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THE IMPACT OF CHINA'S OUTWARD FOREIGN DIRECT INVESTMENT ON THE BILATERAL TRADE WITH BELT AND ROAD COUNTRIES

The Case of Central and Eastern European Countries (2005-2023)

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Table of Contents

1.0	Theoretical background and justification of the topic..	2
1.1	Theoretical background.	2
1.2	Topic justification.	2
2.0	Methodology.	3
2.1	Hypotheses Development.	3
2.2	Description of data and variables.	4
2.3	Model construction.	5
3.0	Findings.	7
4.0	Contributions.	8
5.0	Main references.	9
6.0	List of own publications.	10

1.0 Theoretical background and justification of the topic..

1.1 Theoretical background.

With the deepening of economic globalization, multinational companies have gradually become the main protagonists of economic activities globally. The literature of international trade classifies the FDI behaviors of MNCs into three categories: Horizontal FDI (HFDI), Vertical FDI (VFDI), and the Knowledge-Capital (KC) model that combines HFDI and VFDI. The first literature on HFDI began with Markusen (1984), which indicates that firms conducting HFDI typically set up production in countries close to consumers to avoid high trade costs (Markusen, 1984). These MNCs must trade-off between achieving economies of scale and avoiding tariffs. If they locate the headquarters and all productions in the home country, the firms will gain economies of scale but face high marginal costs from exporting; Conversely, if they locate production in the host country, they will save on trade costs but pay high fixed costs (Markusen, 1984).

Therefore, HFDI is also known as the “Proximity-Concentration Hypothesis”. This hypothesis was first empirically tested and supported by Brainard (1997) using data on U.S. multinationals and developed by Helpman, Melitz & Yeaple (2004) within the framework of heterogeneous firm trade theory (Brainard, 1997) (Helpman, Melitz & Yeaple, 2004). The main factors affecting HFDI are the host country’s market size and trade costs. When HFDI occurs, substitution between FDI and exports occurs.

Helpman (1984) pioneered the study of VFDI. Differences in comparative advantages between countries induce some firms to split production into different stages and allocate production to firms in different countries (Helpman, 1984). For example, allocating labor-intensive and technology-intensive production activities to labor-rich and capital-rich countries, respectively, takes advantage of local comparative advantages and effectively reduces production costs. Yeaple (2003) examines the determinants of OFDI in the United States and confirms the role of comparative advantage, supporting the prediction of VFDI (Yeaple, 2003). The main factors affecting VFDI are the cost of trade and the difference in factor endowments between home and host countries. In addition, Keller & Yeaple (2013) include the cost of knowledge transfer in the analysis of vertical specialization of MNCs and argue that this cost is also one of the determinants of VFDI by MNCs (Keller & Yeaple, 2013). The emergence of VFDI will induce MNCs to engage in intra-firm trade and intermediate product trade, thus triggering the complementarity of FDI and trade.

1.2 Topic justification.

Against the backdrop of increasing global economic integration—where political and economic connections between nations have become increasingly closer through international economic integration and rapid globalization, yet successive global crises including the 2008 financial crisis, European sovereign debt crisis, 2015 refugee crisis, and COVID-19 pandemic have highlighted both the benefits and vulnerabilities of economic connectivity, making strengthening international collaboration the most direct and efficient way to promote economic recovery—and China's strategic "going global" (走出去) implemented alongside "reform and opening up" (改革开放) policies, which transformed China from primarily attracting foreign investment and learning advanced technologies to actively implementing outward investment strategies that maximize resource allocation and boost trade between home and host nations while building communities of interests and destiny characterized by political mutual trust, financial integration, and cultural tolerance. This study examines the impact of China's outward foreign direct investment (OFDI) on bilateral trade flows with Central and Eastern European Countries (CEECs) under the Belt and Road Initiative (BRI) framework. Given their historical ties through the ancient Silk Road and their post-1990s economic transition, which opened up new opportunities for bilateral cooperation through the "16+1" mechanism established in 2012 and subsequent BRI participation, the CEECs—a group of 16 countries with a combined area of 1.33 million square kilometers, a population of 117.5 million, and a GDP of $2.4 trillion—represent a strategically significant region for China's global expansion. .

2.0 Methodology.

This dissertation uses a quantitative analysis method, building statistical models based on the traditional Knowledge Capital Model.

2.1 Hypotheses Development.

This thesis formulated two hypotheses derived from analyzed trends in China-CEEC bilateral trade data from 2005 to 2023, alongside China's OFDI distribution during the same timeframe, indicating a sustained trade surplus and regional concentration. The OFDI patterns show a concentration that is very similar to the trade distribution. The initial hypothesis examines the impact of the BRI on trade and OFDI patterns. It suggests that BRI promotes horizontal OFDI, reflecting market-seeking behavior, while limiting vertical OFDI, which is characterized by efficiency-seeking behavior. This framework theoretically clarifies the observed asymmetric trade flows and the shift towards more market-oriented investments in various CEEC markets. The second hypothesis is based on the idea that both trade data and OFDI patterns show a lot of regional differences. This means that they need to be split into four groups (Central EU, Baltic EU, Balkan EU, and Balkan non-EU, see *Table 1*) based on things like institutional capacity, economic development, and market characteristics. This framework posits that participation in the Belt and Road Initiative (BRI) fosters regional investment specialization aligned with the comparative advantages of each subregion. The observed transition from concentrated to diversified outward foreign direct investment (OFDI) distribution, along with enduring trade asymmetries, offers an empirical basis for statistical examination.

Table 1: Classification of subregions

Groups	Countries
Central EU	Czech Republic, Hungary, Poland, Slovakia, Slovenia
Baltics EU	Estonia, Latvia, Lithuania
Balkan EU	Bulgaria, Croatia, Romania
Balkan non_EU	Albania, Bosnia Herzegovina, Montenegro, North Macedonia, Serbia

Source: Author's construction

Hypothesis 1: BRI participation promotes horizontal OFDI in CEECs and restrains vertical OFDI in CEECs, leading to enhanced bilateral export flows from China to CEECs while moderating import growth from CEECs to China.

Hypothesis 2: BRI creates regional specialization in investment types, with Central EU group attracting more horizontal OFDI while Balkan EU group benefit from vertical OFDI, leading to differentiated trade patterns where Central EU countries experience enhanced Chinese exports, Balkan EU countries show increased Chinese imports, Baltic EU countries demonstrate limited trade effects, and Balkan non-EU countries face constrained bilateral trade growth due to institutional barriers.

2.2 Description of data and variables.

This study utilizes an extensive panel dataset encompassing 16 Central and Eastern European Countries (CEECs) from 2005 to 2023. The dataset combines several secondary data sources to create variables that measure trade performance, investment flows, and economic traits in the CEEC region's different institutional and developmental settings. All data sources are well-documented and available to the public, which makes it possible to completely reproduce the results. The summarized definition of variables and data sources for each variable is presented in *Table 2*.

Table 2: Summarized definition of all variables.

Variable Name	Value	Source

$LnTrade_{jt}$	natural logarithm value of total trade	UN Comtrade Database
$LnExport_{jt}$	natural logarithm value of export trade	
$LnImport_{jt}$	natural logarithm value of import trade	
$LnOFDI_{jt}$	natural logarithm value of total OFDI stock	Combined collection of OECD, MOFCOM, National bank data
$HOFDI_{jt}$	natural logarithm value of total OFDI stock * natural logarithm value of host country GDP	Author's construction based on combined OECD, MOFCOM, National bank data
$VOFDI_{jt}$	natural logarithm value of total OFDI stock * natural logarithm value of host country labor wage	
RD_{jt}	R&D as % of GDP China - R&D as % of GDP CEECs	World Bank Database
PCI_{jt}	Direct Value	UNCTAD
$Tariff_{jt}$	Direct Value	World Bank Database
$BRI\ Central\ EU$	Active BRI MoU = 1, else = 0	Author's construction based on Green Finance and development center
$BRI\ Baltics\ EU$		
$BRI\ Balkan\ EU$		
$BRI\ Balkan\ nonEU$		

Source: Author's construction.

2.3 Model construction.

To differentiate between basic OFDI effects, this dissertation builds horizontal OFDI to represent market-seeking motives (HOFDI = LnOFDI × LnGDP_CEECs) and vertical OFDI represents efficiency-seeking motivations (VOFDI = LnOFDI × LnWages_CEECs).

Model A: Baseline test with the impact of overall OFDI stock on total trade, export and import, respectively.

$$LnTrade_{jt} = \beta_0 + \beta_1 LnOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 1: Model A1

$$LnExport_{jt} = \beta_0 + \beta_1 LnOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 2: Model A2

$$LnImport_{jt} = \beta_0 + \beta_1 LnOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 3: Model A3

Model B: Horizontal OFDI tests the impact of HOFDI on total trade, export and import, respectively through the interaction variable with host countries' market size.

$$LnTrade_{jt} = \beta_0 + \beta_1 HOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 4: Model B1

$$LnExport_{jt} = \beta_0 + \beta_1 HOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 5: Model B2

$$LnImport_{jt} = \beta_0 + \beta_1 HOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 6: Model B3

Model C: Vertical OFDI tests the impact of VOFDI on total trade, export and import respectively through the interaction variable with host countries' labor wage.

$$LnTrade_{jt} = \beta_0 + \beta_1 VOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 7: Model C1

$$LnExport_{jt} = \beta_0 + \beta_1 VOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 8: Model C2

$$LnImport_{jt} = \beta_0 + \beta_1 VOFDI_{jt} + \beta_2 RD_{jt} + \beta_3 PCI_{jt} + \beta_4 Tariff_j + \beta_5 BRI\ Central\ EU + \beta_6 BRI\ Baltics\ EU + \beta_7 BRI\ Balkan\ EU + \beta_8 BRI\ Balkan\ nonEU + \alpha_t + \varepsilon_{jt}$$

Equation 9: Model C3

3.0 Findings.

Model Performance: All models show that they have strong explanatory power, with R-squared values between 0.6522 and 0.8135. This means that the variables explain between 65% and 81% of the differences in China-CEEC economic relationships. All of the models are statistically significant ($p < 0.0000$).

Overall OFDI Effects: China's OFDI consistently shows a strong positive and statistically significant relationship with trade flows. The coefficient ranges from 0.3007 to 0.4876 across different models, with all results significant at the 1% level. This suggests that Chinese investment creates complementarity to trade rather than a substitute, supporting the investment-trade nexus theory.

Hypothesis 1 Testing: Partially Supported

HOFDI (Horizontal Investment): Shows consistently positive and significant coefficients (0.0124-0.0182, all $p<0.001$), supporting Hypothesis 1's prediction that BRI promotes horizontal OFDI. The smaller magnitude compared to basic OFDI suggests BRI facilitates market-seeking investments but with measured effects.

VOFDI (Vertical Investment): Demonstrates larger positive coefficients (0.0423-0.0656, all $p<0.001$), contradicting Hypothesis 1's expectation that BRI restrains vertical OFDI. Instead, the results suggest BRI actually enhances efficiency-seeking investments more than market-seeking ones.

Hypothesis 2 Testing: Fully Supported

Central EU Group (V4 + Slovenia):

Shows strong positive coefficients across all models (0.6572-1.2584, mostly $p<0.001$), strongly supporting Hypothesis 2's prediction that Central EU countries attract more horizontal OFDI and experience enhanced Chinese exports.

The consistently high significance levels confirm the Central EU's preferential position in China's BRI strategy.

Balkan EU Group:

The Balkan EU group perfectly validates the specialization prediction. These countries show non-significant effects in Models A and B but become significant in Model C: total trade (coefficient = 0.524, p = 0.044), exports (coefficient = 0.443, p = 0.091), and imports (coefficient = 0.717, p = 0.039). This finding confirms that BRI benefits for the Balkan EU group are specifically realized through efficiency-seeking investment.

Baltic EU Group:

Predominantly negative coefficients (-0.2403 to -0.4619) with low statistical significance, strongly supporting Hypothesis 2's prediction of limited trade effects for Baltic countries under the BRI framework.

Balkan Non-EU Group:

Consistently negative and often significant coefficients (-0.2607 to -0.7521), strongly confirming Hypothesis 2's prediction of constrained bilateral trade growth due to institutional barriers. This provides robust evidence for the importance of the institutional framework in BRI effectiveness.

4.0 Contributions.

Trade Balance Improvement Through Strategic Investment Allocation.

China has a big trade surplus with CEECs, so it needs to change how it does OFDI from traditional export-focused ventures to market-seeking investments that bring in goods instead. The strategy focuses on setting up Chinese manufacturing and service businesses that serve local CEEC markets while also making it easier to import Chinese parts and intermediate goods. This is based on the fact that horizontal OFDI has been shown to have a strong positive effect on imports (0.0182 coefficient). A key part of this is putting in place "reverse supply chain" systems. This means that Chinese multinational corporations set up procurement offices, supplier certification programs, and technology transfer initiatives to build up a network of local suppliers. This makes sure that CEEC companies can make parts that meet Chinese market needs and creates stable two-way trade flows that solve the current surplus problem. Targeting agricultural processing and food companies to increase Chinese imports of CEEC products would help as well.

Trade Structure Enhancement Through Complementarity-Based Investments.

The strategy focuses on upgrading bilateral trade toward high-value, complementary sectors by targeting investments in areas where TCI values exceed 1.5, particularly manufactured goods (SITC 6), machinery and transport equipment (SITC 7), and miscellaneous manufactured articles (SITC 8). Innovation-focused horizontal OFDI establishes Chinese research and development centers, innovation hubs, and technology transfer facilities that combine Chinese strengths in digital technology and manufacturing expertise with CEEC capabilities in precision engineering, creating joint innovation platforms that serve local and regional markets while generating sustained high-technology trade flows. This approach employs progressive value chain upgrading through phased sectoral development, moving from basic manufacturing in traditional categories toward sophisticated production in machinery sectors while developing emerging complementarity in food and beverage sectors through targeted agricultural processing and food technology investments.

Trade Volume Expansion Through Coordinated Investment Programs.

Strategic OFDI deployment drives substantial trade volume expansion through comprehensive horizontal FDI that establishes Chinese companies as major market participants in CEEC economies via large-scale investments in consumer goods manufacturing, automotive production, electronics assembly, and services sectors, creating substantial local operations requiring ongoing imports of Chinese components while generating significant local sales. The strategy combines this with vertical FDI scaling that creates extensive production networks across multiple CEEC countries, leveraging regional comparative advantages in labor costs and geographic positioning to establish integrated supply chains serving both Chinese and European markets. Infrastructure-supporting OFDI in transportation, logistics, telecommunications, and financial services directly facilitates increased trade flows by reducing transaction costs, improving connectivity, and providing the physical and institutional foundation for sustained trade volume expansion.

5.0 Main references.

Brainard, S. L. (1993). A simple theory of multinational corporations and trade with a trade-off between proximity and concentration. *National Bureau of Economic Research, Inc.*, NBER Working Papers 4269.

Brainard, S. L. (1997). An Empirical Assessment of the Proximity-Concentration Trade-off Between Multinational Sales and Trade. *The American Economic Review*, 87(4), 520-544.

Carr, D. L., Markusen, J. R., & Maskus, K. E. (2001). Estimating the Knowledge-Capital Model of the Multinational Enterprise. *The American Economic Review*, 91(3), 693–708.

Feenstra, R. C. (2004). *Advanced International Trade: Theory and Evidence.* Princeton University Press.

Helpman, E. (1984). Simple Theory of International Trade with Multinational Corporations. *Journal of Political Economy*, 92(3), 451-471.

Helpman, E., Melitz, M. J., & Yeaple, S. R. (2004). Export versus FDI with Heterogeneous Firms. *American Economic Review*, 94(1), 300-316.

Markusen, J. R. (1983). Factor Movements and Commodity Trade as Complements. *Journal of International Economics*, 14(3/4), 341-356.

Markusen, J. R. (1984). Multinationals, Multi-plant Economies, and the Grains from Trade. *Journal of International Economies*, 16(3-4): 205-226. doi:doi.org/10.1016/S0022-1996(84)80001-X

Markusen, J. R. (1997). Trade versus Investment Liberalization. *NBER Working Paper*, 6231.

Markusen, J. R. (2002). Multinational Firms and the Theory of International Trade. *MIT Press*.

Markusen, J. R., Venables, A. J., Konan, D. E., & Zhang, K. H. (1996). A Unified Treatment of Horizontal Direct Investment, Vertical Direct Investment, and the Pattern of Trade in Goods and Services. *NBER Working Paper*. doi:10.3386/w5696

Matura, T. (2019). China–CEE Trade, Investment and Politics. *Europe-Asia Studies*, 71(3), 388-407. doi:https://doi.org/10.1080/09668136.2019.1571166

McBride, J., Berman, N., & Chatzky, A. (2023, 2 2). *China's Massive Belt and Road Initiative*. Retrieved from Council on Foreign Relations: https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative

McCaleb, A., & Szunomar, A. (2017). Chinese foreign direct investment in central and eastern Europe: an institutional perspective. In J. Drahokoupil, *Chinese investment in Europe: corporate strategies and labour relations* (pp.121-140). European Trade Union Institute.

6.0 List of own publications.

Song Wenxuan (2024): Analysis of the relationship between China’s direct investment in Central and Eastern Europe and trade. *SOCIETY AND ECONOMY,* 46 3 pp 288-304.