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School of Slavonic and East European Studies

IMESS: Economics & Business

Master thesis

2023 **Yang Yang**

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Evaluation of International Financial Integration on Growth in CEE Countries

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Abstract

The thesis examines the influence of international financial integration on growth in Central and Eastern European economies using a two-way fixed effects model with macroeconomic data for 16 Central and Eastern European countries from 2007 to 2021. The thesis draws several conclusions. First, the ratio of net FDI inflows and outflows to GDP does not present a significant effect on growth. Although the stock data on FDI is similarly not significant for the overall sample regression, the regression of the sample divided into developed and developing economies shows a positive effect of FDI liabilities on economic growth for developed economies and a negative effect of FDI liabilities on economic growth for developing economies. Second, for both the overall sample, developed economies, and developing economies, none of the portfolio investment asset variables are statistically significant, except for portfolio investment assets in developing economies. Third, both portfolio debt and other investment debt negatively affect economic growth in developing economies and the overall sample, while the result is not significant for developed economies.

Abstrakt

Práce zkoumá dopad mezinárodní finanční integrace na hospodářský růst v zemích střední a východní Evropy pomocí modelu s obousměrnými fixními efekty s makroekonomickými daty pro 16 zemí střední a východní Evropy v letech 2007 až 2021. Práce vyvozuje několik závěrů. Za prvé, poměr čistého přílivu a odlivu přímých zahraničních investic k HDP nemá významný vliv na hospodářský růst. Stejně tak nejsou významné stavové údaje o PZI pro regresi celého vzorku, zatímco regrese vzorku rozděleného na rozvinuté a rozvojové ekonomiky ukazuje pozitivní vliv závazků z PZI na hospodářský růst u rozvinutých ekonomik a negativní vliv

závazků z PZI na hospodářský růst u rozvojových ekonomik. Za druhé, jak pro celkový vzorek, tak pro rozvinuté a rozvojové ekonomiky není žádná z proměnných aktiv portfoliových investic statisticky významná, s výjimkou aktiv portfoliových investic v rozvojových ekonomikách. Zatřetí, dluh portfoliových i ostatních investic negativně ovlivňuje hospodářský růst v rozvojových ekonomikách i v celkovém vzorku, zatímco v případě rozvinutých ekonomik není výsledek významný.

Klíčová slova

Mezinárodní finanční integrace; růst; mezinárodní finance; hospodářský růst; přímé zahraniční investice; portfoliové investice; rozvojové země

Keywords

International financial integration; growth; International finance; Economic growth; Foreign direct investment; Portfolio investment; Developing countries

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Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague 31/07/2023 **Yang Yang**

Content

Introduction

The global financial landscape has witnessed significant transformations, marked by the increasing interdependence of financial markets worldwide. This thesis examines the connection between international financial integration and growth in Central and Eastern European economies, with a focus on recent 15-year data since the financial crisis. The use of up-to-date information allows us to gain fresh insights into the impact of financial integration on economic development.

Theoretically, according to a simple neoclassical model, international financial integration would lead to capital flows from rich to capital-deficient economies, due to higher rates of return in capital-deficient regions. Foreign capital inflows can act as a supplement to domestic savings for capital-deficient economies, while financial flows may be accompanied by technological spillovers that give relatively backward economies access to more advanced expertise, and international financial integration can also diversify the sources of assets that domestic residents can hold (Kose et al., 2009). However, relaxing restrictions on capital flows implies a relatively aggressive attitude towards risk-taking, which has the potential to generate financial volatility, may lead to reduced resilience to shocks, and may lead to a higher-than-expected probability of financial crises (Ranciere et al., 2006).

International financial integration is often measured in terms of both de jure and de facto. A range of literature has analysed and evaluated the measurement of international financial integration. de jure measurements are often based on the International Monetary Fund's Annual Report on Exchange Rate Arrangements and Exchange Restrictions (ARERAER), which assigns standardised scores to various dimensions. However, there may be differences between de jure international financial integration and de facto international financial integration. As an instance, according to Chinn and Ito's (2008) KAOPEN, which measures the de jure indicator of international financial integration, China scores poorly. However, China has higher levels of de facto international financial integration, like foreign direct investment liabilities and assets.

In addition, de jure measures often rely on researchers to develop and update databases based on ARERAER and other literature, which have a narrow coverage and do not provide complete coverage of the range of countries studied in this thesis. Therefore, this thesis uses the de facto measure to represent international financial integration.

The main innovation of this thesis is found in the use of more recent data and the focus on Central and Eastern European countries. Many previous studies have relied on older data and have not covered the period since the financial crisis due to limitations in data availability or the research that was conducted before the crisis. International financial integration, on the other hand, leads to a more positive willingness to take risks, which may be linked to the crisis. As a result, these studies may have missed some of the negative effects of financial integration on economic growth. By using the most recent data, this thesis aims to provide a comprehensive exploration of the impact of international financial integration on economic growth in the CEE. Friedrich et al. (2012) find that the positive impact of international financial integration on economic growth is more pronounced in emerging European countries, which may be linked to European political integration. In contrast, CEE countries have experienced significant shifts in both economic development and the degree of financial integration over the past few decades. Considering the attractiveness of the European integration process for the international financial integration of CEE countries, it is important to analyse the impact of financial integration on these countries. In addition, literature such as Karadam and Ocal (2014) suggests that international financial integration has a threshold effect on economic growth and that its positive impact is evident in economies with sound financial systems and stable macroeconomic policies, which implies that there may be differences in the impact of international financial integration on countries at different levels of development.

Considering the above analyses, this thesis uses a macroeconomic panel that includes 16 CEE countries and is grouped by advanced and developing economies, thus revealing potentially significant differences in the impact of financial integration on economic growth., This dataset includes financial integration data from Estonia, Hungary, Latvia, Lithuania, Montenegro, Poland, Northern Macedonia, Romania,

Serbia, Slovakia, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic and Slovenia. The dataset covers a period of 15 years, from 2007 to 2021, and it is currently the most up-to-date international financial integration data available. The analysis includes de facto measures of international financial integration, such as flow data on net inflows and outflows of foreign direct investment, as well as stock data on foreign direct investment, portfolio equity, portfolio liabilities, and other investments. The thesis is estimated using a two-way fixed effects model. By controlling for unobservable heterogeneity, the two-way fixed effects model enhances the robustness of the findings.

The differentiation of results between developed and developing economies contributes to a deeper understanding of the nuanced impact of financial integration across various economic contexts. Ultimately, this study aims to facilitate informed policy decisions, guide future research endeavours, and contribute to a comprehensive understanding of the global financial landscape and its implications for economic growth in the CEE region.

The rest of the paper is structured as follows. Chapter 1 is a literature review that collates and analyses previous research and literature on the concept of international financial integration, the theoretical effects of international financial integration on growth, the measurement of international financial integration and the existing empirical research literature that examines the relationship between international financial integration and growth. Chapter 2 develops hypotheses for subsequent empirical studies based on the literature and theoretical analyses. Chapter 3 provides a description of the data sources used in this thesis, the regression model and the meaning of the variables used. Chapter 4 provides a preliminary analysis of the data including descriptive statistics, provisional visual analysis, unit root test and correlation matrix. Chapter 5 is the empirical analysis, where a series of analyses and tests are used to select an estimation method more proper for the panel used in this thesis and to interpret and analyse the regression results. The last chapter concludes the thesis.

1. Literature review

1.1 The Theory of international financial integration

1.1.1 The definition of international financial integration

LOOP is a basic condition for the existence of international financial integration (Baele et al., 2004). According to LOOP, in an ideal situation which has free competition, flexible prices and no trade frictions, the price of the same commodities will be the same in different regions. Because once arbitrage opportunities exist, more and more competitors will try to participate in international trade until prices converge. With the development of financial markets, the existence of loops extends from the area of international trade to the area of financial markets. In the financial sector, under ideal assumptions, assets with the same risk should have the same return in different regions. In other words, there should be no covered interest arbitrage between the financial markets of different countries. Therefore, the LOOP holds which means that international financial integration is in existence, and for financially integrated markets, the cash flows generated by the assets should not vary with the region (Baele et al., 2004).

However, the concept of international financial integration based on the law of one price leaves out the question of whether discrimination affects the supply of investment opportunities, which is an ominous aspect of international financial integration (Baele et al., 2004). Furthermore, only quoted, or listed instruments are tested by the LOOP, which means that integration between unlisted instruments should not be considered as a basis for measurement by the LOOP. Specifically, discrimination by an exchange in a particular area might ultimately result in an asset not being listed on that exchange, suggesting that sometimes the LOOP holds without being accompanied by the presence of international financial integration.

As a response to these concerns, a broader definition of international financial integration was proposed by Baele et al. (2004) and is commonly used (Weber, 2006), which contains the LOOP as well. According to this definition, a market for specific

financial instruments or services is considered fully integrated when all potential participants with similar characteristics:

(1) follow the same rules when engaging with said financial instruments or services.

(2) have the same access to these financial instruments or services.

(3) receive equal treatment while being active in the market.

From another perspective of globalisation, international financial integration implies the unrestricted movement of capital between regions. Based on such a perspective, Obstfeld (1994) proposes a definition that consists mainly of a multinational area: there are no official barriers to the conduct of financial transactions; the transaction costs of conducting transactions with other countries in the region are no greater than those that occur in the same country. In other words, the authorities will only provide a legal framework that is not limited by nationality in the process and no other interventions. Such a definition is also widely adopted, for example in Europe specifically, where the European Central Bank (2023) interprets international financial integration in the euro area as the extent to which financial services are available under the same rules and conditions in all countries that use the euro, and where assets with similar risk-return attributes are priced the same regardless of the country in which they are traded in a well-integrated financial institution.

International financial integration can be divided into de jure and de facto (Prasad et al., 2003). de jure international financial integration refers to the liberalisation of capital through policies, laws, or institutions, while de facto international financial integration, from another perspective, implies the movement of capital itself among different locations. There is no equivalence between de jure international financial integration and de facto international financial integration; there are differences between the two. While the former directly reflects the extent to which the law restricts the movement of capital, its ultimate impact is reflected in the latter (Kose et al., 2009). For example, some countries have a very low level of de jure international financial integration, i.e. they have severe restrictions on the free

movement of capital, but the data reflected in de facto international financial integration, such as the flow of foreign capital, is relatively high.

1.1.2 The positive and negative effects of international financial integration on Growth

Studies on the effects of international financial integration on growth vary widely, from studies that suggest that international financial integration can boost growth to literature that suggests that international financial integration can slow down growth under certain conditions. Some studies have argued that international financial integration can in theory directly affect growth. According to a simple neoclassical model, because returns are higher in capital-deficient areas, international financial integration will cause capital to flow from economies that are rich to those that are deficient. But this is not necessarily the case as the simple model predicts (Lucas, 1990). For capital-deficient economies, foreign capital inflows can play a complementary role to domestic savings (Kose et al., 2009). In addition, the lower cost of capital can lead to an increased amount of investment (Korosteleva and Mickiewicz, 2011).

However, this direct impact has also been questioned as to whether external capital inflows can really become domestic investments. Mody and Murshid (2005) explore the multiple reasons why foreign capital does not translate into domestic direct investment in developing economies and, on this basis, challenge the view that the lack of capital is responsible for the lack of growth in developing economies, which means that foreign capital inflows do not necessarily translate effectively into domestic investment and thus growth, i.e. an increase in foreign capital inflows does not necessarily translate into economic growth in a context where international financial integration has eased restrictions on foreign capital.

Apart from the direct influence on investment, international financial integration is also thought to have an impact on growth through several indirect channels, which include both positive and negative effects. The main positive effects are the following. Firstly, financial flows may be accompanied by technological spillovers, which can give relatively backward economies access to more advanced management or other

forms of organisational expertise (Kose et al., 2009). Secondly, international financial integration could lead to a diversification of the sources of assets that domestic residents can hold, which could result in a diversification of risks as well (Kose et al., 2009). Several studies have shown that better risk sharing is associated with a higher degree of specialisation. Thus, the diversity of risks associated with international financial integration can lead to further specialisation (Obstfeld, 1994; Acemoglu and Zilibotti, 1997; Kalemli-Ozcan, Sorensen, and Yosha, 2003). Increased specialisation, in turn, is related to increased productivity and economic growth. Thirdly, international financial integration, to the extent that it removes restrictions on borrowing, can have an indirect impact on growth by boosting investment and increasing productivity (Bekaert et al., 2010). In addition, financial flows resulting from international financial integration can facilitate the development of the domestic financial sector and lead to more stable policies due to the discipline imposed on macroeconomic policies (Kose et al., 2009).

Studies have found that the negative effects of international financial integration, such as financial crises, are correlated with risk. These effects are similar to some of the positive effects mentioned earlier. The relaxation of restrictions on capital flows in international financial integration implies a relatively positive attitude towards risk-taking, which can potentially generate financial volatility. Furthermore, volatility can lead to reduced resilience to shocks and potentially a higher probability of financial crises than is usually assumed (Kaminsky and Reinhart (1999); Demirguc-Kunt and Detragiache (1998); Ranciere et al. 2006), Studies have also demonstrated that the effects of international financial integration bring benefits in the short term, but that the benefits will change over time, with growth decreasing or even recession in the medium to long term (Bussiere and Fratzscher, 2004).

Institutional weakness has also been identified as an important factor affecting the effects of international financial integration in the literature that considers that international financial integration may have a negative effect on growth. In the presence of institutional distortions, such as weak institutions, institutional policies, and underdeveloped legal and financial systems, international financial integration may slow growth (Boyd and Smith, 1992). International financial integration can induce

capital outflows from countries with relatively scarce capital to countries with relatively weak financial and legal institutions but relatively abundant capital. Eichengreen et al (2011) suggest that the effects of international financial integration will only be positive once the institutions have reached a certain level of quality, and even this positive impact can vanish in the face of a crisis. In other words, international financial integration is considered to be positive for growth only in an environment where the institutions meet certain conditions.

1.2 Measurement of international financial integration

The measurement of international financial integration can be generally divided into two main aspects: de jure and de facto. Of these, de jure mainly measures policies with regard to capital liberalisation, while de facto mainly measures the actual existence of capital flows.

1.2.1 De jure measurements

Most de jure measurements are based on the IMF's Annual Report on Exchange Rate Arrangements and Exchange Restrictions (AREAER) (Schindler, 2009). Alesina et al. (1993) suggest that AREAER's binary indicators are suitable for examining the incidence of restrictions on capital flows, but not the intensity of the restrictions in question. Edwards (2001) and Chinn and Ito (2008) suggest that the degree of capital account openness covered by AREAER's binary indicator is aggregated and lacks some specific details of how restrictions are captured in practice.

AREAER-based de jure measurements can be broadly classified as de jure indicators based on the AREAER categorical table of restrictions and de jure indicators based on the text of AREAER. Many researchers have chosen to develop indicators based on the AREAER categorical table of restrictions. Tamirisa (1999) and Johnston and Tamirisa (1998) summed the binary scores of 13 categories for 40 countries in 1996. Miniane (2004) averaged the scores of these categories and extended the years covered from 1983 to 2000. However, the number of countries included is reduced to 34 and no distinction can be made between inflow and outflow restrictions. The

Financial Openness Index (FOI) presented by Brune and Guisinger (2006) extends Johnston and Tamirisa's (1998) data to include the years 1970 to 2004, for a total of 187 countries. The FOI represents 12 cumulative sums of binary scores for each of the 12 categories and distinguishes between inward and outward flows, with a refined treatment of the capital flows subscale, but no details of the mapping from qualitative text to binary scores are publicly available. Abiad and Mody (2005) and Mody and Murshid (2005) average the four variables in the AREAER table, and Chinn and Ito (2002, 2006, 2008) KAOPEN indicator uses the AREAER table to conduct a principal components analysis, with higher scores being associated with greater openness. KAOPEN is still being updated so that it can be used to examine recent trends. In addition to this, KAOPEN is publicly available, unlike the FOI.

The shortcomings of such indicators have been proposed by Quinn (2011), who argues that AREAER's indicators have produced updates since 1995, leaving structural breaks in the data based on this. Also, the threshold of openness and closure inferred from the average data may change over time. In addition, the point in time chosen for the measurement of the table's data varies between countries, which may impede its use.

Many researchers have chosen to develop indicators based on the text of AREAER, which could avoid some disadvantages of de jure indicators based on the AREAER categorical table of restrictions. Quinn (1997) developed a dataset targeted to improve on the issues mentioned above. The dataset is updated to include data for a total of 122 countries from 1949 (or when first reported to the IMF) to 2007, covering categories such as import payments; export earnings; intangible asset payments; intangible asset earnings; capital flows by residents; and capital flows by non-residents, with an assessment of the intensity of restrictions. The details of the assessment of the degree of openness and the associated intensity are missing from the above data. In addition, the AREAER component of 'intra-year changes' includes the dates of key regulatory changes and allows the date to be set to 31 December each year for each country. Edwards (2001) considers its advantage to be the wide range of time coverage. However, it has the problem that it is not up to date and is not suitable for analysis of

the latest trends. The database developed by Kastner and Rector (2003) covers 19 countries, all OECD countries, from 1951 to 1988. Its weakness is that it does not provide a measure of intensity, and the number of countries and years covered is relatively limited. The database developed by Kaminsky and Schmukler (2008) covers financial liberalisation data for a total of 28 countries from 1973 to 2005. The advantage is that the data are monthly, which means that some higher frequency variables can be analysed with this database. The KA index developed by Schindler (2009) covers data for a total of 91 countries between 1995 and 2005 and includes information from six AREAER categories. the most granular of the measurements. Although AREAER provides binary indicators for individual transactions, the KA Index can still be used to assess the intensity of capital controls in different countries because of its fine-grained breakdown of financial openness in different dimensions. The index is based on detailed information from AREAER on restrictions on capital transactions after 1995. On the one hand, this means that the index avoids the shortcomings of the AREAER classification scheme, which has structural breaks. On the other hand, it also means that the index is limited in the years it covers and is only suitable for the study of post-1995 data.

While most de jure measurements have been developed based on AREAER, a small number of researchers have proposed de jure measures that are not based on AREAER. Bekaert et al. (2005) propose a binary indicator, EQUITY, which contains data on equity liberalisation for a total of 95 countries from 1980 to 2006. The economic freedom indicator created by The Heritage Foundation (2010) also contains a classification of "investment freedom" that can be used to measure the level of international financial integration. Possible problems with this dataset are the complexity of the sources used, the inclusion of some secondary sources, and the lack of more descriptive information.

Some researchers have criticised de jure measurement. Kose et al. (2009) argue that de jure measurements have difficulties in describing the level and effectiveness of the implementation of capital controls. Prasad et al. (2003) suggest that the restrictions on the free flow of capital are reflected by de jure measurements The degree of

restrictions on free capital flows does not always correspond to the degree of integration of capital markets in practice, implying that restrictions on free capital flows do not really provide an assessment of the degree of international financial integration in some contexts. In addition, Quinn (2011) suggests that the lack of execution may lead to indicators that de jure measures do not consistently reflect the actual degree of international financial integration.

1.2.2 De facto measurements

Some researchers prefer the de facto measure to assess the degree of international financial integration, considering the deficiencies that exist in the de jure measure. Kose et al. (2009) suggest that the actual degree of integration should receive more attention than when research is conducted on its impact. De facto measurements can generally be subdivided into quantity-based measurements and price-based measurements. Quinn's (2011) classification incorporates a hybrid measurement combining quantity and price-based measurements. On the other hand, Baele et al. (2004) incorporate news-based measures. News-based measures focus on the information effect, where portfolios become diversified as a result of international financial integration, and where asset prices tend to change in response to international rather than local news. However, in practice, researchers usually choose the first two types of measures over news-based measures.

The development of price-based measures is based on LOOP, which states that in a financially integrated market, assets with similar characteristics should have the same price in different geographical locations and that price differences disappear due to the existence of arbitrage opportunities. Therefore, price-based measures need to measure the degree of international financial integration by comparing asset prices or returns (Baele et al., 2004). If assets differ because they are in different geographical locations, this implies that restrictions on the free flow of capital exist and international financial integration may be low. Baltzer et al. (2008) suggest that price-based measures are suitable for studying currency and government bond markets. Yeyati et al. (2009), Dooley et al. (1997) have studied international financial integration using price-based

measures. Kose et al. (2009) point out that the measurement of price-based measures can have several shortcomings in practical application, and that for emerging markets and low-income developing economies, the returns on their financial instruments may contain many difficult-to-quantify risks and liquidity premiums. And Kose et al. (2009) argue that the depth and liquidity of domestic financial markets in these economies may not meet the conditions for efficient arbitrage of price differences. Similarly, Quinn (2011) suggests that the drawback of price-based measures is that inefficient arbitrage may also reflect domestic financial frictions, which makes it not necessarily reflect the impact of international financial frictions and argues that price-based measures are only suitable for the study of selected countries.

Quantity-based measures quantify the demand for and supply of investment opportunities embodied in the process of international financial integration about the extent to which it is subject to frictions and constraints by analysing stocks and flows of assets (Baele et al., 2004). Several researchers have opted for quantity-based measures to carry out measurements of the degree of international financial integration. The TOTAL index developed by Lane and Milesi-Ferretti (2007) is widely used to measure the fact that a country is exposed to international financial markets (Kose et al., 2009), which is obtained from the sum of an economy's total assets and liabilities as a percentage of GDP. Quinn (2011) stated that the calculation of this indicator differs from other indicators in that it chooses to use stock data for measurement and does not include capital mobility, which is vulnerable to other factors and difficult to measure accurately.

The main quantity-based de facto measures are those based on flow data and those based on stock data, both of which have been chosen by many researchers. Several researchers have discussed these two methods and have concluded that the stock data-based method gives more accurate results. Lane et al. (2001) argue that capital flow data do not provide a complete picture of the positive effects of international financial integration because part of the gains are associated with the total holdings of foreign assets and liabilities. However, stock data, such as the composition of equity and debt in international investment positions, can be used to assess an

economy's vulnerability to external shocks and the extent of cross-border risk sharing, while Prasad et al. (2003) argue that stock data have relatively low annual volatility and are less likely to produce measurement error than flow data. Kose et al. (2009) argue, similarly to previous researchers, that stock data retains the core concerns of international financial integration while reducing the potential for error and is more suitable for risk-sharing-related studies. However, the limitation of stock data is reflected in the fact that the range of time and countries it can cover is less than that of flow data. Lane and Milesi-Ferretti (2007) provide a solution to this deficiency by using alternative estimates to generate estimates of equity positions using capital flow data and calculations of capital gains and losses, making the lack of stock data time periods or countries can also be covered by the studies.

Some researchers have proposed measures that involve both de facto measures and de jure measures. Edison and Warnock (2003) developed the FORU indicator, which includes data from 1989 to August 2006. the FORU indicator is a monthly figure that assesses the degree of capital account openness, based mainly on the share of domestic stocks available for foreign purchase. Quinn (2011) classifies FORU as a hybrid measure of international financial integration. On the one hand, the indicator is concerned with whether stock trading is open to foreigners which is a de jure measurement, and the measure's denominator is quantity. On the other hand, FORU also involves a price-based de facto measure, and linking restrictions on stock trading by foreign investors to the dynamic pricing of stocks is consistent with the logic of a price-based de facto measure. Dreher (2006) and Dreher et al. (2008) propose a hybrid indicator, Economic Globalization (eGlobe), containing data from 1970 to 2007. eGlobe combines a quantity-based de facto measure, the AREAER binary codes and tariff-related data.

Quinn (2011) argues that there are limitations to de facto and hybrid indicators. Because of the inconsistencies in FDI reporting and treatment across countries and time periods, it is difficult to achieve meaningful comparisons of FDI data within a panel when using these indicators for research purposes. In addition, Quinn (2011) also suggests that the relationship between de facto measures and policies related to the

capital free flow in that economy is incomplete and that the causal relationship between the two is bidirectional. Ostry et al. (2011) also suggest that firms may choose to invest in more restrictive environments for specific purposes, such as being granted privileged access to other blocked markets. However, Kose et al. (2009) state that the de facto measure has endogeneity problems, while the de jure measures also have strong endogeneity problems and even more limitations besides the endogeneity problems. While both de facto and de jure measures capture much information about the process of international financial integration, the de facto measure is not only more appropriate for capturing the degree of integration of an economy into global financial markets but is also more suitable for empirical analysis.

1.3 Research on international financial integration and growth

Numerous studies have been conducted to investigate the correlation between international financial integration and economic growth. However, the findings of these studies are diverse and sometimes even contradicting.

Some researchers have argued that there is no significant relationship between international financial integration and economic growth. Kraay (1998) estimated macro-level data for 42 countries for the period 1985-1997 using both OLS and two-stage least squares methods. It is ultimately concluded that an increase in the level of capital account openness does not lead to higher levels of growth and investment and that capital account liberalisation does not have a significant impact on economic growth.

An empirical study of data from 1980 to 2000 for 57 countries worldwide was conducted by Edison et al.(2002). The international financial integration indicators involved are de jure and de facto. de jure measures include the IMF restrictions and the international financial integration indicators developed by Quinn (1997). de facto measures include stock of capital flows, flow of capital, and stock of capital Edison et al. (2002) estimate the sample using three estimation methods: OLS, two-stage least squares and GMM, controlling for economic, financial and institutional factors.

According to the research, it seems that economic growth is not affected by international financial integration.

Mody and Murshid (2005) analyse macro-level data for a total of 60 developing countries from 1979 to 1999 using GMM estimation methods to examine the relationship between capital flows and domestic investment. The results show that foreign capital inflows can increase the existing capital stock and have a positive effect on marginal returns, but Mody and Murshid (2005) argue that international financial integration has only led investors to increase their investment in developing countries and thus further optimise their portfolios but has no impact on domestic investment. They argue that in this process, foreign capital inflows are driven by investors' incentives to diversify their portfolios rather than by unmet domestic investment needs in developing countries and that some developing countries become scapegoats for foreign diversification incentives when their domestic returns are lower or equal to world interest rates.

Schularick and Steger (2010) followed Edison et al. (2002) to estimate data for 24 countries. Their study is divided into two time periods, historical and modern, including 1880 to 1913, and 1980 to 2002. According to Schularick and Steger's study (2010), there is a notable correlation between economic growth and international financial integration within the sample period of 1880 to 1913. However, the sample from 1980 to 2002 reflects no significant relationship between international financial integration and economic growth and no significant relationship between openness to international capital markets and the amount of total investment.

The results of empirical analysis by some researchers show that international financial integration has a positive effect on economic growth. Bumann et al (2011) use meta-analysis as a tool to examine the relationship between financial liberalisation and economic growth, based on 60 different empirical studies and 441 t-statistics in a systematic analysis of the empirical literature. Bumann et al (2011) conclude that on average, financial liberalisation has a weak positive effect on growth, and most of the variables that could be used to explain the heterogeneity of the results were found to be not significant. Bosworth et al. (1999) examine macro-level data for a total of 58

developing countries from 1978 to 1995, using OLS, fixed effects and two-stage least squares estimation, to study the impact of capital flows on economic growth in developing countries. They conclude that FDI growth has a positive effect on economic growth through its impact on domestic savings and investment.

Galindo et al. (2002) examined macro-level and industry-level data for 95 countries from 1973 to 1998. They estimate using OLS and fixed effects methods respectively. galindo et al. (2002) suggest that financial liberalisation has had a positive effect on industry-level growth, with firms with more foreign financing benefiting more from the process.

Bekaert et al. (2005) studied the relationship between international financial integration and economic growth, including an aggregate sample of a total of 95 countries and a total sample of 50 countries with financial information, and estimated these samples using OLS regression and GMM respectively. They used a variety of de jure indicators for their study and concluded that equity market liberalisation has led to a statistically significant increase in real GDP per capita of approximately 1% per year.

Ranciere et al. (2006) examine data for 60 countries from 1980 to 2002, using a binary de jure binary indicator and a de facto binary indicator based on the identification of country-specific trend breaks in private capital flows, as proposed by Bekaert et al. Their analysis combines growth and crisis models. The findings show that although international financial integration can lead to occasional crises, it can have a positive effect on growth, leading to faster long-term growth. Further, Ranciere et al. (2006) argue that since crises are rare events, the positive effects of this process on economic growth are much greater than the negative effects of financial crises. However, despite the positive attitude of the researchers towards the low incidence of crises, the financial crisis happened shortly after the publication of this study.

Masten et al. (2008) analysed data from 1996 to 2004 for 31 European countries, including transition economies and new EU countries. Their study included a macro-level study of international financial integration and growth and an industry-level study of financial development and growth, where the macro-level study of international financial integration chose the quantitative-based de facto indicator and the estimation

method used the GMM method. The results of Masten et al. (2008) show that international financial integration has a highly non-linear positive impact on growth. This positive effect is only significant in countries with a certain level of financial development. For most of the new EU countries, however, the level of financial development has already been reached, which means that they can benefit from the process of international financial integration. And Masten et al. (2008) argue that joining European Monetary Union will have a further positive effect on the economic growth of the new EU countries.

Friedrich et al. (2012) conducted research on European transition countries using industry-level data. They used nine quantity-based de facto indicators, including stock and flow indicators. In difference to Ranciere et al. (2006), Friedrich et al.'s (2012) study comes at a time when international financial integration in European transition countries is being questioned in the aftermath of the financial crisis. Indeed, the study by Pungulescu et al. (2013) argues for an increase in international financial integration before the crisis; however, there is a clear reversal of international financial integration in both old and new EU member states after the crisis. This view is refuted by the findings of Friedrich et al. (2012), whose findings based on industry data show that international financial integration has a significant positive effect on industries in emerging European countries that need external finance, but that such an effect does not occur in other developing or developed countries. Friedrich et al (2012) seek an explanation for this evidential effect and find that the positive effects of international financial integration on industries in need of external finance are stronger in countries with higher levels of political integration and conclude that political integration can be a means to the positive effects of international financial integration.

Karadam and Ocal (2014) examine macro-level data for a total of 82 countries from 1970 to 2010, using the Panel Smooth Transition Regression Model. Karadam and Ocal (2014) argue that international financial integration is positive for economic growth when a sound financial institution and stable macroeconomic policies are in place. Karadam and Ocal (2014) argue that international financial integration is positive for economic growth when there is a sound financial system and stable macroeconomic

policies. Similarly, Chen and Quang (2014) run panel threshold regressions using macro-level data for 80 countries from 1984 to 2014 and conclude that international financial integration is positive for growth only when the quality of institutions and the financial depth reaches a certain level. Karadam and Ocal (2022) further find that these threshold effects differ between emerging and industrial countries, with the threshold effects being stronger and different in emerging countries, while increased international financial integration results in industrial countries deriving fewer benefits from it. Coeurdacier et al. (2020) also suggest that the finance-growth relationship is ambiguous and that the effectiveness of international financial integration depends on factors such as country size, risk level and undercapitalisation.

2. Hypothesis

The aim of this thesis is will investigate how the economic growth of Central and Eastern European economies is affected by international financial integration in the wake of the EU global financial crisis. The thesis plans to make de facto measurements from several aspects of foreign direct investment, debt, portfolio debt, and other investment International financial integration not only provides capital replenishment but also has positive indirect effects on economic growth, indicating its beneficial impact. International financial integration not only provides capital replenishment, but also has positive indirect effects on economic growth, indicating its beneficial impact. and portfolio equity, where foreign direct investment involves flow and stock data, and all other aspects are analysed on stock data. In the following part of this section, hypotheses will be developed for each aspect based on the literature review and theoretical discussion.

In general, according to the neoclassical view, international financial integration leads to flows of capital from rich economies to areas of lack, due to the higher rates of return in areas where capital is scarce. Kose et al. (2009) argue that for capital-starved economies, inflows of foreign capital can complement domestic savings. Furthermore, Korosteleva and Mickiewicz (2011) argue that a lower cost of capital in turn leads to an increase in the amount of investment. In addition, the impact of international financial integration on economic growth is linked to indirect effects such as technology spillovers, risk sharing and efficiency gains.

The integration of global finance has a direct impact on capital replenishment and can indirectly contribute to economic growth. However, it's worth noting that the impact of financial integration on economic growth may not always align with this perspective. Capital does not necessarily flow in the way that the neoclassical model expects. (Lucas, 1990). Mody and Murshid (2005) question whether foreign capital can actually be converted into investment and thus lead to economic growth, implying that the increase in foreign capital brought about by international financial integration may not be able to induce economic growth.

In the case of foreign direct investment specifically, the impact on economic growth is also considered to be diverse. Prasad et al. (2003) suggest that the effects of international financial integration are strongly determined by the composition of capital flows, as some of these types of flows have easily reversible characteristics, which makes the positive effects likely to be relatively small. In this process, because foreign direct investment inflows are closely linked to sunk costs, making it relatively less reversible, this makes foreign direct investment inflows to some extent the most beneficial type of capital flows to the recipient country, which may have a positive effect on economic growth. However, the size of the contribution of foreign direct investment depends on the overall business environment of the recipient country (Chamarbagwala et al., 2000). According to the FDI-growth hypothesis, there is a positive relationship between foreign direct investment inflows and growth if the financial system of the recipient country reaches a relatively high level of development. (Alfaro et al., 2004; Durham, 2004).

In addition, foreign direct investment inflows in the financial sector can bring in more capital directly and have an indirect positive impact. In theory, foreign direct investment could contribute to technological change through the spill over effects of knowledge and new capital goods. There are two main channels through which foreign direct investment may contribute to growth (De Mello, 1997). When foreign direct investment comes into a country, it can bring about capital spillovers that make it easier for companies to adopt new technologies in their production processes. This investment can also lead to the transfer of knowledge through labour training and skill-building, as well as introducing new management methods and organisational capabilities. These benefits can help less developed economies to gain access to more advanced management and organizational expertise. Also, asset resource diversification can lead to risk diversification (Kose et al., 2009). Further, the entry of foreign direct investment into the non-financial sector may also create new jobs or facilitate the entry of entrepreneurs through vertical spillovers, thereby contributing to economic growth.

However, some researchers have also argued that foreign direct investment inflows may also have a negative impact on economic growth. Agosin and Mayer (2000)

suggest that FDI in industrialised countries may cause a crowding-out effect on capital formation and growth of domestic investment. Some researchers have also suggested that productivity in foreign direct investment recipient countries has declined rather than increased significantly (Hu and Jefferson, 2002).

However, in general, the causality of FDI is not definitive, especially in emerging market economies (Gorg and Greenaway, 2004). Researchers tend to argue that there is an almost universally accepted positive association between the two, however, the lack of sufficient exploration of the effects of contingency prevents a decisive inference from being made. Görg and Greenaway (2004) show that positive knowledge spillovers from developing economies are not significant. Borensztein et al. (1998)) also find insufficient support for the view that foreign direct investment has a positive exogenous effect on economic growth.

Based on the literature mentioned and the above analysis, the following hypothesis can be formulated:

H1: Foreign direct investment inflows will have a positive impact on economic growth in CEE countries.

H2: Foreign direct investment liabilities will have a positive impact on economic growth in CEE countries.

Foreign direct investment outflows are associated with the purchase of foreign assets by residents. On the one hand, diversification may diversify risk and improve the ability to cope with shocks. On the other hand, foreign direct investment outflows may also lead to capital flows to lower-cost and more profitable regions, with potentially negative effects on economic growth in various ways, such as employment.

Based on the literature mentioned and the above analysis, the following hypothesis can be formulated:

H3: Foreign direct investment outflows will have a negative impact on economic growth in CEE countries.

H4: Foreign direct investment assets will have a negative impact on economic growth in CEE countries.

Portfolio investments are associated with an increase in the availability of capital, which contributes to the sophistication and depth of the domestic financial system and may promote economic growth. However, this type of flow can be easily reversed, and its sudden reversal can lead to financial crises in dependent economies.

However, researchers have diverse views on the relationship between foreign portfolio investment and economic growth.

Some researchers have argued that foreign portfolio investment has a negative or no positive impact on economic growth. The empirical findings of Choong et al. (2010) suggest that foreign portfolio investment has a negative impact on economic growth. The findings of Durham (2004) do not support the positive impact of foreign portfolio investment on economic growth and suggest that the impact of foreign portfolio investment on the host country depends on domestic financial and institutional development. There are also some researchers who suggest the opposite. Kose et al. (2009) assess the impact of financial openness on productivity growth, a key component of economic growth, and suggest that equity inflows from portfolio investment promote total factor productivity growth. Ferreira and Laux (2009), on the other hand, argue that there is a positive correlation between portfolio capital flows in advanced economies and emerging markets, with inflows and outflows into and out of the local stock markets Blair (2003) argues that the opening of stock markets to foreign participants in emerging markets reduces the cost of capital and increases the growth rate of the capital stock and the growth rate of output per worker, while Quinn and Toyoda (2008) suggest that the liberalisation of stock markets has a positive impact on economic growth.

The increase in portfolio equity liabilities can be linked to economic growth. First, it implies an inflow of foreign capital. These funds can be used for investment, contributing to the increase and expansion of economic activity, while the participation of foreign investors can provide additional financial and resource support to domestic enterprises. Second, it means technology transfer and knowledge sharing. Relatively advanced technology and management experience may be introduced to improve the level of technology and production efficiency, which will help promote the upgrading of domestic industries and the enhancement of innovation capacity. Thirdly, increased

inflows of foreign capital could lead to the establishment of new firms or the expansion of existing firms, thus creating jobs and the opportunity to reduce unemployment. However, it is important to note that an increase in foreign Portfolio Equity liabilities may also pose some challenges and risks. For example, foreign investors may have an impact on the decisions and strategies of domestic firms, and domestic firms may be exposed to risks of knowledge and technology dependence, as well as fluctuations in external economic conditions.

Based on the literature mentioned and the above analysis, the following hypothesis can be formulated:

H5: Portfolio equity liabilities will have a positive impact on economic growth in CEE countries.

H6: Portfolio equity assets can have a negative impact on economic growth in CEE countries.

The database used in this thesis, The External Wealth of Nations (Lane and Milesi-Ferretti, 2007), divides debt into two components: portfolio debt and other investments. Other investments include loans, deposits, trade credits etc.

Similarly, foreign portfolio debt liabilities may have an impact on domestic economic growth. Foreign Portfolio Debt liabilities can provide substantial financial inflows to the domestic economy. These funds can be used to invest in domestic enterprises, infrastructure development, and expansion of production capacity. The inflows can help meet the country's capital needs and boost economic growth. Foreign Portfolio Debt liabilities can provide additional sources of financing, thereby lowering the cost of financing for domestic enterprises and governments. Lower financing costs can help encourage investment and stimulate economic activity, promoting industrial development and job creation. Foreign Portfolio Debt liabilities can increase the international and foreign exchange reserves of the domestic economy, thereby increasing the stability of the domestic economy. Foreign investment can reduce the pressure of trade deficits and capital outflows and increase resilience to external shocks. However, it is important to note that foreign Portfolio Debt liabilities may also pose risks and challenges. Overdependence on foreign debt financing can expose the country

to repayment pressures and foreign exchange risks, especially when debt repayment terms are unfavourable.

Although similar to portfolio equity, loans from non-resident banks increase the availability of capital, some studies have suggested the opposite, namely that it can have a negative impact on economic growth. Data on non-resident bank loans, which are not separately listed in the database used here, are included in the debt stock data, portfolio debt, and other debt investments. Lin and Sosin (2001) examine the relationship between government external debt and the growth rate of GDP per capita over the period 1970-1992 for a sample of 77 countries. They find that external debt has a negative, but not always significant, effect on the entire sample. Reinhart and Reinhart (2009) find that the expansion of external debt during the capital inflow dividend period raises the probability of financial and economic crises. Kose et al. (2009) assess the impact of financial openness on productivity growth, a key component of economic growth, and they find that external debt, in turn, is negatively associated with total factor productivity growth. Choong et al. (2010) also show that external debt and portfolio investment have a negative impact on economic growth. Bordo et al. (2010) suggest that foreign currency debt is widely recognised as increasing the risk of financial crises and that the higher the ratio of foreign currency debt to total debt, the higher the risk of currency and debt crises, which can lead to large and permanent output losses.

Based on the literature mentioned and the above analysis, the following hypothesis can be formulated:

H7: Portfolio debt assets will have a positive impact on economic growth in CEE countries.

H8: Portfolio debt liabilities will have a negative impact on economic growth in CEE countries.

H9: Other investment assets will have a negative impact on economic growth in CEE countries.

H10: Other investment liabilities will have a positive impact on economic growth in CEE countries.

3. Data and methodology

3.1. *Data source*

In this thesis, the correlation between economic growth and international financial integration is analysed for Central and Eastern European economies. The examination covers various aspects, including foreign direct investment, debt, portfolio debt, and portfolio equity. This thesis uses a macroeconomic panel for a total of 16 Central and Eastern European economies for the period from 2007 to 2021. The following countries are included: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Montenegro, Poland, Northern Macedonia, Romania, Serbia, Slovenia, and Slovakia. The data used in this paper come from World Development Indicators (World Bank, 2022) and The External Wealth of Nations Mark II database (Lane and Milesi-Ferretti, 2007) and its extension (Lane and Milesi-Ferretti, 2018), respectively. The World Development Indicators (World Bank, 2022) provide data on economic growth and growth-related control variables and some flows related to international financial integration. The Lane and Milesi-Ferretti (2018) database, known as the External Wealth of Nations Mark II, contains crucial information on stock data that pertains to international financial integration.

The External Wealth of Nations Mark II database (Lane and Milesi-Ferretti, 2018) provides a measure of trends in international financial integration and global external imbalances that measure only financial claims and liabilities to non-residents, and therefore only the net external component of a country's wealth. Lane and Milesi-Ferretti (2007) provide The External Wealth of Nations Mark II database, which was extended in 2018. This thesis will use the latest version of the database updated in December 2022. The database contains data from 1970 to 2021 for a total of 210 economies, including the euro area and the entire Eastern Caribbean Currency Union (ECCU), with data also available for Syria (as of 2010) and the Netherlands Antilles (as of 2009). The database reports the division between "Portfolio investments: debt

securities" and "Other investments" in the categories "External debt assets" and "External debt liabilities" for the period after 1995.

The database contains estimates of external financial assets and liabilities of every country. These data also yield estimates of each country's net international investment position (NIIP), the difference between its total external financial assets and its total external liabilities. According to the definition given by the database (Lane and Milesi-Ferretti, 2018), the external financial assets are claims by domestic residents on nonresidents, which includes foreign direct investment (controlling stakes by domestic firms in overseas' affiliates), portfolio investment (holdings by domestic residents of stocks or bonds issued by nonresident entities), other investment (including loans to or deposit in nonresident entities, trade credits, etc), financial derivatives and foreign exchange reserves (holdings of liquid foreign-currency assets by the domestic central bank). Similarly, the definition of financial liabilities corresponds to financial assets.

The main source of The External Wealth of Nations Mark II database (Lane and Milesi-Ferretti, 2018) is the balance of payments (BOP) and international investment position (IIP) statistics for countries published by the International Monetary Fund. One of the advantages of the database is that its coverage has been extended to almost all world economies since 1970, including some for which data are publicly incomplete. Gaps in which the data may be incomplete or imprecise are filled with alternative data and methods to fill in missing IIP data or IIP estimates. Lane and Milesi-Ferretti (2018) extend the database with expanded sources that include bilateral from the International Monetary Fund Coordinated Direct Investment Survey and the International Monetary Fund Coordinated Portfolio Investment Survey partner country data (for countries that do not publish estimates of their external assets and liabilities or only publish incomplete versions); valuation-adjusted cumulative flows; external debt statistics from the World Bank and the International Monetary Fund; and foreign direct investment statistics from the United Nations Conference on Trade and Development and various national sources.

In addition to being the most extensive in terms of time and countries covered compared to other measures of international financial integration, as mentioned above,

covering the full range of economies and years needed for the research in this paper, The External Wealth of Nations Mark II database (Lane and Milesi-Ferretti, 2018) has the following other advantages. First, the data presented in the database are stock data. According to many researchers, stock data is a superior option to flow data when measuring international financial integration. Capital flow data do not provide a full picture of the positive impact of international financial integration because part of the gains are related to total holdings of foreign assets and liabilities (Lane et al., 2001). However, stock data, such as the composition of equity and debt in international investment positions, can be used to assess an economy's vulnerability to external shocks and the extent of cross-border risk sharing. Further, stock data have relatively low annual volatility, are less likely to generate measurement error than flow data (Prasad et al., 2003), and retain the core issues of international financial integration (Kose et al., 2009).

Secondly, the statistical endpoints of all data in the database are harmonised. All variables are available as of 31 December and are expressed in millions of United States dollars and are therefore converted to United States dollars at the end-of-period exchange rate. This effectively avoids some of the errors in the measurement of international financial integration due to differences in the end time of each period of data statistics in different economies.

However, the limitation of stock data is reflected in the fact that it can cover a smaller range of time periods and countries than flow data. Lane and Milesi-Ferretti (2018) provide a solution to this shortcoming by using an alternative estimation methodology that utilises capital flow data and capital gain/loss calculations to generate estimates of stock positions, allowing for the coverage of time periods or countries that do not have stock data. Another limitation of this database that needs to be noted is that, although non-resident bank lending is also a noteworthy aspect of the study of international financial integration, stock data on non-resident bank lending are not provided separately in this database but are only included in the debt stock data along with portfolio debt and other debt investments.

3.2. Model

The focus of this thesis is to examine how the economic growth of Central and Eastern European countries is affected by international financial integration. To address the research question of this thesis, and to estimate the relationship between international financial integration and economic growth, the following equations are developed for subsequent regression analyses:

$$Growth_{it} = \beta_0 + \beta_1 IFI_{it} + \beta_2 C_{it} + \mu_i + \upsilon_t + \varepsilon_{it} \quad (1)$$

Where, $Growth_{it}$ is the independent variable representing the growth rate of real GDP per capita for country i in year t. β_0 is a constant term. IFI_{it} is the dependent variable, denoting the degree of international financial integration of country i in year t, which is a vector consisting of a series of de facto international financial integration measures. C_{it} is a control variable indicating other factors related to economic growth for country i in year t. The inclusion of control variables helps to improve the accuracy of the estimation results. μ_i is the country fixed effect. υ_t is the time fixed effect. ε_{it} is the error term. The variables in the model will be explained specifically below.

3.3. Variable explanation

The purpose of this thesis is to explore the relationship between economic growth and international financial integration. Based on the definition of international financial integration and the various measures of international financial integration, the study adopts a de facto measure based primarily on stock data. Therefore, the independent variable in this thesis is economic growth, the dependent variable is a series of measures related to international financial integration, and a series of control variables related to economic growth are selected with reference to previous studies. Please refer to the table below for the names of the specific variables.

In this thesis, the focus is on economic growth as the dependent variable. To measure growth, we have selected the annual percentage growth of per capita gross domestic product in constant local currency as our data. The source of the data is the World Development Indicators (World Bank, 2022) of the World Bank.

The independent variables in this thesis are de facto measures of international financial integration, which include flow and stock data on foreign direct investment, portfolio debt, portfolio equity, and debt. Considering that the dependent variable is in the form of per cent growth and referring to the approach of other researchers (Masten et al. 2008), the data related to international financial integration are used in the form of per cent of the gross domestic product of the economies.

Economic growth is the dependent variable in the estimated model, and it can be expressed directly in terms of per capita GDP growth. To measure the level of international financial integration, the independent variable, statistical data is required. For this research, the de facto measure is chosen as the index of international financial integration used in the regression models, in order to obtain data that cover the full sample. Many studies have included the de jure measure in their analyses and have attempted to compare whether there is a difference between de jure international financial integration and de facto international financial integration (Edison et al., 2002). However, although KAOPEN (Chinn and Ito, 2006) is updated in 2022 as the de jure international financial integration index covering more countries than other de jure databases, the assessment of Serbia and Montenegro is still not included in the database. Instead, this thesis is concerned with the impact of international financial integration between the CEE countries on economic growth, which means that the examination of developing economies is very important. Therefore, on balance, the option of dropping de jure data, which may not correspond to the actual level of international financial integration, is a more appropriate choice than moving Serbia and Montenegro, which is a developing economy, out of the sample.

Considering the availability of data and the instability of flow data, only net inflows, and outflows of foreign direct investment as a percentage of gross domestic product were selected for flow data. This is because Lane and Milesi-Ferretti (2007) mention that the impact of foreign direct investment on economic growth in the CEE countries is of specific concern. The source for this part of the flow data is also the World Bank's World Development Indicators (World Bank, 2022).

The source of the stock data is the external Wealth of Nations database (Lane and Milesi-Ferretti, 2018). The stock data selected in this thesis include foreign direct investment assets and liabilities as a percentage of gross domestic product respectively, portfolio equity assets and liabilities as a percentage of gross domestic product respectively, portfolio debt assets and liabilities as a percentage of gross domestic product respectively, other investment assets and liabilities as a percentage of gross domestic product respectively, and total foreign assets and liabilities as a percentage of gross domestic product respectively.

According to the definition given by the dataset (Lane and Milesi-Ferretti, 2018) Foreign direct investment assets refer to the stock of foreign direct investment abroad. When foreigners invest in the reporting economy, it's called foreign direct investment liabilities. Portfolio equity assets are financial claims on nonresidents in portfolio equity securities. Portfolio equity liabilities are financial liabilities to nonresidents in portfolio equity securities. Portfolio debt assets are financial claims on nonresidents in portfolio debt securities. Portfolio debt liabilities are financial liabilities to nonresidents in portfolio debt securities. Other investment assets refer to the stock of other investment claims on nonresidents (loans, deposits, trade credits etc). Other investment liabilities refer to the stock of other investment liabilities to nonresidents (loans, deposits, trade credits etc). Total assets refer to the total financial claims on nonresidents (excluding gold holdings). Total liabilities refer to the financial liabilities of nonresidents.

Specifically, the variables foreign direct investment assets and foreign direct investment liabilities report asset and liability holdings according to the Balance of Payments Manual 6 definitions (for most countries) or the Balance of Payments Manual 5 definitions. The difference between foreign direct investment assets and liabilities is the same according to Balance of Payments Manual 5 and Balance of Payments Manual 6, but according to the latter, the asset and liability positions are larger, reflecting the classification of "reverse foreign direct investment" - e.g., a loan from an affiliate to a parent company.

Considering the availability of data and in the light of previous studies (Islam,1995; Forbes,2000; Barro, 2000; Hausmann et al., 2004), this thesis selects a

series of variables related to economic growth as control variables, including factors such as inflation, population growth, gross domestic savings, life expectancy, and import-export trade. The source of all these data is the World Bank's World Development Indicators (World Bank, 2022).

In this context, inflation refers to the annual percentage change in the cost of a basket of goods and services purchased by the average consumer, as measured by the consumer price index, expressed as a percentage. Population growth refers to the exponential growth rate of the population over the course of the year, expressed as a percentage. Gross domestic savings refers to total domestic savings as a share of gross domestic product, expressed as a percentage. This variable is more applicable to this thesis than gross investment, given possible multicollinearity problems and missing data for some economies. Life expectancy refers to the total average life expectancy at birth in years. Import and export trade refers to total exports and imports of goods and services expressed as a percentage of gross domestic product.

Table 1 Main variables description and source

Variables	Description	Source	Type
Growth	Annual percentage growth rate of GDP per capita based on constant local currency.	World Development Indicators (World Bank)	Dependent variable
FDI inflows (% of GDP)	Foreign direct investment inflows 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.	World Development Indicators (World Bank)	Independent variable
FDI outflows (% of GDP)	Foreign direct investment outflows are the net outflows of investment to acquire a lasting management interest (10 percent or more of	World Development Indicators (World Bank)	Independent variable

	voting stock) in an enterprise operating in an economy other than that of the investor.		
FDI assets (% of GDP)	Stock of foreign direct investment abroad.	International Financial Statistics, IMF	Independent variable
FDI liabilities (% of GDP)	Stock of foreign direct investment in the reporting economy.	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Portfolio equity assets (% of GDP)	Stock of financial claims on nonresidents in portfolio equity securities.	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Portfolio equity liabilities (% of GDP)	Stock of financial liabilities to nonresidents in portfolio equity securities.	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Portfolio debt assets (% of GDP)	Stock of financial claims on nonresidents in portfolio debt securities.	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Portfolio debt liabilities (% of GDP)	Stock of financial liabilities to nonresidents in portfolio debt securities.	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Other investment assets (% of GDP)	Stock of other investment claims on nonresidents (loans, deposits, trade credits etc)	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Other investment liabilities (% of GDP)	Stock of other investment liabilities to nonresidents (loans, deposits, trade credits etc)	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Total foreign assets (% of GDP)	Total financial claims on nonresidents (excluding gold holdings).	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable

Total foreign liabilities (% of GDP)	Total financial liabilities to nonresidents.	The external wealth of nations database (Lane and Milesi-Ferretti)	Independent variable
Gross Domestic Savings (% of GDP)	Total domestic savings as a share of GDP is used as an alternative to total investments (due to multicollinearity problem).	World Development Indicators (World Bank)	Control Variable
Inflation, consumer prices (Annual %)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services	World Development Indicators (World Bank)	Control Variable
Population growth (Annual %)	Population growth (annual %) is the exponential rate of growth of midyear population.	World Development Indicators (World Bank)	Control Variable
Life Expectancy, Total (Years)	Total average life expectancy in years.	World Development Indicators (World Bank)	Control Variable
Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of GDP.	World Development Indicators (World Bank)	Control Variable

4. Preliminary analysis

4.1. Descriptive statistics

The main objective of this thesis is to investigate the relationship between economic growth and international financial integration in Central and Eastern European nations. Therefore, the analysis includes an overall examination of the sample, as well as specific evaluations of the sample by segregating them into developed and developing economies, based on the list of advanced economies given by the International Monetary Fund. Due to data availability constraints, 16 countries were selected for analysis from the CEE countries, including 9 developing economies and 7 advanced economies. To ensure uniformity in the measurement of international financial integration across countries, all international financial integration data are presented in the form of per cent of GDP. Descriptive statistics for the entire sample are presented in Table 2 below.

On average, the rate of economic growth is 2.678 %, ranging from -15.208% to 17.384 %, which implies that the CEE countries included in the research samples have experienced dramatic volatility in economic growth in the timeframe from 2007 to 2021, including the impacts involving the financial crisis and Covid-19. Then, focus on the descriptive statistics of the flow data. With a mean value of 159.074 % of net foreign direct investment inflows as a percentage of GDP, it can be assumed to some extent that foreign direct investment inflows are one of the very important sources of capital for the CEE countries. However, the variance of foreign direct investment as a percentage of GDP is as high as 85.748. The fact that the data for this variable varies from 6% to 297% implies that the net foreign direct investment inflows as a percentage of GDP vary considerably among the different Central and Eastern European countries or that the net foreign direct investment inflows as a percentage of GDP underwent a substantial change during this period. However, in sharp contrast to the net foreign direct investment inflow is the net foreign direct investment outflow, which has a mean value of only 2.53%. Although the variance of net foreign direct investment outflows

as a percentage of GDP is also relatively small, at 13.297, it can be seen to range from -42.28 % to 104.693%, with not only large fluctuations or differences but also negative values for this variable in some years and economies.

For the stock data, foreign direct investment exhibits similar characteristics. The mean value of the foreign direct investment debt to GDP ratio is 78.58% while its variance is 58.227, ranging from 26.333% to 341.629%. Similarly, the ratio of foreign direct investment debt to GDP also shows possible large fluctuations or large variations across economies The mean value of foreign direct investment assets to GDP ratio is 26.315 %. Its variance is similar to that of foreign direct investment assets, which is 57.279, and it fluctuates from 1.142% to 296.859%.

The average levels of portfolio equity liabilities and assets as a ratio of each to GDP are the lowest compared to other measures of international financial integration, and its standard deviation is relatively small. The mean value of the portfolio equity liabilities to GDP ratio is 2.78 %, while its standard deviation is 3.410, ranging from 0.076% to 16.524%. The mean value of portfolio equity assets to GDP is 2.141%, while its standard deviation is 2.417, ranging from 0% to 10.507%.

When considering debt, the average for other investments tends to be higher than that of portfolio debt. Specifically, the mean values for portfolio debt liabilities and other investment liabilities are greater and have larger standard deviations, while the mean values for portfolio debt assets and other investment assets are lower and have smaller standard deviations. The mean value of the ratio of portfolio debt liabilities to GDP is 78.58%, while its standard deviation is 58.227, with a range from 26.333% to 341.629 %. The mean value of the ratio of portfolio debt assets to GDP is 2.534%, while its standard deviation is 3.025, with a range from 0% to 15.817%. The mean value of the ratio of other investment liabilities to GDP is 49.455%, while its standard deviation is 19.712, with a range from 18.382% to 134.218%. The mean value of the ratio of other investment assets to GDP is 16.43% while its standard deviation is 5.868, ranging from 5.67% to 30.859%.

The mean value of the total liabilities to GDP ratio is 144.051% while its standard deviation is 75.211, ranging from 54.153% to 419.756%. The ratio of total

assets to GDP has a mean of 73.033%t and a standard deviation of 63.526, ranging from 24.724% to 363.5739%.

The control variables used in this thesis include the inflation rate, life expectancy at birth, population growth rate, the ratio of gross savings to GDP, and the ratio of all import and export trade to GDP.

The mean value of the inflation rate is 142.233% while its standard deviation is 86.087, ranging from 1% to 297%. The mean value of the life expectancy at birth is 76.047 while its standard deviation is 2.014, ranging from 70.9 to 81.529. The mean value of the population growth rate is -0.388% while its standard deviation is 0.621, ranging from -3.742% to 0.904%. The mean value of t the ratio of gross savings to GDP is 18.625% while its standard deviation is 10.364, ranging from -12.124% to 34.817%. The mean value of the ratio of all import and export trade to GDP. is 117.667% while its standard deviation is 32.016, ranging from 58.473% to 189.804%.

The thesis categorises the samples according to the International Monetary Fund's list of advanced economies into two categories, advanced and developing economies, which are analysed respectively. There are seven advanced economies and nine developing economies. Table 3 below shows the results of descriptive statistics for the developing economies in the samples, while Table 4 shows the results of descriptive statistics for the advanced economies in the samples.

Comparisons can be made to conclude that, over the fifteen-year period covered by this research, the developing economies in the CEE area had slightly higher real GDP per capita growth rates and slightly lower standard deviations than the advanced CEE economies. However, both the minimum and maximum rates of economic growth are higher in the developed economies than in the developing economies in the CEE area. In terms of foreign direct investment flow data, the developing economies have higher mean values, but their net foreign direct investment outflows to GDP ratios have much larger standard deviations and data ranges than those of the advanced economies. Similarly, for foreign direct investment stock data, it is also the developing economies that have higher mean values and standard deviations than the advanced economies. Furthermore, it is interesting to note that, similarly to foreign direct investment, among

the other stock data on portfolio equity, portfolio debt and other investment, the biggest difference between advanced and developing economies is in the case of assets. The advanced economies in the samples used in this study have higher mean values of portfolio equity assets, portfolio debt assets, and other investment assets compared to the developing economies. For example, in terms of portfolio debt assets, the mean value for the advanced economies is 18.895%, while the mean value for the developing economies is only 2.534%.

Table 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Growth	240	2.678	4.293	-15.208	17.384
FDI inflows	240	146.438	87.119	1	297
FDI outflows	240	2.209	10.12	-42.286	104.693
FDI liabilities	240	70.616	46.626	23.683	341.629
FDI assets	240	22.895	43.692	1.142	296.859
Portfolio equity liabilities	240	2.567	2.819	.076	16.524
Portfolio equity assets	240	4.557	4.576	0	24.387
Portfolio debt liabilities	240	16.663	12.366	.598	57.882
Portfolio debt assets	240	9.692	12.139	0	52.617
Other investments liabilities	240	54.155	23.821	18.382	155.157
Other investments assets	240	23.935	14.061	5.67	67.036
Total liabilities	240	144.727	59.273	54.153	419.756
Total assets	240	82.77	52.899	24.724	363.573
Population	240	142.233	86.087	1	297
Life	240	76.047	2.014	70.9	81.529
Inflation	240	-.388	.621	-3.742	.904
Savings	240	18.625	10.364	-12.124	34.817
Trade	240	117.667	32.016	58.473	189.804

Table 3 Descriptive Statistics: Developing economies

	N	Mean	SD	Min	Max
Growth	135	3.008	3.741	-15.208	12.815
FDI inflows	135	159.074	85.748	6	297
FDI outflows	135	2.53	13.297	-42.286	104.693
FDI liabilities	135	78.58	58.227	26.333	341.629
FDI assets	135	26.315	57.279	1.142	296.859
Portfolio equity liabilities	135	2.78	3.410	.076	16.524
Portfolio equity assets	135	2.141	2.417	0	10.507

Portfolio debt liabilities	135	12.792	10.866	.598	50.89
Portfolio debt assets	135	2.534	3.025	0	15.817
Other investments liabilities	135	49.455	19.712	18.382	134.218
Other investments assets	135	16.43	5.868	5.67	30.859
Total liabilities	135	144.051	75.211	54.153	419.756
Total assets	135	73.033	63.526	24.724	363.573
Population	135	151.163	88.414	4	297
Life	135	75.629	1.539	71.515	79.282
Inflation	135	-.437	0.491	-1.854	.215
Savings	135	13.582	10.598	-12.124	31.245
Trade	135	103.676	27.360	58.473	168.395

Table 4 Descriptive Statistics: Advanced economies

	N	Mean	SD	Min	Max
Growth	105	2.253	4.899	-14.464	17.384
FDI inflows	105	130.19	86.571	1	295
FDI outflows	105	1.797	2.684	-5.907	17.667
FDI liabilities	105	60.377	20.966	23.683	123.956
FDI assets	105	18.498	11.185	5.38	61.658
Portfolio equity liabilities	105	2.293	1.773	.318	10.879
Portfolio equity assets	105	7.664	4.825	.821	24.387
Portfolio debt liabilities	105	21.64	12.442	3.556	57.882
Portfolio debt assets	105	18.895	13.221	3.488	52.617
Other investments liabilities	105	60.197	27.162	23.124	155.157
Other investments assets	105	33.585	15.584	10.014	67.036
Total liabilities	105	145.596	27.997	90.085	211.705
Total assets	105	95.289	30.820	40.088	180.583
Population	105	130.752	81.991	1	283
Life	105	76.586	2.398	70.9	81.529
Inflation	105	-.325	0.754	-3.742	.904
Savings	105	25.108	5.166	10.897	34.817
Trade	105	135.655	28.467	70.13	189.804

4.2. Provisional visual analysis

In this thesis, the data related to the dependent and independent variables are presented in Figures 1 to 13. The time series are grouped by country for clarity. Figure

1 illustrates the evolution of economic growth in each country, and it can be seen that over the time period covered by this study, economic growth has fluctuated in each country, with negative GDP per capita growth rates falling below zero, mainly as a result of the financial crisis and Covid-19. Some of the economies' growth was much more negatively affected by the financial crisis than by Covid-19, such as Estonia, while others' growth was much more negatively affected by Covid-19 than by the financial crisis, such as Croatia, and still, others were not very well differentiated in terms of the graphs' negative impact, such as Bulgaria. The existence of such differences may be related to the variability in the degree of international financial integration between countries.

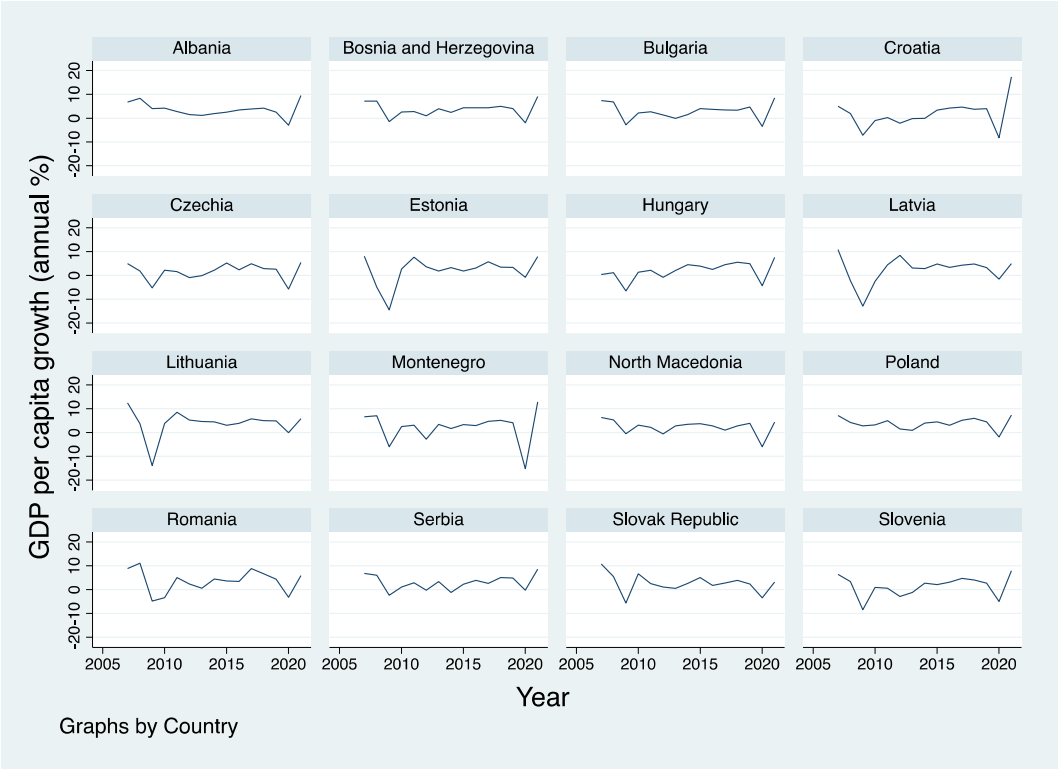

Figure 1 Time series graphs by country: growth

Figures 2 and 3 illustrate the flow data used in this paper over time, grouped by country. In particular, Figure 2 shows the time series of net foreign direct investment inflows to gross domestic product, grouped by country, while Figure 3 shows the time series of net foreign direct investment outflows to gross domestic product grouped by country. Comparing Figure 2 and Figure 3 with the subsequent several figures of the

stock data, it can be easily found that the volatility of the flow data is very drastic, and the ensuing possible errors will affect the estimation results of the model, which is why this thesis prefers to use the stock data more flow data. For most of the samples selected for this thesis, the net foreign direct investment inflows to gross domestic product ratio has fluctuated dramatically over the fifteen years covered by the study. However, the ratio of net foreign direct investment outflows to gross domestic product is quite different, with most economies showing small fluctuations of around 0 per cent and slow growth, except for Hungary, where the ratio of net foreign direct investment outflows to gross domestic product is significantly higher than the others and fluctuates sharply.

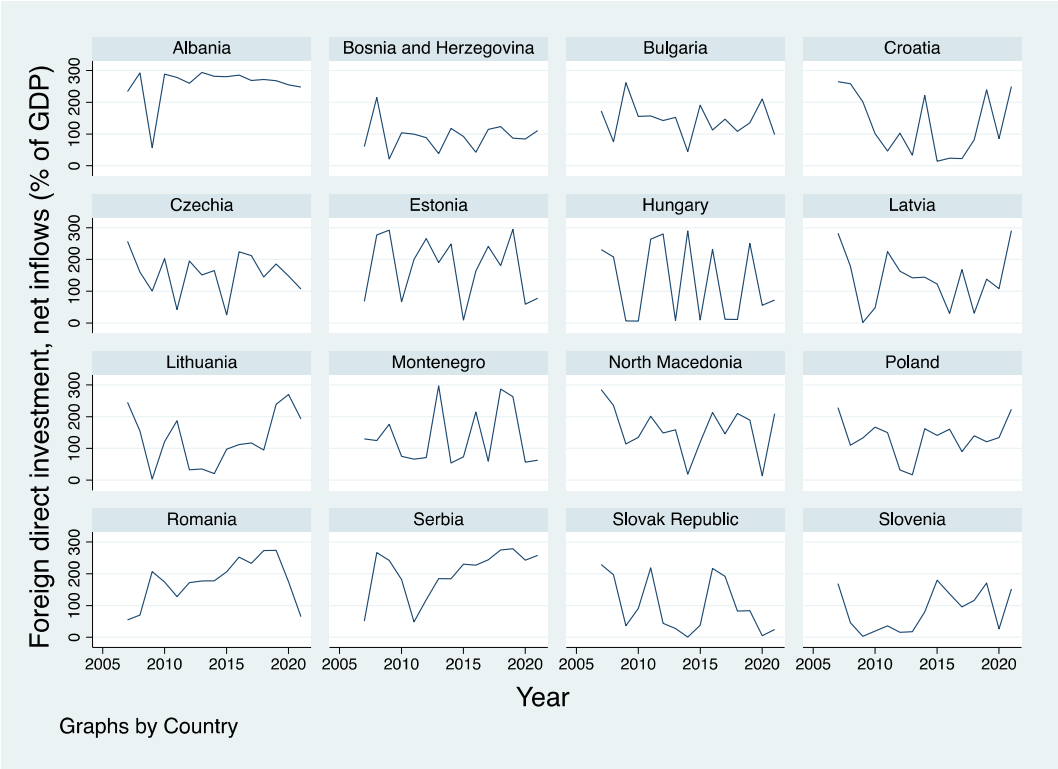

Figure 2 Time series graphs by country: Net foreign direct investment inflows (%GDP)

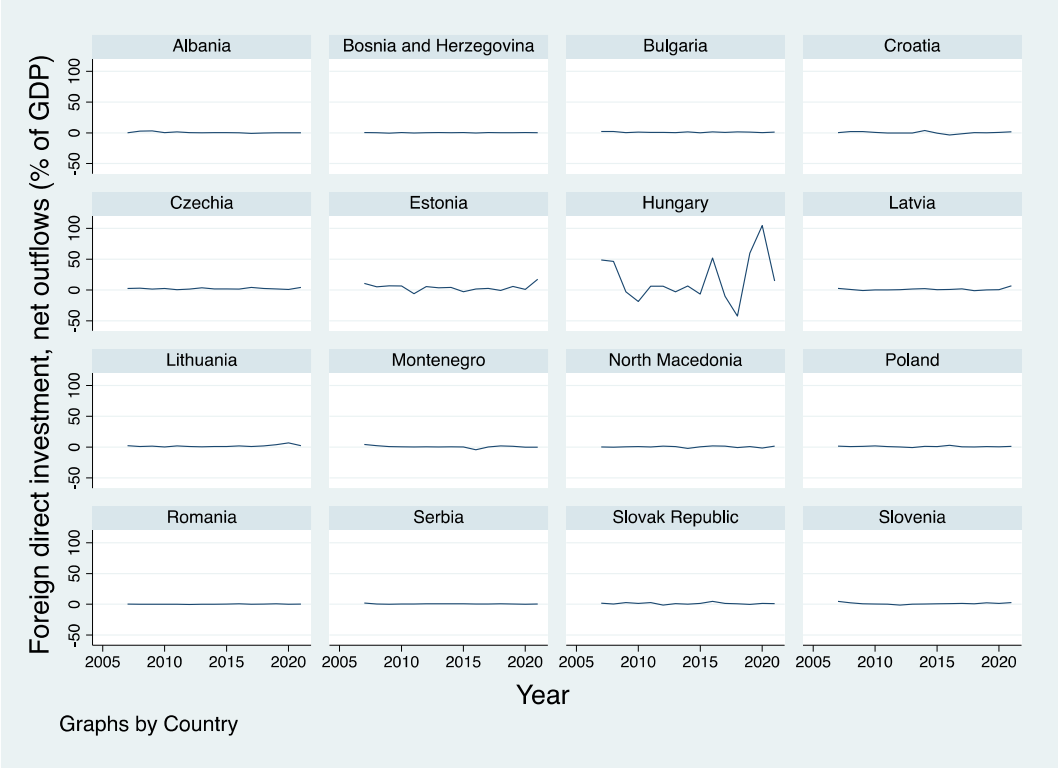

Figure 3 Time series graphs by country: Net foreign direct investment outflows (%GDP)

Figures 4 and 5 present the stock data related to foreign direct investment, and when compared with the previous data on the flow data related to foreign direct investment, it can be observed that the stock data fluctuate more gently and mainly show a slowly increasing trend. Similarly, Hungary's trend is different from that of other economies, and furthermore, from the comparison of the trend in the graph with that of economic growth, it can be surmised that the change in the ratio of foreign direct investment stock data to economic growth in that economy may be caused mainly by changes in economic growth rather than by changes in the stock of foreign direct investment liabilities and assets.

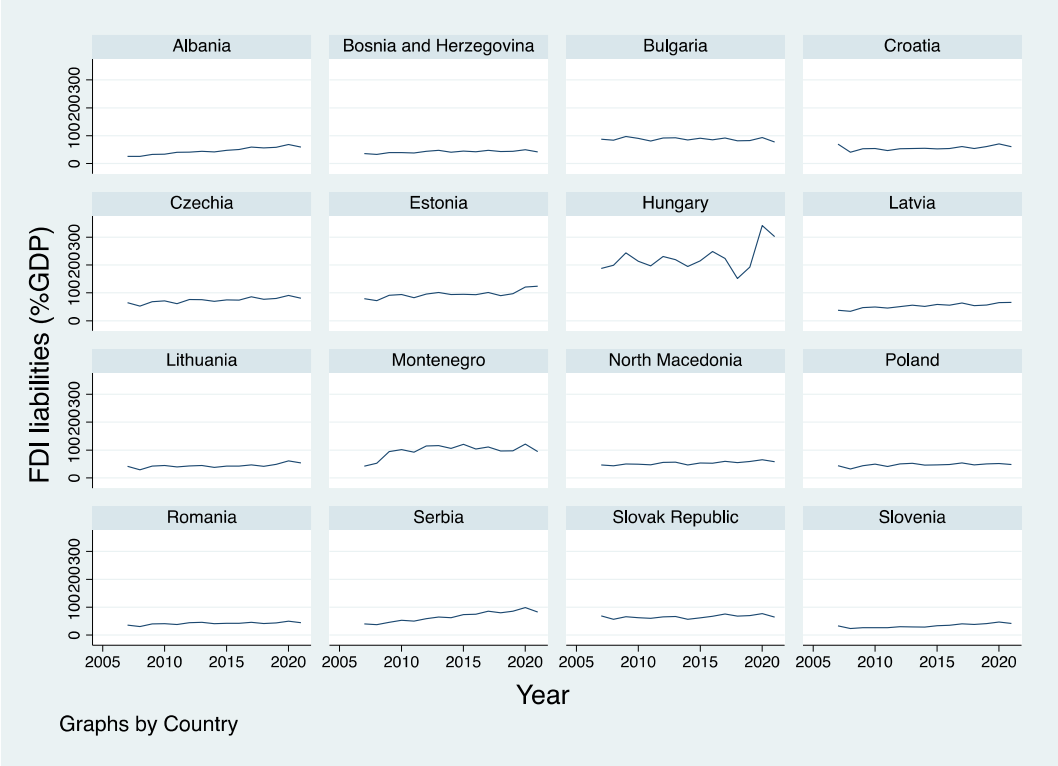

Figure 4 Time series graphs by country: Foreign direct investment liabilities

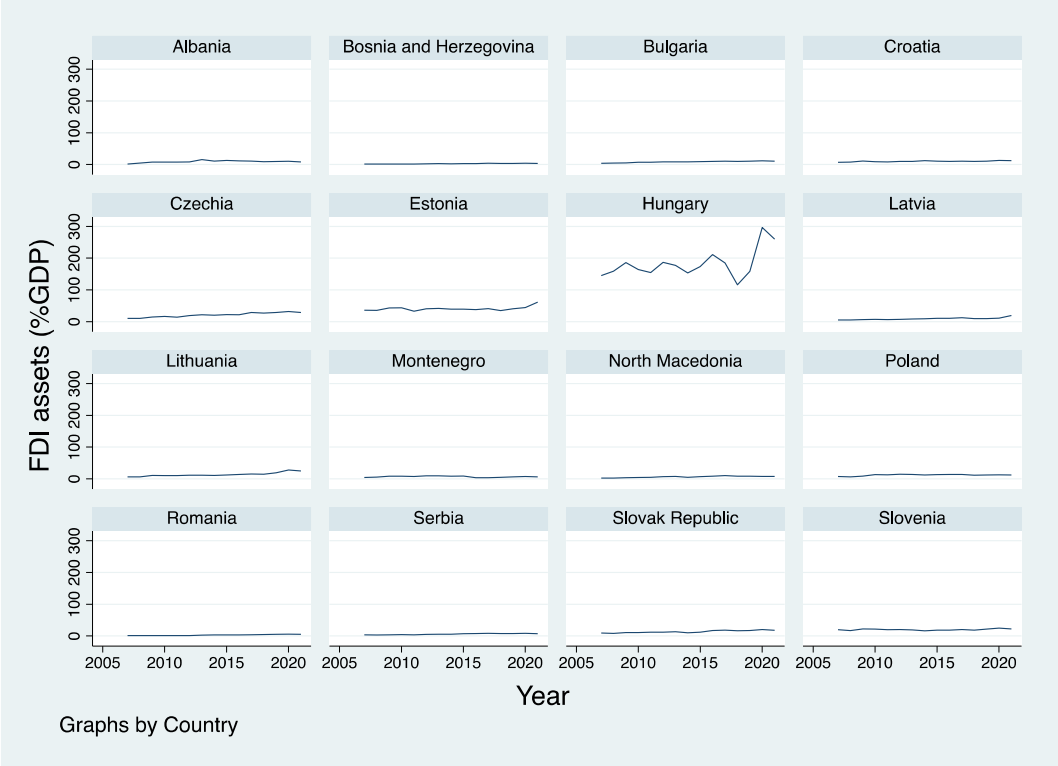

Figure 5 Time series graphs by country: Foreign direct investment assets

Figures 6 and 7 present time-series graphs of portfolio-equity-related stock data. In particular, Figure 6 illustrates time-series graphs of the ratio of portfolio equity liabilities to gross domestic product, and Figure 7 illustrates time-series graphs of the ratio of portfolio equity assets to gross domestic product. For most of the economies considered in this study, portfolio equity liabilities have not changed significantly over this 15-year period. However, as can be seen in Figure 6, there were more intense fluctuations in this indicator in Estonia, Hungary and Poland. However, the trends in the ratio of portfolio equity assets to GDP are not similar. A part of the economies, such as Albania, Bosnia and Herzegovina, Poland, Romania, and Serbia, did not produce significant trends in this indicator during the time frame covered by this study. Meanwhile, other economies have shown an increase in the indicator.

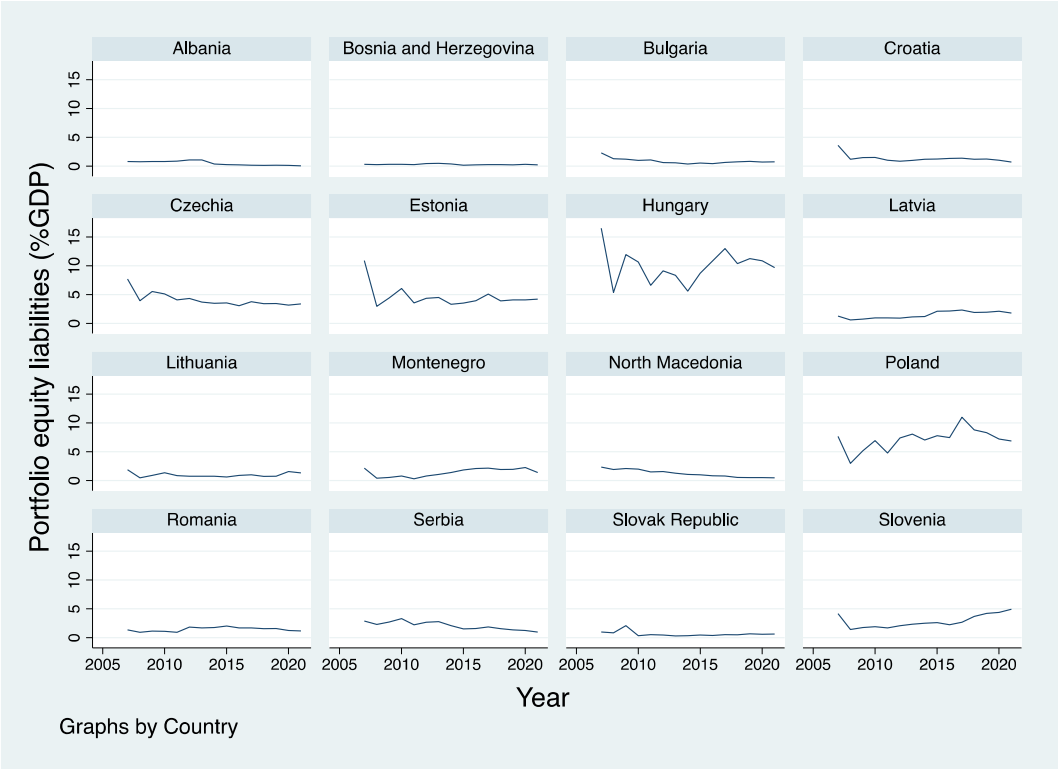

Figure 6 Time series graphs by country: Portfolio equity liabilities (%GDP)

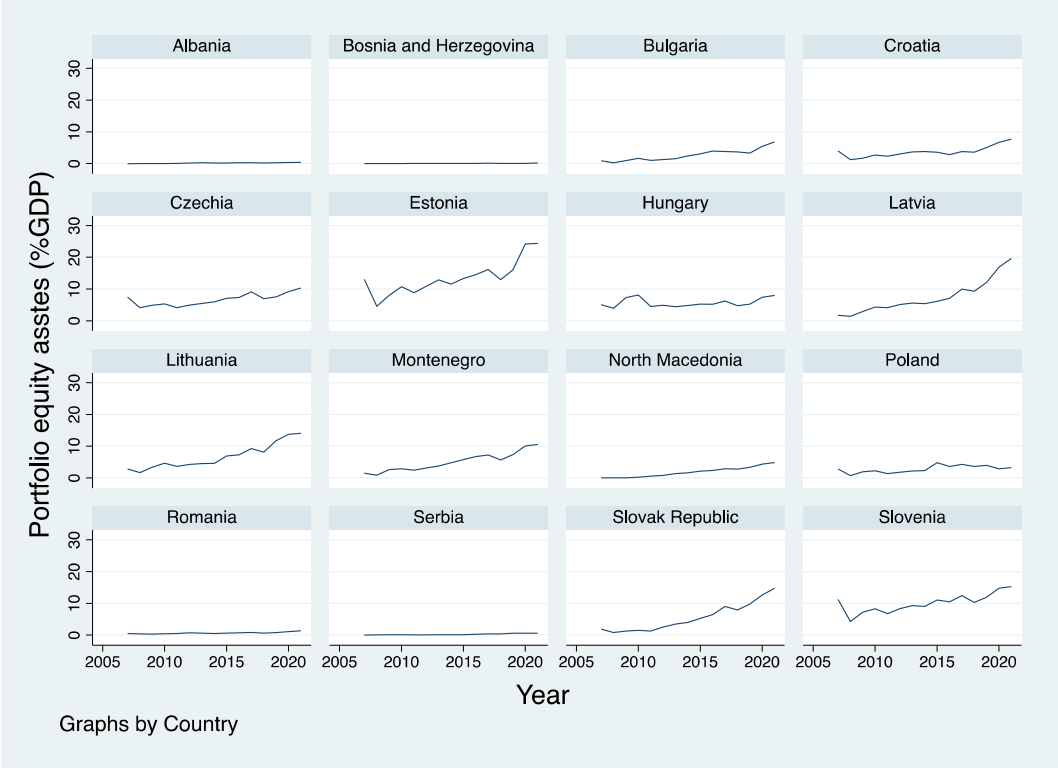

Figure 7 Time series graphs by country: Portfolio equity assets (%GDP)

Figures 8 and 9 illustrate time series graphs of stock data related to portfolio debt. Of these, Figure 8 illustrates the time series graphs of the ratio of portfolio debt liabilities to gross domestic product and Figure 9 illustrates the time series graphs of the ratio of portfolio liabilities assets to gross domestic product. Figure 8 shows that the ratio of portfolio debt liabilities to gross domestic product for most of the economies covered in this case has shown a fluctuating upward trend over the period covered by the study, with the exception of some economies, such as Bosnia and Herzegovina, which do not have a clear trend of change. However, the trend in the ratio of portfolio debt assets to gross domestic product exhibited in Figure 9 does not, with only a few economies, such as Lithuania, maintaining a fluctuating upward trend, and the rest of the economies having this indicator mostly located near 0% with slight fluctuations.

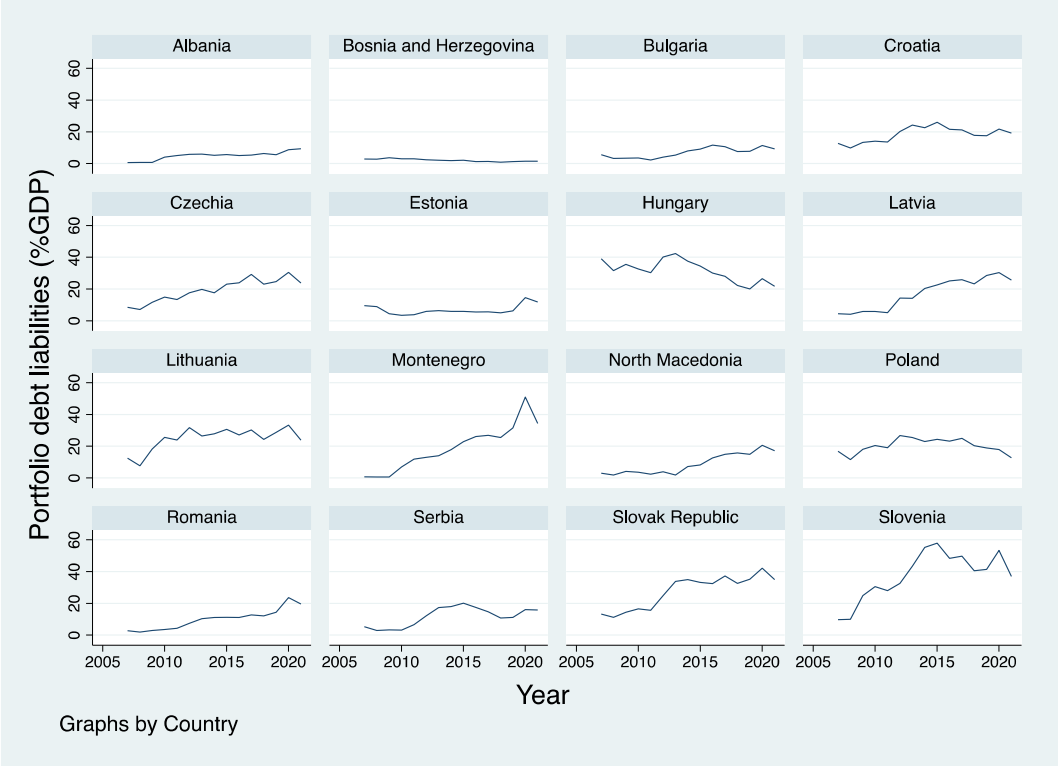

Figure 8 Time series graphs by country: Portfolio debt liabilities (%GDP)

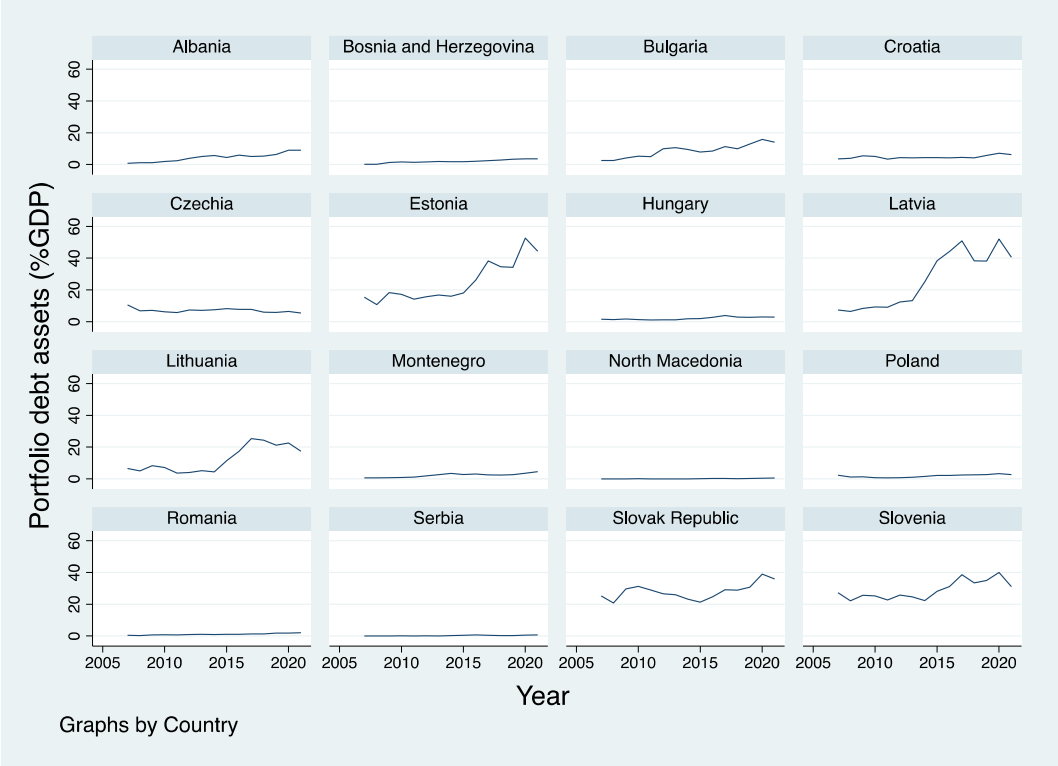

Figure 9 Time series graphs by country: Portfolio debt assets (%GDP)

Figures 10 and 11 present time series graphs of stock data for other investments. These include Figure 10, which shows time series graphs of the ratio of other investment debt to gross domestic product, and Figure 11, which shows time series graphs of the ratio of other investment assets to gross domestic product. According to Figure 10, the ratio of other investments liabilities to gross domestic product does not appear to show a clear pattern of variation. Some economies maintain a more stable state of slight fluctuation, such as Poland. Some economies show a volatile downward trend, such as Hungary. Some economies have fluctuating growth trends, such as Montenegro. According to Figure 11, the time series graphs of the ratio of other investments to gross domestic product can be broadly divided into two groups, one with fluctuations but no clear increasing or decreasing trend, as in the case of Poland, and the other with a fluctuating upward trend, as in the case of Montenegro.

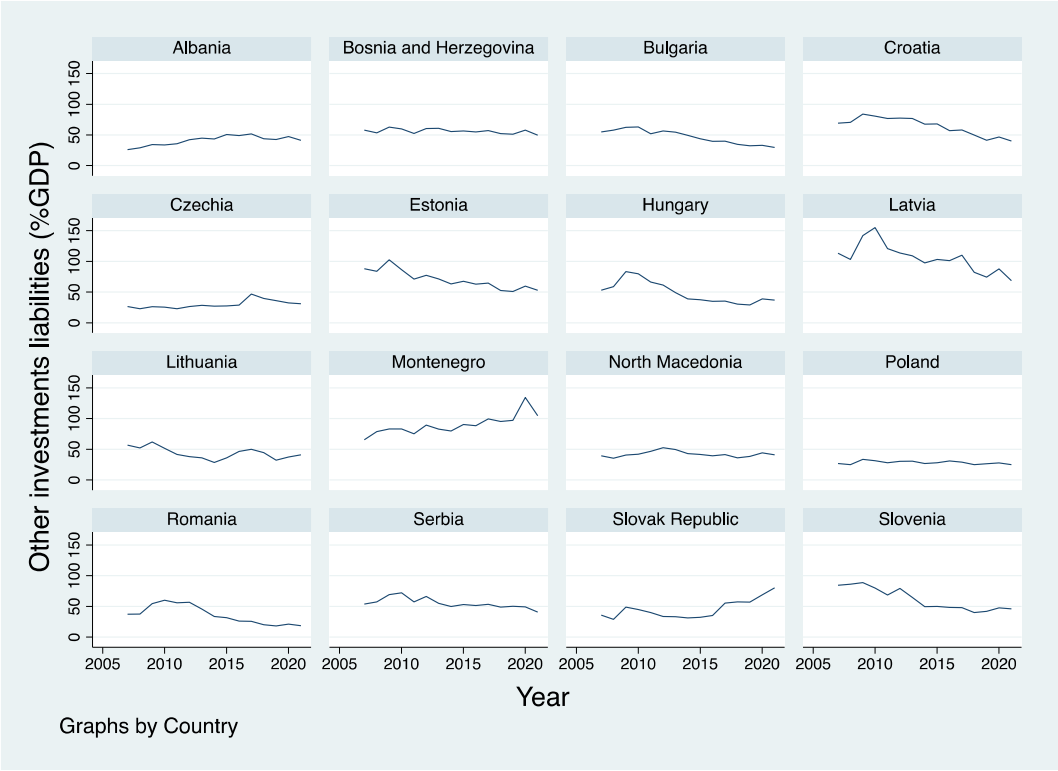

Figure 10 Time series graphs by country: Other investments liabilities (%GDP)

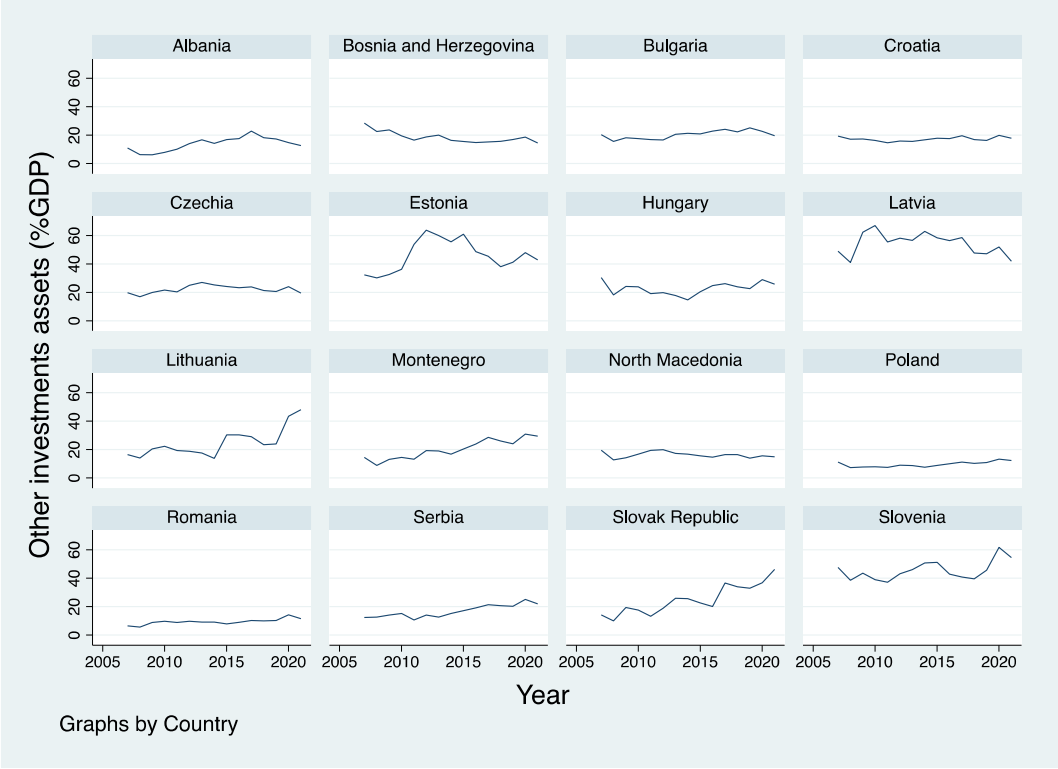

Figure 11 Time series graphs by country: Other investments assets (%GDP)

Figures 12 and 13 present time-series graphs of the total stock data. In particular, figure 12 shows time series graphs of the ratio of total financial liabilities to non-residents to gross domestic product and figure 13 shows time series graphs of the ratio of total financial claims on non-residents (excluding gold holdings) to gross domestic product. The time-series graphs of total liabilities or assets show somewhat flatter fluctuations than most of the other disaggregated measures of international financial integration mentioned above. Similarly, for most of the economies studied here, the ratio of total financial claims on non-residents (excluding gold holdings) to GDP has shown a slow growth over the period, while Hungary has shown large fluctuations in this indicator and is higher than the other economies.

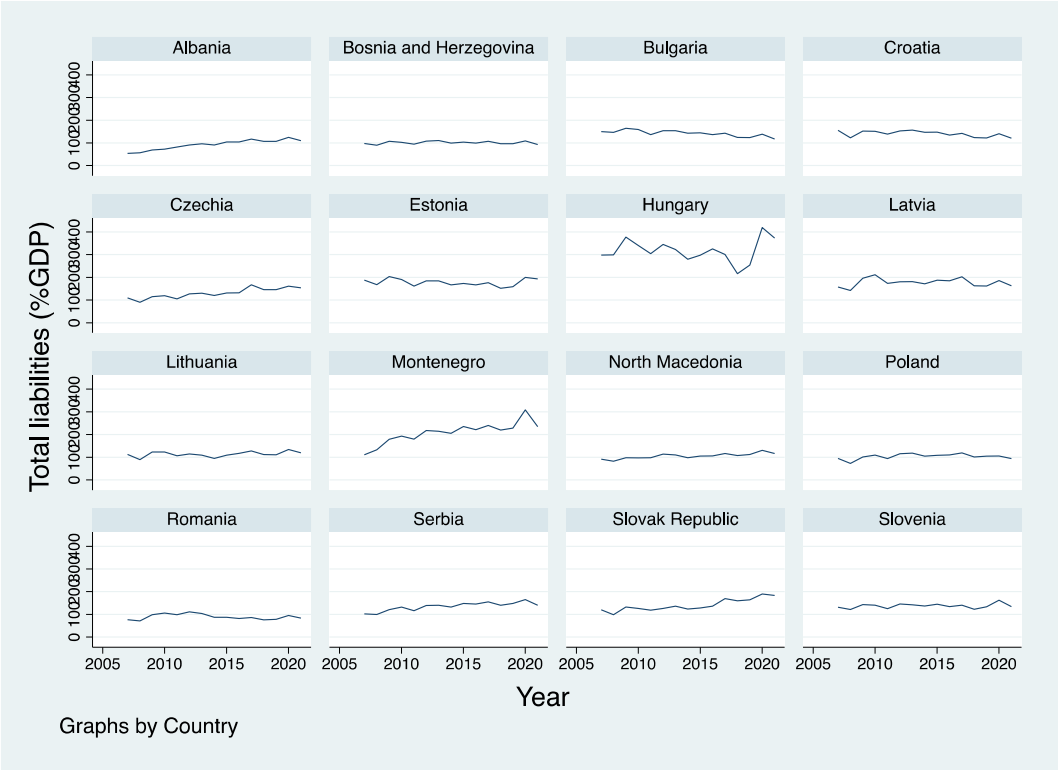

Figure 12 Time series graphs by country: Total liabilities (%GDP)

Figures 14 and 15 are used to analyse the potential heteroskedasticity of the data. Figure 14 displays the economic growth rates of the 16 economies studied in this thesis during the analysed period, as well as the average growth rates for the entire period. It is possible that there is cross-sectional heteroskedasticity in the panel data due to the variations in average economic growth rates. Figure 15 displays the economic growth rates for the economies studied over a 15-year time frame covered in this thesis, along with the average growth rate for all economies in each year. Differences in average economic growth rates across years suggest that time-series heteroskedasticity may be present in the panel data. Subsequent testing will determine the presence of heteroskedasticity.

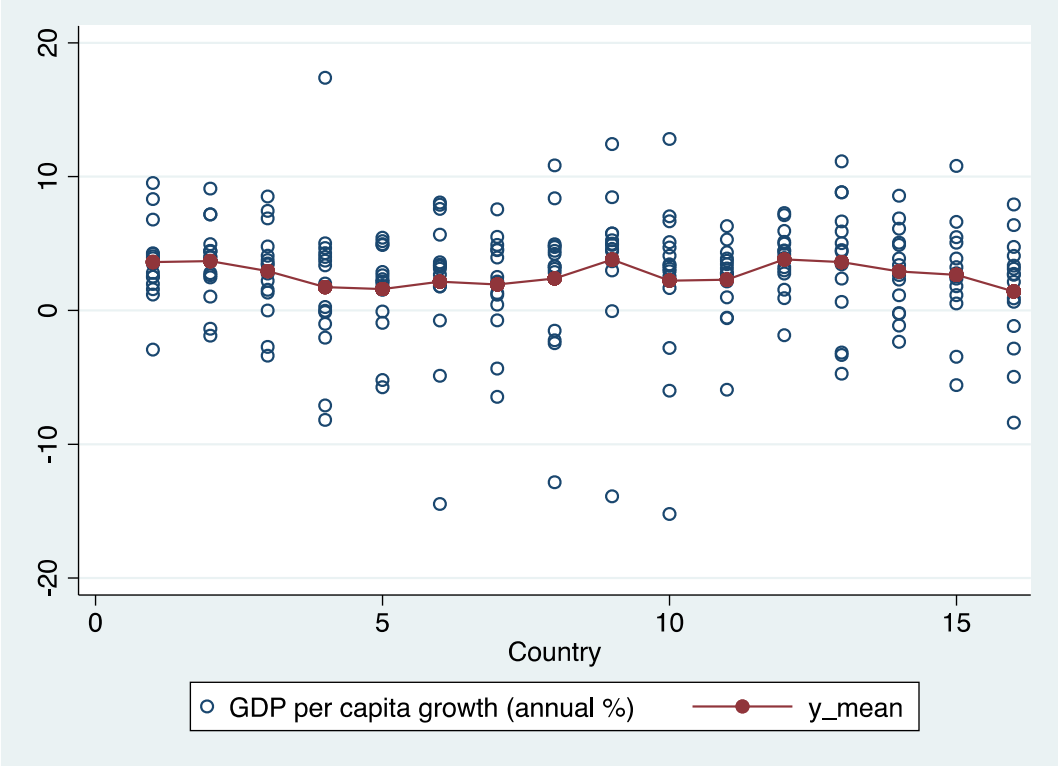

Figure 14 Visual analysis over cross-section units: Growth

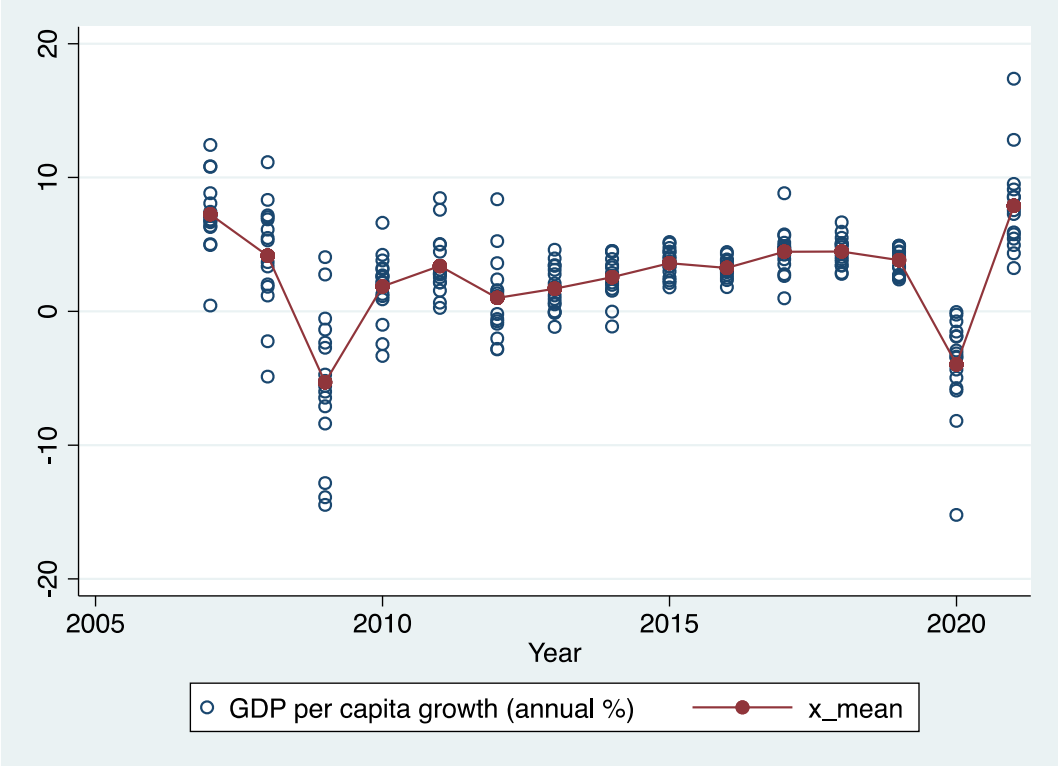

Figure 15 Visual analysis over time series: Growth

4.3. Provisional testing

A number of non-stationary economic time series often indicate a common trend of change and there is not necessarily a direct correlation between the series themselves, at which point a regression of these data, albeit with a high R-squared, results in nothing of practical significance. This situation is known as spurious regression. In other words, the non-stationarity of the panel data may lead to spurious regression. Therefore, performing a unit root test before estimating the panel data is extremely necessary and critical. Unit root tests for the stationarity of each panel series can ensure that the data involved in the regression are either stationary or cointegrated of the same order, thus reducing the possibility of spurious regression lines and enhancing the credibility and validity of the regression results.

In this thesis, the Im-Pesaran-Shin unit root test is chosen. The Im-Pesaran-Shin test was proposed by Im et al. (2003) to address the limitations of some of the other unit root tests. The Levin-Lin-chu test was proposed by Levin et al. (2002) improved it by proposing the Levin-Lin-Chu test which further allows the random error term to have different forms of serial correlation. However, the limitation of the Levin-Lin-Chu test is that it assumes that the regression coefficients of the first-order lagged terms of each panel series are the same under the null and alternative hypotheses, i.e., that all the panel time series contain a unit root, or all the series are smooth. The LLC test is used to test for the convergence of economic growth in each country, rejecting the null hypothesis implies that each country's economic growth converges at the same rate, which is not practical. However, the Im-Pesaran-Shin test relaxes the assumption that the regression coefficients of the first-order lagged terms of each panel series are the same, making it applicable to panel data where heteroskedasticity exists. And the previous visual analysis of heteroskedasticity for the panel data used in this paper found that the panel data used in this paper may indeed have heteroskedasticity. Therefore, in this thesis, the Im-Pesaran-Shin unit root test is adopted to test the smoothness of each series of the panel.

When conducting the Im-Pesaran-Shin test on panel data, the null hypothesis is that a unit root exists, and the alternative hypothesis is that some panels are stationary. When the p-value of the statistic is below 0.05, it indicates that the null hypothesis should be rejected. This suggests that there is no unit root in the panel data at a 95% confidence level and the panel data can be considered stationary.

The results of the Im-Pesaran-Shin unit root tests are shown in Table 5. Based on the table, all the variables used in this research have a p-value less than 0.05. This means that the null hypothesis of a unit root in the panel is rejected with 95% confidence. Therefore, it can be concluded that the panel used in this paper is stationary. In the upcoming regression analyses, there is no requirement for additional adjustments like first-order differencing of the panel data. Moreover, the economic significance of the variables remains unchanged.

Table 5 Im–Pesaran–Shin unit-root test

		Number of panels = 16 Number of periods = 15
AR parameter: Panel-specific	Asymptotics: T,N -> Infinity sequentially	
Panel means: Included	Cross-sectional means removed	
Time trend: Included	ADF regressions: No lags included	
Variables	Statistic	P-value
Growth	-6.0980	0.0000
FDI inflows	-6.3759	0.0000
FDI outflows	-5.7385	0.0000
FDI liabilities	-3.7316	0.0001
FDI assets	-2.9999	0.0014
Portfolio equity liabilities	-7.1222	0.0000
Portfolio equity assets	-3.5123	0.0002
Portfolio debt liabilities	-2.4961	0.0063
Portfolio debt assets	-3.8901	0.0001
Other investments liabilities	-2.3221	0.0101
Other investments assets	-2.2269	0.0130
Total liabilities	-3.0928	0.0010
Total assets	-2.7402	0.0031
Population	-3.4195	0.0003
Life	-2.6572	0.0039
Inflation	-6.5533	0.0000
Savings	-3.0089	0.0013

Trade	-1.9302	0.0268

4.4. Correlation matrix

Table 6 presents the correlation matrix of the regressors. The results indicate that countries with higher net foreign direct investment inflows to gross domestic product ratios have higher per capita gross domestic product growth rates. However, this is not the case for the other international financial integration measures categories. Net foreign direct investment outflows, foreign direct investment liabilities, foreign direct investment assets, portfolio equity liabilities, portfolio equity assets, portfolio debt liabilities, portfolio debt assets, other investments liabilities, other investments assets, and more generally total liabilities and total assets are all negatively correlated with per capita gross domestic product growth. However, the correlation between net foreign direct investment outflows, foreign direct investment assets, portfolio equity liabilities, portfolio equity assets and portfolio debt assets do not exhibit a statistically significant correlation with economic growth.

To further understand the correlation between the regression variables, the sample was grouped into developed and developing economies (according to IMF criteria) and their correlation matrices are analysed separately. Table 7 presents the correlation matrix of each variable for the developing economies in the sample. As can be seen from Table 7, the correlation of the regression variables with economic growth is similar to that of the overall sample. Net foreign direct investment outflows, foreign direct investment liabilities, foreign direct investment assets, portfolio equity liabilities, portfolio equity assets, portfolio debt liabilities, portfolio debt assets, other investment liabilities, other investment assets, and, more generally, total liabilities and total assets, were negatively correlated with growth in per capita gross domestic product. In particular, the correlations between net foreign direct investment outflows, foreign direct investment assets, portfolio equity liabilities, portfolio equity assets and portfolio debt assets are not statistically significant correlations with economic growth.

Nevertheless, although net foreign direct investment inflows are positively correlated with economic growth as in the entire sample, no statistical significance is demonstrated.

Table 8 presents the correlation matrix for each regression variable for developed economies, foreign direct investment assets, portfolio equity liabilities, portfolio equity assets, portfolio debt liabilities, portfolio debt assets, other investment liabilities, and growth are negatively correlated with growth, and the correlation between net outflows of foreign direct investment, foreign direct investment assets, portfolio equity liabilities, portfolio equity assets, and portfolio debt assets, and growth is not statistically significant. The correlation between net foreign direct investment outflows, foreign direct investment assets, portfolio equity liabilities, portfolio equity assets and portfolio debt assets and growth are statistically insignificant. However, unlike in developing economies, the ratio of net foreign direct investment inflows to gross domestic product is significantly positively correlated with economic growth at the 99% confidence level. Therefore, it can be surmised that there may be differences in institutions or levels of financial development between advanced and developing economies, which may further lead to differences in the impact of international financial integration on economic growth.

Table 6: Correlation matrix of regression variables

	Growth	**FDI inflows**	FDI outflows	FDI liabilities	FDI assets	Portfolio equity liabilities	Portfolio equity assets	Portfolio debt liabilities	**Portfolio debt assets**
Growth	1								
FDI inflows	0.185***	1							
FDI outflows	-0.0650	0.132**	1						
FDI liabilities	-0.113*	-0.0230	0.464***	1					
FDI assets	-0.0800	-0.0650	0.516***	0.906***	1				
Portfolio equity liabilities	-0.0230	-0.0510	0.334***	0.609***	0.707***	1			
Portfolio equity assets	-0.0330	-0.143**	0.109*	0.233***	0.244***	0.265***	1		
Portfolio debt liabilities	-0.125*	-0.254***	0.101	0.258***	0.336***	0.310***	0.508***	1	
Portfolio debt assets	-0.0370	-0.158**	-0.00700	-0.0800	-0.0280	-0.0630	0.743***	0.393***	1
Other investments liabilities	-0.267***	-0.138**	-0.0570	0.0490	-0.0490	-0.155**	0.201***	-0.0180	0.210***
Other investments assets	-0.111*	-0.127**	0.0480	0.0660	0.106	0.0420	0.700***	0.305***	0.702***
Total liabilities	-0.226***	-0.132**	0.382***	0.897***	0.806***	0.539***	0.390***	0.429***	0.104
Total assets	-0.115*	-0.118*	0.445***	0.817***	0.888***	0.608***	0.568***	0.452***	0.328***

*** p<0.01, ** p<0.05, * p<0.1

Note: This table reports the correlations between the main regression variables. The sample consists of 16 countries. Statistics

Table 7: Correlation matrix of regression variables: Developing economies

	Growth	**FDI inflows**	FDI outflows	FDI liabilities	FDI assets	Portfolio equity liabilities	Portfolio equity assets	Portfolio debt liabilities	**Portfolio debt assets**
Growth	1								
FDI inflows	0.0880	1							
FDI outflows	-0.122	0.120	1						
FDI liabilities	-0.212**	-0.148*	0.475***	1					
FDI assets	-0.127	-0.135	0.515***	0.929***	1				
Portfolio equity liabilities	-0.0630	-0.177**	0.338***	0.632***	0.739***	1			
Portfolio equity assets	-0.142	-0.261***	0.212**	0.687***	0.548***	0.530***	1		
Portfolio debt liabilities	-0.213**	-0.113	0.206**	0.654***	0.597***	0.683***	0.775***	1	
Portfolio debt assets	-0.0240	0.0300	-0.00700	0.108	-0.0150	-0.143*	0.234***	-0.0610	1
Other investments liabilities	-0.316***	-0.157*	-0.0710	0.210**	-0.0310	-0.188**	0.315***	0.148*	-0.0690
Other investments assets	-0.183**	-0.0930	0.216**	0.579***	0.392***	0.135	0.520***	0.330***	0.316***
Total liabilities	-0.282***	-0.182**	0.398***	0.962***	0.841***	0.594***	0.757***	0.729***	0.0490
Total assets	-0.160*	-0.155*	0.487***	0.949***	0.975***	0.684***	0.617***	0.606***	0.139

*** p<0.01, ** p<0.05, * p<0.1

Note: This table reports the correlations between the main regression variables. The sample consists of 9 developing economie
2007 to 2021.

Table 8: Correlation matrix of regression variables: Advanced economies

	Growth	FDI inflows	FDI outflows	FDI liabilities	FDI assets	Portfolio equity liabilities	Portfolio equity assets	Portfolio debt liabilities	Portfolio debt assets	C in li
Growth	1									
FDI inflows	0.185***	1								
FDI outflows	-0.0650	0.132**	1							
FDI liabilities	-0.113*	-0.0230	0.464***	1						
FDI assets	-0.0800	-0.0650	0.516***	0.906***	1					
Portfolio equity liabilities	-0.0230	-0.0510	0.334***	0.609***	0.707***	1				
Portfolio equity assets	-0.0330	-0.143**	0.109*	0.233***	0.244***	0.265***	1			
Portfolio debt liabilities	-0.125*	-0.254***	0.101	0.258***	0.336***	0.310***	0.508***	1		
Portfolio debt assets	-0.0370	-0.158**	-0.00700	-0.0800	-0.0280	-0.0630	0.743***	0.393***	1	
Other investments liabilities	-0.267***	-0.138**	-0.0570	0.0490	-0.0490	-0.155**	0.201***	-0.0180	0.210***	
Other investments assets	-0.111*	-0.127**	0.0480	0.0660	0.106	0.0420	0.700***	0.305***	0.702***	
Total liabilities	-0.282***	-0.182**	0.398***	0.962***	0.841***	0.594***	0.757***	0.729***	0.0490	
Total assets	-0.160*	-0.155*	0.487***	0.949***	0.975***	0.684***	0.617***	0.606***	0.139	

*** p<0.01, ** p<0.05, * p<0.1

Note: This table reports the correlations between the main regression variables. The sample consists of 7 advanced economies. to 2021.

5. Choice of estimation method and estimation results

5.1. Choice of estimation method

In order to get more accurate estimation results, it is necessary to perform some tests on the data and compare the results of different estimation methods in order to select a more suitable estimation method. First, a comparison is made between pooled and fixed effects models. When analysing data, it's possible that there are underlying variables that differ from person to person but remain the same over time. These are called fixed effects. To determine which model is better for estimating results - fixed effects or pooled - we need to compare and test the regression results of both. Table 9 displays the pooled model estimation results for the sample, while Table 10 shows the fixed model estimation results. Table 11 presents the Chow F-test results for the sample. In this test, the null hypothesis states that there is no significant difference between the starting points of various entities. The alternative hypothesis, however, proposes that there is a significant difference between the starting points of different individuals. If we reject the null hypothesis, it indicates that the overall model is unsuitable and that the sample may have distinct fixed effects.

The Chow F-tests are performed on flow, stock, and aggregate data, and the results are presented in Table 11. The tests revealed that the p-value for each test is 0.000, indicating that the null hypothesis cannot be accepted. This means that there is a significant difference in the intercept terms of different entities. As a result, the pooled model is not the best estimation method, and further analysis is needed to determine if the fixed effects model is a more appropriate estimation method.

Table 9 Results of pooled regression

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	FDI flow	FDI stock	Portfolio equity	Portfolio debt	Other investment	Total
FDI inflow	0.012***					

	(0.003)					
FDI outflow	-0.055**					
	(0.026)					
Population	-2.235***	-1.970***	-2.099***	-2.116***	-2.100***	-1.861***
	(0.487)	(0.510)	(0.510)	(0.495)	(0.488)	(0.515)
Savings	-0.011	-0.002	0.009	0.013	-0.051	-0.015
	(0.032)	(0.034)	(0.035)	(0.033)	(0.034)	(0.036)
Trade	0.033***	0.032***	0.028**	0.037***	0.023**	0.042***
	(0.011)	(0.011)	(0.012)	(0.012)	(0.011)	(0.011)
Life	0.185	0.120	0.241	0.308*	0.030	0.042
	(0.151)	(0.163)	(0.159)	(0.160)	(0.158)	(0.161)
Inflation	0.008**	0.010***	0.009***	0.008**	0.008***	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
FDI liabilities		-0.014				
		(0.015)				
FDI assets		-0.004				
		(0.016)				
Portfolio equity liabilities			-0.015			
			(0.109)			
Portfolio equity assets			-0.098			
			(0.078)			
Portfolio debt liabilities				-0.065**		
				(0.027)		
Portfolio debt assets				-0.028		
				(0.027)		
Other investment liabilities					-0.069***	
					(0.017)	
Other investment assets					0.030	
					(0.032)	
Total liabilities						-0.026***
						(0.010)
Total assets						0.003
						(0.012)
Constant	-18.579	-11.284	-20.764*	-25.851**	-0.353	-3.718
	(11.782)	(12.966)	(12.529)	(12.512)	(12.681)	(12.934)

Observations	240	240	240	240	240	240
Number of country	16	16	16	16	16	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 Results of fixed effect regression

VARIABLES	(1) FDI flow	(2) FDI stock	(3) Portfolio equity	(4) Portfolio debt	(5) Other investment	(6) Total
FDI inflow	0.007**					
	(0.003)					
FDI outflow	-0.031					
	(0.026)					
Population	-1.813***	-1.953***	-1.812***	-2.446***	-1.907***	-2.206***
	(0.674)	(0.659)	(0.678)	(0.671)	(0.637)	(0.614)
Savings	0.174**	0.289***	0.193**	0.207***	0.175**	0.251***
	(0.077)	(0.078)	(0.078)	(0.074)	(0.072)	(0.071)
Trade	0.163***	0.154***	0.172***	0.189***	0.130***	0.128***
	(0.026)	(0.025)	(0.026)	(0.025)	(0.026)	(0.024)
Life	-0.828***	-0.556*	-0.787**	-0.844***	-0.989***	-0.715**
	(0.301)	(0.303)	(0.315)	(0.310)	(0.293)	(0.282)
Inflation	0.006*	0.006*	0.007**	0.002	0.007**	0.005
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
FDI liabilities		-0.103***				
		(0.030)				
FDI assets		0.069*				
		(0.037)				
Portfolio equity liabilities			0.389*			
			(0.223)			
Portfolio equity assets			-0.030			
			(0.099)			
Portfolio debt liabilities				-0.169***		
				(0.038)		
Portfolio debt assets				0.131***		
				(0.045)		

Other investment liabilities					-0.105***	
					(0.022)	
Other investment assets					-0.024	
					(0.044)	
Total liabilities						-0.094***
						(0.014)
Total assets						0.043**
						(0.017)
Constant	40.656*	25.502	36.090	41.123*	63.785***	45.815**
	(21.884)	(21.761)	(23.169)	(22.557)	(21.755)	(20.575)
Observations	240	240	240	240	240	240
R-squared	0.327	0.358	0.321	0.376	0.397	0.444
Number of country	16	16	16	16	16	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11 Results of Chow F-test

Independent variables	F statistics	Prob > F
FDI flow	4.25	0.0000
FDI stock	5.93	0.0000
Portfolio equity	5.25	0.0000
Portfolio debt	6.49	0.0000
Other investment	5.52	0.0000
Total	7.51	0.0000

To determine which regression model is most suitable for this paper, we compared the random effects model and the pooled model using the Breusch and Pagan Lagrangian multiplier test. This test examines whether there is a significant difference between the entities being analysed. The null hypothesis is that there is no variance across the entities, while the alternative hypothesis is that there is a significant difference. We analysed the test results to select the most appropriate model for our analysis. If the null hypothesis is accepted, it indicates that using the pooled model is a superior option compared to the random effects model. Conversely, if the null hypothesis is rejected, it implies that the pooled model is not a more suitable alternative to the random effects model.

The results of the random effects model regression can be found in Table 12, while Table 13 displays the outcomes of the Breusch and Pagan Lagrangian multiplier test. According to Table 13, all the tests have p-values of 1, which means that the null hypothesis should be accepted. This indicates that the variance between entities is considered to be zero. As a result, the pooled model is a more suitable method for estimating this panel data than the random effects model.

Table 12 Results of random effect regression

VARIABLES	(1) FDI flow	(2) FDI stock	(3) Portfolio equity	(4) Portfolio debt	(5) Other investment	(6) Total
FDI inflow	0.012***					
	(0.003)					
FDI outflow	-0.055**					
	(0.026)					
Population	-2.235***	-1.970***	-2.099***	-2.116***	-2.100***	-1.861***
	(0.487)	(0.510)	(0.510)	(0.495)	(0.488)	(0.515)
Savings	-0.011	-0.002	0.009	0.013	-0.051	-0.015
	(0.032)	(0.034)	(0.035)	(0.033)	(0.034)	(0.036)
Trade	0.033***	0.032***	0.028**	0.037***	0.023**	0.042***
	(0.011)	(0.011)	(0.012)	(0.012)	(0.011)	(0.011)
Life	0.185	0.120	0.241	0.308*	0.030	0.042
	(0.151)	(0.163)	(0.159)	(0.160)	(0.158)	(0.161)
Inflation	0.008**	0.010***	0.009***	0.008**	0.008***	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
FDI liabilities		-0.014				
		(0.015)				
FDI assets		-0.004				
		(0.016)				
Portfolio equity liabilities			-0.015			
			(0.109)			
Portfolio equity assets			-0.098			
			(0.078)			
Portfolio debt liabilities				-0.065**		
				(0.027)		

Portfolio debt assets				-0.028		
				(0.027)		
Other investment liabilities					-0.069***	
					(0.017)	
Other investment assets					0.030	
					(0.032)	
Total liabilities						-0.026***
						(0.010)
Total assets						0.003
						(0.012)
Constant	-18.579	-11.284	-20.764*	-25.851**	-0.353	-3.718
	(11.782)	(12.966)	(12.529)	(12.512)	(12.681)	(12.934)
Observations	240	240	240	240	240	240
Number of country	16	16	16	16	16	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13 Breusch and Pagan Lagrangian multiplier test for random effects

Independent variables	chibar2(01)	Prob > chibar2
FDI flow	0.00	1.0000
FDI stock	0.00	1.0000
Portfolio equity	0.00	1.0000
Portfolio debt	0.00	1.0000
Other investment	0.00	1.0000
Total	0.00	1.0000

Thirdly, in order to further identify the more appropriate model to be used for estimation, a comparison between the random effects model and the fixed effects model is required. Therefore, the Hausman test was conducted to analyse which of the random effects model and the fixed effects model is more appropriate for use in estimating the panel data used in this paper. The null hypothesis of the Hausman test is both the coefficients estimated with fixed effects and those estimated with random effects are consistent, and the coefficients estimated with random effects are the most efficiently estimated. The alternative hypothesis is that estimated coefficients under random

effects are inconsistent, but estimated coefficients for fixed effects remain consistent. Therefore, a comparison is made between the random effects model and the fixed effects model. If the difference between the estimated coefficients of the two is significant, a fixed effects model is required; otherwise, the null hypothesis cannot be rejected, i.e., it should be assumed that both the random effects estimates and the fixed effects estimates are consistent and that the random effects estimates are the most efficient.

Table 14 provides the results of the five Hausman tests after regressions using FDI flow data, FDI stock data, portfolio equity stock data, portfolio debt stock data, other investment stock data and total stock data respectively. According to Table 14, the p-value obtained from the three Hausman tests is 0, which means that the null hypothesis of the Hausman test should be rejected and there is a significant difference exist between the random effect model and the fixed effect model. Therefore, the random effects model is not a more appropriate estimation method than the fixed effects model. Therefore, the fixed effects model is a more suitable choice.

Table 14 Hausman test for random effects

Independent variables	P-value
FDI flow	0.0000
FDI stock	0.0000
Portfolio equity	0.0000
Portfolio debt	0.0000
Other investment	0.0000
Total	0.0000

Based on the comparison of the pooled, random effects and fixed effects models above, it can be concluded that the fixed effects model will be the more appropriate estimation method for the panel used in this paper. Therefore, the regression analysis below will be based on the regression results of the fixed effects model.

However, in addition to this, there are a number of factors that may affect the validity and robustness of the regression results that need to be looked at, including

possible autocorrelation, heteroskedasticity, cross-sectional dependence and endogeneity. Therefore, a series of tests are conducted to confirm the existence of the above issues and optimise the model based on this.

To check for autocorrelation problems, we conducted Wooldridge tests. The null hypothesis is that the regression does not have first-order autocorrelation, while the alternative hypothesis suggests the presence of first-order autocorrelation. For each regression, we conducted Wooldridge tests and displayed the results in Table 15. The p-value for the Wooldridge test result is less than 0.01 for each independent variable, meaning that the null hypothesis can be rejected with 99% confidence, indicating first-order autocorrelation. Therefore, we need to make further adjustments to the regression model to address this issue.

Table 15 Results of Wooldridge test

Independent variables	F(1, 15)	Prob>F
FDI flow	30.305	0.0001
FDI stock	37.606	0.0000
Portfolio equity	26.221	0.0001
Portfolio debt	30.914	0.0001
Other investment	29.068	0.0001
Total	32.314	0.0000

After reviewing the previous visual analysis figure, it seems that there may be an issue with cross-session heteroskedasticity. To confirm this, we carried out a modified Wald test. The null hypothesis of this test is that there is no cross-session heteroskedasticity in the panel, whereas the alternative hypothesis is that there is. The test results are presented in Table 16, where the p-values of the regressions for each group of independent variables are all less than 0.01. This means that we reject the null hypothesis of the test, indicating that there is indeed an issue with the estimate.

Table 16 Results of Modified Wald test

Independent variables	chi2 (16)	Prob>chi2
FDI flow	61.14	0.0000
FDI stock	78.73	0.0000

Portfolio equity	80.86	0.0000
Portfolio debt	60.71	0.0000
Other investment	32.99	0.0074
Total	69.65	0.0000

Similarly, the panels used in this paper may also have heteroskedasticity in the time series, as shown in Figure 15 of the previous visual analysis diagram. Therefore, the problem of heteroskedasticity on the time series should also be addressed.

We conducted the Pesaran tests to check for cross-sectional dependence in the panel. The null hypothesis of the test is that there is no cross-sectional dependence, while the alternative hypothesis is that there is. The results of the tests are presented in Table 17, and all the p-values of the statistics in the table are zero. This indicates a problem of cross-sectional dependence in the regression, and the null hypothesis is rejected. To address this issue, the estimated model need to be modified.

Table 17 Results of Pesaran's test of cross-sectional independence

Independent variables	Pesaran's test of cross-sectional independence	Pr
FDI flow	18.931	0.0000
FDI stock	16.423	0.0000
Portfolio equity	19.295	0.0000
Portfolio debt	18.366	0.0000
Other investment	19.743	0.0000
Total	16.147	0.0000

Endogeneity issues cannot be completely avoidable in panel data analysis. Its possible causes include possible omitted variables or sample select bias. Although some of the possible endogeneity due to omitted variables are addressed in previous regressions by the introduction of entity fixed effects. However, the panel may also have some omitted variables that do not change with individuals but change over time, and Figure 15 also shows that there may be some endogeneity due to macroeconomic factors. Therefore, in addition to individual plot fixed effects, time-fixed effects are further introduced to minimise the impact of endogeneity on the regression results.

To cope with the endogeneity problem, some previous empirical studies on international financial integration chose to include the economic growth rate of the lagged period in the dependent variable to construct a dynamic panel and estimate the panel using generalised method of moments (GMM) to estimate. However, the estimation using the GMM method is more stringent on the panel, in addition to the need to pass the over-identification test and the autocorrelation test, and its rationale also leads to the fact that the method is often applied to short panels, i.e., the number of countries N should be larger than the number of years T. Although the panel in this paper initially meets this condition, the focus of the growth-related problems should be more focused on the developing economies, and therefore, this thesis also estimates the growth rate of the sample of countries according to the developed economies and the developing economies. countries in the sample according to the distinction between developed and developing economies. Therefore, when regressions by groups are performed, the panel no longer satisfies the short panel condition that the GMM method needs to fulfil. In contrast, two-way fixed effects models require more inclusive conditions to be met. Therefore, the two-way fixed effects model is chosen.

In addition, according to Table 15, Table 16 and Table 17 above, the panel exists issues related to autocorrelation, cross-session heteroskedasticity and cross-sectional dependence, which need to be addressed to improve the validity of the estimation. Hoechle (2007) suggests that Driscoll and Kraay standard errors are robust to perturbations in heteroskedasticity, autocorrelation and cross-sectional dependence. Therefore, Driscoll and Kraay standard errors were used to reformulate and re-estimate the model to cope with autocorrelation, group heteroskedasticity and cross-sectional dependence.

5.2. Estimation results

Table 18 shows the results of regressing the total samples using the two-way fixed effects model with Driscoll and Kraay standard errors. The thesis runs separate regressions using size-based de facto measures including foreign direct investment,

portfolio equity, other investment in portfolio debt (including loans, deposits, trade credits, etc.), and total stock data as indicators of the degree of international financial integration, according to a specific categorisation of the relevant measures of international financial integration. According to the first column, the ratio of net foreign direct investment inflows to gross domestic product has a positive impact on the growth rate of gross domestic product per capita at the 90% confidence level, while the ratio of net foreign direct investment outflows to gross domestic product has a negative impact on the growth rate of gross domestic product per capita. This result is consistent with hypotheses H1 and H3 presented in the previous sections of the thesis. However, the regression results for the stock data on foreign direct investment are not as hypothesised as H2 and H4 conjecture. foreign direct investment liabilities are negatively correlated with economic growth, while foreign direct investment capital is positively correlated with economic growth, but the regression coefficients for both indicators are not statistically significant. Similarly, the regression coefficients for portfolio equity do not show statistical significance, although the regression coefficient for portfolio equity liabilities is positive as in hypothesis H5. The regression coefficients for portfolio debt liabilities are statistically significant. In particular, the regression coefficient for portfolio liabilities debt is -0.081, which implies that for every 1% increase in the ratio of portfolio debt liabilities to GDP, the growth rate of real GDP per capita decreases by 0.081%. The regression coefficient for portfolio debt assets is 0.137, which implies that for every 1% increase in the ratio of portfolio debt assets to GDP, the growth rate of real GDP per capita increases by 0.173%. This is consistent with the hypothesis the previous hypotheses that H8 Portfolio debt liabilities have a negative impact on economic growth and H7 Portfolio debt assets have a positive impact on economic growth. For other investment, the regression coefficient for other investment liabilities is statistically significant, while the regression coefficient for other investment assets is statistically insignificant. The regression coefficient for other investment liabilities is -0.093, which means that when the ratio of other investment debt to gross domestic product increases by 1% the growth rate of real gross domestic product per capita decreases by 0.093 %. Hypothesis H10 presented in the previous section suggests that

other investment liabilities, as one of the major components of debt, have a negative impact on economic growth and the regression results fit the hypothesis. The regression coefficients for total financial liabilities to nonresidents and total financial claims on nonresidents (excluding gold holdings) are both significant at the 99 % confidence level. The regression coefficient for total financial liabilities to nonresidents is -0.068, which means that every time the ratio of total financial liabilities to nonresidents to GDP increases by 1%, the growth rate of real GDP per capita decreases by 0.068%. The regression coefficient for total financial claims on nonresidents is 0.063, which implies that the growth rate of real GDP per capita increases by 0.063% for every 1% increase in the ratio of total financial claims to nonresidents to GDP. However, the regression results for total financial liabilities on assets remain the opposite of the hypothesis.

Table 18 Regression results of two-way fixed effects model with Driscoll and Kraay standard errors

VARIABLES	(1) FDI flow	(2) FDI stock	(3) Portfolio equity	(4) Portfolio debt	(5) Other investment	(6) Total
FDI inflow	0.007*					
	(0.003)					
FDI outflow	-0.031*					
	(0.017)					
Population	-1.813**	-1.746**	-1.817***	-2.389***	-1.872***	-1.931***
	(0.713)	(0.590)	(0.562)	(0.406)	(0.503)	(0.444)
Savings	0.174**	0.194**	0.190**	0.198**	0.185**	0.226***
	(0.072)	(0.080)	(0.078)	(0.067)	(0.067)	(0.063)
Trade	0.163**	0.050	0.056	0.068*	0.026	0.036
	(0.056)	(0.034)	(0.035)	(0.034)	(0.034)	(0.029)
Life	-0.828	0.702	0.403	0.234	0.078	0.165
	(0.636)	(0.424)	(0.370)	(0.231)	(0.305)	(0.297)
Inflation	0.006	0.000	-0.000	-0.002	0.001	-0.001
	(0.005)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
FDI liabilities		-0.021				
		(0.017)				
FDI assets		0.019				
		(0.019)				

Portfolio equity liabilities			0.023			
			(0.186)			
Portfolio equity assets			0.150			
			(0.145)			
Portfolio debt liabilities				-0.081**		
				(0.027)		
Portfolio debt assets				0.137*		
				(0.070)		
Other investment liabilities					-0.093***	
					(0.023)	
Other investment assets					0.049	
					(0.036)	
Total liabilities						-0.068***
						(0.015)
Total assets						0.063***
						(0.014)
Constant	40.656	-53.426	-33.255	-21.617	-1.332	-8.962
	(47.182)	(31.915)	(27.720)	(19.310)	(22.061)	(22.382)
R-squared	0.3272	0.6946	0.6967	0.7193	0.7363	0.7374
Observations	240	240	240	240	240	240
Number of groups	16	16	16	16	16	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The topic of this thesis is the relationship between international financial integration and economic growth, with a special focus on developing economies. Therefore, the samples are divided into seven advanced economies and nine developing economies according to the list of advanced economies provided by the International Monetary Fund, and regressions are run on each of these two sets of data.

Table 19 reports the results of the regressions for the subgroup of developed economies. In this case, as in the overall sample, the regression coefficients are positive for net foreign direct investment outflows and negative for net foreign direct investment

outflows. However, unlike the overall sample, the regression coefficients are not statistically significant. And the regression results for the foreign direct investment stock data also differ from the results of the overall sample review. The regression coefficients for both foreign direct investment liabilities and foreign direct investment assets are statistically significant. In particular, the regression coefficient for foreign direct investment liabilities is 0.135, which implies that for every 1% increase in the ratio of foreign direct investment liabilities to GDP, the growth rate of real GDP per capita increases by 0.135%. The regression coefficient for foreign direct investment assets is -0.248, which means that for every 1 per cent increase in the ratio of foreign direct investment assets to GDP, the growth rate of real GDP per capita decreases by 0.248%. Therefore, for the developed economies in the CEE region, the impact of foreign direct investment on economic growth is in line with the analyses of the previous hypotheses, i.e., foreign direct investment liabilities positively affect economic growth and foreign direct investment assets negatively affect economic growth. However, apart from foreign direct investment, the regression coefficients of several international financial integration de facto index namely portfolio equity, portfolio debt, and other investments, do not show statistical significance, and it can be further inferred that probably there is not a significant relationship between portfolio equity, portfolio debt, and other investments and economic growth in the developed economies of Central and Eastern Europe. However, as in the overall sample, the regression coefficients of total financial liabilities to nonresidents and total financial claims on nonresidents are significant in the developed economies and the regression coefficients of total financial liabilities to total financial liabilities to nonresidents and total financial claims on nonresidents are significant, with negative regression coefficients for total financial liabilities to nonresidents and positive regression coefficients for total financial claims on nonresidents.

Table 19 Regression results of two-way fixed effects model with Driscoll and Kraay standard errors: Advanced economies

	(1)	(2)	(3)	(4)	(5)	(6)

VARIABLES	FDI flow	FDI stock	Portfolio equity	Portfolio debt	Other investment	Total
FDI inflow	0.003					
	(0.002)					
FDI outflow	-0.082					
	(0.138)					
Population	-1.695	-1.342	-1.906	-2.197**	-1.756	-1.638
	(1.273)	(1.406)	(1.276)	(0.949)	(1.033)	(1.015)
Savings	0.583***	0.653***	0.592***	0.571***	0.425***	0.281***
	(0.073)	(0.093)	(0.100)	(0.075)	(0.048)	(0.076)
Trade	0.024	0.013	0.026	0.054	0.035	0.059
	(0.035)	(0.036)	(0.038)	(0.043)	(0.040)	(0.041)
Life	0.123	-0.638	0.139	-0.501	-0.137	-0.463
	(1.263)	(1.375)	(0.914)	(1.062)	(1.273)	(1.307)
Inflation	0.000	0.002	-0.001	-0.002	0.003	0.001
	(0.005)	(0.005)	(0.005)	(0.003)	(0.005)	(0.005)
FDI liabilities		0.135**				
		(0.059)				
FDI assets		-0.248*				
		(0.138)				
Portfolio equity liabilities			0.102			
			(0.372)			
Portfolio equity assets			0.105			
			(0.189)			
Portfolio debt liabilities				-0.078		
				(0.054)		
Portfolio debt assets				0.118		
				(0.075)		
Other investment liabilities					-0.070	
					(0.045)	
Other investment assets					0.026	
					(0.041)	
Total liabilities						-0.121**
						(0.053)
Total assets						0.100**
						(0.034)
Constant	-20.138	31.641	-22.376	22.644	5.933	36.278

	(91.968)	(98.980)	(66.776)	(77.759)	(94.613)	(98.725)
Observations	105	105	105	105	105	105
Number of groups	7	7	7	7	7	7

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 20 reports the results of the regression for the subgroup of developing economies. Like the overall sample and the group of developed economies, the regression coefficients for the foreign direct investment flows data are not significant. However, the regression coefficients for the foreign direct investment stock data are statistically significant. In particular, the regression coefficient for foreign direct investment debt is -0.06, which implies that for every 1% increase in the ratio of foreign direct investment debt to GDP, the growth rate of real GDP per capita decreases by 0.06%. The regression coefficient for foreign direct investment assets is 0.065, which implies that for every 1 per cent increase in the foreign direct investment debt-to-GDP ratio, real GDP per capita growth increases by 0.065%. And it is interesting to note that for the developing economies of Central and Eastern Europe, the association between foreign direct investment and economic growth shows the opposite effect to that of the developed economies of the same region. The regression coefficient for portfolio equity debt is statistically insignificant, while the regression coefficient for portfolio equity assets is statistically significant at -0.476, implying that a 1% increase in the ratio of portfolio equity assets to GDP reduces the growth rate of real GDP per capita by 0.467% and that this negative impact of portfolio equity assets on growth is also in line with the previous hypotheses consistent with the previous hypothesis. The regression coefficient for portfolio debt liabilities is significant at -0.138 implying that for every 1% increase in the portfolio debt liabilities to GDP ratio, the real GDP per capita growth rate decreases by 0.138%. This is contrary to the previous hypothesis. The regression coefficients for portfolio liability assets, on the other hand, did not show statistical significance. The regression coefficient for debt on other assets was statistically significant at -0.100, implying that for every 1 % increase in the ratio of other investment debt to GDP, the growth rate of real GDP per capita would fall by 0.1 %.

The regression coefficient for other investment assets was possessed statistically significant. For the aggregate level stock data, the regression coefficient for total debt is -0.055, implying that for every 1 % increase in the total debt to GDP ratio, the growth rate of real GDP per capita decreases by 0.055.While the regression coefficient for total assets is 0.043 at the 90 % confidence interval, which implies that for every 1% increase in the ratio of total assets to GDP, the per capita real GDP growth rate increases by 0.043%.

Table 20 Regression results of fixed effects model with Driscoll and Kraay standard errors: Developing economies

VARIABLES	(1) FDI flow	(2) FDI stock	(3) Portfolio equity	(4) Portfolio debt	(5) Other investment	(6) Total
FDI inflow	-0.001					
	(0.003)					
FDI outflow	-0.008					
	(0.018)					
Population	-1.672*	-2.244**	-2.558**	-2.704***	-1.837**	-2.504***
	(0.914)	(1.001)	(0.999)	(0.613)	(0.800)	(0.753)
Savings	0.097	0.122	0.123	0.110	0.134	0.144
	(0.111)	(0.104)	(0.105)	(0.104)	(0.126)	(0.099)
Trade	0.008	-0.002	-0.011	-0.009	-0.022	-0.013
	(0.025)	(0.021)	(0.022)	(0.019)	(0.018)	(0.019)
Life	-0.005	-0.103	-0.010	-0.062	-0.458	-0.053
	(0.481)	(0.524)	(0.466)	(0.518)	(0.486)	(0.375)
Inflation	-0.003	-0.004	-0.003	-0.006**	-0.004	-0.004
	(0.004)	(0.004)	(0.004)	(0.003)	(0.002)	(0.003)
FDI liabilities		-0.060***				
		(0.015)				
FDI assets		0.065**				
		(0.024)				
Portfolio equity liabilities			0.039			
			(0.230)			
Portfolio equity assets			-0.476*			
			(0.269)			

Portfolio debt liabilities				-0.138***		
				(0.043)		
Portfolio debt assets				-0.109		
				(0.151)		
Other investment liabilities					-0.100**	
					(0.038)	
Other investment assets					0.010	
					(0.092)	
Total liabilities						-0.055***
						(0.015)
Total assets						0.043*
						(0.021)
Constant	5.176	15.428	7.027	12.046	45.726	13.983
	(35.478)	(37.745)	(35.738)	(38.598)	(35.551)	(27.542)
Observations	135	135	135	135	135	135
Number of groups	9	9	9	9	9	9

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.3. Further discussion

The regression results for foreign direct investment flow data vary according to the different sample ranges, which can to some extent corroborate previous researchers' evaluation of the use of flow data to measure international financial integration, including the fact that capital flow data do not fully capture the impact of financial integration, as some of the gains are related to the total holdings of foreign assets and liabilities (Lane et al., 2001), while flow data are more volatile and more likely to be subject to error compared to stock data (Prasad et al., 2003). Indeed, the previous time series figure also shows the high volatility of flow data. The regression results for the overall sample show the significance of the regression coefficients of net foreign direct investment inflows and outflows and fit the hypothesis that net foreign direct investment inflows have a positive impact on economic growth because of the increase in capital and the consequent spillover effects. However, according to Table 18, the

regression coefficient of net foreign direct investment inflow is only 0.003, and the R-squared of using flow data to measure international financial integration is only 0.3272, which is much lower than that of regression using stock data as a proxy of international financial integration, which implies that the relationship between the two is relatively weak, and the goodness of fit of the regression model is relatively low. Therefore, flow data may still not be the most appropriate choice when using de facto measures to study international financial integration, despite the relatively wider country and time coverage of data from the World Bank.

However, the regression results for the foreign direct investment stock data are not significant, which may be explained by the regression according to the grouping of advanced and developing economies. According to Table 19, the regression coefficient for foreign direct investment liabilities, i.e., the existing stock of foreign direct investment in the economy, is significantly positive, while the regression coefficient for foreign direct investment assets, i.e., the stock of foreign direct investment owned by the economy in other regions, is significantly negative. The results of the regressions based on developed economies are consistent with the previous hypothesis that foreign direct investment debt is considered to have a positive impact on economic growth. However, for developing economies, the regression coefficients for foreign direct investment liabilities and assets present diametrically opposite results, i.e., foreign direct investment liabilities negatively affect economic growth. In fact, some researchers have previously suggested that the impact of international financial integration on economic growth has a threshold effect (Chen and Quang,2014), which may be related to the level of institutional and financial development, and that international financial integration does not show a significant positive impact on economic growth until the institutional and other conditions reach a certain level. This may be the case with the differences shown in the regression results after grouping in this paper, where the differences between advanced and developing economies in the CEE region are not limited to differences in GDP per capita, but also differences in financial systems, laws, economic policies, and the level of democracy. It is worth

noting that all the advanced economies are in the European Union, which may also explain why the countries in question benefit from foreign direct investment liabilities. Furthermore, Karadam and Ocal (2022) suggest that the threshold effect could be even stronger in emerging markets, which also relate to the developing economies in CEE.

For portfolio equity, the regression coefficient for portfolio equity assets is significant at the 90% confidence level for developing economies only, in line with the previous hypothesis suggesting that investing in equity assets negatively affects economic growth. However, all other portfolio equity variables are not statistically significant either for the overall sample, developed economies or developing economies. Therefore, it can be concluded that there is no significant association between portfolio equity and economic growth in CEE countries. And as can also be seen from the previous time-series graphs, both portfolio equity liabilities and portfolio equity assets to GDP ratios are low relative to the other de facto international financial integration indices, which is also likely to be linked to the threshold effect of international financial integration, whereby perhaps the relatively low level of financial development has not allowed the entry of foreign portfolio equity to have an impact on economic growth.

The regression results for the debt-related international financial integration proxy portfolio debt and other investments also reflect differences between developed and developing economies. For both the overall sample and the developing economies, the regression coefficients for both portfolio debt liabilities and other investment liabilities are significantly negative, as hypothesised in the previous section, with a negative impact on economic growth. But for developed economies, such a negative impact does not exist. As mentioned earlier, this can equally be linked to the threshold effect. The relaxation of restrictions on capital flows in the context of international financial integration implies a relatively proactive attitude towards risk-taking, which may generate financial volatility. For economies where factors such as institutional and financial development are not sufficiently supportive of the positive impact of international financial integration on economic growth, the costs of absorbing foreign liabilities and lowering impediments to capital flows may not be exchanged for

sufficient economic growth, which ultimately manifests itself in a negative impact on economic growth.

Conclusion

The thesis examines the impact of international financial integration on economic growth in Central and Eastern European countries using a two-way fixed effects model with macroeconomic data for 16 CEE countries for a total of 15 years, from 2007 to 2021, and a sample grouped into developed and developing economies in accordance with International Monetary Fund criteria. Considering that the de jure index may not be compatible with de facto international financial integration and that indices such as KAOPEN cannot cover the range of countries covered in this thesis, the de facto measure is used to indicate the level of international financial integration. Specifically, the de facto indices used in this paper include the ratios of net inflows and outflows of FDI and GDP for flow data, and the ratios of assets and liabilities to GDP for stock FDI, portfolio equity, portfolio debt, and other investments.

The thesis draws the following conclusions. First, the ratio of net foreign direct investment inflows to outflows to GDP does not have a significant effect on economic growth, which may be due to fluctuations in the flow data itself. However, while the stock data on foreign direct investment turned out to be insignificant when regressed using all 16 countries as a sample, regressions that grouped the sample into developed and developing economies yielded significant but opposite results. In this case, the positive impact of foreign direct investment liabilities on economic growth in developed economies and the negative impact of foreign direct investment liabilities on economic growth in developing economies may be due to the level of institutional or financial development in developing economies, and the positive impact of foreign capital inflows may need to reach a certain level of institutional and other factors before they become apparent. Second, all portfolio asset variables are statistically insignificant, whether for the overall sample, developed economies or developing economies, except for portfolio equity assets for developing economies. This may also be related to the threshold effect of international financial integration, i.e., relatively low levels of financial development may prevent the entry of foreign portfolio equity from having an impact on economic growth. Third, for both developing economies and the overall

sample, both portfolio debt and other investment debt, as analysed for debt in previous studies, have a negative impact on economic growth. This may be because foreign debt is widely recognised as increasing the risk of financial crises, and the higher the ratio of foreign debt to total debt, the higher the risk of currency and debt crises, which can lead to large permanent output losses. For developed economies, however, the association is not significant, again pointing to a possible threshold effect.

It needs to be acknowledged that this thesis still has some limitations and needs to be improved. Firstly, the availability of data may have had some impact on the accuracy of the regression results. The control variables used in this thesis are a range of economic growth-related variables from the World Bank, but due to the limitations of data availability, some control variables that should have been taken into account, such as those related to the level of education, were not, and the possible omission of the variables poses an endogeneity problem. Secondly, the results of the regression show that international financial integration is relatively more beneficial to the growth of developed economies, while developing economies may not be able to benefit from the increase in the degree of international financial integration due to the existence of the threshold effect, but this paper does not conduct further empirical research to provide evidence for the conjecture, so based on the results, it is necessary to incorporate the system or the index related to financial development into the regression. Based on this result, it is necessary to include either institutional or financial development-related indices in the regression and to include the threshold effect in the regression. Thirdly, most empirical studies that test the relationship between international financial integration and economic growth add growth in the lagged period as a dependent variable into the model in order to construct a dynamic panel and regress it using the GMM methodology, although this methodology can better address issues such as endogeneity, the grouped regressions in this paper do not satisfy this requirement for a short panel due to its requirement for the panel used to be a short panel. So, a two-way fixed effects model is chosen to address endogeneity in a modest way.

Bibliography

ABIAD, A. & MODY, A. 2005. Financial Reform: What Shakes It? What Shapes It? The American economic review, 95, 66-88.

ACEMOGLU, D. & ZILIBOTTI, F. 1997. Was Prometheus Unbound by Chance? Risk, Diversification, and Growth. The Journal of political economy, 105, 709-751.

AGOSIN, M. R. & MACHADO, R. 2005. Foreign Investment in Developing Countries: Does it Crowd in Domestic Investment? Oxford development studies, 33, 149-162.

BAELE, L., FERRANDO, A., HÖRDAHL, P., KRYLOVA, E. & MONNET, C. 2004. Measuring financial integration in the euro area. European Central Bank.

BAELE, L., FERRANDO, A., HÖRDAHL, P., KRYLOVA, E. & MONNET, C. 2004. Measuring European Financial Integration. Oxford review of economic policy, 20, 509-530.

BALTZER, M., CAPPIELLO, L., DE SANTIS, R. A. & MANGANELLI, S. 2008. Measuring financial integration in new EU member states. ECB Occasional Paper.

BANK, E. C. 2023. Financial integration [Online]. European Central Bank: European Central Bank. Available: https://www.ecb.europa.eu/home/search/financial_integration/html/index.en.html [Accessed 2023].

BEKAERT, G., HARVEY, C. R. & LUNDBLAD, C. 2005. Does financial liberalization spur growth? Journal of financial economics, 77, 3-55.

BEKAERT, G., HARVEY, C. R. & LUNDBLAD, C. 2011. Financial Openness and Productivity. World Development, 39, 1-19.

BORDO, M. D., MEISSNER, C. M. & STUCKLER, D. 2010. Foreign currency debt, financial crises and economic growth: A long-run view. Journal of international money and finance, 29, 642-665.

BORENSZTEIN, E., LEE, J.-W. & DE GREGORIO, J. 1998. How does foreign direct investment affect economic growth?1. Journal of international economics, 45, 115-135.

BOSWORTH, B. P., COLLINS, S. M. & REINHART, C. M. 1999. Capital Flows to Developing Economies: Implications for Saving and Investment. Brookings papers on economic activity, 1999, 143-180.

BOYD, J. H. & SMITH, B. D. 1992. Intermediation and the equilibrium allocation of investment capital: Implications for economic development. Journal of monetary economics, 30, 409-432.

BRUNE, N. E. & GUISINGER, A. 2007. Myth or reality? The diffusion of financial liberalization in developing countries. Yale University MacMillan Center Working Paper (New Haven, Connecticut, Yale University).

BUMANN, S., HERMES, N. & LENSINK, R. 2013. Financial liberalization and economic growth: A meta-analysis. Journal of International Money and Finance, 33, 255-281.

BUSSIÈRE, M. & FRATZSCHER, M. 2008. Financial Openness and Growth: Short-run Gain, Long-run Pain? Review of international economics, 16, 69-95.

CHEN, J. & QUANG, T. 2014. The impact of international financial integration on economic growth: New evidence on threshold effects. Economic modelling, 42, 475-489.

CHINN, M. D. & ITO, H. 2002. Capital Account Liberalization, Institutions and Financial Development: Cross Country Evidence. Cambridge: National Bureau of Economic Research.

CHINN, M. D. & ITO, H. 2006. What matters for financial development? Capital controls, institutions, and interactions. Journal of development economics, 81, 163-192.

CHINN, M. D. & ITO, H. 2008. A New Measure of Financial Openness. Journal of comparative policy analysis, 10, 309-322.

COEURDACIER, N., REY, H. & WINANT, P. 2020. Financial integration and growth in a risky world. Journal of Monetary Economics, 112, 1-21.

DEMIRGÜÇ-KUNT, A. & DETRAGIACHE, E. 1998. The Determinants of Banking Crises in Developing and Developed Countries. IMF staff papers, 45, 81-109.

DOOLEY, M. P., MATHIESON, D. J. & ROJAS-SUAREZ, L. 1997. Capital mobility and exchange market intervention in developing countries. National Bureau of Economic Research Cambridge, Mass., USA.

DREHER, A. 2006. Does globalization affect growth? Evidence from a new index of globalization. Applied economics, 38, 1091-1110.

DREHER, A., GASTON, N., MARTENS, P. & FALVEY, R. 2009. Measuring globalisation: gauging its consequences.

EDISON, H. J., LEVINE, R., RICCI, L. & SLØK, T. 2002. International financial integration and economic growth. Journal of international money and finance, 21, 749-776.

EDISON, H. J. & WARNOCK, F. E. 2003. A simple measure of the intensity of capital controls. Journal of empirical finance, 10, 81-103.

EDWARDS, S. 2001. Capital Mobility and Economic Performance: Are Emerging Economies Different? Cambridge: National Bureau of Economic Research.

EICHENGREEN, B., GULLAPALLI, R. & PANIZZA, U. 2011. Capital account liberalization, financial development and industry growth: A synthetic view. Journal of International Money and Finance, 30, 1090-1106.

FRIEDRICH, C., SCHNABEL, I. & ZETTELMEYER, J. 2013. Financial integration and growth — Why is Emerging Europe different? Journal of International Economics, 89, 522-538.

GALINDO, A., MICCO, A., ORDOÑEZ, G., BRIS, A. & REPETTO, A. 2002. Financial Liberalization: Does It Pay to Join the Party? [with Comments]. Economía (Washington, D.C.), 3, 231-261.

GÖRG, H. & GREENAWAY, D. 2004. Much Ado about Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment? The World Bank research observer, 19, 171-197.

HU, A. G. Z. & JEFFERSON, G. H. 2002. FDI Impact and Spillover: Evidence from China's Electronic and Textile Industries. World economy, 25, 1063-1076.

IM, K. S., PESARAN, M. H. & SHIN, Y. 2003. Testing for unit roots in heterogeneous panels. Journal of econometrics, 115, 53-74.

JOHNSTON, M. R. & TAMIRISA, M. N. T. 1998. Why do countries use capital controls?, International Monetary Fund.

KALEMLI-OZCAN, S., SØRENSEN, B. E. & YOSHA, O. 2003. Risk Sharing and Industrial Specialization: Regional and International Evidence. The American economic review, 93, 903-918.

KAMINSKY, G. L. & REINHART, C. M. 1999. The Twin Crises: The Causes of Banking and Balance-Of-Payments Problems. The American economic review, 89, 473-500.

KARADAM, D. Y. & OCAL, N. 2014. Financial integration and growth: A nonlinear panel data analysis. ERC Working Papers in Economics 14/15.

KASTNER, S. L. & RECTOR, C. 2003. International Regimes, Domestic Veto-Players, and Capital Controls Policy Stability. International studies quarterly, 47, 1-22.

KOROSTELEVA, J. & MICKIEWICZ, T. 2011. Start-Up Financing in the Age of Globalization. Emerging markets finance & trade, 47, 23-49.

KOSE, M. A., PRASAD, E., ROGOFF, K. & WEI, S.-J. 2009. Financial Globalization: A Reappraisal. IMF Staff Papers, 56, 8-62.

KOSE, M. A., PRASAD, E. S. & TAYLOR, A. D. 2009. Thresholds in the Process of International Financial Integration. National Bureau of Economic Research Working Paper Series, No. 14916.

KRAAY, A. 1998. In search of the macroeconomic effects of capital account liberalization. World Bank.

LANE, P. R. & MILESI-FERRETTI, G. M. 2001. The external wealth of nations: measures of foreign assets and liabilities for industrial and developing countries. Journal of international economics, 55, 263-294.

LANE, P. R. & MILESI-FERRETTI, G. M. 2007. The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. Journal of international economics, 73, 223-250.

LANE, P. R. & MILESI-FERRETTI, G. M. 2018. The External Wealth of Nations Revisited: International Financial Integration in the Aftermath of the Global Financial Crisis. IMF economic review, 66, 189-222.

LEVIN, A., LIN, C.-F. & JAMES CHU, C.-S. 2002. Unit root tests in panel data: asymptotic and finite-sample properties. Journal of econometrics, 108, 1-24.

LEVY YEYATI, E., SCHMUKLER, S. L. & VAN HOREN, N. 2009. International financial integration through the law of one price: The role of liquidity and capital controls. Journal of financial intermediation, 18, 432-463.

LUCAS, R. E. 1990. Why Doesn't Capital Flow from Rich to Poor Countries? The American economic review, 80, 92-96.

MASTEN, A. B., CORICELLI, F. & MASTEN, I. 2008. Non-linear growth effects of financial development: Does financial integration matter? Journal of International Money and Finance, 27, 295-313.

MINIANE, J. 2004. A New Set of Measures on Capital Account Restrictions. IMF Staff Papers, 51, 276-308.

MODY, A. & MURSHID, A. P. 2005. Growing up with capital flows. Journal of international economics, 65, 249-266.

MORAN, T. H., GRAHAM, E. M. & BLOMSTRÖM, M. 2005. Does foreign direct investment promote development? / edited by Theodore H. Moran, Edward M. Graham and Magnus Blomström, Washington, DC, Institute for International Economics.

OBSTFELD, M. 1994. International Capital Mobility in the 1990s.

OBSTFELD, M. 1994. Evaluating risky consumption paths: The role of intertemporal substitutability. European economic review, 38, 1471-1486.

OSTRY, J. D., GHOSH, A. R., CHAMON, M. & QURESHI, M. S. 2011. Capital controls: when and why? IMF Economic Review, 59, 562-580.

PRASAD, E., ROGOFF, K., WEI, S.-J. & KOSE, M. A. 2003. Effects of Financial Globalisation on Developing Countries: Some Empirical Evidence. Economic and political weekly, 38, 4319-4330.

PUNGULESCU, C. 2013. Measuring financial market integration in the European Union: EU15 vs. New Member States. Emerging Markets Review, 17, 106-124.

QUINN, D. 1997. The Correlates of Change in International Financial Regulation. The American political science review, 91, 531-551.

QUINN, D., SCHINDLER, M. & TOYODA, A. M. 2011. Assessing Measures of Financial Openness and Integration. IMF economic review, 59, 488-522.

QUINN, D. P. 2003. Capital account liberalization and financial globalization, 1890-1999: a synoptic view. International journal of finance and economics, 8, 189-204.

RANCIERE, R., TORNELL, A. & WESTERMANN, F. 2006. Decomposing the effects of financial liberalization: Crises vs. growth. Journal of Banking & Finance, 30, 3331-3348.

SAMI, S. A. F. 2016. Impact of Financial Integration on Growth in Developing, Transition, and Emerging Market Economies: Quest for Threshold Analysis, UCL School of Slavonic and East European Studies (SSEES).

SCHINDLER, M. 2009. Measuring Financial Integration: A New Data Set. IMF staff papers, 56, 222-238.

SCHULARICK, M. & STEGER, T. M. 2010. FINANCIAL INTEGRATION, INVESTMENT, AND ECONOMIC GROWTH: EVIDENCE FROM TWO ERAS OF FINANCIAL GLOBALIZATION. The review of economics and statistics, 92, 756-768.

TAMIRISA, N. T. 1999. Exchange and Capital Controls as Barriers to Trade. IMF Staff Papers, 46, 69-88.

WEBER, A. A. 2006. European financial integration and (its implications for) monetary policy Available: https://www.bis.org/review/r060531a.pdf.

World Bank. 2022. World Development Indicators. The World Bank Group. https://databank.worldbank.org/source/world-development-indicators/preview/on

YEYATI, E. L., SCHMUKLER, S. L. & VAN HOREN, N. 2009. International financial integration through the law of one price: The role of liquidity and capital controls. Journal of Financial Intermediation, 18, 432-463.

YOLCU KARADAM, D. & ÖCAL, N. 2022. Analysis of distinct asymmetries in financial integration–growth nexus for industrial, emerging and developing countries. International journal of finance and economics, 27, 2326-2344.