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**The Impact of FDI on Income Inequality  
- Evidence from Emerging Markets in CEE and  
China**

Master's Thesis

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## **Declaration**

1. I hereby declare that I have compiled this thesis using the listed literature and resources only.
2. I hereby declare that my thesis has not been used to gain any other academic title.
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In Prague on 07/2024

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## References

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## **Abstract**

In the context of the deepening and expansion of globalisation over the past two decades, foreign direct investment (FDI) flows have boosted the economies of many countries. And emerging markets, represented by the Central and Eastern Europe (CEE) region and China, have enjoyed economic growth and even take-off during the process. Meanwhile, various income inequalities have been deeply affected by it. Thus, understanding the role of FDI inflows can help countries in emerging markets better balance the relationship between economic growth and income equality to achieve more sustainable development in the long run. Through the critical literature review, it can be found that there is sufficient literature on the impact of FDI inflows on overall income inequality and systematic conclusions have been drawn. However, for gender income inequality, the related works are less and relatively weak. Although the emerging market is a popular research topic nowadays, there are not many studies that include the CEE region and China, which have similar political background and economic characteristics, in their analyses together. Therefore, this paper hopes to explore the impact of FDI inflows on overall income inequality and gender income inequality in the two regions over the two decades from 2000 in detail and in depth. STATA is used to conduct baseline regression analyses on data from major international authorities, and subsequent tests for lagged effects, heterogeneity and moderating effects are undertaken to further refine the conclusions. Also, robustness tests are successfully performed. Ultimately, the main conclusion is that for the five countries in the CEE region and China, the impact of FDI inflows on overall and gender income inequality is found to exacerbate them both. Furthermore, education has a mitigating moderating effect. Also, the impact of economic growth and some of the governance indicators considered in the model varies. In the end, some policy recommendations are proposed, stressing the necessity of adjusting the orientation of FDI flows, enhancing education efforts and optimising the governance environment, and other measures. Thereby, it is hoped that the positive effect of FDI inflows on overall and gender income inequality can be reduced and social equity and harmony can be promoted.

## Abstrakt

V souvislosti s prohlubováním a rozšiřováním globalizace v posledních dvou desetiletích podpořily toky přímých zahraničních investic (PZI) ekonomiky mnoha zemí. A rozvíjející se trhy, reprezentované regionem střední a východní Evropy (SVE) a Čínou, se během tohoto procesu těšily hospodářskému růstu, a dokonce i vzestupu. Mezitím byly hluboce ovlivněny různé příjmové nerovnosti. Pochopení role přílivu přímých zahraničních investic tak může zemím na rozvíjejících se trzích pomoci lépe vybalancovat vztah mezi hospodářským růstem a příjmovou rovností a dosáhnout tak dlouhodobě udržitelnějšího rozvoje. Prostřednictvím kritického přehledu literatury lze zjistit, že existuje dostatek literatury o vlivu přílivu PZI na celkovou příjmovou nerovnost a byly vyvozeny systematické závěry. V případě příjmové nerovnosti žen a mužů je však souvisejících prací méně a jsou poměrně slabé. Ačkoli je rozvíjející se trh v současné době populárním výzkumným tématem, neexistuje mnoho studií, které by do svých analýz společně zahrnovaly region střední a východní Evropy a Čínu, které mají podobné politické zázemí a ekonomické charakteristiky. Tento článek se proto snaží podrobně a do hloubky prozkoumat dopad přílivu přímých zahraničních investic na celkovou příjmovou nerovnost a nerovnost v příjmech mužů a žen v obou regionech v průběhu dvou desetiletí od roku 2000. K provedení základních regresních analýz na datech od hlavních mezinárodních autorit je použit program STATA a k dalšímu zpřesnění závěrů jsou provedeny následné testy zpožděných efektů, heterogenity a moderujících efektů. Úspěšně jsou provedeny také testy robustnosti. Hlavním závěrem nakonec je, že v případě pěti zemí regionu střední a východní Evropy a Číny se ukazuje, že vliv přílivu přímých zahraničních investic na celkovou příjmovou nerovnost a nerovnost mezi muži a ženami obě tyto nerovnosti prohlubuje. Vzdělání má navíc zmírňující, moderující účinek. Také dopad hospodářského růstu a některých ukazatelů správy věcí veřejných, které jsou v modelu uvažovány, se liší. V závěru jsou navržena některá politická doporučení, která zdůrazňují nutnost úpravy orientace toků přímých zahraničních investic, zvýšení úsilí v oblasti vzdělávání a optimalizace prostředí pro správu věcí veřejných a další opatření. Tím se doufá, že se podaří snížit pozitivní vliv přílivu PZI na celkovou příjmovou nerovnost a nerovnost mezi muži a ženami a podpořit sociální spravedlnost a harmonii.

## **Keywords**

Foreign Direct Investment, Income Inequality, Gender Wage Gap, Emerging Market, Central and Eastern Europe, China

## **Klíčová slova**

Přímé zahraniční investice, nerovnost příjmů, rozdíl ve mzdách mužů a žen, rozvíjející se trh, střední a východní Evropa, Čína

## **Název práce**

**Dopad Přímých Zahraničních Investic na Příjmovou Nerovnost  
- Důkazy z Rozvíjejících se Trhů ve Střední a Východní Evropě a v Číně**

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## **Introduction**

### **Background and context**

#### **the background of FDI**

With the wave of economic globalisation further expanding and deepening in recent years, the cost of trade and investment from foreign countries has been able to be reduced remarkably (Akhmetova et al., 2017). Hence, it is also an undeniable phenomenon that more and more frequent variations in the flow of FDI are taking place. According to the World Investment Report for the year 2023, the global FDI has maintained its downward trend, falling by 2% from the previous year to \$1.3 trillion (UNCTAD, 2024). Moreover, this is the second consecutive year that global FDI has declined by more than 10%, which is attributed to the continued and escalating geopolitical conflicts, as well as rising trade protectionism and trade barriers. As for the CEE region and China, which are the focus of this paper, the form of the change in FDI over the period 2000-2020 is very different. In particular, FDI inflows in the former fluctuated upwards in the first half of the decade and vice versa thereafter, while in China the indicator was able to maintain its overall trend of steady growth.

Besides, the interest in FDI has been increasing gradually. It can be reflected in the large amount of literature concerning FDI, in which scholars have investigated and analysed the vital role of FDI in an intensive and comprehensive manner. Economic development is always regarded as one of the most intuitive and crucial features of a country, and it is also one of the most direct indicators that can reflect the impact and function of FDI. Thus, it is not surprising to find that most studies pay more attention to exploring the relationship between FDI and growth. For instance, Clark et al. (2011) pointed out that FDI inflows would promote the role of technological spillovers, thus boosting the growth of the local economy. In addition to this, there is also a way in which the influx of FDI increases the demand for local labour and contributes to a more favourable employment environment. Therefore, the economic level of the host country can be improved (Hale and Xu, 2016). Another working mechanism is that FDI inflows

allow for greater productivity and enrichment of factors of production, which in turn achieves further economic development (Helpman, Melitz and Yeaple, 2004; Nguyen, 2021). But apart from the promoting effect on the economy, there are also scholars who hold the conclusion that it will make the economy shrink. More specifically, they argue that while the majority of people agree that globalisation and integration appear to be beneficial to the economy, the increase in FDI inflows that it brings about could have the negative effect of lowering incomes in the recipient countries. For developed countries, this manifests itself in a significant decline in the wages of unskilled workers, while labour becomes even cheaper in developing ones (Wood, 1995; Gottschalk, 1997; Roy-Mukherjee and Udeogu, 2021). Thus, the economic significance of FDI can be demonstrated.

### **the background of overall income inequality**

It should be noted that although FDI is associated with and acts on many other variables, it is not a surprise to find through the analysis above that more scholars prefer to explore its intuitive effect on economic growth, instead not so much in other areas in comparison. Income inequality, which is the subject of this paper, represents one of these relatively under-researched areas. Despite the fact that it has not received as much attention as economic growth, the objective existence of income inequality is one of the major core issues that cannot be denied in the real world, and it also deeply affects the multifaceted development of countries. It is concretely manifested in the huge disparities between high-income and low-income groups, between male and female, between urban and rural areas, and between various industries and occupations. This type of inequality is not only reflected in the immediate differences in monetary income, but also extends further to the unequal distribution of non-material resources such as educational opportunities, medical resources and social welfare. As a consequence, a vicious circle of “the rich getting richer and the poor getting poorer” has been formed. Therefore, the importance of income inequality is evident.

Thus, it is decided that this indicator should be investigated thoroughly in this paper. Specifically, the concept of income inequality will be refined and categorised into two

categories, “overall income inequality” and “gender income inequality”, which will be explored in depth and in detail. Firstly, the development and current status of overall income inequality will be discussed. Mankiw and Taylor (2020) argued that inequality, particularly in income distribution, is widespread. This implies that inequality exists not only in the emerging economies that are the main focus of this paper, but also in the developed countries that are traditionally considered to have reached a mature stage of development. This view is also endorsed by Goldberg and Pavcnik (2007), which suggests that FDI could have a more serious effect on income inequality in developing countries in the context and process of globalisation. Worse still, the status of this phenomenon is shown to be steadily worsening in several countries around the globe (Allison et al., 2014; United Nations Development Programme, 2019). This can also be seen through visual data. According to the World Inequality Report 2022, global income inequality over the last decade has been alarmingly high, with the richest 10% of the population holding around 54% of global income (Chancel et al., 2022). At the same time, this proportion is relatively low in China, remaining at roughly 42%. The CEE region, on the other hand, performs the best, with the level fluctuating slightly around 37% over the decade. Also, the overall level of income inequality in the transition economies in the CEE region is broadly similar to the rest of the EU (Roaf et al., 2014). What is more, descriptive statistics by Alili and Adnett (2017), based on data available in the TRANSMONEE database, showed that the Czech Republic has the lowest level of inequality among these countries. As for China, Chen, Ge and Lai (2011) pointed out that since the Reform and Opening up in the 1980s, the entry and participation of foreign capital has positively impacted on income inequality within China, namely, it has increased inequality.

Given that the current state of income inequality is not optimistic across the globe, and the relative lack of research on the subject, an in-depth research in this paper is necessary and meaningful. The earliest and most classic literature in this field is the study of Kuznets (1955), and the hypotheses he put forward have been referred to as the originator of income inequality research. In detail, the level of income inequality varies with the level of economic development under a combination of factors such as industrial structural upgrading, market forces and policy interventions (Aristei and

Perugini, 2014). That is to say, as time passes and the latter ascends and matures, the former usually exhibits a tendency to increase, then stabilise and finally decrease. On the basis of such an inverted U-shaped curve, various studies have emerged to test this hypothesis. Hale and Xu (2016) conducted a meta-analysis of a large body of empirical literature, which yielded the conclusion that the findings of about three quarters of the literature surveyed displayed a positive effect of FDI inflows on overall income inequality. In other words, income disparity is enlarged and worsened by the inflow of FDI. Clark et al. (2011) also conducted a similar statistical study on a large number of literatures and came up with the same conclusion. Moreover, adding to this, they supplemented that the mechanism of FDI's effect on inequality is through the enhancement of technological spillovers and the facilitation of economic growth.

### **the background of gender income inequality**

However, the literature and research on gender income inequality is even more scarce in relation to the dimension of overall income inequality. The World Inequality Database has observed and counted women's income as an indicator of their share of total income (Chancel et al., 2022). It can be found that on a global and European scale it has been on an upward trend since 1991, with latest figures of 35.1% and 38.8% in 2019 respectively. In contrast, this proportion has been declining in China. The specific figures reflect a fall from 39.1% to 33.4% in the same period of time, which implies that the situation of gender inequality is worsening year by year. Certainly, this is only the statistical result of one of the institutions, and it is reasonable that the research of some scholars may show a different situation.

According to Fodor and Horn (2015), FDI inflows have become one of the key drivers of the production structure in the less developed regions in the world, which in turn is altering the gender income gap. The most significant manifestation of this aspect is the fact that large multinational corporations have opted to keep their core institutions in what were originally developed countries, but have been relocating their plants and factories to more distant regions such as Latin America, Southeast Asia, and China, as well as to the more recent CEE regions. According to Fodor and Horn (2015), FDI inflows have become one of the key drivers of the production

structure in the less developed regions in the world, which in turn is altering the gender income gap. The most significant manifestation of this aspect is the fact that large multinational corporations have opted to keep their core institutions in what were originally developed countries, but have been relocating their plants and factories to more distant regions such as Latin America, Southeast Asia, and China, as well as to the more recent CEE regions. For instance, Mexico, Poland and Hungary have emerged as the world's leading automotive production bases, while China's southern coastal provinces have also become one of the world's largest electronics sites. It is undeniable that such initiatives have brought huge FDI inflows and created jobs and demand for employment in the local regions. In particular, the employment opportunities for women have been substantially enhanced by this wave of investment liberalisation and globalisation, which Standing (1989) aptly defines as the “feminization of labour”.

However, for women in particular, Mies (1999) argues that the majority of employment opportunities are in positions that require subtle and flexible movements. Moreover, such work is of a highly precarious and substitutable nature compared to men's positions (Kudva and Beneria, 2005). Also, it exhibits extremely exploitative and unhealthy characteristics as far as it is concerned (Enloe, 2000). In addition, there used to be a commonality in the post-socialist countries of the CEE region, represented by the excessively long maternity and parental leave for women in state-owned enterprises, which made the role of mothers in the workplace even more marginalised (Mandel and Semoyonov, 2006). There was even a phenomenon where an early retirement age and the more likely potential of losing their partners made the elderly retired women poorer (Bohle and Greskovits, 2012; Fodor and Horn, 2015). All of these reasons can reduce women's income, which in turn can widen the gender income gap and gender poverty inequality even further. Nevertheless, with the entry of FDI and the emergence of foreign-owned enterprises, these situations have been greatly improved. With the advancement of economic transformation, the situation of gender income inequality is also gradually improving in China. For instance, relatively mature and well-established gender policies in foreign-owned multinational enterprises would promote equity and thus reduce the income gap between male and female employees (Chen, Ge and Lai, 2011).

## **the common background of the CEE region and China**

What also needs to be emphasised is the reason for choosing China and the CEE region. Although there is no official and fixed definition, the basic characteristics of emerging markets, as summarised by the International Monetary Fund, are their once backward economies and their current rapid growth. Therefore, emerging markets themselves have been one of the most heated topics in recent years. Some scholars even refer to them as ‘miracle countries’ to distinguish them from ordinary developing countries and transition economies (Çelik and Basdas, 2010). In line with these features, there is an essential commonality and linkage between China and the CEE region, which is relatively rare among the large group of countries and regions that are emerging markets. Before China carried out its “Reform and Opening Up” reforms and shifted to a market economy open to the outside world, it and the CEE region were part of the same state-controlled, planned economy. The reason behind such a phenomenon is that the political context was once the identical, that is, the post-socialist countries in the CEE region and the current socialist system of government that China has been adhering to have deeply affected the degree of economic freedom. Thus the states and characteristics of the two large regions mentioned and explored in this paper before opening up to the outside world have much in common.

## **Significance of the study**

According to the analysis above, it can be observed that the general context of the study of this paper can be described as follows. With the wave of economic globalisation and integration, the flows of FDI are changing in many different ways. It not only has an important impact on the economy, but also plays a role in the inequality of countries. However, it can be observed that, firstly, more literature has focused on investigating the impact of FDI on economic growth and development, and relatively fewer studies have been conducted on the aspect of the effect on inequality. Secondly, in the field of inequality, it is also possible to find studies on overall income inequality, whereas the literature on gender income gaps is insufficient. Thirdly, although there has been a significant amount of literature

addressing the situation in this area of emerging markets, very few have examined the two regions together and jointly. The emerging markets that are the subject of this paper (China and the CEE region) share commonalities in terms of the political context as well as the reforms and current state of the economy, but the numerical changes in the various indicators involved are very diverse. Therefore, it is of great interest to study both together in the same article.

To conclude, the academic significance of this paper lies in the following aspects, corresponding to the points above respectively. Firstly, focusing on the study of income inequality of FDI inflows to recipient countries could further enrich and improve the academic results in this field. Secondly, studying the gender income gap and the overall income gap in parallel with equal importance could effectively supplement the current literature's insufficiency and inadequacy of attention in the former. Finally, the approach of studying the post-socialist countries in the CEE region together with China is relatively innovative and could produce more constructive conclusions that are more suitable for both regions.

## **Research questions**

In the light of the discussion above, the following two major research questions are proposed in this paper, along with the corresponding hypotheses. Also, it should be noted that the hypotheses are only briefly explained here, and more detailed and specific statements are provided later.

**Research Question 1:** Does FDI inflows have an impact on overall income inequality in the emerging market CEE regions and China? And what kind of impact would it have?

**Hypothesis 1:** FDI inflows would exacerbate overall income inequality.

**Research Question 2:** Does FDI inflows have an impact on gender income inequality in the emerging market CEE regions and China? And what kind of impact would it have?

**Hypothesis 2:** FDI inflows would exacerbate gender income inequality.



## **Structure of the thesis**

This paper will be written in accordance with the structure below. After this section “Introduction”, a critical literature review section will be presented. In this section, after briefly analysing the literature on the introduction of emerging markets, the existing literature on the impact of FDI on overall income inequality and gender income inequality in the two regions will be systematically discussed and analysed separately. Then comes the data and empirical analyses that are the main focus of this paper. In the “Data and Methodology” section, data and variables will be characterised separately and descriptive statistics will be performed. Moreover, necessary analyses such as the stationarity test, multicollinearity test and correlation analysis will be implemented. After that, the hypotheses will be stated and the model will be constructed and selected. As for the crucial “empirical results” section, it is organised as follows. After the baseline regression analysis, testing for lag effects, heterogeneity and robustness will be conducted. In addition, the moderating effect of education will also be discussed. Finally, the analysis will be summarised and conclusions will be drawn. In addition, reasonable and suitable policy recommendations will be provided to contribute to the better development of emerging markets and even the world.

# **1. Literature Review**

## **1.1 Introduction of the literature review**

As a major international economic activity, FDI has a broad and profound impact on economic development and income distribution globally. Over the past two decades, emerging markets, especially the CEE region and China, have been among the favoured destinations for FDI in the world. There is a vast debate on the impact of FDI on income inequality, with the majority of studies concluding that FDI inflows have exacerbated overall income inequality in emerging markets. However, scholars have struggled to reach a consensus on the merits of the impact on gender income inequality.

Although numerous studies have already paid attention to the impact of FDI on income inequality, there are still research gaps. Firstly, the time period studied in most of the existing literature focuses on the early stages and fails to adequately consider the developments in recent years. Secondly, although China and the CEE region share a similar background of political and economic reforms, there is little literature that combines the two in a research comparison. Finally, the discussion on the impact of FDI on gender income inequality in emerging markets is relatively not abundant, and there is still much room to be explored. Therefore, the objective of this study is to fill these research gaps and deeply investigate the impact of FDI on overall income inequality and gender income inequality in emerging markets of China and the CEE region during the period of 2000 to 2020, to provide new insights and suggestions to the relevant academic and policy fields.

## **1.2 Emerging markets in CEE and China**

### **1.2.1 Emerging markets in the CEE region**

Emerging markets in CEE are characterised by the interplay of external economic influences and changing market dynamics. Karreman (2009) noted the significant impact of FDI on the financial geography of CEE, highlighting the progressive development of capitals such as Vienna and Warsaw as central nodes controlled by Western European

countries. This massive inflow of FDI, which is crucial for economic growth, also increases the dependence of CEE countries on external economic cycles and further increases the risk of their financial sovereignty being undermined. In addition, Ramasamy and Yeung (2022) emphasised that great external powers like China have similarly redefined local economic paths through large FDI inflows, influencing the geopolitical landscape and economic policies of the CEE.

At the same time, market changes also deeply affect emerging markets in the CEE region. Gruber-Muecke and Hofer (2015) discussed how market orientation and entrepreneurship programmes have positively impacted the performance of companies in the region, but have simultaneously exacerbated the risks due to the inherent instability of emerging markets. They stressed the importance of finding adaptive strategies to achieve the delicate balance between growth and stability in these dynamic markets. Moreover, such a view has been echoed by Burgess and Steenkamp (2013). The broader theoretical framework they provided challenged the applicability of well-established and valid Western business theories in developed economies to the CEE region. This is due to the fact that the unique socio-economic conditions of the local emerging markets necessitate a reassessment of existing conclusions. This perspective triggers further attention and scrutiny of strategies for the exploration of the geographical characteristics of the CEE.

### **1.2.2 Emerging markets in China**

Meanwhile, the emerging markets in China are marked by further globalisation and the need for integration. Walters and Samiee (2003) argued that China's accession to the WTO and its entry into the global economy have brought tremendous growth opportunities for domestic firms, but at the same time, complex challenges have also arisen. The opening up of the market has allowed factors such as different consumer behaviour and economic conditions to be exchanged both at home and abroad, thus localising changes in business strategies has become crucial.

In turn, this echoes the particular emphasis placed by scholars when it comes to the globalisation process in the emerging economies of the CEE region. For instance, Du and Choi (2010) found that the pay-for-performance (PFP) system in Western human resource

management practices did not work well with the traditional values of Chinese firms. That is, the former encourages individual creation of achievements, while the latter emphasises seniority and collective rewards. In addition to the cultural aspects that need to be adapted by foreign firms, the local political system should not be ignored. As Zhou and Poppo (2010) pointed out, technology transfer, which is an essential indicator of FDI inflows, would be more restricted in China as the local government would be relatively more involved in the operation of the firms. Hence, the significance of the balance between foreign business interests and Chinese industrial policy is evident. Besides the entry of foreign capital, the internationalisation efforts of local Chinese SMEs are also notable. Luo and Zhang (2009) focused on a variety of proactive measures taken by these firms in the context of constraints posed by domestic institutional gaps and market imperfections. Furthermore, they indicated that these situations were not unique to China, but were common features of firms in many emerging markets.

### **1.3 the impact of FDI on overall income inequality**

#### **1.3.1 the impact in the CEE region**

As for the impact of FDI on income inequality in CCE countries, most scholars can now largely agree. That is, such an effect is positive. Bandelj and Mahutga (2010) examined panel data for ten post-socialist countries over a period of more than a decade from 1989. The random effects regression model they developed revealed that the coefficient of direct FDI inflows per capita presented a statistically significant positive figure, indicating that the entry and penetration of foreign capital were associated with an increase in the level of income inequality in these countries. Notably, the degree of this is stronger than the degree to which the expansion of the private sector affected inequality. Not coincidentally, they have also reached the same conclusion in previous studies with different models. A relatively conservative fixed effects regression model modelled on data from these countries showed that FDI inflows over the period worsened income inequality by widening the wage gap between management and workers (Bandelj and Mahutga, 2008).

A study by Halmos (2011) likewise proved a similar conclusion. His OLS analysis

based on data from fifteen CEE countries revealed that the increase in the stock of FDI in these countries from 1991-2006 significantly worsened income inequality. It is not only analyses of groups of countries that can demonstrate that FDI exacerbates overall income inequality, but also analyses of individual countries. Mysíková's (2011) empirical analysis of the Czech Republic's data demonstrates that the entry of foreign investment produced a relatively significant increase in the level of individuals' income inequality in the 20-year period starting in 1988. Moreover, the increase was largest at the beginning of the post-communist transition and remained constant in the middle and end of the period. In addition, she also pointed out the differences in international comparisons.

This is precisely the point that needs to be emphasised, that the impact of FDI on income inequality in a decade or so after the dramatic changes that led to the fall of communism reflects large cross-country disparities. In a comparison with the four neighbouring countries of the Czech Republic, Mysíková (2011) noted that, despite the similar political and economic backgrounds of these countries, the trends in income inequality varied from county to county, and even from subcategory to subcategory in each country. This was due to political, social and cultural differences across countries, with factors such as privatisation, marketisation and globalisation, as well as levels of educational attainment, varying significantly. These key influences further contribute to the heterogeneity of inequality and outcomes across countries within the CEE region (Franco and Gerussi, 2010; Rose and Viju, 2014). At the same time, the large body of literature in this area, as represented by the papers above, focused on a time period of a decade or so after the dramatic changes occurred, with a certain lag from the present. While this is one of the research gaps that this paper tries to fill, which is to investigate the period of 2000-2020, making the conclusions more up-to-date and innovative.

At the same time, differences in research methodology can also lead to differences in the degree of significance of the results. Alili and Adnett (2017) reached generally the same conclusions from their study of 19 transition countries from 1993 onwards, but with some differences. They similarly concluded that as the share of FDI generally reached in GDP rose, so did wage income inequality. However, tests and examinations of multiple models showed that the magnitude of the impact varied depending on the choice of indicators used to measure inequality. Such an effect was significant and positive when

measured using the THEIL coefficient. In the case of the Gini coefficient, which has been chosen by most scholars, the magnitude of the impact was relatively weak (only 0.05% in the latter would increase with an increase of 1% in the former). The study by Bhandari (2007) is a good complementary and explanatory one. His study of 19 transition countries, including the CEE region, for the period 1990-2002 showed no direct evidence that FDI inflows affect income inequality. However, after decomposing this fixed effect model into multiple parts, the effect was significant and also favoured capital income equality. Such a more in-depth and comprehensive study not only adds perspective and depth to the field of research, but also largely remedies aspects that previous scholars have failed to address due to their relatively fixed methodology.

### **1.3.2 the impact in China**

Similarly to the CEE region, studies on China have concluded that increased FDI inflows exacerbate income inequality as well. Li (2012) used data on larger industrial firms in China's Yangtze River Basin in 2004, categorised them according to ownership, and conducted an OLS analysis. After controlling for several factors such as labour quality and capital size, he found that wages are highest in foreign-invested firms. Even though this conclusion was reached lacking broad geographical applicability, the magnitude of the effect still varies between provinces and cities in this economically developed region alone. The generalisability of this finding was enhanced by an econometric analysis of a panel dataset of Chinese firms for the period 1998-2007 conducted by Chen, Ge and Lai (2010). They found that FDI dampens wage growth in local firms in the same region and that the foreign firms involved are more inclined to offer higher wages. Consequently, the wage gap was further widened and income inequality worsened. Chen, Zhao and Zhou (2017) obtained similar findings from their analysis of panel data on Chinese manufacturing firms over the period 1999-2007, but with necessary useful additions. They discovered that the impact of increased FDI on wage-income inequality increased and then decreased, and that the inflection point was caused by the labour force transfer effect and technology spillovers. It is worth emphasizing that this result also matches the trends assumed by the Kuznets curve. However, a common limitation of most studies is that the database of firms used contains only manufacturing industries, and China's monopolies are not included, so the effect of monopoly is not addressed.

While much of the research on China focuses on microeconomic dimensions at the firm level, there is also evidence at the relatively macro level that complements similar findings. Mah's (2015) GMM analyses of China's national and city-level data from 1982-2010 show that FDI inflows exacerbated income inequality and that such an effect was non-linear. Moreover, Yuldashev et al. (2023) showed that all ten Asian economies studied for 1990-2020 confirmed the conclusion that FDI inflows are detrimental to income equality, and China is covered.

The impact of FDI on income inequality in China is more often reflected in regional disparities, but scholars are inconclusive about the trend of this impact. Based on the observation and analysis of China's provincial panel data for the period 1987-2001, Wan, Lu and Chen (2007) argued that the impact of globalisation and FDI inflows on regional income inequality in China is positive and increasing. Also, Wei, Yao and Liu (2009) conducted a convergence analysis on China's panel dataset for the 1979-2003 period and noted that FDI is an important contributor to regional inequality. However, they also emphasised that it is the unequal distribution of FDI instead of FDI itself that is responsible for such unfortunate results.

Meanwhile, some scholars have also given the opposite opinion. Yu et al. (2011) analysed a conjunctive equation model on the provincial data of China for a period of fifteen years from 1990 and found that FDI stock is only a relatively small influencing factor on regional income inequality. Besides, the magnitude of its impact has been decreasing from year to year since 2002. Chen's (2016) fixed-effects model for panel data of 30 Chinese provinces over the period 1987-2010 showed that FDI inflows exacerbated income inequality in the form of international trade. Moreover, this effect is particularly more pronounced in regions and cities with high trade openness, further deepening regional and urban-rural disparities. Yet, FDI inflows directly reduce regional income inequality through, for example, job creation, and the overall trend in the magnitude of the impact is consistent with the Kuznets inverted U-curve (Kuznets, 1955). Moreover, Wang, Fidrmuc and Luo (2021) arrived at more nuanced findings. They chose the spatial Durbin model to analyse China's provincial data from 2000-2016, and the results showed that FDI inflows did not exacerbate urban-rural income inequality. On this basis, firms with foreign investment entry reduced the wage gap.

### **1.3.3 Factors related to the impact of FDI on overall income inequality**

According to the discussion and analyses above, FDI inflows are not the only factors that have a deep influence on overall income inequality, both in the CEE region and in China. That is to say, there are always a lot of other factors involved in the process that work together. One of the most crucial factors is the shift in the demand for labour. Alili and Adnett (2017) summarise previous research by arguing that one of the underlying causes of rising income inequality in transition economies is skill-biased technological transformation with the entry of foreign investment and multinational corporations. As a consequence, the demand for labour in what used to be a relatively closed market shifted in the direction of a large and urgent demand for skilled workers, so that overall income inequality was exacerbated in the early stages of the transition but declined in later stages as the number of skilled workers increased (Aghion and Commander, 1999; Feenstra and Hanson, 1996). Such a trend is also consistent with the well-known inverted U-shaped Kuznets curve proposed by Kuznets (1955).

Furthermore, the research of Figini and Görg (2011) not only demonstrated such a non-linear relationship as above, but also proposed a new influencing factor - the level of economic development. It can be found that scholars can generally reach a consensus on that indicator can affect the degree of overall income inequality in FDI inflows, although the direction of its role is controversial. Tchamyou et al.'s (2019) empirical study of nearly a decade's worth of data from 48 African countries showed that increasing the level of the economy decreases income inequality. The results of Helpman et al. (2017), on the other hand, went in the opposite direction. Drawing on a study of Brazil, an emerging market, they argue that economic growth would make this inequality increase. Also, it is necessary to emphasise that it is not only the increase or decrease of the economy that can have an impact, but also the level of economic development of the FDI recipient country itself that contributes to the final outcome of the inequality situation. For instance, Völlmecke, Jindra and Marek (2016) examined data from nearly three hundred regions within the EU for the period 2003-2010 and discovered that the lower the income, the weaker the trend of income convergence and the higher the inequality. While Çelik and Basdas (2010) innovatively chose to categorise their sample of research into developed countries, developing countries (such as some of the CEE countries), and miracle countries (countries



that have reached an economic take-off in a short period of time through effective policies, such as China, Singapore and so on) by analysing them separately. They came to the conclusion that FDI inflows have a mitigating effect on overall income inequality in the miracle countries, and vice versa for the other effects. Meanwhile, there are also a few other studies that show that FDI inflows do not have a significant impact on inequality in either developed or transition economies (Franco and Gerussi, 2013).

It is undeniable that there are many other factors besides the two above that influence the process and outcome of FDI's effect on overall income inequality. The first one is trade openness. Khan, Nawaz and Saeed (2019) and Khan and Nawaz (2021) conducted studies using the System Generalised Method of Moments (SYS-GMM) for the five South Asian countries and the Commonwealth of Independent States (CIS), respectively, and in turn managed to validate that the process by which this factor affects the FDI is in line with the Kuznets hypothesis. However, Xu et al. (2021) analysed the data of countries in Sub-Saharan Africa under the same methodology but only proved its mitigating effect on income inequality and could not prove the hypothesis. Secondly, the significance of education cannot be ignored. In addition to the three papers mentioned above, which all pointed out that an increase in the power of education attenuates the negative impact of FDI on income inequality, many other scholars also agree with this finding (Asteriou, Dimelis and Moudatsou, 2014; Auguste, 2018; Liebrand, 2018; Nguyen, 2021; and Wang and Lee, 2021). Nguyen's (2021) two-step system GMM (S-GMM) analysis on data from thirty-seven developing countries over the period 2002-2018 revealed that the effects of FDI and governance, respectively, on overall income inequality individually are both shown to mitigate. Yet, the interaction and influence of the two worsened inequality. In addition, it is also important to highlight that the imbalance of regional development in China is also one of the major influential factors. In this country, the conditions and development of the countryside are markedly behind those of the cities, while those in the cities along the coast are superior to those in the inland. As a result, a variety of resources, including FDI, tend to flow to more developed areas, further expanding the overall income gap and making the situation of equality even less optimistic (Chen, 2015; Wu and Rao, 2017; Yu et al., 2011).

## **1.4 the impact of FDI on gender income inequality**

### **1.4.1 the impact in the CEE region**

The existing literature on the impact of FDI on gender income inequality is divided, but regional heterogeneity is widely recognised. Some scholars believe that such inequality is exacerbated by FDI inflows. Fodor and Glass (2018) analysed cross-sectional data for 2008 and 2012 and showed that the entry of FDI did not contribute to the reduction of the gender income gap in the ten CEE countries studied. They attributed this mainly to labour protections in the EU and the higher education levels of local women. Therefore, the foreign firms seeking cheap and docile female labour had to move to other regions. In addition, other scholars' studies of individual countries in the CEE region similarly support their conclusions. King et al. (2017) developed a multilevel linear regression model based on administrative tax data for Slovenia for the period 1993-2007. The results show that market-oriented reforms and FDI inflows make gender income inequality increase day by day. In addition to this, such effects were more severe in the younger groups and worsened further with the retirement of the senior generation. Furthermore, Magda and Sałach (2021) analysed the Polish Statistical Office's data on the structure of wages and salaries in 2014 with several models including standard generalised linear decomposition, fixed effects and others. They found that the gender earnings gap is significantly larger in foreign-owned firms than in domestic-owned firms, and that such inequality is most evident at the top and bottom. However, the shortcoming of their results lies in the fact that the data were chosen in such a way that people such as self-employed people, who might be among the higher income groups in society, were not included in the analysis. In addition, the study by Vahter and Masso (2019) of multiple datasets from Estonia found that although employees in companies with foreign ownership arising from FDI inflows were all paid more than those in domestic ones, the extent of the wage premium was four to five times higher for men than for women. In other words, the gender wage gap, which already exists, has widened even more as a result of FDI.

Nevertheless, there are also studies showing the opposite conclusion that the impact of FDI inflows on gender income inequality is negative. Based on an OLS regression analysis

of the results of the 2008 PCA survey, Zulfiu-Alili (2014) concluded that FDI inflows contribute to the reduction of gender income inequality in Macedonia. This was demonstrated by his calculation that the gender wage gap in foreign-owned firms is smaller than in domestic-owned firms. However, the wage inequality was also higher for men and women, respectively. Also, Taylor et al. (2024) conducted RX-2SLS estimation on a cross-sectional dataset of the Polish job market for 2013-2017. He found that the entry of foreign capital not only raised the overall wage level, but that this effect had a greater utility for women, namely, it helped to equalise the gender wage gap. It is not a surprise to discover that the variability of the final conclusions is obvious due to the differences in the countries and regions studied, the methodology used, the time period selected, and other factors. Indeed, this is one of the shortcomings of the field at present, which is that there is a need for more papers with a wider scope and more up-to-date coverage in order to arrive at more generalisable conclusions.

#### **1.4.2 the impact in China**

Like the CEE region, China also undertook economic reforms in the 1980s with the aim of introducing foreign investment and opening up trade. While most scholars agree that the huge inflow of FDI brought about by such policies had a positive impact on gender income inequality, it has been difficult to reach a consensus. Appleton et al. (2002) stated that the structural reforms of 1992 and the new economic policies it brought with it, which favoured liberalism, led to a significant increase in gender income disparity. Dong, and Summerfield (2007), through qualitative analyses of a large body of literature, similarly show that while FDI inflows helped improve China's overall economic performance, multiple inequalities, including gender income inequality, have increased.

Besides, many scholars have proved this viewpoint through quantitative research. Yu et al. (2021) analysed the double-difference strategy by analysing the data related to China's census from 1990 to 2005. They came to the conclusion that trade liberalisation and fierce competition from FDI have made it more difficult for women to be employed and widened the gender gap in the labour market. Also, Maurer-Fazio and Hughes (2002) demonstrated that the impact of market opening and liberalisation on women's level of economic equality in China is negative. Their regression analyses of China's 1992 dataset indicated that

gender discrimination and gender income gaps were greatest in joint ventures that brought in foreign investment. Instead, it is the most conservative state-owned enterprises that performed the best in this regard. And a quantitative study by Ng (2007) of China's regional data over a decade from 1998 revealed an essentially widening trend in the gender wage gap. Moreover, such differences were more pronounced in regions that were more open and had more FDI inflows. Additionally, Braunstein and Brenner's (2007) regression analyses of data from urban areas in China for 1995 and 2002 suggested that the gender income gap was undoubtedly and significantly larger at both the micro (individual) and macro (provincial) levels in the early part of the period under investigation. Nevertheless, the reversal of this situation in the middle and late stages of the period has led to an undoubtedly significant increase in the gender income gap. Sun's (2023) empirical analysis using the local labour market approach as an identification strategy proved that FDI inflows due to trade liberalisation made it more challenging for female labour to move across sectors, thus expanding the gender income gap.

However, there are also scholars who have proved that FDI inflows contribute to the reduction of gender income inequality from different dimensions. Tang and Zhang (2014) built a multi-sector task-based model to empirically study China's data for the period of 2004-2007 from the perspective of both firm-level and the angle of cultural diffusion. They concluded that FDI reduces gender income inequality through cultural spillovers, especially when FDI comes from countries with better affirmative action. Yu, Zhang and Wen (2019) corroborated similar findings at the household level. The results of their double difference estimation on a dataset of Chinese urban households exhibited that China's openness to and introduction of FDI helps to equalise gender income inequality within households, which in turn improves women's economic position. Besides, Chen et al. (2013) empirically analysed the dataset from the corporate demographic level and concluded that economic globalisation represented by FDI inflows is beneficial to women's employment status. That is, foreign investment and joint ventures played an important role in encouraging female employment and reducing the gender income gap.

### **1.4.3 Factors related to the impact of FDI on gender income inequality**

Similarly to overall income inequality, there are other factors that play a part in the

process and results of FDI's impact on the gender income gap. Firstly, education is the first and most important variable for either type of inequality and its impact cannot be ignored (Iwasaki and Satogami, 2023). Although the relevant literature is not as extensive and specific as the overall income inequality, many studies have reached the conclusion that increased strength of education could optimise the impact of FDI inflows on the gender income gap regardless of time. Regression analyses by Gustafsson and Li (1998), working with data from two large-scale censuses, indicated that the gender income gap in urban China has continued to deteriorate in the context of economic transition and massive entry of foreign investment, and to a greater extent for women with lower levels of education. Such findings are further supported by Guo, Wang and Zhan (2021). Their empirical results illustrated that FDI inflows reduce the gender education gap and thus the gender income gap. Moreover, similar conclusions have been drawn in studies of CEE countries as well as other regions. Fodor and Horn (2015) carried out an analysis of ten post-socialist CEE EU countries by means of random coefficients logistic regression modelling. They found that where FDI flows are high, the gender poverty gap is more likely to occur and that education reduces the risk of this. Also, higher levels of educational attainment have been empirically proven to help women obtain superior positions, which in turn reduces the gender wage gap and improves women's well-being. (Sharma, 2019).

In addition to this, along with overall income inequality, economic growth also works when FDI affects gender income inequality. Most scholars believe that the role played by economic growth is mitigating. Oostendorp's (2009) regression analysis of data from 83 countries over a period of approximately two decades demonstrates that FDI in the context of globalisation can reduce occupational gender income inequality. Moreover, such a moderating effect is more prominent in rich countries and less significant in poor ones. Meanwhile, his conclusions were also echoed by the results of some latest literature and studies recently (Almasifard, 2018; Karapanagiotis and Reimers, 2024). Yet, a few different conclusions have also emerged. For example, a study by Fodor and Glass (2018) substantiated that the entry of foreign investment in the background of economic globalisation deepens employment gender discrimination and the gender wage gap, further corroborating the concerns of former authors (Nash and Fernandez-Kelly 1983; Shittirak 1998). In addition, Trapido (2007) conducted a linear regression decomposition study based on longitudinal data on full-time workers in four former Soviet countries. He

revealed that gender income inequality increased in regions with substantial economic expansion after the transition and the influx of foreign capital, while regions with relatively stagnant economies fared well in this respect.

## **1.5 Summary of the literature review**

This literature review provides an in-depth examination of the impact of FDI on overall and gender income inequality, as well as a comparative analysis of emerging markets in China and the CEE region. By discussing the existing literature, some major conclusions can be drawn. Also, it is hoped that some recommendations can be proposed to address inequality and promote inclusive economic growth.

Firstly, there are complexity, diversity and heterogeneity in the impact of FDI on the two types of income inequality. If different countries and regions and different time periods are chosen, or even different research methods are used, it can be found that the impact of FDI on the gender income gap is hard to determine. Moreover, such conclusion has also been validated by Mitra and Yemtsov (2006). This demonstrates the need for policymakers to tailor their policies to specific situations. Besides, there are various other factors such as the level of economic development, education, labour market, and so on, that influence the effect of FDI on the two types of inequality being studied.

Secondly, it is recommended that policymakers should implement measures to ensure that the impact of FDI on income equality is positive. In addition to improving the overall level of education and thus strengthening the education level of the population. It is even more necessary for the country to secure fair access to education for women and to promote the spread and strengthening of gender equality awareness. This will help enhance overall employment competitiveness, thereby narrowing the income gap. Furthermore, the government should also strengthen the regulation of the labour market to guarantee women fair employment opportunities and remuneration packages. Besides, the regulation and management of FDI also need to be strengthened. It is essential to prevent FDI from being overly concentrated in a small number of enterprises, industries and regions, thereby aggravating income inequality.

Finally, the significance of international cooperation cannot be ignored. In the context of globalisation, governments and international organisations should enhance cooperation and share the latest experiences and best practices in order to jointly address inequality and achieve sustainable development.

## **2. Data and Methodology**

### **2.1 Definition of variables and data sources**

#### **2.1.1 Study horizons and periods**

The data used in the research are sourced from China and six CEE countries (namely, Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia). Also, it spans the time period from 2000 to 2020, as shown in Table 1. The reasons for choosing the above countries as the object of study in this paper are as follows. Firstly, all of them are emerging markets that have undergone economic transformation. These CEE countries used to be under communism, and all of them implemented political transition and the transformation from planned economy to market economy in the 1990s. While China, which has always been a communist regime, carried out its economic transition “Reform and Opening Up” about 20 years earlier than they did. Despite the difference in timing, their transformations have come of maturity in the first two decades of the millennium, and the countries themselves are now emerging markets. Therefore, it is both comparable and informative to discuss them in parallel. Secondly, in the overall background of marketisation and globalisation, these countries have attracted a large amount of foreign investment, which has become an enormous driving force for their economic growth. Thirdly, based on the discussion and analysis of the existing literature in the previous section, it can be observed that the existence and exacerbation of overall and gender income inequality has become an essential issue that cannot be neglected by these countries as they undergo rapid economic growth. Analysing them as a sample will make a valuable contribution to the further avoidance of this problem in emerging markets and developing countries other than them.

**Table 1. List of countries used for the study**

CEE(6)	Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia
Asia(1)	China

Nevertheless, in addition to the first reason that has already been mentioned above, there are other reasons why the 2000-2020 interval was selected for study. The first and foremost is the availability of data. That is, the economic and social data for these seven countries during this period are more complete and accessible in various authoritative databases, thereby laying a solid data base for empirical analyses. Second, research on this period can capture and analyse economic phenomena in a qualitatively better way. This is because after 2000, there was a significant increase in FDI flows as multinational corporations positioned their production and investments globally against the backdrop of an accelerated process of globalisation. And these countries actively participated in it and were deeply influenced by it. Thirdly, there is a strong similarity in the general policy context of the above countries during this period. In other words, they all introduced a range of policies of an effective nature to further enhance their attractiveness to FDI. Specifically, in addition to their accession to the EU in 2004 (Poland, Hungary, the Czech Republic and Slovakia) and 2007 (Bulgaria and Romania), respectively, the CEE countries' efforts to integrate into the world economy have also included measures such as introducing tax incentives, setting up investment promotion agencies, and establishing free trade zones. In addition, China's performance is generally similar to theirs. However, its strategy for regional development is reflected in initiatives such as the promotion of the Belt and Road Initiative and the launch of the Asian Development Bank. Finally, this time period is of sufficient coverage and is more than up-to-date.

## **2.1.2 Variable descriptions and data sources**

### **2.1.2.1 Dependent and independent variables**

The dependent variables in this paper are the overall income gap (Inequality) and the gender income gap (Gap), respectively. The overall income inequality in the seven countries studied is characterised by the Gini coefficient, which is obtained from the database of the Organisation for Economic Cooperation and Development (OECD).



As for the gender income gap, the Gender Wage Index published on the OECD official website is referred to, calculated as (median male income - median female income) / median male income. In addition, considering that the Chinese government has not released any similar macro data, the approach of this paper is to draw on a fairly authoritative micro survey data in China: the Chinese General Social Survey (CGSS). The survey of this database commenced in 2003, and is the first academic survey project of a national, comprehensive and continuous nature in China. Moreover, CGSS has been committed to and successfully achieved the systematic and thorough collection of statistical data at multiple levels of society, community, family and individual, summarising the trend of social change. Also, the samples extracted from this micro-database are in the tens of thousands every year, which is in line with the Law of Large Numbers. In this paper, the gender income gap index is calculated based on the median income of men and the median income of women surveyed by CGSS. However, it should be noted that the years in which CGSS conducted surveys (2002, 2004, 2005, 2007, 2009, 2010, 2011, 2012, 2014, 2016, 2017, 2020) do not fully cover the research period of this study. Thus, for the years in which no surveys were conducted, interpolation is used in this paper to fill in the gaps.

In terms of independent variables, it should be emphasised that the core explanatory variable of this study is FDI inflow. This data comes from the database of the United Nations Conference on Trade and Development (UNCTAD).

### **2.1.2.2 Control Variables**

In addition to the two critical variables above, other factors that may affect the overall income gap and the gender income gap are also taken into account in this paper. Among them are: the level of economic development (PGDP), the level of corruption governance (Corruption), the level of social stability (Stability) and the level of legal system (Law) . The first one is captured through the indicator GDP per capita, for which the data are derived from the database of World Development Indicators (WDI) of the World Bank. Besides, the data source for the other three variables is the database of the World Bank's World Governance Indicators (WGI).

Meanwhile, there are two dummy variables with year-fixed effects (Year) and country-

fixed effects (Country) added to the empirical model. Thereby, the effect of unobservable factors during the period of the sample can be eliminated.

## **2.2 Descriptive statistics**

In this paper, the variables of Social Inequality Index (Inequality), Gender Income Difference Index (Gap), GDP per capita (PGDP), Foreign Direct Investment (FDI), Corruption Governance Index (Corruption), Social Stability Index (Stability), and Rule of Law Level Index (Law) have been standardised in order to reduce the effect of heteroskedasticity. This method allows the original data to be subtracted from its mean and then divided by the standard deviation of the variable to calculate the new variable values, which are consistent with each other and produce more robust regression results. In addition, this paper has also carried out a 1% to 99% shrinkage of all variables to minimise the influence of extreme values on the results of the analysis.

Table 2 shows the results of the descriptive statistics. It can be found that in general, the means of each variable are close to 0 and the standard deviation is around 1. Specifically for the major factors, the Inequality Index has a mean of 0, a standard deviation of 1, a minimum of -1.433, and a maximum of 1.980. The Gender Income Difference Index has a mean of 0.010, a standard deviation of 0.992, a minimum of -1.453, and a maximum of 2.038. The GDP per capita has a mean of 0.010, a standard deviation of 0.994, a minimum of -1.665, and a maximum value is 2.214. The mean value of FDI is 0.001 with a standard deviation of 0.998, a minimum value of -0.409, and a maximum value of 3.332. Besides, the related situation of the Corruption Governance Index (CGI), Social Stability Index (SSI) and Legal Level Index can be observed as well. In conclusion, these results show that after standardisation, the distribution of the variables is more uniform and the extremes are controlled, providing a reliable basis for the subsequent regression analysis.

**Table 2. Descriptive Statistics**

Variables	N	mean	sd	min	max
Inequality	118.000	0.000	1.000	-1.433	1.980
Gap	134.000	0.010	0.992	-1.453	2.038
PGDP	146.000	0.010	0.994	-1.665	2.214
FDI	146.000	0.001	0.998	-0.409	3.332
Corruption	146.000	0.091	0.380	-0.599	0.721
Stability	146.000	0.476	0.497	-0.602	1.132
Law	146.000	0.320	0.483	-0.650	1.107

### 2.2.1 the trend of the GINI index

Figure 1 presents the trend of the GINI index for the period from 2000 to 2020. Comparisons are made for the Overall Inequality Index (Inequality), the Inequality Index for CEE countries (Inequality (CEE)) and the Inequality Index for China (Inequality (China)), respectively. First, the overall inequality index fluctuated in the early 2000s, but levelled off after 2005 and showed less volatility around 40%. Moreover, the inequality index of the CEE countries is relatively low and has a relatively small range of fluctuations throughout the time period, staying around 30% most of the time. This can suggest that income inequality in CEE countries is relatively low and stable. In addition, China's inequality index was more volatile in the early 2000s. However, since 2005, the index has stabilised and fluctuated between 40% and 50%, which is higher than the level of CEE countries. Therefore, it can be concluded that China experiences a relatively high level of income inequality. Moreover, the inequality index of the CEE countries is relatively low and has a relatively small range of fluctuations throughout the time period, staying around 30% most of the time. This can suggest that income inequality in CEE countries is relatively low and stable. In addition, China's inequality index was more volatile in the early 2000s. However, since 2005, the index has stabilised and fluctuated between 40% and 50%, which is higher than the level of CEE countries. Therefore, it can be concluded that China experiences a relatively high level of income inequality.

In conclusion, from the analysis of Figure 1, it can be noted that between 2000 and 2020, the global inequality index as a whole shows a stable trend and CEE countries have a

relatively low and stable degree of inequality, while China exhibits a relatively high and fluctuating inequality index. This reflects the differences in income distribution in different regions as well as the varying policy measures undertaken by countries to respond to the problem of income inequality.

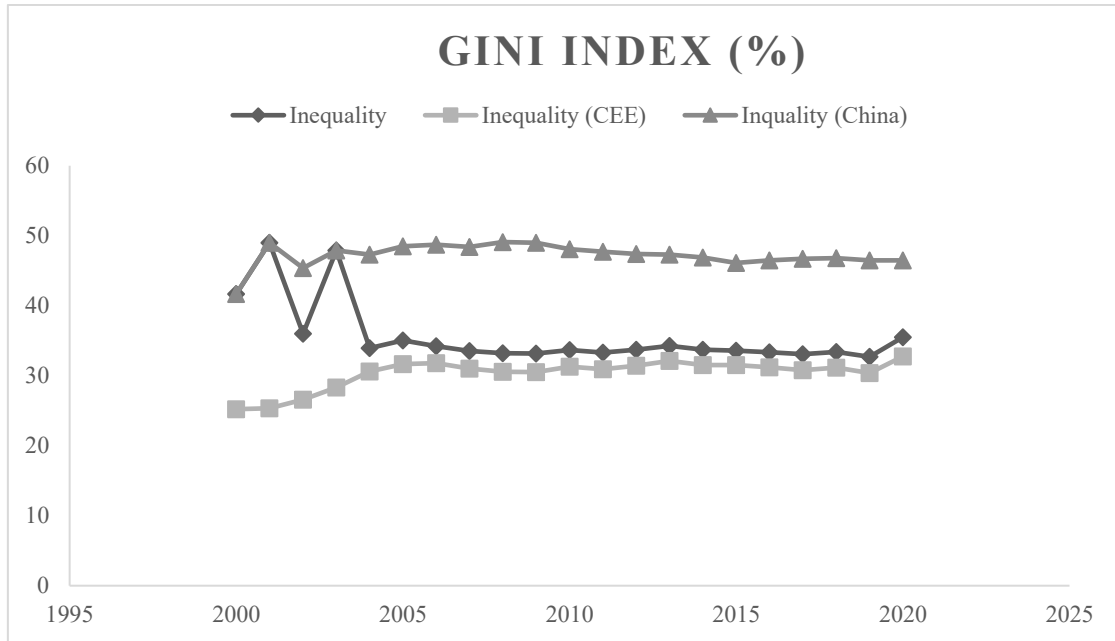


Figure 1. The trend of Gini Index (2000-2020)

### 2.2.2 the trend of the Gender Income Gap Index

Figure 2 shows the trend of the Gender Income Gap Index for the period from 2000 to 2020. Moreover, comparisons are conducted for the overall Gender Income Gap (Gender Income Gap), the Gender Income Gap (Gender Income Gap (CEE)) of Central and Eastern European countries, and the Gender Income Gap (Gender Income Gap (China)), respectively. The overall Gender Income Gap Index was volatile in the early 2000s, but has flattened out and fluctuated around 20% since 2005, maintaining a constant range between 20% to 25% from 2005 to 2020. The Gender Income Gap Index for CEE countries is comparatively lower and shows a smaller range of fluctuations throughout the time period, staying between 10% to 15% for most of the time, indicating that the gender income gap in CEE countries is smaller and more stable. However, China's gender income gap index fluctuated considerably in the early 2000s, but has stabilised since 2005, fluctuating between 10 and 15 per cent, which is lower than the overall level. This phenomenon

demonstrates that the gender income gap in China is relatively small.

Through the analysis of Figure 2, it is evident that the overall global gender income gap index shows a stable trend during the period from 2000 to 2020. That is to say, the gender income gap in CEE countries is relatively small and stable, while China's gender income gap index is relatively low and remains at a somewhat constant level. This is a reflection of the differences in gender income gaps in various regions, as well as the differences in the measures adopted and the effectiveness of the countries in narrowing the gender income gap.

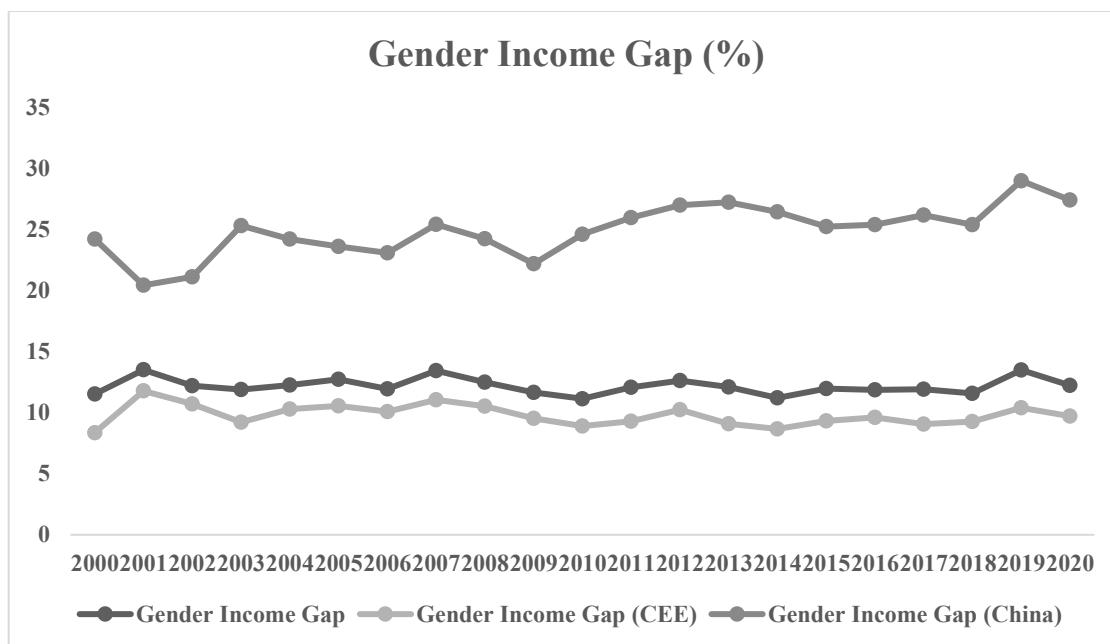
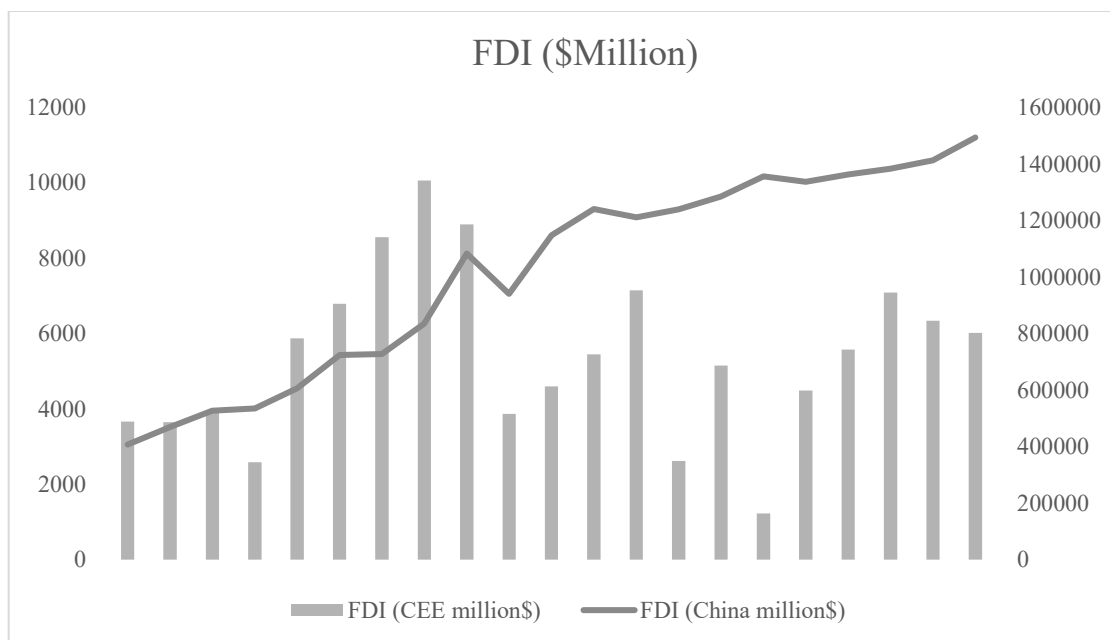


Figure 2. The trend of Gender Income Gap Index (2000-2020)

### 2.2.3 the trend of FDI inflows

Figure 3 illustrates FDI inflows to China and CEE countries over the period 2000 to 2020. It should be clarified in advance that the data for China in the graph uses the primary axis on the right, while that for CEE is on the secondary axis on the left. Thus, the values for CEE are lower than those for China during all the time periods studied. The analysis reveals that China's FDI has shown a significant rising trend during this period. Especially after 2010, when FDI growth accelerated to reach nearly US\$ 1,500,000 million by 2020, demonstrating a strong growth momentum. However, FDI in CEE countries has shown

greater volatility. This is evidenced by the fact that, with 2010 as the cut-off point, there was an upward but volatile trend in the period leading up to that time. Since then, it has failed to maintain a sustainable growth path and the fluctuations have remained significant. In contrast, China has shown more stability and sustained growth trends in attracting FDI, while CEE countries appear to be unstable. China's remarkable FDI growth after 2010 may be related to its advantages in terms of policy, market size, and infrastructure. Overall, China has significant advantages in attracting FDI. Hence, policymakers could draw on China's successful experience to further enhance the attractiveness of investment in CEE countries and promote steady growth in FDI.



**Figure 3. The comparison of FDI between China and CEE countries (2000-2020)**

### 2.3 Stationarity test

Due to the large T in this paper, particular attention is paid to the stationarity of the data to ensure the effectiveness of the estimation results and to prevent the occurrence of “pseudo-regression”. It is worth pointing out that since the dataset in this paper is unbalanced panel data, the ADF-Fisher unit root test is employed to evaluate the stability of the data process. The unit root test is a statistical test that is designed to detect whether the time series data is of a stable mean and variance. In other words, whether it presents a random wandering characteristic. Moreover, Table 3 reports the results of the stationarity

test.

**Table 3. Stationarity**

Variables	Chi-squared	P value	Stationarity
Inequality	69.6625	0.0000	Yes
Gap	35.3658	0.0004	Yes
FDI	24.1833	0.0435	Yes
PGDP	23.1477	0.0579	Yes
Corruption	37.3621	0.0007	Yes
Stability	55.5272	0.0000	Yes
Law	23.0585	0.0593	Yes

It can be observed that the original hypothesis of the existence of unit root was successfully rejected for all the variables included, which implies that these time series are smooth. Specifically, the Chi-squared values ( $C^2$ ) and P-values of these variables suggest that the stochasticity of these series was successfully verified at the significance level that has been set, thus backing up the hypothesis of them as stationary series. For example, Gap exhibits a high  $C^2$  value of 35.3658 and a P-value of only 0.0004, which is far below the commonly assumed significance level of 0.05, thus strongly supporting the smoothness of the Gap sequence. Likewise, similar statistical properties are also displayed for all the other sequences, proving their stationarity.

## 2.4 Correlation analysis

The results of the correlation analysis are displayed in Table 4.

**Table 4. Correlation**

	Inequality	Gap	PGDP	FDI	Corruption	Stability	Law
Inequality	1						
Gap	0.375***	1					
PGDP	-0.841***	-0.145	1				
FDI	0.765***	0.752***	-0.465***	1			
Corruption	-0.806***	-0.202**	0.742***	-0.528***	1		
Stability	-0.933***	-0.396***	0.818***	-0.768***	0.833***	1	
Law	-0.897***	-0.350***	0.852***	-0.641***	0.908***	0.897***	1

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

The analysis demonstrates that income inequality is strongly correlated with a number of factors. In the case of income inequality, it is positively correlated with the gender income gap (0.375\*\*\*), indicating that the greater the gender income gap, the higher the overall income inequality. There is also a positive correlation of it with FDI (0.765\*\*\*),

indicating that the higher the FDI, the higher the overall income inequality. Yet, it is strongly negatively correlated with GDP per capita (-0.841\*\*\*), indicating that the higher the GDP per capita, the lower the overall income inequality. Moreover, the indicator is also significantly negatively correlated with corruption governance (-0.806\*\*\*), social stability (-0.933\*\*\*) and the level of the rule of law (-0.897\*\*\*), signalling that the better these factors are, the lower income inequality is.

When it comes to the gender income gap, it is strongly and positively correlated with FDI (0.752\*\*\*), indicating that the greater the inflow of FDI, the larger the gender income gap. However, it is negatively correlated with corruption governance (-0.202\*\*), social stability (-0.396\*\*\*) and the level of the rule of law (-0.350\*\*\*), suggesting that the better these factors are, the smaller the gender income gap. There is also significant positive correlation between GDP per capita, corruption governance, social stability and level of rule of law, whereas FDI is negatively correlated with these factors.

To conclude, such findings demonstrate that higher levels of GDP per capita, good governance, social stability and the rule of law are all associated with lower income inequality. While increases in FDI inflow may exacerbate income inequality and gender income gaps.

## **2.5 Hypothesis and empirical model**

The research question in this study is the impact of FDI on social income inequality and gender income inequality in CEE countries and China. Therefore, we refer to and operationalise the methodology used by Khan and Nawaz (2019) as well as Xu et al.(2021). Despite being based on this, the models in this paper differ from theirs in several key aspects. First and foremost is the distinction in the study population. Their study examined these factors across the context of CIS and Sub-Saharan Africa, whereas this study concentrates on the CEE region and China as emerging markets. Also, one of the major focuses of their study is on the impact of trade openness. Secondly, their model selected school enrolment and inflation as control variables, while this study considers corruption governance, social stability the level of the rule of law as significant regional



determinants of inequality. Thirdly, they only included overall income inequality in the discussion, but this paper highlights, additionally, gender income inequality, which has been neglected by numerous previous studies.

Therefore, the following hypotheses are proposed respectively:

**Hypothesis 1:** FDI inflows would exacerbate overall income inequality.

**Hypothesis 2:** FDI inflows would exacerbate the gender income gap.

On such basis, taking into consideration that the sample of this paper is panel data from 2000 to 2020, the fixed effect model which is more appropriate for panel data is chosen for empirical testing. Moreover, the model test in the later section verifies the appropriateness of the model. In order to enhance the robustness of the regression results, this study has further controlled for both year-fixed effects and country-fixed effects. Also, a two-way fixed effects model is built to conduct the empirical study. The model is set up to test the hypothesis respectively as follows:

$$Inequality_{it} = \alpha_0 + \alpha_1 FDI_{it} + \alpha_3 PGDP_{it} + \alpha_4 Corruption_{it} + \alpha_4 Stability_{it} + \alpha_5 Law_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

$$Gap_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_3 PGDP_{it} + \beta_4 Corruption_{it} + \beta_4 Stability_{it} + \beta_5 Law_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

In the model above in the equation above,  $i$  denotes the country, and  $t$  denotes the year. Besides,  $Inequality_{it}$  is the social income inequality index, and  $Gap_{it}$  is the gender income inequality index, which is another explanatory variable in this paper.  $FDI_{it}$  is the core explanatory variable of FDI in this study. In addition,  $PGDP_{it}$  provides the control variable of GDP per capita, which measures the level of economic development in this paper.  $Corruption_{it}$  is also one of the control variables, corruption governance index. Higher values indicate that the political environment is cleaner.  $Stability_{it}$  is the control variable of social stability index, which measures the degree of harmony in the society. Similarly, the higher the index is, the more stable the social security environment is.  $Law_{it}$  is the control variable of rule of law index, which measures the level of rule of law in the

country.

It is worth emphasising that the coefficients of interest in this paper are  $\beta_1$  and  $\alpha_1$ . More specifically, if their performance turns out to be significantly positive, it implies that the increase in FDI has a widening effect on the gender income gap as well as the overall social income inequality. The opposite is true if the coefficient is significantly negative. In addition,  $\mu_i$  is the country-fixed effect,  $\lambda_t$  is the year-fixed effect, and  $\varepsilon_{it}$  denotes the random perturbation term. Moreover, in order to mitigate the issue of heteroskedasticity, this study considers the robust standard error of clustering to individuals in each regression model.

## 2.6 Model selection

In Table 5, four distinct model selection methods and their corresponding statistics and p-values are presented. Firstly, it is noticeable that for the variables of Income Inequality (Inequality) and Gender Income Gap (Gap), the results of the F test are 19.69 and 55.92 respectively. Moreover, both of them have a P-value of 0, which is much less than 0.0002, highly suggesting that there is a significant difference between the models that are being compared. In other words, the results of the F test show that the fixed effect model (FE) is more suitable for processing these data than the Ordinary Least Squares (OLS) or the Random Effect model (RE). Secondly, the results of the Housman test indicate a significant discrepancy between the FE model and the RE model ( P-value of 0.0002 and 0.002, respectively), and the P-value of the former is smaller. This signifies that the FE model is more applicable to the current dataset, which further validates the superiority of the model. In addition, a joint model of FE and RE (FE & RE) was also examined. But given that the FE model alone has shown a better fit and carries a lower P-value, it can be inferred that the FE model is the optimal choice in the particular context of this study.

In summary, for the two variables of Income Inequality (Inequality) and Gender Income Gap (Gap), both the F-test and the Hausman test show that the FE model is the most proper model choice. Consequently, in subsequent regression analyses, the fixed effects model should be employed to examine the influences of these variables. This choice

would allow for better control of both individual heterogeneity and time-invariant factors, thus giving more reliable results in terms of estimation

**Table 5. Model Test**

Variable	Test	Models Selection	Statistics	P Value	Model
Inequality	F test	OLS or FE&RE	19.96	0.000	FE
	Hausman test	FE & RE	25.94	0.000	
Gap	F test	OLS or FE&RE	55.66	0.000	FE
	Hausman test	FE & RE	20.67	0.002	

### 3. Empirical Results

#### 3.1 Baseline regression

Baseline regression analysis is a typical empirical method of statistical analysis that is designed to develop a basic or default model with which to compare other more sophisticated models. In the discussion of this paper, the analysis is represented by the co-occurrence and mutual comparison of a fixed effect model and a two-way fixed effect model. The joint discussion focuses on the impact of FDI inflows on overall income inequality (Inequality) and gender income gap (Gap), under the effect of control variables such as corruption governance (Corruption), social stability (Stability), and the level of the rule of law (Law), respectively. Nevertheless, the existence of differences is also apparent. The former controls for individual fixed effects and centres on variation between individuals. That is, it is predicated on the assumption that each of the countries under study has its own unique fixed effects that do not vary over time, as well as controlling mainly for characteristics that fulfil this criterion. The latter, on the other hand, allows for both individual fixed effects and time fixed effects to be taken into consideration, and therefore enables a more comprehensive control for potentially omitted variables. In particular, on the basis of the former, it further supposes that there is also a fixed effect at each point in time that does not change with the individual. Thus, omitted variables that do not vary with individuals but may influence the dependent variables are also to be

identified and captured, thereby allowing for the exclusion of time-related disturbances. Overall, the joint testing and exploration of the two models enables a higher degree of comprehensiveness and accuracy in the results of the study.

In the next paragraphs, the results of the baseline regression analysis are further discussed to reveal the impact of several critical economic and social factors on income inequality and the gender wage gap. The concrete empirical results are shown in Table 6.

**Table 6. Base Regression (Fixed Effect Model/Two-way Fixed Effect Model)**

	(1)	(2)	(3)	(4)
	Inequality	Inequality	Gap	Gap
FDI	0.1548** (2.47)	0.1256** (2.13)	0.2824*** (3.33)	0.2405** (2.74)
PGDP	-0.1747*** (-3.36)	-0.1399* (-1.78)	-0.0639 (-1.24)	-0.3130** (-2.13)
Corruption	-0.4610** (-2.55)	-0.5203*** (-3.39)	0.3108 (1.24)	0.4538 (1.17)
Stability	0.1472 (1.03)	0.2955* (1.94)	0.1309 (0.74)	0.1761 (0.57)
Law	-0.0823 (-0.40)	-0.1111 (-0.69)	-0.4575 (-1.59)	-0.4545 (-1.64)
_cons	0.0152 (0.21)	-0.0762 (-0.92)	0.0612 (0.61)	0.0377 (0.29)
<i>N</i>	118	115	134	134
YearFE	No	Yes	No	Yes
CountryFE	No	Yes	No	Yes
r <sup>2</sup> <sub>a</sub>	0.1033	0.9548	0.0249	0.8801

*t* statistics in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Firstly and most importantly, FDI exhibits a significant positive impact on both aspects. The data indicates that an increase in FDI would contribute significantly to overall income inequality (Inequality: 0.1548\*\*, 0.1256\*\*) whilst at the same time highly widening the gender income gap (Gap: 0.2824\*\*\*, 0.2405\*\*\*). It is notable that this conclusion is the same as the one reached by Xu et al. (2021) despite the fact that they employed a different two-step GMM technique with robust standard errors for their study than the one used in this study. In addition, this result agrees with and echoes the results of several scholars' studies on the CEE region and China, respectively, by different empirical methods (Reuveny and Li, 2003; Halmos, 2011; Greaney and Li, 2012; Chen, Zhao and Zhou, 2017; Yuldashev et al., 2022).

Meanwhile, this demonstrates that the results of the fixed-effect model are further validated by the two-way fixed-effect model, hence the conclusions derived from the analyses are of greater precision and completeness. Again, this conclusion can be mutually verified with numerous previous studies. For instance, the approach taken by Fodor and Glass (2018) departs from that of this paper. Their two independent panels of multivariate model analyses of the data for 2008 and 2012 for ten post-socialist countries in the CEE region likewise find that foreign investment introduced by economic transition did not feminise the labour force or shrink the gender wage gap. Moreover, King et al. (2017) also argue that the gender gap in work could widen as a result, especially among younger age groups.

Besides, the implication of this finding is that more FDI inflows are always seen as one of the major drivers of economic growth in the backdrop of deepening globalisation and greater efforts by emerging markets to integrate and participate in international markets. Accordingly, governments, institutions, and firms in these countries, etc. are often motivated to attract more FDI inflows. However, it is not commonly noticed that it will bring about an increase in social inequality to a greater extent, especially between genders. In addition, in conjunction with the correlation analysis in Table 5, the correlation coefficient between FDI and PGDP is  $-0.465^{***}$ , which shows a significant negative correlation. This reveals that an increase in FDI inflows could also play a negative role in the enhancement of per capita GDP. Although this negative correlation would not necessarily imply that FDI has a direct negative effect on PGDP, it is still a warning to the relevant parties that they should not ignore the enhancement of economic per capita level while focusing on the overall economic development. Therefore, when designing policies to attract FDI, policymakers would need to carefully weigh its potential social impacts. Moreover, it is highly desirable to put in place appropriate mitigating measures. For instance, the consequent widening of overall income and gender income inequality needs to be properly addressed, as well as the rise in per capita economic level requires urgent attention. In addition, the government should encourage FDI to flow to more equitable and sustainable fields so as to facilitate the comprehensive development of the economy.

In contrast, the effect of higher per capita GDP (PGDP) on reducing overall income inequality and narrowing the gender income gap is found to be positive. According to

Table 6 in specific, the coefficient between GDP per capita and income inequality is significantly negative (Inequality: -0.1747\*\*\*, -0.1399\*). Additionally, a slightly different picture of the gender income gap can be observed, with a coefficient of -0.0639 in the fixed effects model, which can only reflect a statistically weak negative relationship. In a further test of the two-way fixed effect model, however, the coefficient is -0.3130\*\*. The marked increase in absolute value and the closer proximity to zero is more than convincing. This suggests that PGDP exhibits a statistically significant negative effect on the role of GAP after taking both year and country fixed effects into account more thoroughly. In this way, the results are more complete and accurate. This finding underscores the significance of economic development in promoting multiple levels of equity in the society. Whereas growth in GDP can only reflect an increase in the overall economic level of the country, ignoring the individual level, a rise in GDP per capita represents an improved economic position of the individual, and thus a true indication of overall economic growth. This is usually associated with an increase in employment opportunities, higher levels of education and a stronger social security system, which in turn contributes to the reduction of poverty and inequalities. Hence, the Government should continue to promote economic development and effectively raise the level of per capita GDP with a view to reducing inequalities and endeavouring to reach social equity. This can be accomplished through the introduction of policies to foster industrial upgrading, strengthening the innovation drive, optimising the business environment, and so on. At the same time, the quality and efficiency of economic development should also be given attention to ensure that the fruits of economic development could benefit a wider range of people.

Improvements in the governance of corruption (Corruption) demonstrate a significant negative impact on overall income inequality in both models (Corruption: -0.4610\*\*, -0.5203\*\*\*), signalling a substantial reduction in this type of inequality under the impact. But in the same two models, the significance level of the impact of this indicator on the Gender Income Gap (GAP) is not high enough (t-values of 1.18 and 1.16, respectively, which are both less than 1.96), showing that the impact is not significant. This indicates that combating corruption can not only contribute to the effectiveness of government governance, but also alleviate the overall income gap. Therefore, the government should intensify its anti-corruption efforts and enhance the level of corruption governance in order to promote overall social equity.

The performance of social stability (Stability) shows a different pattern. According to the chart, it can be noticed that this indicator does not show a remarkable effect on overall income equity in the fixed effects model (0.1472), but shows a more significant positive impact in the later two-way fixed-effects model (0.2955\*). Nonetheless, the significance level of this impact is not as great as that of the indicators discussed previously. In addition, it does not have a statistically significant influence on the gender income gap, even to a lesser extent (0.1309, 0.1761). To sum up, the growth and improvement of social stability might in certain cases increase income inequality to some extent, but the effect on gender income inequality is not evident. This finding hints that while pursuing social stability, there is also a need to pay attention to the income distribution issues that it might lead to. Although social stability is an indispensable prerequisite for economic development, the consequence of excessive degree of stability is the lack of circulation of all sorts of resources. That is to say, the solidification of resources, power and even social class will further deteriorate, and as a result, income inequality will get even more unpromising. Therefore, the government should place more emphasis on the fairness of income distribution while maintaining social stability. Furthermore, income disparity could be further regulated and improved through redistributive means such as taxation and social security so as to ensure that social stability and fairness go hand in hand.

As can be understood from the table, the effect of the level of the rule of law (Law) on both income inequality and gender income gap is not significant (Inequality: -0.0823, -0.1111; Gap: -0.4575, -0.4545). The level of the rule of law is an influential indicator for measuring the governance capacity of a country or region, yet the regression analyses reveal that its effect on income inequality and gender income gap is not apparent. This might imply that the current legal environment is still inadequate in protecting the rights and interests of vulnerable groups and fighting unfair behaviours. This point also corroborates the overall conclusion in the latest World Rule of Law Index report published by the World Justice Project (WJP, 2023). That is, the level of the rule of law in most countries has fallen for six consecutive years, and the overall global legal environment is not favourable. Therefore, the government should reinforce the rule of law and raise the level of the rule of law in order to ensure that laws and regulations could be effectively enforced and provide powerful legal safeguards for social fairness and justice. At the same time, the government should also strengthen the public's understanding and acceptance of

laws and regulations, so as to create a favourable atmosphere for the whole society to abide by the law.

### 3.2 Multicollinearity Test

In this paper, the VIF test is applied to examine the issue of multicollinearity. The results of the VIF test for both the overall income gap and the gender income gap are listed in Table 7. The higher the value of the VIF, the higher the degree of multicollinearity between that variable and the other ones, which could result in instability of the estimation of the model. However, it can be observed that the largest value of VIF in the table is not greater than 10, so there is no severe problem of multicollinearity.

**Table 7. VIF Test**

Variable	VIF	1/VIF
Law	5.9200	0.1689
Stability	5.8800	0.1701
Corruption	5.6000	0.1787
PGDP	4.5200	0.2212
<b>FDI</b>	3.2100	0.3113
<b>Mean</b>	<b>VIF</b>	<b>5.0260</b>
Law	5.8400	0.1712
Stability	5.2500	0.1905
Corruption	4.3000	0.2326
PGDP	2.9200	0.3422
<b>FDI</b>	2.6700	0.3745
<b>Mean</b>	<b>VIF</b>	<b>4.1960</b>

### 3.3 Lag effect test

In order to achieve more accurate and comprehensive outcomes, this paper conducts a lagged effect test. Through this method, the dynamic changes and long-term effects of FDI on the two kinds of inequality can be examined and learned in depth. Therefore, it contributes to the policymakers' understanding of the time-dependent relationship between economic variables, which could enable them to develop more effective economic policies. The data of the lagged effect test is presented in Table 8. According to the data therein, some more profound conclusions can be extracted from the analyses. For example, the impact of FDI on overall income inequality and gender income gap as well as how other economic and social factors interact with it.



**Table 8. Lag effect Test (Lag FDI 1/2 YEAR)**

	(1) inequality	(2) gap	(3) inequality	(4) gap
Lag1_fdi	0.1156** (2.16)	0.3112*** (3.94)		
pgdp	-0.1551** (-2.14)	-0.1942 (-1.49)	-0.1611** (-2.16)	-0.1287 (-0.93)
Corruption	-0.5242*** (-3.38)	0.1710 (0.54)	-0.5059*** (-3.30)	-0.0404 (-0.13)
Stability	0.2896* (1.88)	0.0681 (0.23)	0.2811* (1.76)	0.0904 (0.33)
Law	-0.0997 (-0.61)	-0.4945** (-2.19)	-0.0933 (-0.55)	-0.5830** (-2.55)
Lag2_fdi			0.0881 (1.68)	0.3320*** (4.29)
_cons	-0.0696 (-0.85)	0.1443 (1.19)	-0.0643 (-0.77)	0.1872 (1.71)
<i>N</i>	115	128	115	122
YearFE	Yes	Yes	Yes	Yes
CountryFE	Yes	Yes	Yes	Yes
r2_a	0.9548	0.8866	0.9543	0.9001

*t* statistics in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

First of all, the results of the lagged effect test indicate that FDI has a significant positive impact on both overall income inequality and the gender income gap, and such impact is most pronounced after one year. More specifically, the coefficients of FDI on income inequality and gender income gap with a one-year lag are 0.1156\*\* and 0.3112\*\*\* respectively, showing that the rise of FDI worsens these two problems to a certain extent. Nevertheless, when data with a two-year lag are examined, the effect of FDI on income inequality appears to be less significant. Still, its positive impact on the gender income gap remains significant, as evidenced by a slight upward shift in the coefficient (0.3320\*\*\*). In addition to FDI, the increase in per capita GDP (PGDP) is negatively significant on both income inequalities (-0.1551\*, -0.1611\*\*), which implies that economic growth could help to alleviate social inequality. At the same time, however, the effect of GDP per capita on the gender income gap is not significant (-0.1942, -0.1287).

In the area of corruption governance, improvements in it markedly reduced overall income inequality with a negative coefficient (-0.5242\*\*\*, -0.5059\*\*\*), indicating the importance of the fight against corruption in promoting overall social equity. Nonetheless, the effect of corruption governance on gender income gap is not statistically significant (0.1710, -0.0404). Besides, the analysis of social stability (Stability) further supports the

previous conclusions. The coefficients in the one-year and two-year tests following the increase in this indicator are 0.2896\* and 0.2811\*, respectively, which continue to be positively correlated with overall income inequality. This could imply that under certain circumstances, an increase in social stability may be associated with an increase in income inequality. Yet, in the same manner as the previous analyses, the effect of social stability on gender income gap is again insignificant (0.0681, 0.0904). In addition, the lagged effects test indicates that increases in the level of the rule of law (Law), on the other hand, significantly reduce the gender income gap, with a negative coefficient (-0.4945\*\*, -0.5830\*\*).

However, the effect of the level of the rule of law on overall income inequality is not significant (-0.0997, -0.0933). The former differs from the results of the baseline regression, indicating that improvements in the legal system contribute positively to the promotion of gender equality. However, such positive effects appear with a lag of one and two years after the implementation of the regulations, showing that it takes a certain amount of time for the legislation to take hold and be implemented in a thorough manner before it can play its role. Thus, in assessing the effects of the regulations, the time lag should be fully taken into account to avoid losses resulting from partial judgements made solely on the basis of short-term data. Meanwhile, the implementation of the regulations should be constantly monitored in the process of execution and market response, and the relevant measures should be adjusted and improved in a timely way. In this regard, it can be guaranteed that the regulations can give full expression to their expected effects to the greatest extent possible.

### **3.4 Endogeneity test**

During the model construction process in this study, there is a challenge that is not easy to avoid completely, namely, the problem of omitted variables and potential reciprocal causation. These issues could lead to the endogeneity of the model and thereby interfere with the accuracy of the results of the analysis. In an attempt to overcome these obstacles, the approach taken in this research is to select the lagged term of FDI as an instrumental

variable. The objective of such an approach is to minimise the impact of endogeneity on model estimation by introducing a variable that is highly correlated with the endogenous explanatory variables but uncorrelated with the error term. After conducting a detailed regression analysis, the findings obtained are presented in Table 9.

**Table 9. Endogeneity**

	(1)	(2)
	Inequality	Gap
FDI	0.1309** (2.21)	0.3378*** (3.73)
PGDP	-0.1395* (-1.79)	-0.1627 (-1.28)
Corruption	-0.5235*** (-3.38)	0.1787 (0.56)
Stability	0.2973* (1.96)	0.0794 (0.26)
Law	-0.1126 (-0.70)	-0.5208** (-2.21)
N	115	128
YearFE	Yes	Yes
CountryFE	Yes	Yes
r <sup>2</sup> a	0.0692	0.0571
Kleibergen-Paap rk LM	0.0011	0.0004
Cragg-Donald Wald F	1066.591	1789.321
Hansen J statistic	0.000	0.000
r <sup>2</sup> a	0.0692	0.0571

Notes: *t* statistics in parentheses  
\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

In this case, the F-statistic for the weak instrumental variable test is significantly above 10. Such a result provides convincing evidence that the chosen instrumental variables are sufficiently strong to be effective substitutes for the endogenous explanatory variables. In addition, the unidentifiable tests for overall income gap and gender income gap are similarly built. The Kleibergen-Paap rk LM statistic for both the aggregate income gap and gender income gap non-identification tests are significant at the level of 1%, rejecting the original hypothesis of “non-identification”. This further proves the validity of this instrumental variable. This result implies that the selected instrumental variables are not only strongly correlated with the endogenous explanatory variables, but also capable of effectively capturing the impact of the endogenous explanatory variables on the dependent variable.

The Cragg-Donald Wald F statistic values are also all well in excess of the critical

values in terms of the weak instrumental variables test. This is another strong indication that the model in this case does not suffer from the weak instrumental variable problem. Such a issue could lead to inaccurate estimation results, and the test results in the table show that this influence is successfully avoided. Ultimately, the impact coefficient of FDI can be obtained by substituting the fitted values of the first stage IV into the second stage regression. The impact coefficient of FDI remains significantly positive after the inclusion of instrumental variables. This outcome not only makes the robustness of the benchmark results validated, but likewise further substantiates the importance and effect of FDI in the model. Through the series of tests and regression analyses, the endogeneity issue was addressed satisfactorily, providing solid ground for the findings of the study.

### **3.5 Robustness test**

In the robustness test, the main concern is the statistical significance of the model and the stability of the coefficients. Considering the more direct impact of FDI on coastal countries, this paper excludes three landlocked ones (Hungary, Czech Republic and Slovakia) to change and adjust the sample, and conducts the regression analyses again with the two-way fixed effect model.

As can be seen from Table 10 below, the coefficients of most of the variables are accompanied by high t-statistics. This suggests that the coefficients of these variables are statistically significant, meaning that they have a high explanatory power for the model. More specifically, the coefficients of FDI with inequality (inequality) and income gap (gap) are positive and significant with large t-values. This implies that FDI has a significant positive effect on both of these factors, which means that increases in FDI would worsen both of the problems. More importantly, the validity of the conclusions drawn from previous analysis. Furthermore, their relationship with economic growth (PGDP) and other dependent variables) is significant and the relationship is statistically robust.

**Table 10. Robustness test**

	(1) inequality	(2) gap
FDI	0.2937*** (3.33)	0.1804** (2.52)
PGDP	-0.7755** (-2.27)	0.1923 (0.73)
Corruption	-1.2365*** (-5.34)	0.6505* (1.95)
Stability	0.7576*** (3.21)	-0.4212* (-2.06)
Law	-0.3398 (-1.17)	0.6963** (2.85)
_cons	0.0162 (0.10)	0.1857 (1.22)
<i>N</i>	63	73
YearFE	Yes	Yes
CountryFE	Yes	Yes
r2 a	0.9164	0.9633

Notes: *t* statistics in parentheses  
\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Also, it is worth noting that the p-values in the table also provide vital information about the robustness of the model. For most variables, the p-values are less than 0.05 or 0.01, showing that the coefficients of these variables are statistically significant and that the robustness of the model is high. In particular, when the p-value is less than 0.01, indicating that the significance of the variable is so high that the model results carry a high degree of confidence.

Therefore, the following conclusions that echo previous analyses can also be derived from the information in the table. First, an increase in per capita GDP (PGDP) could be helpful in reducing overall income inequality but does not have a significant effect on the gender income gap. Better governance of corruption (Corruption) could significantly reduce overall income inequality, but might widen the gender income gap. Moreover, higher levels of social stability (Stability) are likely to lead to higher levels of overall income inequality, but might help to minimise the gender income gap. Yet, the level of the rule of law is not significantly affecting overall income inequality, but would enlarge the gender income gap.

In sum, according to the contents and discussion of Table 10, the following findings

about the robustness test could be reached. The models have a high level of robustness and credibility in interpreting the relationship between FDI and overall income inequality and gender income gap. Besides, the coefficients of most of the variables are significant and the statistical significance level of the model is found to be high. This not only demonstrates the accuracy and robustness of the construction and analysis of the previous empirical models, but also gives an important reference for policymakers and helps to formulate a more scientific and sound economic policy.

### **3.6 Moderated test**

In addition, the study also looks at the impact of education on the two types of inequality indicators of concern. According to previous analyses in the literature review, education is also one of the most crucial factors that could affect inequality. Therefore, the moderator variable selected is education expenditure (EDU), which is derived from the database of the World Bank's World Development Indicators (WDI). Also, a two-way fixed effect model is still being employed. Then, this moderator variable and the interaction term between the moderator variable and FDI are added to the baseline model. The concrete results of the analysis of the moderating effect are shown in Table 11.

Based on the data in the table, several crucial conclusions are revealed by the analysis of the moderating effect of education expenditure on income inequality and gender income gap. Firstly, FDI has a significant positive effect on income inequality, which is manifested by a coefficient of 0.4426\*\* in Model (1) and further enhanced to 0.4872\*\*\* in Model (2). This indicates that income inequality increases further with the increase in FDI. However, the effect of FDI on gender income gap is not found to be significant (-0.0157, 0.1338), implying that the inflow of foreign capital does not have a noticeable effect on the income gap between genders. This finding is the same as the results of the baseline regression previously. In addition, the increase in education expenditure contributes to the decrease in income inequality (Model (1): -0.1725\*), but does not clearly affect the gender income gap (Model (3):0.1566, Model (4):0.3177). This suggests that the role of education in advancing gender equality needs to be further strengthened. Furthermore, it is worth noting that education expenditure enhances the positive impact of FDI on income inequality to

some extent (Model (2): 0.1126\*). Yet, such a moderating effect is not significant for FDI's impact on the gender income gap (model (4): 0.3246).

Moreover, the increase in per capita GDP (PGDP) plays a positive role in reducing gender income gap, which is verified in Model (3) (-0.3695\*\*) and Model (4) (-0.3644\*\*). In the meantime, improvement in corruption governance contributes significantly to the reduction of income inequality with coefficients of -0.5123\*\*\* and -0.4888\*\*\* in Model (1) and Model (2), respectively. This suggests that further intensification of the anti-corruption fight can contribute to the mitigation of income inequality. Nevertheless, the impact of corruption governance on gender income gap is not obvious (Model (3): 0.4229, Model (4): 0.4867).

Additionally, there is a positive correlation between an increase in social stability (Stability) and income inequality, which is reflected in Model (1) (0.3312\*) and Model (2) (0.3438\*). This demonstrates that an increase in social stability is accompanied by an increase in overall income inequality. However, the effect of social stability on gender income gap proved to be insignificant (Model (3): 0.1522 and Model (4): 0.1791). Finally, the level of the rule of law (Law) has a non-significant effect on both overall income inequality and gender income gap, which could be an indication that the building of the rule of law does not have a significant effect on these two variables in the context of the current study.

In conclusion, the various results obtained from the analysis of the moderating effect generally corroborate and echo the previous analyses. Hence, in the process of formulating relevant policies, the positive effects of increasing education expenditure and strengthening corruption control on reducing and alleviating income inequality should be adequately taken into account. At the same time, measures to reduce the possible income inequality exacerbating the effect of FDI are also more than essential. Besides, the role of enhanced education and political integrity in promoting gender equality should also be given sufficient priority. In other words, as policymakers endeavour to attract FDI, there should be measures to mitigate its potential negative influence on overall income inequality and gender income gap. Meanwhile, attention should be paid to raising GDP per capita and enhancing corruption governance to promote social equity, as well as to balancing the

varying impacts of social stability and the level of the rule of law on the distribution of income.

**Table 11. Regulating Effect of Education Expenditure**

	(1)	(2)	(3)	(4)
	inequality	inequality	gap	gap
FDI	0.4426** (2.29)	0.4872** (2.16)	-0.0157 (-0.07)	0.1338 (0.37)
EDU	-0.1725* (-2.01)	-0.3350 (-0.77)	0.1566 (1.29)	-0.3177 (-0.47)
PGDP	-0.0485 (-0.44)	-0.0477 (-0.42)	-0.3695** (-2.48)	-0.3644** (-2.50)
Corruption	-0.5123*** (-3.28)	-0.4888*** (-3.14)	0.4229 (1.10)	0.4867 (1.18)
Stability	0.3312* (2.01)	0.3438* (1.98)	0.1522 (0.49)	0.1791 (0.54)
Law	-0.1126 (-0.67)	-0.1272 (-0.74)	-0.4436 (-1.65)	-0.4932 (-1.69)
FDI*EDU		0.1126** (2.37)		0.3246 (0.77)
_cons	-0.1247 (-1.23)	-0.1242 (-1.23)	0.0546 (0.40)	0.0468 (0.33)
N	115	115	134	134
YearFE	Yes	Yes	Yes	Yes
CountryFE	Yes	Yes	Yes	Yes
r2_a	0.9553	0.9548	0.8799	0.8791

Notes: *t* statistics in parentheses  
 \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### 3.7 Finding and discussion

#### 3.7.1 Finding

The primary research question of this paper is to explore how FDI inflows would impact overall income inequality and gender income gap in emerging markets such as CEE and China. Based on these two questions, Hypothesis 1 and Hypothesis 2 are developed respectively. That is, the impact of FDI on both indicators is positive, which means that it will increase these two types of inequality. Then, a variety of empirical models are constructed to examine both hypotheses. After the analysis and summary, the empirical results of all the models above for hypothesis testing could prove that both hypotheses are successfully verified. Also, the success of the robustness test has further validated and affirmed the correctness of the hypotheses. The details are shown in Table 12.



**Table 12. Summary of results of hypothesis test**

Empirical models		Coefficient (T) of Inequality	Coefficient (T) of Gap
Baseline Regression	Fixed effect Model	0.1542** (2.35)	0.2986*** (3.38)
	Two-way fixed effect Model	0.1161* (2.01)	0.2569*** (2.95)
Lag effect test	Lag FDI 1 Year	0.1089*(1.97)	0.3385*** (4.16)
	Lag FDI 2 Year	0.0911 (1.65)	0.3513*** (4.30)
Moderated test	Model 1/3	0.5909** (2.52)	0.0298 (0.09)
	Model 2/4	0.7206*** (3.02)	0.1128 (0.29)

Notes: *t* statistics in parentheses  
\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

It can be observed that for Hypothesis 1, the coefficients between FDI and Inequality are positive in all the empirical models that have been constructed. Also, all the impacts are highly significant (especially in the most critical model of the baseline regression), except for the test of the lagged effect with a lag of two years. Hence, Hypothesis 1 can be proved to be true. That is, FDI inflows increase overall income inequality in CEE and China. When it comes to Hypothesis 2, the empirical results of its validation are more than similar to those of Hypothesis 1. In particular, the coefficients between FDI and Inequality are all positive and reflect great significance in the most dominant model of the baseline regression as well. Therefore, Hypothesis 2 is likewise valid, namely that FDI inflows exacerbate the gender income gap in CEE and China.

### 3.7.2 Discussion

In this paper, the variables of overall income inequality index (Inequality), gender income gap index (Gap), per capita GDP (PGDP), foreign direct investment (FDI), corruption governance index (Corruption), social stability index (Stability), and law and order level index (Law) were standardised. Also, all variables were subjected to a 1 % to 99 % shrinkage to reduce the effect of extreme values on the results of the analysis. The results of descriptive statistics show that the mean of each variable is close to 0 and the standard deviation is about 1, indicating that the data are evenly distributed and the extreme values are controlled. Thus, a reliable basis was established for the subsequent regression analyses.

The results of the analysis indicate that the overall global inequality index shows a stable trend between 2000 and 2020. That is, inequality in CEE countries is relatively low

and stable, while China's inequality index is relatively high and fluctuates, reflecting the differences in income distribution in different regions and the different policy measures taken by countries to tackle the problem of income inequality. It is noticeable that such results are largely in accordance with the latest findings of the World Inequality Report 2022 which was summarised previously. The only difference is that the global level of inequality analysed in this paper has been consistently lower than that of China, contrary to the report. This is fully plausible, due to the different indicators chosen to capture the level of inequality. In this paper, the Gini coefficient was selected, whereas in the report, the income of the richest 10% of the population as a percentage of total local income was selected. The Gini coefficient used in this paper is a widely accepted indicator of income inequality used in most studies, and the results are therefore convincing. However, there is no denying the impact of the selection of indicators on the study. Thus, in further studies, consideration could be given to adopting less commonly used indicators for analyses, which might provide innovative conclusions from diverse perspectives.

As for the gender income gap, the overall global index shows a stable trend. In CEE countries, the gender income gap is relatively narrow and steady, while in China, the gender income gap is relatively low and remains at a stable level. This indicates the different measures and effectiveness of different regions in narrowing the gender income gap. Such findings are the same as those reported. The formula proposed by the OECD to represent the gender income gap,  $(\text{median male income} - \text{median female income}) / \text{median male income}$ , is employed in this paper. The report, on the other hand, opted to use female income as a share of total income. Despite the different measures employed, the conclusions obtained are of a highly similar character. Therefore, the results of this paper can be considered accurate and reliable. Moreover, the unpromising picture of gender income inequality in the studied region and even in the world as a whole can be a consensus. Hence, efforts in this regard should be taken into account and implemented fully further.

In terms of FDI, China's FDI has shown a notable upward trend between 2000 and 2020. In particular, its growth accelerated after 2010, showing strong growth momentum. In contrast, FDI in CEE countries exhibits greater volatility and fails to maintain sustained growth. China has demonstrated greater stability and a sustained growth trend in attracting FDI, which might be related to its policy, market size, infrastructure and other advantages.

Moreover, correlation analyses reveal the relationship between income inequality and different factors. It is positively correlated with the gender income gap, strongly negatively correlated with GDP per capita, positively correlated with FDI, and strongly negatively correlated with corrupt governance, social stability and the level of the rule of law. As for the gender income gap, the results are different. It is highly positively correlated with FDI and negatively correlated with corrupt governance, social stability and the level of the rule of law. These findings indicate that high levels of GDP per capita, good governance, social stability and the rule of law are all associated with lower income inequality, and that increased FDI may exacerbate income inequality and the gender income gap.

The results of the model test show that the fixed effects model (FE) is the most appropriate model choice. The baseline regression analyses indicate that FDI has a significant positive effect on both overall income inequality and the gender income gap, and that rising GDP per capita contributes to the reduction of income inequality and potentially reduces the gender income gap. Additionally, improvements in corruption governance contribute significantly to reducing income inequality, but have a non-significant effect on gender income gaps. Social stability may increase income inequality under certain circumstances, and the level of the rule of law has a non-significant effect on both variables.

In this manner, it can be pleasing to see that the conclusions of this paper are the identical to those of the majority of the literature that has been discussed earlier. Regarding overall income inequality, the work published by Bandelj and Mahutga (2008 and 2010), which was discussed and analysed in detail before this article, it can be noticed that their argument that FDI inflow worsens this inequality has been re-validated successfully by this paper. Although there are differences in their target countries and regions examined between those of this paper's, the agreement that FDI positively influences overall income inequality is true. In addition, the finding that increases in GDP per capita will attenuate income inequality also echoes the majority of the papers reviewed in previous discussions. Taken together, Völlmecke, Jindra & Marek (2016) concentrated on more than three hundred regions within the EU for an insightful investigation, whereas Tchamyu et al. (2019) expanded their view to almost fifty countries in Africa. As for this paper, the selection is of representative countries in emerging markets (China and CEE) and the

findings coincide with the two aforementioned studies. Also, the findings that enhanced governance reduces overall income inequality are the same as those reached in Nguyen's (2021) research with a two-step GMM approach on a sample of data from nearly forty developing countries. Additionally, with regard to other factors that may potentially effect the impact of FDI on overall and gender income equality, the indicators selected in this article are derived from the Worldwide Governance Indicators and the World Development Indicators released by the World Bank. In this regard, the research conducted and its results are not only more credible as they are endorsed by authoritative institutions, but also are of a more systematic and complete quality.

In terms of gender inequality, the findings of this paper likewise strongly corroborate each other with the past literature that has been analysed. In the case of the CEE region, King et al.'s (2017) in-depth study of Slovenia and Vahter and Masso's (2019) comparable study of Estonia both revealed the same role of FDI on gender income inequality. Specifically, FDI inflows would intensify the gender income gap, which is the same as the conclusion of this paper. As for China, the studies by Ng (2007) and Braunstein and Brenner (2007) employed domestic district-level or provincial-level data that are more granular, and adopted a different empirical methodology. Given this premise, their findings remain the same as those reached in this paper, which utilised national-level data. A range of geographically and methodologically diverse studies, including this article, have collectively managed to prove the actual existence of gender income inequality exacerbated by FDI, thus making such a finding all the more conclusive and credible.

Furthermore, the results of the lag effect test provide additional support for these findings. It suggests that FDI has a significant positive effect on both overall income inequality and gender income gap, and that this effect is most significant after one year. Although an increase in GDP per capita helps to reduce income inequality, it does not show a significant effect on the gender income gap. Whereas improvements in corruption governance significantly reduce income inequality, the effect on the gender income gap is insignificant. Increased social stability may lead to an increase in income inequality, but the effect on the gender income gap is insignificant. Finally, higher levels of rule of law significantly reduce gender income gaps, but their effect on income inequality is found to be insignificant.

In addition, some new findings have emerged from the analysis of the moderating effects of education expenditures on income inequality and gender income gaps as a further complement to the research outcomes. It can be discovered that the increase in education expenditure helps to reduce income inequality, but the effect on the gender income gap is not apparent. In the case of the former, the conclusions echo once again the two core references mentioned earlier in this paper that shared similar methodologies and differed in the regions of study (Khan, Nawaz and Saeed, 2019; Xu et al., 2021). In addition to this, a comparable study by Khan, Nawaz (2021) on five countries in South Asia has likewise reached the same conclusions. Thus, the generalisability, correctness and significance of the findings of this paper is evident. Moreover, education expenditure strengthens the positive effect of FDI on income inequality to some extent, yet its moderating effect on the worsening impact of FDI on the gender income gap is not remarkable. Such findings are in agreement with Sharma (2019, with the latter further adding that the way in which education exerts a moderating effect is through the advancement of women to attain higher management positions in the workplace.

In summary, policymakers should emphasise the positive impact of education spending and corruption governance on income inequality. At the same time, while attracting FDI, measures should be taken to mitigate its potential negative impact. Besides, It is also important to note that attention should be paid to increasing GDP per capita and improving corruption governance to foster social equality.

### **3.7.3 Limitations**

However, there are also certain limitations in this study. Firstly, in terms of the solution to the endogeneity problem, despite the fact that the appropriate instrumental variable (FDI lag term) is selected to mitigate the endogeneity, it cannot be guaranteed that the possible endogeneity problem between the independent and dependent variables could be completely eliminated. However, there are also certain limitations in this study. Firstly, in terms of the solution to the endogeneity problem, despite the fact that the appropriate instrumental variable (FDI lag term) is selected to mitigate the endogeneity, it cannot be guaranteed that the possible endogeneity problem between the independent and dependent

variables could be completely eliminated. This is a consequence of the complexity and variability of the data and it also implies that not all potential omitted variables or reverse causality effects can be absolutely ruled out. Therefore, it is reasonable to maintain necessary caution in the interpretation of the results. Moreover, more refined and comprehensive approaches to dealing with such issues need to be explored in future research.

Secondly, in terms of digging into the mechanism of influence, the relationship between FDI on income inequality is explored in this paper, but there is a lack of research on its mechanism. This is because such mechanism of its influence on the two inequality factors concerned in this paper is complex and dynamic. Also, it may involve multi-dimensional factors such as industrial structure upgrading, labour market demand changes, income distribution changes and policy adjustments. While these have not been fully discussed and argued in this paper. Therefore, a more in-depth exploration in this area can be conducted in the future to obtain a more comprehensive and integrated understanding of the impact of FDI on overall and gender income inequality.

## **Conclusions and Policy Implications**

### **4.1 Conclusions**

Over the past two decades, the wave of economic globalisation has been sweeping across the world, and its impact has become more pronounced and far-reaching. It has not only reshaped the landscape of the international economy, but has also brought about impressive changes in the pattern and efficiency of capital flows. Against the backdrop of continuously lowering costs and thresholds for foreign investment, FDI has greatly facilitated the free flow and optimal allocation of capital on a global scale.

The frequent movement of FDI has accelerated the cross-border transfer of technology and contributed to industrial upgrading. In turn, it has driven the growth of international trade, bringing unprecedented economic dynamism and growth opportunities to its participating countries. However, the two-sided character of the impact of FDI inflows is also undeniable. While it is regarded as one of the major drivers of economic openness and prosperity, the problem of income inequality that comes along with it cannot be ignored. Instead of gradually alleviating over time, income inequality has maintained a slightly fluctuating but steady and slightly increasing trend at the global level. Such a trend not only exacerbates social stratification, but could even pose a threat to social stability and sustainable development in the long run. On the other hand, the trend in gender income gap is somewhat different, showing a longer-term trend that is more stable. Except that the level of China is higher than that of the world in relative terms, and fluctuates more in the early period.

In this context, there has been a great amount of interest among scholars in the effects and implications of FDI on these two types of inequality, and a substantial body of literature on the subject has emerged as a result. In the field of academic research, a considerable amount of literature has been accumulated within the field that targets the impact of FDI inflows on overall income inequality, producing more systematic conclusions. In contrast, research on the relationship between gender income inequality and FDI inflow is relatively weak and fragmented. Although some studies have begun to give attention to this issue, on the whole, their depth and scope tend to be insufficient to fully reveal the specific mechanisms and patterns of the effects of FDI on gender income

inequality, and thus to support conclusive results. Moreover, this situation also highlights the fact that the issue of income inequality from the gender perspective has not yet been adequately addressed and thoroughly explored as countries endeavour to attract FDI inflows.

In the case of this study, the core objective is not only to investigate the impact of FDI inflows on overall income inequality as a means of complementing and enriching the findings of the earlier studies. More importantly, gender income inequality has been paid equal attention and has been studied in depth. This is because gender income inequality is a pervasive social issue that is critical to a comprehensive understanding of the impact of economic globalisation. In order to analyse these issues more precisely, five countries in the CEE region, as well as China, are carefully selected as the research samples in this paper, based on the similarities in political backgrounds and economic states. Such a choice enables the study not only to break through in terms of its geographical applicability, but also to take into account the aspect of gender income inequality in particular, thus filling in some of the gaps in existing research. In terms of research methodology, for this paper, the main reference is the studies of Khan and Nawaz (2019) and Xu et al. (2021). On this basis, relevant data of the six countries above during the period 2000-2020 are used to systematically examine the impact of FDI inflows on overall and gender income inequality by building a fixed-benefit model and conducting baseline regression analyses. Moreover, according to the literature summarised previously, the level of the economy and several world development indicators are also simultaneously taken into account so as to achieve more thorough and accurate results. In addition, the moderating role of a factor of education is also detected by the corresponding moderated test.

For the first research question presented, that is, whether there is an effect of FDI inflows on overall income inequality and how exactly, the findings of this paper are as follows. According to the result obtained from the two models in the baseline regression, the impact of FDI inflows on overall income inequality is positive and significant. Whereas such outcome implies that this inequality under discussion is intensified and worsened, and is in line with the findings of most of the works analysed in the literature review. In the CEE region, many previous works corroborate such a view. For example, the same



conclusion was reached in Halmos' (2011) study of multiple CEE countries and Mysíková's (2011) study of a single country, the Czech Republic. As for the studies on China, whether they are based on firm-level datasets (Chen, Ge and Lai, 2010; Chen, Zhao and Zhou, 2017) or databases at the municipal level and above (Mah, 2015). Besides, Yuldashev et al., (2023) similarly concluded that the inflow of FDI increases the overall income inequality levels. Moreover, the empirical analyses similarly address the association between overall income inequality and other factors. In brief, the other variables examined in this paper are all strongly negatively correlated with it, meaning that increases in GDP per capita, corruption governance, social stability and the level of the rule of law are all effective in lowering the level of overall income inequality. Likewise, such results echo findings from literature studies that have been done previously.

The second research question of this paper is whether and exactly what the effect of FDI inflows on gender income inequality is. For this question, the findings of this study are the same as those of the previous research on overall income inequality. That is, the impact of FDI inflows on gender income inequality is precisely present and positive, that is, the latter's situation is worsened by the former. Similarly, in the CEE region, such conclusions have been demonstrated by studies by scholars for a group of countries (Fodor and Glass, 2018) and for individual countries (King et al., 2017; Magda and Sałach, 2021). For China, the studies can also validate the findings in this paper. Berik, Dong, and Summerfield (2007), in their critical literature review, qualitatively proved that FDI inflows could have a pernicious effect on gender income inequality, despite the economic growth they bring. Furthermore, there is a growing volume of literature that demonstrates this conclusion more accurately from a quantitative perspective by applying various empirical models. For instance, Yu et al. (2021) argued that the entry of FDI into the local market has reduced women's employment opportunities in China, thereby widening the gender income gap. The regression analyses of Maurer-Fazio and Hughes (2002) also demonstrated that the gender discrimination and income gap in state-owned enterprises in China is actually smaller than that in foreign-owned enterprises. Moreover, Ng (2007) added that such differences are even more significant in relatively developed regions in China where there are greater FDI inflows. Moreover, similarly to the aspect of overall income inequality, the effects of other studied factors on the gender income gap are also present, but still different. More specifically, an increase in GDP per capita can help reduce the gender

income gap. However, improvements in corruption governance, the level of the rule of law and social stability do not have a significant level of impact on this variable in comparison. In addition, it is important to stress that there is a moderating role played by education. According to the moderating effect tests carried out in this paper, education expenditure is able to mitigate the adverse effects of FDI when it aggravates the level of income inequality, both on the type of overall and gender. This finding can be quantitatively demonstrated by a detailed test of moderating effects. The results of the study reveal that the coefficients of the term EDU are significantly lower than the those of the single term FDI when the interaction between FDI and education expenditure is accounted for. This is a clear signal, indicating that education expenditure plays an important part in alleviating the increase in income inequality due to FDI inflow. Such phenomenon is a profound insight into the function of education as a society's regulator in balancing the unequal distribution of resources brought about by FDI inflows, thereby mitigating the impact on overall income equality. Moreover, the test also captures the fact that education itself reduces both overall income inequality and gender income inequality, albeit to a relatively lower extent on the latter. These findings also corroborate much of the literature in the literature review, similarly to the earlier conclusions. This means that education lays a solid foundation for the realisation of gender equality by giving equal opportunities of learning in order to develop the professional skills and leadership of women.

## **4.2 Policy implications**

In summary, the policy implications of this study can be described in the aspects below.

Firstly, the CEE region and China should adjust and upgrade their economic policies relating to FDI to render them more refined and comprehensive. As an essential driving force for the states' economic growth, the positive effects of FDI are undeniable, but the problem of rising economic levels and income inequality at the individual level caused by it should be addressed as a matter of urgency. Specifically, FDI inflows should be moderated to prioritise and direct them to relatively less developed regions, so as to balance the differences in development among various regions. Furthermore, in accordance

with the requirements of local industrial structural adjustment and upgrading, it should be encouraged to flow to sectors that are more capable of promoting the internal growth dynamics of the economy. At the same time, it is also crucial to focus on economic growth, as it shows a mitigating effect on both types of inequality. In addition, as one of the efficient ways to alleviate income inequality, economic growth at the individual level should be one of the core considerations when it comes to the design of policies. In sum, it is necessary to reduce the gap between the rich and the poor in a fundamental manner and to advance equity and equality by fostering the achievement of comprehensive and well-balanced economic growth.

Secondly, there should be more emphasis on spending on education for all the countries, since it turns out to be one of the key elements in the advancement of income equality. According to the results of this study, expenditure on education has had an ameliorating impact on both overall income inequality and gender income inequality in the context of the inflows of FDI. Therefore, the significance of investing more in education is not only limited to raising the quality of the population through the primary education system, but also to improving the overall quality of the labour force by perfecting vocational education. In other words, it is necessary to ensure that the content of education matches closely with the needs of the labour market, so that the workforce is more compatible with the current situation and more competitive. In addition, particular emphasis should be put on the provision of more sophisticated and detailed basic and vocational education for women, tailored to local circumstances. For instance, programmes should be introduced to publicise women's legitimate rights and interests, as well as to provide gender-sensitive job training and career guidance, with a view to ensuring that women are given the same or even better career development opportunities as men. Also, women's leadership development should not be neglected, as it encourages them to reach the senior level and participate in management. In this way, barriers to gender disparity could be broken down and the gender income gap could be minimised.

Thirdly, the improvement of governance indicators also deserves special attention. First of all, what has the strongest correlation with income inequality is the control of corruption, which profoundly affects social equity. Hence, the countries should strengthen their anti-corruption measures in order to create a clean and transparent environment for

conducting business. In addition, it should not just be a domestic issue, but also enhance international cooperation and information sharing, as well as the introduction of high-tech instruments to increase the efficiency of anti-corruption. In this way, the improvement of the global economic environment and the attainment of income equality will be jointly promoted at multiple levels and in various fields. Moreover, the rule of law requires better and more thorough consideration in the enactment of legislation, so as to guarantee the fulfilment of people's legal rights and benefits. In particular, more priority needs to be accorded to laws and regulations to protect women's rights and interests, which are not as complete and powerful as those in the traditional fields. Meanwhile, enforcement of the law needs to be stepped up, including through the provision of courses on legal awareness for women in the field of employment, as well as the imposition of more severe penalties on enterprises that engage in gender-based discrimination. In addition, publicity and dissemination of the concept of gender equality should be intensified in order to enhance the recognition of the concept by society as a whole, thereby fostering the formation of a favourable atmosphere in the society.

Ultimately, the effective implementation of these comprehensive measures will further promote fairness in the overall and gender income distribution, thus contributing to the harmonious and stable development of the society.

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