries). The data of OFDI to sample countries from China in the OECD database are incomplete, so this paper uses the OFDI data from the statistical bulletin of China’s outward foreign direct investment. Because the effect of OFDI on economic growth is persistent and the flow of China’s OFDI to some countries greatly change, this paper uses the stock data of China’s OFDI to sample countries, and the data are converted to the constant price of the US dollar in 2010 by using the US GDP deflator. To avoid duplication with capital stock and multicollinearity in the model, the indicator of OFDI of China is defined as the proportion of OFDI of China in the GDP of each sample country. The US GDP deflator and GDP data from the sample countries come from the WDI database of the World Bank.

(3) Explanatory variable: MFP (multifactor productivity of sample countries). Technological advances are one of the most important factors of a country’s long-term economic growth. China’s OFDI to sample countries can contribute to their long-term economic growth through the mediating effect of technological advances. The OECD database provides MFP (multifactor productivity) data for sample countries. It holds that MFP represents the part of GDP growth that cannot be explained by labor and capital. Traditionally, MFP growth is considered to represent technological advances. Therefore, this article first takes MFP as an explained variable of model B and model E to examine whether OFDI and R&D capital of each sample country have a significant impact on its technological advances, and then introduces this variable into model C and model F as an explanatory variable of economic growth to examine whether technological advances of each sample country have a significant impact on its economic growth. This paper uses the logarithm of the MFP of each sample country as the indicator of this variable. The data of MFP are from the OECD database. Due to the lack of data of the Czech Republic, Hungary, Israel, and Poland, the number of sample countries of this variable is 22.

(4) Explanatory variable: GERD (R&D capital of the sample country). Research and development capital can greatly promote technological advances and then promote long-term economic growth. This paper argues that China’s OFDI to sample countries can have a positive impact on the long-term economic growth of sample countries through the double-layer mediating effect of R&D and MFP. Therefore, this paper first takes this variable as the explained variable of model D to examine whether China’s OFDI has a significant impact on R&D capital of developed host countries, and then introduces this variable into model E and model F as an explanatory variable of technological advances and economic growth to...
examine whether R&D capital has a significant impact on technological advances and economic growth. This paper uses the logarithm of total R&D expenditure of each sample country as the indicator of this variable, and the data come from the OECD database.

(5) Control variables: KS (capital stock), L (labor), H (human capital), and GE (government efficiency). The indicator of variable KS is set as the logarithm of the ratio of capital stock to GDP. The capital stock of each country is calculated by the perpetual inventory method, and the calculation formula is as follows: \[ K_{i,t} = I_{i,t} + (1 - \delta) \times K_{i,t-1}. \] In the formula, \( K_{i,t} \) is the capital stock of country \( i \) in \( t \) year, \( I_{i,t} \) is gross fixed capital formation of the country \( i \) in \( t \) year, and \( \delta \) is the capital depreciation rate, which is 9.6% based on the research of Zhang et al. [41]. This paper uses 2003 as the base year to measure the capital stock of each sample country from 2003 to 2017. The calculation formula of the capital stock in the base year is as follows: \[ K_{2003} = I_{2003} / (g + \delta), \] where \( g \) is the geometric average growth rate of gross fixed capital formation of each sample country from 2003 to 2017. The data of gross fixed capital formation come from the WDI database of the World Bank.

The indicator of variable \( L \) is set as the logarithm of the number of labor forces in each sample country, and the data come from the OECD database.

The indicator of variable \( H \) is set as the logarithm of human capital level of each sample country measured by average years of education of labor force [42]. Due to the availability of data, the calculation formula of human capital level is as follows: the proportion of under-tertiary education multiply 9 and the proportion of tertiary education and multiply 16, and relevant data come from the OECD database.

The indicator of variable \( GE \) is set as the logarithm of government efficiency of each sample country, and the data come from Worldwide Governance Indicators (WGI).

Descriptive statistical results of the main variables are shown in Table 1. Most variables have small standard deviation, except for OFDI and government efficiency. This shows the fact that China’s OFDI between host countries and host countries’ government efficiency greatly vary.

### 5. Empirical Results and Analysis

#### 5.1. Empirical Analysis of the Benchmark Model

In order to test Hypothesis 1 and empirically examine whether China’s OFDI contributes to the economic growth of developed host countries, pooled ordinary least square (OLS), random effect, fixed effect, and robust fixed effect are used to regress model A in turn. Before regression, this paper tests the stationarity of the variables of model A. As shown in Table 2, the stationarity test results show that only the variable of government efficiency is stationary, and other variables are integrated of order one \( I(1) \). Therefore, first-order difference data of nonstationary variables are adopted in OLS regression.

As shown in Table 3, many coefficients in OLS regression are not significant. Therefore, this paper uses the method of generalized method of moments (GMM) proposed by Arellano and Bond [43] to test model A. As shown in Table 3, all coefficients in regression results using the GMM are significant. In addition, the \( p \)-value of the Sargan test is 1, and there is no autocorrelation in the fifth-order difference of disturbance term, which indicates that there is no over-identification of instrumental variables and no autocorrelation in the disturbance term. Therefore, the GMM is appropriate for the regression of model A.

From the regression results by the GMM of model A in Table 3, it can be seen that the OFDI coefficient, the key explanatory variable of economic growth, is significantly

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### Table 1: Description statistics of variables.

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Symbol</th>
<th>N</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita</td>
<td>( \ln PGD_{i,t} )</td>
<td>390</td>
<td>10.49941</td>
<td>0.263752</td>
<td>6.63353</td>
<td>11.06414</td>
</tr>
<tr>
<td>China’s OFDI</td>
<td>( \ln OFD_{i,t} )</td>
<td>390</td>
<td>0.1503345</td>
<td>0.3398855</td>
<td>0.0000203</td>
<td>2.328313</td>
</tr>
<tr>
<td>R&amp;D capital</td>
<td>( \ln GERD_{i,t} )</td>
<td>390</td>
<td>9.467087</td>
<td>1.344966</td>
<td>7.213733</td>
<td>13.08917</td>
</tr>
<tr>
<td>Multifactor productivity</td>
<td>( \ln MFP_{i,t} )</td>
<td>330</td>
<td>4.607225</td>
<td>0.0360473</td>
<td>4.383501</td>
<td>4.6969632</td>
</tr>
<tr>
<td>Capital stock</td>
<td>( \ln KS_{i,t} )</td>
<td>390</td>
<td>0.6851475</td>
<td>0.2170638</td>
<td>0.1264936</td>
<td>1.571635</td>
</tr>
<tr>
<td>Labor force</td>
<td>( \ln L_{i,t} )</td>
<td>390</td>
<td>9.137042</td>
<td>1.139617</td>
<td>7.549938</td>
<td>11.98493</td>
</tr>
<tr>
<td>Human capital</td>
<td>( \ln H_{i,t} )</td>
<td>390</td>
<td>2.420731</td>
<td>0.2170638</td>
<td>2.275441</td>
<td>2.56264</td>
</tr>
<tr>
<td>Government efficiency</td>
<td>( \ln GE_{i,t} )</td>
<td>390</td>
<td>0.2800999</td>
<td>0.4651739</td>
<td>1.621379</td>
<td>0.8561152</td>
</tr>
</tbody>
</table>

### Table 2: Results of stationarity test.

<table>
<thead>
<tr>
<th>Variables</th>
<th>( p )-value of HT</th>
<th>( p )-value of IPS</th>
<th>( p )-value of Fisher’s DF</th>
</tr>
</thead>
<tbody>
<tr>
<td>loggdp</td>
<td>0.9970</td>
<td>0.5416</td>
<td>0.7320</td>
</tr>
<tr>
<td>ofdi</td>
<td>1.0000</td>
<td>1.0000</td>
<td>1.0000</td>
</tr>
<tr>
<td>logks</td>
<td>0.9944</td>
<td>0.9700</td>
<td>0.9926</td>
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<tr>
<td>logl</td>
<td>0.9999</td>
<td>0.9977</td>
<td>0.3605</td>
</tr>
<tr>
<td>logh</td>
<td>1.0000</td>
<td>1.0000</td>
<td>1.0000</td>
</tr>
<tr>
<td>logge</td>
<td>0.0001</td>
<td>0.0048</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

#### Table 3: Description statistics of variables.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>Minimum</th>
<th>Maximum</th>
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<tr>
<td>loggdp</td>
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<td>ofdi</td>
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<td>logge</td>
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</tbody>
</table>
positive with a value of 0.0152. This result empirically confirms the contribution of China’s OFDI to the economic growth of developed host countries and shows that every 1% increase in the proportion of China’s OFDI stock to the GDP of developed host countries will lead to an increase of 1.52% in GDP per capita of developed host countries. The proportion of China’s OFDI stock to the total GDP of 26 sample countries rapidly increased from 0.00526% in 2003 to 0.39275% in 2017. The proportion increased by 0.38749, which means that the GDP per capita of 26 host countries increased by 0.59% due to China’s OFDI. In the same period, the growth rate of GDP per capita of 26 sample countries is 19.63%. Then, when other factors remain unchanged, the contribution rate of China’s OFDI to the growth of GDP per capita of 26 host countries rapidly increased from 0.00526% in 2003 to 0.39275% in 2017. The proportion increased by 0.38749, which means that the GDP per capita of 26 sample countries increased by 0.59% due to China’s OFDI. In the same period, the growth rate of GDP per capita of 26 sample countries is 19.63%.

In addition, the human capital coefficient in model A is significantly positive with a value of 0.243. It shows that the human capital of developed economies plays a significant role in promoting economic growth. For every 1% increase in human capital, GDP per capita will increase by 0.243%. The coefficient of capital and labor is significantly negative, which indicates that capital and labor are no longer the core factor of economic growth in developed host countries. Developed host countries need to adjust the core input factors to achieve economic growth. The coefficient of government efficiency is also significantly negative, because the data of government efficiency from 2003 to 2017 are decreasing.

5.2. Empirical Analysis of the Mediating Effect of Technological Advances. In order to test Hypothesis 2 and empirically examine whether there is a mediating effect of technological advances on China’s contribution of OFDI to the economic growth of developed host countries, this article uses the method of Wen and Ye [44] to establish model B and model C. Then, combined with the regression results of model A, this paper can find out whether there is a mediating effect and calculate the value.

If the independent variable X affects dependent variable Y through the variable M, then M is called the mediating variables. As shown in Figure 1, the coefficient c in equation I is the total effect of X on Y, the coefficient a in equation II is the effect of X on M, the coefficient b in equation III is the effect of X on Y after controlling M, and the coefficient c' is the effect of M on Y after controlling X.

There are four methods to judge whether the mediating effect of M is significant. The first method is stepwise regression, which needs to test equations I, II, and III in turn. If the coefficients c, a, and b are all significant, then the mediating effect of M is significant. The stepwise regression is easy to understand and easy to operate. But it is too strict, so it is easy to miss mediating effects. The second method is the coefficient product test, which tests whether ab (the product of coefficients a and b) is significant. This method regard ab as the mediating effect of M. If ab is significantly nonzero, then the mediating effect of M is significant. The third method is the difference coefficient test, which tests whether the difference between coefficients c and c’ is significant. If c-c’ is significantly nonzero, the mediating effect of M is significant. This method is similar to the second method. The fourth method is the bootstrap method. When the
The research stated that technological advances have a significant mediating effect on China’s OFDI to the economic growth of developed host countries. The mediating effect is calculated to be 24.3%.

The regression results of model A, B, and C are shown in Table 4, with robust standard errors in parentheses.

<table>
<thead>
<tr>
<th>Explained variable</th>
<th>lgdp (Model A)</th>
<th>logmf (Model B)</th>
<th>lgdp (Model C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loggdp</td>
<td>0.862***</td>
<td>0.578***</td>
<td></td>
</tr>
<tr>
<td>ofdi</td>
<td>0.0152***</td>
<td>0.00343</td>
<td>0.00833***</td>
</tr>
<tr>
<td>logksg</td>
<td>−0.217***</td>
<td>−0.0453*</td>
<td>−0.323***</td>
</tr>
<tr>
<td>logl</td>
<td>−0.0348***</td>
<td>0.00348</td>
<td>0.00337</td>
</tr>
<tr>
<td>logh</td>
<td>0.243***</td>
<td>0.0434</td>
<td>0.156**</td>
</tr>
<tr>
<td>logge</td>
<td>−0.00943***</td>
<td>0.0106***</td>
<td>−0.000144</td>
</tr>
<tr>
<td>Llogmf</td>
<td>0.761***</td>
<td>0.0786</td>
<td></td>
</tr>
</tbody>
</table>

In Table 5, the R&D capital is 0.107, which can be considered statistically significant (p-value of the coefficient of R&D capital is 0.00343). The coefficient of China’s OFDI after controlling other factors, R&D capital is 0.0416172 and 0.05498, respectively.

Hypothesis 3 is confirmed by this research. The double-layer mediating effect of R&D capital and technological advances is presented in Figure 2.

5.3. Empirical Analysis of Double-Layer Mediating Effect of R&D Capital and Technological Advances. In order to test Hypothesis 3, and empirically examine whether there is a double-layer mediating effect of R&D capital and technological advances in the contribution of China’s OFDI to the economic growth of developed host countries, this paper uses the method of Liu and Gal [45] to establish models D, E, and F. Then, combined with the regression result of model A, this paper can find out whether there is a double-layer mediating effect and calculate the value.

If independent variable X affects W through variable M, and finally affects dependent variable Y through variable W, then M and W are called double-layer mediating variables. As shown in Figure 2, coefficient c in equation I is the total effect of X on Y, coefficient a1 in equation II is the effect of X on M, coefficient a2 in equation III is the effect of X on W after controlling M, coefficient a3 in equation III is the effect of M on W after controlling X, coefficient c in equation IV is the effect of X on Y after controlling M and W, coefficient b1 is the effect of M on Y after controlling X and W, and coefficient b2 is the effect of W on Y after controlling X and M. This paper uses stepwise regression to test the double-layer mediating effect of R&D capital and technological advances in the contribution of China’s OFDI to the economic growth of developed host countries. Regression results are shown in Table 5 and Figure 3.

As shown in Table 5 and Figure 3, regression results confirm the double-layer mediating effect of R&D capital and technological advances in the contribution of China’s OFDI to the economic growth of developed host countries. In model D, the coefficient of China’s OFDI is significantly positive, which is 0.0106, indicating that China’s OFDI has a positive impact on the R&D capital of developed host countries. In model E, coefficients of China’s OFDI and R&D capital are also significant (p-value of the coefficient of R&D capital is 0.107, which can be considered statistically significant), which are 0.0073 and 0.00804, respectively, which means that after controlling other factors, China’s OFDI and R&D capital of developed host countries both...
have a positive impact on technological advances of developed host countries. In model F, the coefficients of China’s OFDI and technological advances of developed host countries are significant, which are 0.00694 and 1.021, respectively, which means that after controlling other factors, China’s OFDI and technological advances of developed host countries both have a positive impact on the economic growth of developed host countries. The coefficient of R&D capital in model F is not significant, which means that the direct impact of R&D capital on the economic growth of developed host countries is not significant when other factors are controlled.

As shown in Figure 3, the total effect of China’s OFDI to the economic growth of developed host countries is 0.0152, and the direct effect after controlling R&D capital and technological advances of developed host countries is 0.00694. Therefore, the mediating effect of R&D capital and technological advances of developed host countries is 0.00826, which means the contribution rate of mediating effect is 54.34%. Furthermore, there are two paths with a significant mediating effect: the first is the double-layer mediating effect path of “China’s OFDI → R&D capital of developed host countries → technological advances of developed host countries → economic growth of developed host countries,” and the second is the mediating effect path of “China’s OFDI → technological advances of developed host countries → economic growth of developed host countries.” Since the direct impact of R&D capital on the economic growth of developed host countries is not significant, the mediating effect path of “China OFDI → R&D capital of developed host countries → economic growth of developed host countries” is not significant.

In summary, in order to test Hypothesis 1, this paper uses the GMM to regress model A, and finds that China’s OFDI contributes to the economic growth of developed host countries and the contribution rate of China’s OFDI to the growth of GDP per capita of 26 host countries from 2003 to 2017 is 3.01%. Then, this paper uses the method of Wen Zhonglin and Ye Baojuan to test Hypothesis 2. The test results confirm that China’s OFDI can promote the technological advances of developed host countries and then promote their economic growth. Furthermore, this paper uses the method of W. Liu and D. Gal to test Hypothesis 3. The test results confirm that there is a double-layer mediating effect of R&D capital and technological advances in the contribution of China’s OFDI to the economic growth of developed host countries. Therefore, China’s investment in developed countries not only benefits China but also benefits the developed host countries.

### 6. Conclusions

The relationship between OFDI and the economic growth of host countries has always been a hot topic in economic research. A large number of literature have confirmed that OFDI can help developed host countries and some developing host countries with sufficient technology, human capital, and financial efficiency achieve long-term economic growth. However, all these research studies are all based on the premise that OFDI can bring advanced technology to the host country. Therefore, this paper studies the contribution and mechanism of China’s inverse OFDI to the economic growth of developed host countries, which enriches the research in this field.

Through mechanism analysis, this paper finds that China’s inverse OFDI has competitive advantages and can have a positive impact on the economic growth of developed host countries. Furthermore, this paper presents the hypothesis that China’s OFDI can contribute to the economic growth of developed host countries through the mediating effect of R&D capital and technological advances. The empirical results show that China’s inverse OFDI has a positive impact on the economic growth of developed host countries.
countries. Every 1% increase in the proportion of China’s OFDI stock to GDP of developed host countries will lead to an increase of 1.52% in GDP per capita of developed host countries. When other factors remain unchanged, the contribution rate of China’s OFDI to the growth of GDP per capita of 26 developed host countries is 3.01% from 2003 to 2017. The contribution rate of the mediating effect of technological advances is 24.3%, and the contribution rate of the double-layer mediating effect of R&D capital and technological advances is 54.34%.

The capital of developed countries has been extremely rich, for which the rate of return on capital has declined to a very low level. Therefore, it is not suitable for developed countries to have a large amount of capital in middle-end and low-end manufacturing and corresponding research. They must focus on the development of high-end leading technology and high value-added links such as brand marketing and creativity. Therefore, the inverse OFDI of China can undertake the manufacturing and R&D of middle- and low-end industries in developed host countries, and developed countries can focus on the development of high-end manufacturing and corresponding R&D, so that both sides can take their comparative advantages and form a stable growth pattern of the global economy. In addition, China’s OFDI has also contributed to the increase in employment and technological advances in developed host countries. Therefore, trade protectionism and the policy of restricting China’s investment of the USA will go against the interest of the USA and the global economy. It not only has a negative impact on the economic growth of the USA and China, but also will greatly affect the stable growth of global economy.

The suggestions are as follows: (1) developed countries should lift restrictions on investment from China. A free competitive market is an important factor in the improvement of world technology and the development of world economy. COVID-19 has had a huge impact on the technological and economic development of the world. All countries in the world should unite to cope with the impact, rather than limiting China’s investment, which is conducive to economic development. (2) China should seize every opportunity to invest more in developed countries. China’s investment stock in developed countries is still relatively small, and its contribution to the economic growth of developed countries is also relatively small. Therefore, many host countries have not realized the importance of Chinese investment. (3) China should communicate more effectively with the host countries. Many host countries restrict Chinese investment because they have not comprehensively studied the contribution of Chinese investment and take it for granted that Chinese investment is a great threat. Therefore, based on the facts and scientific research, effective communication between China and the host countries can make all countries realize that China’s investment can achieve win-win results.

**Abbreviations**

OFDI: Outward foreign direct investment

OECD: Organization for Economic Co-operation and Development
R&D: Research and development
GDP: Gross domestic product
PGDP: GDP per capita of sample countries
WDI: World development indicators
MFP: Multifactor productivity
GERD: Gross domestic expenditure on R&D
KS: Capital stock
L: Labor
H: Human capital
GE: Government efficiency
WGI: Worldwide Governance Indicators
OLS: Ordinary least square

**Data Availability**

The data used to support the findings of this study can be obtained from the author upon reasonable request.

**Conflicts of Interest**

The author declares that there are no conflicts of interest.

**References**


