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INVESTIGATING THE NEXUS AMONG FOREIGN CAPITAL, WORKING CHILDREN, AND MULTINATIONAL ENTERPRISES IN TURKEY

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ABSTRACT

The present research is motivated by the eclectic approach and aims to shed light on the locational non-traditional determinants of foreign direct investment inflows. Considering the limited available knowledge on the interaction between foreign capital inflows and a worldwide socioeconomic phenomenon, namely child labor, the research extends an empirical model and examines the significance of location advantages when investing abroad, focusing on Turkey as a recipient country. A time series analysis using secondary annual data over the period 2002-2021 is conducted. Unit root and cointegration tests, as well as autoregressive distributed lag and error correction models, are applied. The results reveal that child labor in Turkey has a statistically insignificant negative impact on foreign capital inflows in both the short- and the long-run period, while the reverse causality analysis proves that the impact of FDI inflows on child labor in Turkey is statistically insignificant in the long- and short term. Policy implications and suggestions for future research are discussed.

1. INTRODUCTION

Child labor in several developing and developed countries remains an unsolved social issue, despite the significant efforts of several international organizations, namely the International Labor Organization (ILO), the UNICEF, etc. As of recent estimates, approximately 160 million minors are engaged in child labor, and almost half of them in hazardous activities, while the outbreak of the pandemic increased the risk of child labor for another 9 million minors and has further exacerbated the problem. (ILO, 2024; UNICEF, 2024). On the one hand, despite the legal framework against child labor in several countries, including Turkey, the problem could deteriorate because of the increasing inflows of migrants, which are associated with child exploitation and trafficking, mostly of unaccompanied and vulnerable minors (Digidiki & Bhabha, 2018; Achilli, 2022; Capaldi & Altamura, 2023). On the other hand, increased rates of child labor could attract more multinational enterprises (MNEs) and foreign investors (Edmonds & Pavcnik, 2005), and foreign assistance and Foreign Direct Investment (FDI) inflows could further increase percentages of working children in the recipient countries (Neumayer & de Soysa, 2005; Davies & Voy, 2009; Mizushima, 2021).

In recent years, several MNEs of different sectors have been accused of employing minor employees. Among them, Gap Inc., H&M, and Nike Inc. (Chan et al., 2020; Fraser & Van der Ven, 2022), the Hershey Company, Nestlé S.A., Mars Inc. (Chambers, 2023; Chelli et al., 2025), IKEA (Christopherson & Lillie, 2005; Hahn, 2015), etc. are criticized for the use to child labor in developing countries. MNEs choose to invest in developing countries to exploit their insufficient labor standards, poor regulatory and judicial systems, and to increase profits through child labor (Giuliani, 2019). As Hossain and Fazi (2024) argue, the establishment of MNEs in developing countries to

maximize profits and achieve low-cost production often leads to violations of human and employee rights, including child labor.

The problem of working children worldwide continues to garner significant research and social interest. Minor laborers often present work-related injuries (Schlick et al., 2014; Fouad et al., 2022), morbidity and high mortality rates (Shendell et al., 2016; Ibrahim et al., 2019), sexual abuse and economic exploitation (Ramaswamy & Seshadri, 2020; Kyegombe et al., 2021), and poor academic performance, early dropout, or absenteeism (Kumar & Saqib, 2017). Collectively, a broader violation of the working children's and adolescents' fundamental human rights is observed (Egan, 2015; Lansdown, 2022).

According to the United Nations Convention on the Rights of Children, particular emphasis should be placed on the personal development, the protection of children's rights, and the non-discrimination of minors (United Nations, 2020), while working children's rights are also protected by the ILO Convention 138 and Convention 182 (ILO, 2023). The present research aims to investigate the role of child labor in attracting FDI inflows in Turkey, which receives increasing inflows of migrants and unaccompanied children.

Motivated by the eclectic paradigm of Dunning, the purpose of the research is to empirically examine whether child labor in Turkey plays a crucial role in attracting FDI for the period 2002-2021. Considering that the association between child labor and FDI is under-investigated (Kechagia & Metaxas, 2018), the present research examines child labor as an FDI determinant. Moreover, working children are considered a form of cheap labor (Abdullah et al., 2022; Kechagia & Metaxas, 2023) and could attract more MNEs. Finally, Turkey's growing inflows of minor migrants and refugees may intensify the problem and labor vulnerability in the country. In this context, a positive interaction between FDI and immigrants in the Organization for Economic Cooperation and Development (OECD) countries (Bang & MacDermott, 2019) is identified.

Building on the aforementioned discussion, the present study investigates whether child labor affects foreign investors' decisions in developing countries, focusing on Turkey. The study is structured as follows: In Section 2, the theoretical framework is presented, Section 3 includes the empirical approach, and Section 4 includes the empirical findings. The study concludes with a summary of the results, policy implications, and suggestions for future research.

1.1. Contribution and rationale of the study

The existing literature reveals a significant gap in the investigation of child labor as an FDI determinant (Kechagia & Metaxas, 2023). Most empirical studies examined the impact of FDI on child labor rates in the recipient countries. Neumayer and de Soysa (2005) were the first to investigate FDI as a determinant for child labor, with

also considered by subsequent studies (e.g. Davies & Voy, 2009; Dagdemir & Acaroglu, 2010; Voy, 2012; Doytch, Thelen, & Mendoza, 2014). Recent contributions to the field have also examined child labor as a dependent variable, and FDI inflows as the main explanatory variable (Burhan, Sidek, & Ibrahim, 2016; Fatima, Sundjo 2017; et al., 2018; Kechagia & Metaxas, 2023). In contrast, child labor as an FDI determinant was investigated solely by Busse and Braun (2004), who examined a sample of 132 countries for the period 1995-2000. In the national level, several studies investigated the problem of child labor in Turkey and the social and health issues arising for minor employees, namely child abuse at work (Öncü et al., 2013), school drop-out or high absenteeism (Bademic, Karadayi, & Vural, 2016; Kahraman & Karataş, 2018), pessimism (Sevinç et al., 2020), lack of perceived social support (Mert & Kadioğlu, 2014; Sevinç et al., 2020), and limited leisure capabilities (Açıkğöz & Demirbaş, 2023). Building on earlier work, certain studies examined the cases of migrants and refugees as minor employees in Turkey (e.g. Yalçın, 2016; Thévenon & Edmonds, 2019; Fehr & Rijken, 2022; Dayıoğlu, Kırdar & Koç, 2023). It is important to shed light on this unsolved problem in Turkey, which deepens youth inequalities and leads to poor physical and mental health (Öncü et al., 2025), while there is increasing interest among Turkish consumers in child labor, which is characterized as a determinant of their purchasing choices (Firinci Orman, 2024). Children are also vulnerable to international shocks, which could improve earning opportunities and intensify the problem in developing countries (Ravetti et al., 2024).

MNEs, along with governments and international organizations, apply policies regarding child labor. Still, although the ILO identifies child labor abolition as one of the fundamental human rights, it is observed that the problem remains unsolved (Rubino et al., 2024). The literature review reveals that child labor remains under-investigated as a determinant for FDI inflows, although MNEs that invest abroad often employ minor employees (e.g. Chambers, 2023; Chan et al., 2020; Hahn, 2015). The present research examines whether child labor as a locational characteristic in a recipient country, namely Turkey, could attract more FDI inflows. Extending the above, the present study aims to address the following research question: *Does child labor, as a cheap form of labor, influence FDI inflows in Turkey?* The analysis focuses on the case of Turkey, which is uniquely positioned at the crossroads of minor and unaccompanied migrants, and explores whether the presence of working children creates locational advantages that attract foreign investors. The examination and understanding of the relationship between child labor and FDI is vital for policymakers, and if the presence of child labor does not deter MNEs, this could incentivize the Turkish government to enforce labor regulations. Conversely, ethical issues arise if economic growth from FDI inflows in the country conflicts with children's human rights. Therefore, the value added of the analysis is expressed as follows: a novel proxy for child labor and an extended empirical model are presented; an expanded institutional analysis is performed, moving beyond the role of democracy of Busse and Braun (2004); policy implications are guided by the empirical evidence a country-specific analysis is conducted, shedding light in a

host country that experiences significant inflows of migrant children, often involved in child labor, and conducting a reverse causality analysis to examine whether FDI inflows boost child labor. The research contributes to the debate on whether labor standards, as expressed by child labor, influence MNEs' decisions when investing in Turkey, contributes novel empirical evidence to the existing knowledge and literature on the determinants that influence FDI inflows in developing countries, focusing on Turkey, and contributes to the understanding of Sustainable Development Goals (SDGs) to eradicate forced labor (SDG 8.7), to hinder quality education (SDG 4), and to reduce inequalities (SDG 10).

2. THEORETICAL FRAMEWORK

2.1. *Relevant theories of FDI*

Dunning (1973, 1977) argued that MNEs invest overseas to reduce operating costs and to gain benefits for market imperfections, and followed Hymer's (1960) approach, according to which MNEs need advantages to overcome operating costs that arise when investing abroad. In particular, according to Dunning (1977), these benefits refer to ownership, location, and internationalization (OLI) advantages, and they are also known as the eclectic approach. Among these advantages, the present research aims to expand knowledge on one of the pillars of the eclectic paradigm, namely the L-specific advantages in host countries, which include raw materials, low-labor costs, natural resources, tariff barriers, large markets, and other tangible assets (Dunning, 1977). Over recent decades, a notable trend has emerged whereby MNEs relocate their capital from developed to developing economies, including Turkey, to achieve labor-intensive production, and exploit locational advantages, namely unskilled employees and low wages (Engin & Parlak, 2024). Globalization and the technological evolution increased interest in L-specific advantages and skills, respectively (Dunning, 2000; 2004). Within this context, transnational suppliers of MNEs operating in developing countries are forced to reduce costs, which results in low labor costs and child labor (Nova & Wegemer, 2016; Lotfi & Pisa, 2024).

The research emphasizes child labor in host economies as an FDI determinant, which is listed among the location advantages of the OLI paradigm, as mentioned above, for several reasons. Firstly, the availability of a cheap labor force attracts foreign investors (e.g. Donges, 1976; Eckel, 2003; Konings & Murphy, 2006; Abbas, Moosa & Ramiah, 2022). Secondly, MNEs are oriented to low-wage host countries to improve productivity and reduce production costs (e.g. Feenstra & Hanson, 1997; Eckel, 2003; Bayraktar-Sağlam & Sayek Böke, 2017; Santos, 2023). Thirdly, cheap employees are crucial for resource-seeking MNEs (Dunning, 1993).

Nevertheless, a cheap labor force could be attributed to unskilled or minor employees (Kechagia & Metaxas, 2023). Furthermore, the globalization process and trade liberalization both increase the demand for unskilled employees and the supply of child labor in recipient countries (Simas et al., 2014). Building on this, the present research focuses on child labor in the recipient countries, which is characterized as a form of flexible and cheap labor force, even cheaper than working women in developing countries (Nieuwenhuys, 2020).

2.2. *Child labor in Turkey*

Although child labor remains a widespread socioeconomic issue (Radfar et al., 2018), the present research focuses on the case of Turkey for several reasons. Firstly, minors in Turkey are allowed to work in certain agricultural and small-scale businesses, and they could be victims of exploitation (Yiğitbaşı & Üstün, 2022). Secondly, several migrant underage employees work in Turkey, mainly in the agricultural industry, they are exposed to occupational risk (European Commission, 2020), and they are characterized by scholars as a “lost generation” (Dayıoğlu, Kırdar, & Koç, 2024). Thirdly, apart from migrants, Turkish children and adolescents engage in domestic labor and the production of several agricultural products, namely cumin, tobacco, cotton, etc. (Dedeoğlu, Sefa Bayraktar, & Çetinkaya, 2019; Susanlı, Inanc-Tuncer, & Kologlugil, 2016). Fourthly, children in Turkey are legally allowed to work in agricultural regions and small-scale enterprises with no more than 50 employees (Yiğitbaşı & Üstün, 2022). Finally, the risk of child labor in the region is increasing due to several socio-economic factors, namely the COVID-19 pandemic, the massive economic collapse, armed conflicts, natural hazards (Habib et al., 2025), and paternalism in humanitarian programs of refugees in Turkey (Mencütek, Karal, & Altıntop, 2023).

Despite the ongoing challenges, the number of minor employees in Turkey aged below 17 years decreased over the past decade, while the reduction for employees below 14 years was even higher, estimated at approximately 50% (European Commission, 2020). The Turkish government and the Ministry of Family, Labour, and Social Services made significant efforts to prevent and eliminate illegal working activities and child labor. In particular, several national programs were applied, including the “Time-Bound National Policy”, and the legal framework was revised to reduce dropout rates. (European Commission, 2020; Uyan-Semerçi & Erdoğan, 2022).

Nonetheless, child labor in Turkey persists due to several reasons, including poverty, migration, early dropout rates, parental education, shortages in the legal framework, tradition, and negative social norms (European Commission, 2020; Sevinç et al., 2020; Yiğitbaşı & Üstün, 2022). Additional determinants of child labour in Turkey are the low family social status, the gender (male), and the number of siblings (at least five) (Öncü et al., 2025). Multinational companies that operate in Turkey and the apparel industry do not comply with the labor standards and often employ poor

children (Engin & Parlak, 2024). Notably, the country ranks second among the OECD members regarding child poverty (Erdoğan & Uyan Semerci, 2018), which is proven to be the most important determinant of child labor (e.g. Scanlon et al., 2002; Radfar et al., 2018; Luckstead, Tsiboe, & Nalley, 2019).

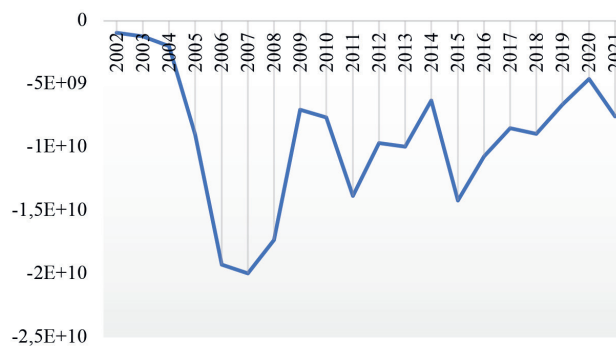
Finally, Sevinç et al. (2020) found that minor employees in Turkey do not complete school, and in a sample of 276 working children in the country, it was observed that approximately 9% of them were Syrian refugees. Additionally, the ongoing pandemic of COVID-19 further exacerbated food insecurity and unemployment among refugees in Turkey (European Commission, 2020). Currently, it is estimated that 720 thousand children in Turkey engage in economic activity, and different sectors, namely agriculture, industry, and service. Furthermore, 4.4% of them are aged from 5 to 11 years, while the majority of them work as casual employees (63.3%) (ILO, 2024).

3. METHODS AND DATA

3.1. *The dependent variable*

Building on the OLI paradigm and the empirical framework of Busse and Brown (2004), the present study examines FDI inflows in Turkey as the dependent variable and focuses on the period ranging from 2002 to 2021, upon data availability. As illustrated in Figure 1, net inflows FDI in current \$ for the studied period in Turkey follow a downward trajectory until 2021 (disinvestment), which is attributed to the country's macroeconomic and political instability, population, energy consumption, and inflation (Khudari, Sapuan, & Fadhil, 2021; Sirin, 2017).

Figure 1. Net FDI inflows in Turkey (2002-2021)



Source: Author's calculations

While the impact of child labor on FDI remains under-investigated, it is observed that the impact of FDI on child labor rates was examined by limited empirical studies, which reached contrasting results (Kechagia & Metaxas, 2023). As for the role of child labor as an FDI determinant, which was examined solely by Busse and Braun (2004), it was observed that child labor is negatively associated with FDI in developing countries.

3.2. *The explanatory variables*

Child labor is examined as the main explanatory variable in the original formulation. Nevertheless, there are certain limitations when studying the phenomenon of working children, considering that it is not easy to collect and estimate child labor rates with accuracy (Scanlon et al. 2002). To overcome this limitation, an indirect measure of child labor is used, namely, non-attendance school rates, which is a proxy used in previous empirical studies (e.g. Cigno, Rosati, & Guarcello, 2002; Kucera, 2002; Braun, 2006; Basu, Das, & Dutta, 2010; Kechagia & Metaxas, 2023; Khan et al., 2024; Neumayer & De Soysa, 2005). It is argued that working and attending school are characterized as incompatible activities (ILO, 2000; Heyman et al., 2013; Mihigo, Vermeylen, & Munguakonkwa, 2024), and child labor is expressed as follows (Eq. 1):

$$\text{Child labor} = 100 - \text{total school enrolment secondary} \quad (1)$$

As presented in Figure 2, child labor in Turkey declined from 2002 to 2021, which could be attributed to the recent educational reform in the country, that renderer a 4-year secondary education compulsory for all, and increased net enrollment rate in secondary education, although there are still gender and regional disparities (Gumus & Chudgar, 2016; Kırdar, Dayıođlu, & Koc, 2016).

Figure 2. Child labor in Turkey (2002-2021) expressed as secondary non-enrolment



Source: Author's calculations

In addition to child labor, the study examines several explanatory variables in the original formulation. In particular, Gross Domestic Product (GDP) per capita is a traditional determinant of FDI and it is used as a proxy for market size (Kechagia & Metaxas, 2019). Previous studies observed a positive association between FDI and GDP (e.g. Bevan & Estrin, 2004; Asongu, Efobi, & Beecroft, 2021). Higher GDP growth rates also attract more foreign investors (e.g. Arthur & Addai, 2022; Bazán Navarro & Álvarez-Quiroz, 2022; Wehncke, Marozva, & Makoni, 2023), and GDP growth is studied as a proxy for economic growth. These findings are in accordance with Dunning (1997, 1998a), who concluded that GDP is crucial for MNEs that choose market-seeking FDI to expand abroad.

Additionally, it is argued that the abolition of trade barriers and restrictions could enable a country's expansion abroad (Seyoum, Wu, & Lin, 2014), and trade openness is also examined as an independent variable. Trade openness is associated with liberalization arrangements and the improvement of the business environment, which attracts more foreign investors (Taylor, 2000). Several empirical studies observed a positive association between FDI and trade freedom (e.g. Busse & Hefeker, 2007; Ezeoha & Ugwu, 2015; Maryam & Mittal, 2020; Radmehr et al., 2022).

Finally, institutions in Turkey are also examined as an FDI determinant, since according to Dunning (1998b), they are included among the locational advantages of the recipient economies, and foreign investors and MNEs prefer countries that offer institutional and economic facilities and institutions. Institutions, also, play a crucial role in foreign investors' decisions (Jensen, 2008), and influence the business climate in the host economy (Busse & Hefeker, 2007), while poor institutional quality discourages foreign investors (e.g. Erkekoglu & Kiliçarslan, 2016; Sabir, Rafique, & Abbas, 2019; Qureshi et al., 2021; Kechagia & Metaxas, 2022).

3.3. *The research hypotheses*

Keeping in view the theoretical and empirical evidence, considering the purpose of the research, and applying a reverse causality analysis, the research hypotheses are developed as follows:

H1a: Child labor has a statistically significant negative impact on FDI inflows in Turkey from 2002 to 2021.

H1b: FDI inflows have a statistically significant negative impact on child labor in Turkey from 2002 to 2021.

Although there is no empirical evidence on the interaction between child labor and FDI in Turkey, it is observed that in large samples of developed and developing countries, there are vague findings on the impact of FDI on child labor. Among them, Dagdemir and Acaroglu (2010) and Doytch et al. (2014) studied 92 developing economies and 100 countries and observed a positive impact of FDI on child labor, while Neumayer and de Soyza (2005), Davies and Voy (2009), Voy (2012), and Fatima

(2017) reached to opposite results. Finally, according to Busse and Braun (2004), MNEs avoid investing their capital in countries that present high rates of child labor.

H2a: GDP has a statistically significant positive impact on FDI inflows in Turkey from 2002 to 2021.

H2b: GDP growth has a statistically significant positive impact on FDI inflows in Turkey from 2002 to 2021.

H2c: GDP has a statistically significant negative impact on child labor in Turkey from 2002 to 2021.

H2d: GDP growth has a statistically significant negative impact on child labor in Turkey from 2002 to 2021.

Previous studies concluded that foreign investors are more likely to choose recipient countries with a large market size (e.g., Asongu et al., 2021; Bevan & Estrin, 2004). Foreign capital inflows contribute to capital accumulation and technology transfer, and previous studies observed a positive association between FDI and GDP in Turkey (e.g., Dumludag, 2009; Klasra, 2011; Öğrül & Eryiğit, 2015; Gökmenoğlu & Taspinar, 2016; Kalayci & Tekin, 2016).

H3a: Trade openness has a statistically significant positive impact on FDI inflows in Turkey from 2002 to 2021.

H3b: Trade openness has a statistically significant negative impact on child labor in Turkey from 2002 to 2021.

Recipient countries that present higher trade openness attract more FDI inflows, according to previous empirical studies (e.g., Liargovas & Skandalis, 2012; Kumari et al., 2023). The literature review reveals that FDI and trade openness in Turkey are positively associated (e.g., Acaravci et al., 2015; Kalyoncu et al., 2015; Öğrül & Eryiğit, 2015; Uzar & Eyuboglu, 2019).

H4a: Better institutions have a statistically significant positive impact on FDI inflows in Turkey from 2002 to 2021.

H4b: Better institutions have a statistically significant negative impact on child labor in Turkey from 2002 to 2021.

Better institutions in Turkey are proven to be a determinant factor for MNEs and foreign investors who invest their capital in the country (e.g., Dumludag, 2009; Aslan & Okten, 2010; Tosun et al., 2014; Eren & Jimenez, 2015; Öğrül & Eryiğit, 2015; Simet et al., 2015).

3.4. Data and sample

Reliable international databases are used to collect secondary data, and Table 1 presents the definitions and sources of the dependent and independent variables.

Table 1. Databases and definitions of the variables

Variable	Database	Definition
FDI per capita	World Bank	“Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor (%GDP)” (divided by population)
School enrolment secondary per capita	World Bank	“Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the secondary level of education” (divided by population)
GDP per capita	World Bank	“GDP per capita is gross domestic product divided by midyear population. Data are in current U.S. dollars per capita”
GDP growth per capita	World Bank	“Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars (divided by population)”
Trade openness	World Bank	“Ratio of total exports and imports divided by GDP”
Institutional quality		
Voice and accountability	Worldwide Governance Indicators (World Bank)	“Voice and accountability refer to the extent to which citizens are able to participate in selecting their government, freedom of expression, association and a free media (–2.5 to 2.5 scale)”
Political stability	Worldwide Governance Indicators (World Bank)	“Political stability and absence of violence refer to the likelihood of political instability and/or politically-motivated violence, including terrorism (–2.5 to 2.5 scale)”
Government effectiveness	Worldwide Governance Indicators (World Bank)	“Government effectiveness refers to the quality of public services, civil service and the degree of its independence from political pressures (–2.5 to 2.5 scale)”
Regulatory quality	Worldwide Governance Indicators (World Bank)	“Regulatory quality refers to the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development (–2.5 to 2.5 scale)”
Rule of law	Worldwide Governance Indicators (World Bank)	“Rule of law refers to the extent to which agents have confidence in and abide by the rules of society (–2.5 to 2.5 scale)”
Control of corruption	Worldwide Governance Indicators (World Bank)	“Control of corruption refers to the extent to which public power is exercised for private gain, including petty and grand forms of corruption. (–2.5 to 2.5 scale)”

Source: The World Bank

3.5. The empirical model

The present research builds on the theoretical foundation of the OLI paradigm (Dunning, 1973, 1977, 1988, 2003). According to the “L” component of the eclectic paradigm, location-specific factors, namely, economic size, trade openness, institutional quality, and labor market conditions, play a crucial role in attracting foreign capital and MNEs. Additionally, following the empirical approach and model used by Busse and Braun (2004), the model is developed as follows (Eq. 2 and Eq. 3):

$$FDI = \beta_1 Child\ labor\ rate_t + X_t + \varepsilon_t \quad (2)$$

Where X includes the explanatory variables, or

$$FDI = \beta_1 Child\ labor\ rate_t + \beta_2 GDP_t + \beta_3 GDP\ Growth_t + \beta_4 Trade\ Openness_t + \varepsilon_t \quad (3)$$

Busse and Braun (2004) incorporated a dummy variable representing the ratifications of the child labor conventions of the ILO, and additional explanatory variables, such as gross secondary enrolment percentages and insufficiencies in the legal system. For estimating child labor, the authors used the ILO’s data on the rate of minors aged from 10 to 14 who do not participate in the labor force. On the contrary, in the present research, the above-presented empirical model is extended. To overcome issues of missing data and following previous studies (ILO, 2000; Kucera, 2002; Braun, 2006; Neumayer & de Soysa, 2005; Kechagia & Metaxas, 2023) in the present research, child labor is estimated as the number of children who are not enrolled in secondary education. Similarly, according to the ILO (2000), engaging in labor activities and school enrolment are incompatible activities, and based on this assumption, children drop out of school to work.

To achieve a holistic understanding of the role of institutions as determinants of FDI and to expand the empirical model of Busse and Braun (2004), who studied the indicator “Democracy” as a proxy for institutional quality, the present research examines a set of institutional indicators as an explanatory variable of FDI. Therefore, the empirical model is expressed as follows (Eq. 4):

$$FDI = \beta_1 Child\ labor_t + \beta_2 GDP_t + \beta_3 GDP\ Growth_t + \beta_4 Trade\ Openness_t + \beta_5 Democracy_t + \varepsilon_t \quad (4)$$

In this formulation,

- Child labor reflects a labor market characteristic in Turkey that may reflect weak enforcement of labor standards and low labor costs.
- GDP is a proxy for market size and reflects the potential of market- or demand-seeking FDI.
- GDP growth represents economic dynamism, which is an important consideration for MNEs that invest in a foreign country.
- Trade openness indicates the extent to which Turkey is integrated with the global markets and supports export-oriented FDI, and refers to the abolition of trade restrictions.

- Institutional quality indicates six indicators for institutions, namely Control of Corruption (CC), Voice accountability (VA), Political Stability and Absence of Violence (PV), Rule of Law (RL), Government Effectiveness (GE), and Regulatory Quality (RQ). This proxy is used to capture the credibility and the reliability of Turkey's regulatory and legal frameworks, which are crucial for foreign investors' long-term decisions.

Per capita values are used for FDI inflows, GDP, GDP growth, and child labor, following Busse and Braun (2004). The above-presented empirical model (Eq. 4) is used to test whether the presence of child labor in Turkey, as a proxy for labor market distortion, is a determinant of FDI inflows for the studied period. The model combines theoretical insights from the OLI paradigm along with the empirical design of Busse and Braun (2004), aiming to provide a nuanced understanding of the factors that determine FDI inflows in Turkey. Additionally, the model is used to examine whether child labor is a push or pull factor for MNEs that invest in Turkey.

Building on the above, the present research introduces a new proxy for child labor as a determinant for FDI inflows, distinguishing it from the approach of Busse and Braun (2004). In addition, the above-presented empirical model not only extends the empirical model of Busse and Braun (2004) but also includes different aspects of institutional quality, contrary to Busse and Braun (2004), who focused on a single aspect of institutions, namely democracy.

The reverse causality is performed to examine whether the presence of MNEs in Turkey has a statistically significant impact on child labor. It is assessed whether FDI could act as a cause of child labor in Turkey for the period 2002-2021. A reverse alternative model was constructed (Eq. 5), as suggested by previous studies in the field (e.g., Abor et al. 2023; Khan et al. 2020), where child labor serves as the dependent variable and FDI inflows as an explanatory one.

$$\text{Child labor} = \beta_1 \text{FDI}_t + \beta_2 \text{GDP}_t + \beta_3 \text{GDP Growth}_t + \beta_4 \text{Trade Openness}_t + \beta_5 \text{Institutional Quality}_t + \varepsilon_t \quad (5)$$

Following the methodology applied in previous empirical studies (e.g., Belfqih, Qafas, & Jerry, 2022; Khan et al., 2023; Yakubu, 2020), before the application of the Autoregressive Distributed Lag (ARDL) bounds test and to check the stationarity of the variables, the presence of a unit root is investigated. The second step is to proceed to the lag selection and to test for co-integration. To specify the optimal number of lags and before estimating the ARDL model, the Schwarz Bayesian Criterion (SC), the Akaike Information Criterion (AIC), and the Hannan-Quinn (HQ) information criterion are used for lag determination. Then, the Wald test is conducted to control for co-integration, and in the last step, the long- and the short-run models are estimated, as well as the Error Correction Model (ECM). To ensure model stability and validity, a set of diagnostic tests was conducted. Estimations are performed using the Eviews 13.0.

4. RESULTS

The descriptive statistics of the studied variables and the correlation matrix are presented in Table 2 and Table 3, respectively.

Table 2. Descriptive statistics

Variable	Mean	Median	Maximum	Minimum	St. Dev.	Jarque Bera	N
FDI	-9.25E+09	-8.70E+09	-9.39E+08	-199E+10	5.44E+09	0.812	20
GDP growth	5.539	5.923	11.353	-4.823	3.959	2.016	20
GDP per capita	9306.846	9664.932	12507.59	3640.826	2378.280	3.023	20
School enrolment secondary	94.340	90.197	105.992	80.04	9.006	2.308	20
Trade openness	52.723	50.818	70.834	46.142	6.741	5.595	20
GE	0.160	0.123	0.432	-0.127	0.179	1.67	20
PV	-1.095	-1.058	-0.59	-2.009	0.37	2.575	20
RL	-1.107	-0.036	0.117	-0.416	0.185	2.236	20
RQ	0.203	0.296	0.463	-0.081	0.175	1.617	20
VA	-0.327	-0.213	0.013	-0.86	0.329	2.629	20
CC	-0.116	-0.134	0.161	-0.507	0.201	1.011	20

Source: Author's calculations

Table 3. Correlation matrix

	FDI	GDP growth	GDP per capita	School enrolment secondary	Trade openness	GE	PV	RL	RQ	VA	CC
FDI	1										
GDP growth	0.011	1									
GDP per capita	-0.513	-0.033	1								
School enrolment secondary	0.071	0.021	0.321	1							
Trade openness	0.115	0.051	0.242	0.711	1						
GE	-0.426	-0.018	0.581	-0.411	-0.436	1					
PV	-0.034	0.185	-0.482	-0.694	-0.334	0.141	1				
RL	-0.064	-0.148	-0.206	-0.855	-0.796	0.566	0.681	1			
RQ	-0.514	0.022	0.602	-0.376	-0.492	0.940	0.104	0.534	1		
VA	-0.195	0.127	-0.205	-0.869	-0.852	0.571	0.664	0.972	0.558	1	
CC	-0.627	-0.082	0.543	-0.509	-0.474	0.794	0.186	0.593	0.816	0.611	1

Source: Author's calculations

Table 2 reports the summary statistics, and it is observed that school enrolment in secondary education has the highest mean of 94.3. The standard deviation is highest for GDP growth, and, as for the Jarque-Bera test, it is concluded that the null hypothesis of the normal distribution is rejected for trade openness, GDP per capita, and voice and accountability, which indicates that these variables could contain outliers. Similarly, the correlation matrix (Table 3) shows notable relationships between FDI inflows and GDP growth (0.011), GDP per capita and government effectiveness (-0.018), school enrolment in secondary education and GDP growth (0.021), and regulatory quality and GDP growth.

Table 4 presents the results of the unit root test, using the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests. To ensure that none of the variables are stationary and since the null hypotheses of the tests are accepted, first differences are presented, including intercept and intercept and trend.

Table 4. Unit Root test results

		FDI	GDP growth	GDP per capita	Child labor	Trade openness	GE	PV	RL	RQ	VA	CC
Panel level series	ADF (Individual intercept)	-2.449 (0.142)	-3.23** (0.033)	-2.963* (0.056)	-0.886 (0.769)	1.535 (0.998)	-0.907 (-0.763)	-1.493 (0.515)	-0.035 (0.943)	0.131 (0.957)	0.689 (0.988)	-2.215 (0.207)
	ADF (Trend and intercept)	-4.251** (0.019)	-3.084 (0.137)	-1.731 (0.697)	-2.242 (0.442)	-1.713 (0.705)	-1.17 (0.887)	-1.701 (0.710)	-3.393* (0.082)	-0.172 (0.987)	-1.569 (0.762)	-3.987** (0.028)
	PP (Individual intercept)	-2.468 (0.138)	-2.797* (0.055)	-2.963* (0.056)	-0.781 (0.801)	2.072 (0.999)	-1.08 (0.701)	-1.479 (0.522)	-0.035 (0.943)	-1.003 (0.730)	0.353 (0.974)	-2.32 (0.176)
	PP (Trend and intercept)	-2.227 (0.449)	-2.718 (0.24)	-1.808 (0.660)	-2.195 (0.464)	-1.462 (0.806)	-1.113 (0.899)	-1.813 (0.657)	-3.330* (0.091)	-0.866 (0.939)	-3.183 (0.117)	-7.838*** (0.000)
1 st difference	ADF (Individual intercept)	-3.157** (0.042)	-4.439*** (0.003)	-3.411** (0.024)	-4.526*** (0.002)	-3.693** (0.014)	-4.403*** (0.003)	-3.739** (0.012)	-4.998*** (0.001)	-3.246** (0.035)	-2.015 (0.277)	-4.895*** (0.001)
	ADF (Trend and intercept)	-3.782** (0.042)	-4.302** (0.016)	-4.443** (0.012)	-4.462** (0.012)	-4.56*** (0.011)	-5.249*** (0.002)	-3.746** (0.047)	-4.716*** (0.007)	-3.443* (0.083)	-2.487 (0.328)	-2.849 (0.2)
	PP (Individual intercept)	-3.706** (0.013)	-5.483*** (0.000)	-3.411** (0.024)	-4.56*** (0.002)	-4.072*** (0.006)	-4.418*** (0.003)	-3.817*** (0.010)	-5.157*** (0.000)	-2.842* (0.072)	-3.942*** (0.008)	-4.968*** (0.001)
	PP (Trend and intercept)	-3.821** (0.039)	-5.952*** (0.000)	-4.614*** (0.009)	-4.499*** (0.011)	-6.916*** (0.000)	-5.262*** (0.002)	-4.292** (0.016)	-4.824*** (0.006)	-3.809** (0.040)	-3.588* (0.059)	-6.174*** (0.000)
2 st difference	ADF (Individual intercept)	-5.605*** (0.000)	-4.537*** (0.003)	-5.438*** (0.000)	-5.526*** (0.002)	-4.903*** (0.001)	-9.489*** (0.000)	-5.873*** (0.000)	-6.588*** (0.000)	-3.626 (0.019)	-6.922*** (0.000)	-4.872*** (0.001)
	ADF (Trend and intercept)	-5.411*** (0.002)	-4.486** (0.013)	-5.452*** (0.002)	-5.512*** (0.002)	-4.783*** (0.009)	-9.221*** (0.000)	-5.78*** (0.001)	-6.446*** (0.000)	-3.417* (0.089)	-7.400*** (0.000)	-5.35*** (0.003)
	PP (Individual intercept)	-10.783*** (0.000)	-10.620*** (0.000)	-11.824*** (0.000)	-13.827*** (0.000)	-8.390*** (0.000)	-9.906*** (0.000)	-8.700*** (0.000)	-12.445*** (0.000)	-6.134*** (0.000)	-6.922*** (0.000)	-15.389*** (0.000)
	PP (Trend and intercept)	-12.021*** (0.000)	-14.569*** (0.000)	-13.668*** (0.000)	-15.164*** (0.000)	-9.456*** (0.000)	-9.568*** (0.000)	-8.583*** (0.000)	-13.210*** (0.000)	-5.950*** (0.000)	-7.382*** (0.000)	-18.41*** (0.000)

***, **, * Denote levels of significance at 1%, 5%, and 10%, respectively

Source: Author's calculations.

It is observed that the studied variables are integrated at the second difference and that the dependent variable, namely FDI, is integrated in both intercept and trend, and intercept in the second difference since ADF and PP values are less than 0.005. Additionally, in the second difference at intercept and trend and intercept, ADF values for the main independent variable, namely child labor, are less than 0.005, and PP values for child labor are less than 0.001. The variables used in the reverse causality model are the same as those in the original specification; therefore, the results for the descriptive statistics, the correlation matrix, and the unit root tests (ADF/PP), with child labor as the dependent variable, remained unchanged, and they are not repeated for brevity.

In Tables 5a and 5b, the results for the optimal lag selection for the ARDL model are presented, estimating FDI as the endogenous variable (Table 5a) and child labor as the endogenous variable in the alternative model (Table 5b). According to Altintas and Taban (2011), to estimate optimal lag in yearly data, four lags can be used, then three, two, and, lastly, one. The next step is to compare the values of the AIC, SC, and HQ criteria at different numbers of lags. Among the above-mentioned criteria, AIC is asterisked at lag one and presents the lowest value among the asterisked criteria. Therefore, lag one is the best optimal lag for the empirical model in the present analysis. Results for additional criteria, namely Final Prediction Error (FPE) and sequential modified LR test statistic (LR) are also available upon request.

Table 5a. VAR lag selection criteria for the original specification

Lag	AIC	SC	HQ
0	48.89883	47.38169*	46.92355
1	46.87075*	47.40191	46.89795*
2	46.29018	47.49962	46.94985
3	46.98304	47.61077	47.01519
4	47.05956	47.73558	47.09418

* indicates lag order selected by the criterion
Source: Author's calculations

Table 5b. VAR lag selection criteria for the reverse model

Lag	AIC	SC	HQ
0	7.20337	6.24481*	7.21574
1	5.99567*	6.48539	6.01051*
2	6.02517	6.36318	6.04248
3	6.07707	6.46336	6.09685
4	5.99862	6.47320	6.02087

* indicates lag order selected by the criterion
Source: Author's calculations

Additionally, before applying the WALD test to control for cointegration, the ARDL bounds are estimated using the ARDL Error Correction Regression. ARDL bounds devised by Pesaran, Shin, and Smith (2001) are applied to test short-run and long-run relationships between FDI and the independent variables.

The following tables (Table 6a and 6b) include the results of the co-integration test.

Table 6a. Wald test results for the original specification

Level of significance (%)	Lower-bound critical values	Upper-bound critical values	Wald F-Statistics
10%	3.17	4.14	6.422732
5%	3.79	4.85	
2.5%	4.81	6.52	
1%	5.15	6.36	

Source: Author's calculations

Table 6b. Wald test results for the reverse model

Level of significance (%)	Lower-bound critical values	Upper-bound critical values	Wald F-Statistics
10%	2.63	3.35	3.621333
5%	3.1	3.7	
2.5%	3.55	4.38	
1%	4.13	5	

Source: Author's calculations

In the original specification, the Wald F-test is 6.422, which is higher than the upper bound critical value at a 5% level of significance (4.85). Similarly, in the reverse model, the Wald F-test is 3.621, which is higher than the upper bound critical value at a 5% level of significance (3.7). In both models, the null hypothesis of no cointegration is rejected at a 5% level of significance.

Based on the above, the variables are cointegrated and both long- (Tables 7a and 7b) and short-run (Tables 8a and 8b). models are estimated.

Table 7a. Long-run estimation results for the original specification

Dependent variable: FDI			
Dependent variable	Coefficient	t-statistic	Prob.
FDI(-1)	0.304752	0.599301	0.565
Child labor(-1)	-1.77E+08	0.111474	0.914
Trade openness(-1)	40458770***	2.234746	0.006
GDP growth(-1)	2.49E+108***	-0.652688	0.002
GDP(-1)	1217177***	-0.599874	0.005
CC(-1)	2.41E+09	0.118833	0.908
RL(-1)	-1.21E+08	-0.002390	0.998
RQ(-1)	-3.18E+10	-1.332458	0.219

PV(-1)	-5.48E+09	-0.931159	0.379
VA(-1)	1.13E+09	0.038230	0.970
GE(-1)	3.66E+10***	1.748083	0.008
R-squared		0.643109	
Adjusted R-squared		0.196996	
Durbin Watson stat.		2.630709	
AIC		47.65985	
SC		48.20663	
HQ		47.75239	

***, **, * Denote levels of significance at 1%, 5%, and 10%, respectively
Source: Author's calculations

Table 7b. Long-run estimation results for the reverse model

Dependent variable: Child labor			
Dependent variable	Coefficient	t-statistic	Prob.
FDI(-1)	-6.27E+10	-2.123437	0.0665
Child labor(-1)	0.567167**	3.259035	0.0115
Trade openness(-1)	-0.255758	-1.122863	0.2598
GDP growth(-1)	-0.288421	-1.301849	0.2292
GDP(-1)	0.003311**	2.808809	0.0229
CC(-1)	29.18841**	-2.481250	0.038
RL(-1)	33.50735	1.139727	0.2874
RQ(-1)	-54.91954**	-3.958266	0.0042
PV(-1)	5.331502	-0.931159	0.379
VA(-1)	1.13E+09	1.560222	0.1573
GE(-1)	6.744865	0.555192	0.5939
R-squared		0.960801	
Adjusted R-squared		0.911801	
Durbin Watson stat.		2.1137989	
AIC		5.127310	
SC		5.674091	
HQ		5.219847	

***, **, * Denote levels of significance at 1%, 5%, and 10%, respectively
Source: Author's calculations

As presented in Table 7a, in the long run, the coefficient of child labor is -1.77E+0,3 but statistically insignificant ($p=0.914$) at levels of 1%, 5%, and 10% of significance,

and there is a negative, but statistically insignificant relationship between child labor and FDI in Turkey. On the contrary, the coefficient of trade openness is positive and statistically significant at level 1% of significance, which proves that trade openness attracts more FDI inflows in the country. This result suggests that, in the long run, one unit increase in trade openness will boost FDI inflows in Turkey by 40458770 units. Similarly, the coefficients of GDP and GDP growth were 49E+108, and 1217177, respectively, and statistically significant at a level 1% of significance. As for institutional indicators, a positive but statistically insignificant relationship was observed between CC and FDI, at level 1%, 5%, and 10% of significance, and VA and FDI at level 1%, 5%, and 10% of significance, and a negative but statistically insignificant relation between RL and FDI, RQ and FDI, and PV and FDI inflows at level 1%, 5%, and 10% of significance. On the contrary, a positive and statistically significant relationship was observed solely between GE and FDI at a 1% level of significance, which proves that one unit increase in the index of government effectiveness will increase FDI inflows in Turkey by 3.66E+10 units.

The results in Table 7b reveal that, in the long run, the coefficient for FDI inflows is negative, but statistically insignificant at levels of 1%, 5%, and 10% of significance. There is also a negative impact of trade openness, GDP growth, and RQ on child labor in Turkey, but the coefficients of trade openness and GDP growth are statistically insignificant at levels of 1%, 5%, and 10% of significance. On the contrary, there is a positive impact of GDP, PV, VA, RL, CC, and GE on child labor; but the coefficients of these explanatory variables proved to be statistically insignificant at levels of 1%, 5%, and 10% of significance, except for CC, which was statistically significant at a 5% level of significance.

Table 8a includes the results of the short-run model at the second difference and one lag, using Ordinary Least Squares (OLS) for the original specification, and Table 8b includes the results for the alternative model.

Table 8a. Short-run estimation results for the original specification

Dependent variable: D(FDI,2)			
Dependent variable	Coefficient	t-statistic	Prob.
D(FDI(-1),2)	0.254319	1.170989	0.286
D(Child labor(-1),2)	-836114998	-0.492974	0.639
D(Trade openness(-1),2)	5.59E+08***	2.234746	0.006
D(GDP growth(-1),2)	1.24E+08**	-0.747629	0.029
D(GDP(-1),2)	117357.4*	-0.148808	0.086
D(CC(-1),2)	1.84E+09	0.205026	0.844
D(RL(-1),2)	3.50E+10*	2.240280	0.066
D(RQ(-1),2)	2.60E+10*	2.240280	0.066

D(PV(-1),2)	-7.93E+10	1.811807	0.120
D(VA(-1),2)	2.76E+10	1.710576	0.138
D(GE(-1),2)	-3.45E+10***	-4.188794	0.005
R-squared		0.894641	
Adjusted R-squared		0.719044	
Durbin Watson stat.		2.120656	
AIC		46.56408	
SC		47.10322	
HQ		46.61767	

***, **, * Denote levels of significance at 1%, 5%, and 10%, respectively
Source: Author's calculations

Table 8b. Short-run estimation results for the reverse model

Dependent variable: D(Child labor,2)			
Dependent variable	Coefficient	t-statistic	Prob.
D(FDI(-1),2)	-2.88E+10	-0.845505	0.4302
D(Child labor(-1),2)	0.449289	1.687328	0.1425
D(Trade openness(-1),2)	0.760395	1.902846	0.1058
D(GDP growth(-1),2)	0.083541	0.321911	0.7584
D(GDP(-1),2)	0.000143	0.115510	0.9118
D(CC(-1),2)	-16.44699	-1.168368	0.2870
D(RL(-1),2)	38.88120	1.586589	0.1637
D(RQ(-1),2)	29.18999	1.295049	0.2429
D(PV(-1),2)	-7.644173	-1.664004	0.1472
D(VA(-1),2)	20.77995	0.821804	0.4426
D(GE(-1),2)	-18.34157	-1.418029	0.2060
R-squared		0.707076	
Adjusted R-squared		0.688869	
Durbin Watson stat.		2.023484	
AIC		6.019545	
SC		6.558683	
HQ		6.073136	

***, **, * Denote levels of significance at 1%, 5%, and 10%, respectively
Source: Author's calculations

In Table 8a and in the short run, there is a negative but statistically insignificant between child labor and FDI in Turkey. As for the FDI determinants, a positive and statistically significant relationship is observed between trade openness and FDI. Similarly, GDP has a positive and statistically significant impact on FDI, as well as GDP growth. Finally, among the institutional indicators, a positive but statistically insignificant relationship is observed between CC and FDI, and VA and FDI. On the contrary, a negative and statistically significant (at a 10% level of significance) relationship is observed between RL and FDI, and RQ and FDI. Finally, a negative and statistically significant (at a 1% level of significance) is observed between GE and FDI. The reverse model yield to different results (Table 8b). It was observed that there was a negative impact of FDI, CC, PV, and GE on child labor; the coefficients of these variables were statistically insignificant at levels of 1%, 5%, and 10% of significance. Similarly, the reverse causality analysis revealed that the coefficients of trade openness, GDP growth, GDP, RQ, and VA were positive, but statistically insignificant at levels of 1%, 5%, and 10% of significance. RL proved to be statistically significant at a 1% level of significance, and the coefficient of this variable was positive.

The following tables (Table 9a and 9b) present the results of the ECM, using the residual to estimate the ECM term.

Table 9a. ECM estimation results for the original specification

Dependent variable: D(FDI(-1),2)			
Dependent variable	Coefficient	t-statistic	Prob.
D(FDI(-1),2)	-0.197988	-0.883357	0.417
D(Child labor(-1),2)	-2.74E+08	-1.631784	0.163
D(Trade openness(-1),2)	1.91E+08**	0.714989	0.016
D(GDP growth(-1),2)	4.55E+08**	-2.696673	0.043
D(GDP(-1),2)	249949.7*	-0.300386	0.076
D(CC(-1),2)	-5.43E+10	-0.603918	0.572
D(RL(-1),2)	2.15E+10	1.371162	0.228
D(RQ(-1),2)	-1.13E+10	1.371162	0.228
D(PV(-1),2)	-8.13E+09**	-2.679079	0.043
D(VA(-1),2)	9.48E+09	0.592981	0.579
D(GE(-1),2)	2.98E+08	0.029919	0.977
Residual(-1)	-0.349065	-3.753682	0.013
R-squared		0.953766	
Adjusted R-squared		0.852052	
Durbin Watson stat.		2.081210	

AIC	46.48011
SC	47.06826
HQ	46.53857

***, **, * Denote levels of significance at 1%, 5%, and 10%, respectively
Source: Author's calculations

Table 9b. ECM estimation results for the reverse model

Dependent variable: D(Child labor(-1),2)			
Dependent variable	Coefficient	t-statistic	Prob.
D(FDI(-1),2)	-429E-10	-0.838988	0.4397
D(Child labor(-1),2)	-0.041088	-0.107248	0.9188
D(Trade openness(-1),2)	0.451164	0.740076	0.4925
D(GDP growth(-1),2)	-0.230340	-0.598927	0.5753
D(GDP(-1),2)	0.000411	0.216607	0.8371
D(CC(-1),2)	-37.01611	-1.805020	0.1309
D(RL(-1),2)	41.30544***	1.153545	0.0008
D(RQ(-1),2)	-0.340755	-0.010189	0.9923
D(PV(-1),2)	-5.36041	-0.775501	0.4731
D(VA(-1),2)	24.66878	0.676745	0.5286
D(GE(-1),2)	-0.155165	-0.006820	0.9948
Residual(-1)	-0.000159***	-0.693773	0.0007
R-squared		0.778500	
Adjusted R-squared		0.691199	
Durbin Watson stat.		1.761073	
AIC		6.682299	
SC		7.270450	
HQ		7.740762	

***, **, * Denote levels of significance at 1%, 5%, and 10%, respectively
Source: Author's calculations

Table 9a reveals that the value of the ECM term is -0.349 for the original formulation and is statistically significant at a 5% level of significance. This proves that the dependent variable, namely FDI, returns to equilibrium at a 34% speed of adjustment, after a change in the explanatory variables. In other words, there is a slow speed of convergence of disequilibrium estimated at 34%. Similarly, in the reverse model (Table 9b) the value of the ECM term is -0.00015, and statistically significant at a 1% level of significance. This finding proves that child labor returns to equilibrium at a

0,015 speed of adjustment, which is quite lower than the original formulation. Finally, to check the stability and robustness, the Breusch-Pagan (1979) Serial Correlation LM Test is applied to control for autocorrelation, and the results are presented in Tables 10a and 10b.

Table 10a. Breusch-Godfrey Serial Correlation LM Test results for the original specification

F-statistic	0.228074	Prob. F. (2,6)	0.6579
Obs*R-squared	0.917028	Prob. Chi-Square(2)	0.5383

Source: Author’s calculations

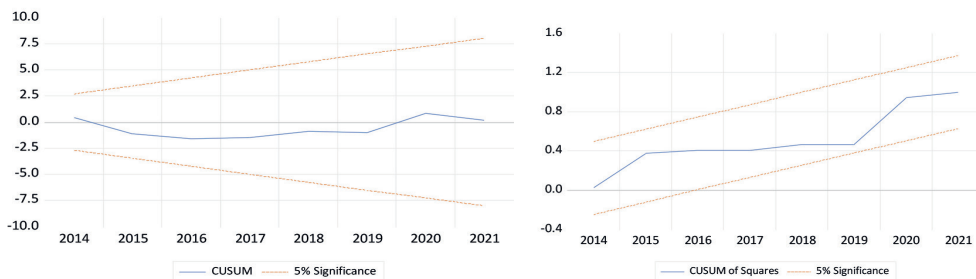
Table 10b. Breusch-Godfrey Serial Correlation LM Test results for the reverse model

F-statistic	22.67937	Prob. F. (2,6)	0.5422
Obs*R-squared	15.32431	Prob. Chi-Square(2)	0.0025

Source: Author’s calculations

It is concluded that the P-value (Prob F) is above 5%, and the null hypothesis that errors are serially independent is not rejected. This proves that both the original formulation and the reverse model are not suffering from serial correlation. Additionally, a model stability test was applied, and cumulative sum (CUSUM) (Figures 3a and 3b) and cumulative sum of squares (CUSUMQ) (Figures 3c and 3d) were used.

Figure 3a. CUSUM Square graph / **Figure 3b.** CUSUMQ Square graph

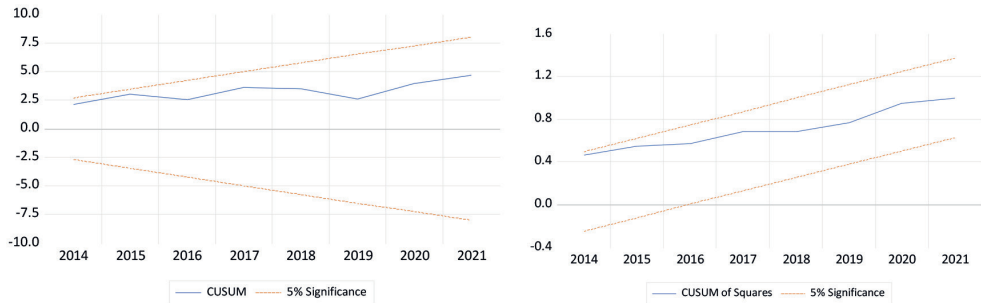


Source: Author’s calculations

Figure 3a: The figure presents the CUSUM Square from 2014 to 2021 for the original formulation. The statistics graph remains within the range of critical values at the 5% level of significance, thus implying the stability of the model.

Figure 3b: Similarly, the figure presents the CUSUMQ Square within the range of critical values at the 5% level of significance for the original formulation, which proves the stability of the model.

Figure 3c. CUSUM Square graph / **Figure 3d.** CUSUMQ Square graph



Source: Author’s calculations

Figure 3c: The figure presents the CUSUM Square from 2014 to 2021 for the reverse model. The statistics graph remains within the range of critical values at the 5% level of significance, thus implying the stability of the model.

Figure 3d: Similarly, the figure presents the CUSUMQ Square within the range of critical values at the 5% level of significance for the reverse model, which proves the stability of the model.

It is concluded that the estimated values lie within the critical bounds (at a 5% level of significance) and thus the models are stable. Finally, the model stability was evaluated, and a set of diagnostics was conducted to check the validity. The Heteroskedasticity test Breusch-Pagan-Godfrey (Godfrey, 1978; Breusch & Pagan, 1979) was used, and the results are presented in Tables 11a and 11b.

Table 11a. Heteroskedasticity test Breusch-Pagan-Godfrey results for the original formulation

F-statistic	4.415879	Prob. F. (2,6)	0.817
Obs*R-squared	15.80682	Prob. Chi-Square(12)	0.200
Scaled explained SS	0.934847	Prob. Chi-Square(12)	1.000

Source: Author’s calculations

Table 11b. Heteroskedasticity test Breusch-Pagan-Godfrey results for the reverse model

F-statistic	0.869490	Prob. F. (12,3)	0.6312
Obs*R-squared	12.42694	Prob. Chi-Square(12)	0.4120
Scaled explained SS	0.501579	Prob. Chi-Square(12)	1.000

Source: Author’s calculations

It is revealed that the p-value of the test is 0.817 for the original formulation and 0.6312 for the reverse model, respectively, and the null hypothesis is not rejected at a 5% level of significance. Based on the above, the models exhibit no heteroscedasticity.

5. DISCUSSION

The present research investigated the role of the labor force as an FDI determinant and brought original answers to the association between working children and foreign capital in Turkey. The study examined FDI inflows as the dependent variable, motivated by the eclectic paradigm (Dunning, 1973, 1977, 1988, 2003) and previous studies (e.g., Busse & Braun, 2004). The case of FDI and MNEs in Turkey is examined, arguing that MNEs operating in the garment industry in the country, among which H&M and ASOS, employ minor employees or Syrian refugees (David, 2024; Fehr & Rijken, 2022; Fraser & Van der Ven, 2022; Sanghera, 2019).

The empirical analysis revealed that in the long- and short-run, there is a negative, but statistically insignificant influence of child labor on FDI inflows. This may hint at a problem, arguing that child labor in Turkey does not discourage MNEs, as well as a structural problem in international investment decisions. Child labor is a clear violation of fundamental human rights, but this indifference suggests that social and ethical concerns do not influence foreign investors' decisions. Recent empirical evidence (Kechagia & Metaxas, 2023) revealed that there is a unidirectional causality from FDI to child labor, but no evidence that child labor causes FDI inflows in a panel of 42 developing countries. This finding strongly supports the results of the present analysis, which proved that there is a negative but statistically insignificant impact of child labor on FDI inflows in Turkey. The results are also in line with Busse and Braun (2004), who observed a negative impact of child labor on FDI inflows, but investigated groups of developing countries, while Sundjo et al. (2018) observed a statistically insignificant interaction between FDI and child labor. It is concluded that among the location advantages of the OLI paradigm, working children do not attract MNEs and foreign investors in Turkey. Similarly, the reverse causality analysis revealed that the impact of FDI on child labor in Turkey for the studied period was positive, but statistically insignificant, which aligns with the results of Sundjo et al. (2018). Therefore, this implies that FDI inflows in Turkey do not have a consistent or real impact on child labor for the period 2002-2021, and there is no causal relationship between FDI and child labor. The H1a and H1b research hypotheses are rejected.

Among the traditional determinants of FDI inflows, the present research concludes with a positive and statistically significant impact of GDP, GDP growth, and trade openness on FDI inflows in the short- and long-run period. These results suggest a solution for Turkey and highlight the importance of macroeconomic variables as FDI determinants, proving that open and large economies attract more FDI due to their integration into the global trade system and market potential. It is concluded that the findings represent a sustainable solution for the country, which could further encourage trade liberalization and promote stable growth in order to increase its attractiveness to MNEs and create a favorable investment environment. The findings are consistent with the mainstream of empirical studies, which concluded that GDP (e.g. Dumludag, 2009; Gökmenoğlu & Taspınar, 2016; Kalayci & Tekin, 2016) and trade

openness (e.g. Öğrül & Eryiğit, 2015; Uzar & Eyuboglu, 2019) attract FDI in Turkey. On the contrary, Temiz and Gökmen (2014) reached different results and observed that there is no statistically significant relationship between GDP growth and FDI inflows in Turkey in the short- and long-run period from 1992-2007; however, the study did not consider additional FDI determinants. Based on the above, the research hypotheses H2a, H2b, and H3a are not rejected. On the contrary, the reverse causality analysis revealed that the impact of GDP, GDP growth, and trade openness on child labor was statistically insignificant, and as a result, the research hypotheses H2c, H2d, and H3b are rejected.

Finally, as for the role of institutions, differences are observed between the short- and the long-run period. In particular, GE has a positive and statistically significant impact on FDI inflows in the long run, arguing that institutional reforms could be an effective tool to attract more FDI inflows to the country. This finding reflects the vital role of government effectiveness in sustaining MNEs over time through gaining foreign investors' trust and improving the investment climate. Ezikoğlu (2023) and Ertas (2024) argued that government effectiveness could be improved by applying reforms made by the citizens' suggestions and complaints, while it is crucial to eliminate authoritarianism in governance structures. The findings are in line with Kurul and Yalta (2017) and Kechagia and Metaxas (2022), who concluded that government effectiveness attracts more FDI inflows in groups of developing countries, including Turkey. Additionally, RL and RQ discourage FDI inflows in the short run, which reflects foreign investors' sensitivity to judicial uncertainty and regulatory burdens; however, these indicators lose statistical significance in the long run, which implies that the effect of RL and RQ does not persist over time. According to Benabdennour et al. (2023), this could be attributed to the foreign investors' adjustment to institutional changes in the long run. Peres et al. (2018) reached to similar findings and observed that the impact of RL on FDI inflows in developing countries (in a panel of 110 countries, including Turkey) is insignificant due to the high instability and weak structure of institutions. Therefore, the research hypothesis H4a is partially accepted. Similarly, in the reverse model, it was observed that, over the long term, RQ was associated with a decrease in child labor in Turkey, and this impact was statistically significant and CC increased child labor, and the impact was statistically significant. On the contrary, over the short term, no institutional indicator was statistically significant. This implies that improvements in the regulatory quality could reduce child labor over time, which reflects a solution for the country, and aligns with the findings of Ali and Gul (2019), who studied the case of Pakistan using ARDL analysis and concluded that there was a negative and statistically significant impact of governance indicators on child labor.

The present research contributes novel insight to the existing knowledge by jointly analyzing child labor, institutional quality, and macroeconomic variables in Turkey. The empirical results confirm the positive and statistically significant impact of well-established FDI determinants, namely GDP, GDP growth, and trade openness, on FDI inflows in Turkey, and they are consistent with previous studies (e.g. Dumludag,

2009; Dunning, 1993; Uzar & Eyuboglu, 2019). Nevertheless, the present analysis diverges from previous and conventional findings in three ways. Firstly, it proves that the impact of child labor on FDI inflows in Turkey is statistically insignificant in the short- and long-run, which suggests a weak investor response to social phenomena in Turkey. Secondly, the investigation of institutional quality and the distinction between short- and long-run provide extended depth in the analysis. Thirdly, the study includes a country-specific insight that highlights the importance of government effectiveness in the long term. Finally, a novel aspect of the present research lies in the investigation of the reverse causality between FDI and child labor, and addresses a frequently overlooked dimension of the nexus between FDI and child labor, contrary to previous studies that treated child labor solely as a dependent variable (e.g. Davies & Voy, 2009 in a sample of 145 countries; Doytch et al. 2014 for 100 countries over the period 1990-2009; Iram & Fatima, 2008 for Pakistan; Muthugala et al., 2025 for 37 African countries), which provides a more comprehensive understanding of the causality between labor conditions and foreign capital flows.

6. CONCLUSION

6.1. Theoretical/analytical implications

The present research contributes to the growing body of literature on FDI determinants, focusing on macroeconomic indicators, trade openness, and institutional quality that shape FDI inflows. The study reinforces theories grounded in the eclectic paradigm, suggesting that, in the long-run, the improvement of government effectiveness could attract more FDI inflows in Turkey. Additionally, the study contributes to the discussion on the role of child labor as a determinant for FDI, paving the way for future empirical studies in the field.

6.2. Practical/managerial contributions

From a policy perspective, the present research provides directions for national authorities in Turkey and MNEs that are interested in investing in the country. Turkey could improve its image as an FDI destination by prioritizing trade liberalization, arguing that trade openness attracts more FDI in the short- and long-run. To achieve this goal, external trade tariffs should be reduced and restrictions should be loosened. The public procurement system could be improved by reinforcing transparency mechanisms and reducing bureaucracy to attract more foreign investors. It is also crucial to enhance government effectiveness by promoting internet accessibility, press freedom, and digitalization in the public sector, such as e-government applications.

Finally, considering that child labor is a complex and multidimensional issue, it is crucial for policymakers and managers to adopt a child-centered policy, which ensures that economic development is aligned with the minors' fundamental rights.

6.3. *Limitations*

The present research is subject to certain limitations. Firstly, a single-country time series is analyzed, and it is impossible to generalize the results to other developing or Asian countries. Secondly, another limitation is associated with the availability of reliable data on child labor, considering that neither the ILO nor the UNICEF provides annual data on child labor in Turkey. To overcome this limitation, as mentioned above, an estimation technique of child labor applied by previous studies was used. Nevertheless, these data constraints do not measure important dimensions of the phenomenon, such as legal status or working conditions. Thirdly, aggregate macroeconomic indicators were used, which may overlook regional or sectoral variations of FDI or child labor in Turkey.

6.4. *Future research directions*

The present research provided a macro-level time series analysis of the relationship among FDI, child labor, and FDI determinants in Turkey. Future studies could investigate the association between FDI and child labor in different countries that receive minor migrants and refugees, arguing that the problem of working children is present in both developed and developing countries. In particular, considering that a research gap is identified, it would be interesting to examine the cases of other countries in the region that received increased inflows of migrant, undocumented, separated, or unaccompanied children, namely the case of Greece or other European Union members and European countries. Similarly, different institutional indicators could be investigated, namely the Economic Freedom Index, bureaucracy. A comparative study among different countries would reveal whether other economies of the region are consistent with the broader trend.

Upon data availability, a sector-specific analysis could reveal whether sectoral FDI responds differently to child labor conditions among industries. Similarly, different types of FDI could be investigated, namely mergers and acquisitions and greenfield investments. Furthermore, future studies could use different indexes of child labor, on data availability, namely the number of children aged from 10 to 14 who actively participate in the labor force or the number of children not enrolled in primary and secondary education. Based on the above, it would be interesting to incorporate qualitative dimensions of child labor, which remain under-investigated, including age, hazardousness, etc. Nevertheless, measuring child labor remains a critical issue,

and variations in the statistics of the phenomenon are observed. To overcome this issue, and to effectively assess the extent of the problem in developing countries, self-reported questionnaires could be conducted to collect primary data.

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The datasets presented in this article are available upon request.

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