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Does regional trade integration reinforce or weaken capital mobility? New evidence from four free trade areas

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Abstract

The study aims to empirically determine whether a higher level of trade openness and the presence of better legal protection for investors enhances the impact of trade bloc membership on capital mobility based on four trading blocs: Eurasian Economic Union (EAEU), Central American and Dominican Republic Free Trade Agreement (CAFTA-DR), Central European Free Trade Agreement (CEFTA), and the Pacific Alliance. This study employs the fully modified and dynamic ordinary least squares estimators and a panel quantile regression cointegration estimator. The study finds that a country's affiliation with a trade bloc improves capital mobility in the whole group and EAEU region, low capital mobility in the Pacific Alliance region and moderate low capital mobility in the CAFTA-DR region. The legal protection system alone provided for the investors does not improve the level of capital mobility unless its interaction with investment is included. Also the study reveals that high trade openness does not necessarily lead to better capital mobility for the studied trade blocs.

Keywords

- regional integration
- capital mobility
- trading blocs
- panel cointegration estimators

JEL codes: C23, F21, O55

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Introduction

The world economy has undergone significant changes in both its structure and nature. The change from trade interactions as the engine of the world economy to cross-border capital movements playing a more dominating role is one major transition. This change in dynamics has led to increased interconnectivity and interdependence among national economies, affecting various aspects of the global economic landscape (Ganić, 2020). In recent decades the number of regional trade blocs has risen while the deepening of existing trade integrations was followed by capital flow liberalization. Capital mobility holds immense importance for any economy and particularly within trading blocs as it expedites investment and fosters economic growth. It highlights the role of enhanced capital mobility in facilitating the flow of funds across countries thereby creating favourable conditions for investment opportunities contributing to economic growth. There is still no general consensus about the role of the many channels through which various determinants can have an impact on capital mobility. Referring to the increasing capital mobility and the possibility of covering domestic savings deficits it would be interesting to explore whether deepening regionally based trade integration increases capital mobility. Markusen (1983) investigated the complementarity between trade and capital flows. He concludes that capital mobility can increase gross trade flows in a variety of models where comparative advantage is not driven by differences in capital-labour ratios across countries. Also Cavallo and Frankel (2008) examined trade openness as a determinant of capital vulnerabilities concluding that economies that trade less with other countries are more prone to capital inflows and currency crises. The rationale for examining the link between trade integration and capital mobility assumes that a country's affiliation in a trading bloc is followed with the lowering of trade barriers. This reduction in trade barriers is expected to facilitate an increase in capital mobility within these countries. For example, it is anticipated that the deployment of digital technology will result in a large decrease in trade costs, increased transparency, and simpler access to foreign markets. This will make it possible for more businesses and people to engage in international trade (Rymarczyk, 2021).

The measurement of capital mobility levels and the factors that encourage investment growth has served as a motivation for numerous authors to conduct various empirical studies. These studies have made both theoretical and empirical contributions for developed, less developed and underdeveloped countries.

The debate over saving and the investment link in the context of capital mobility inspired this research and brought up the idea of conducting empirical tests which would prove or disapprove the existence of positive role deepening in regionally based trade integration on rise of capital mobility.

There are plenty of studies addressing investment-savings correlation in the European Union (EU), the OECD (Organization for Economic Cooperation and Development) and developing countries but less to address the impact of regional economic integration on capital mobility with the mediation role of level trade openness and legal protection of the investor.

The purpose of this study is to make a contribution to the ongoing debate on saving and investment. More precisely a case study of four trade blocs is conducted using the available data between 2000 and 2020 to determine if a higher level of trade openness and the presence of better legal protection of the investor enhances the impact of trading bloc membership on capital mobility. The rationale of this proposition and the study's contributions within that context are as follows. First, increasing trade openness promotes regional trade integration by facilitating trade and investment between trade bloc member countries and augments economic growth (Kumar et al., 2014; Matthews, 2003). Second, as part of their reform processes many countries have started the process of strengthening the legal protection of investors. The aim of these activities is to increase the inflow of capital and enhance efficiency and productivity in the national economy by strengthening the legal protection of investors thus enhancing investor confidence for both beneficiary countries and the relevant sub-region (Collier, 1991).

The study employs methodologies such as the FMOLS estimator, the DOLS estimator and a panel quantile regression cointegration estimator to analyze data. Although some aspects of these aims have been assessed partially, others have been ignored while in the areas of FTAs where the findings differed across studies. This study aims to answer the following questions:

1. Does a country's affiliation with a trade bloc improve capital mobility?
2. Does the effect of a country's affiliation with a trade bloc on increasing capital mobility is amplified in the presence of higher level trade openness?
3. Does the effect of a country's affiliation with a trade bloc on increasing capital mobility increase in the presence of legal protection of investor?

In investigating the research questions above three hypotheses will be tested:

H1: There is increased capital mobility after country's affiliation with a trade bloc.

H2: The effect of a country's affiliation with a trade bloc on increasing capital mobility is amplified in the presence of higher level trade openness, and

H3: The effect of a country's affiliation with a trade bloc on increasing capital mobility is amplified in the presence of better legal protection of the investor.

The findings of this paper contribute to the existing literature the on capital mobility and trade integration because the previous related studies (Kumar,

2015; Kumar et al. 2014) that address the relationship between trade integration and capital mobility are limited especially to four trade blocs it this study. Also the data set covers the last two decades where capital controls were abolished and where some new countries joined FTAs. It gives interesting views for the current saving and investment debate and examination of the existence of a positive role of regionally based trade integration on the rise of capital mobility. In comparison with other similar empirical studies this study explores whether regional trade integration with the presence of high-level trade openness and legal protection of the investor increases capital mobility for a group of four trade blocs (EAEU, CAFTA-DR, CEFTA, and the Pacific Alliance). To the best of the authors' knowledge there has been no such study implemented in the other trade blocs. In addition, this study makes another contribution to the existing literature by investigating the importance of regional savings in the financing of investments in four trade blocs (EAEU, CAFTA-DR, CEFTA, and the Pacific Alliance) providing additional evidence on the role of trade regionalism in capital market integration. These findings can be extended to the other trade blocs as they share many common features such as proximity to each other and a similar pattern of economic development

Additionally, the contribution of research can be visible in the econometric approach applied to examine some cases where domestic savings and investment might vary from one to another by depending on quantile, a characteristic that is neglected in most previous empirical studies.

The article is organised as follows: Section 1 reviews the literature on trade integration and capital mobility. Section 2 presents the research data and method. In Section 3 research results are depicted. Section 4 discusses empirical results. The last section concludes the article.

1. Literature review

Analyzing the six major puzzles in International Macroeconomics, Obstfeld and Rogoff (2000) identified the Feldstein and Horioka (F-H) puzzle as one of the most robust highlighting its valuable contribution to the understanding of international capital mobility. For instance, Obstfeld and Rogoff (2000) revealed that most studies appeared to confirm theoretical arguments of the F-H hypothesis but they are empirically inadequate. In fact, solving one puzzle comes at the expense of creating others. The authors suggest that the F-H regularity becomes unpredictable if intranational regional data is used implying that factors inherent in trade between different nations are at work.

The most widely used method in assessing a link between gross domestic investments and gross domestic savings is the method developed by the F-H (Feldstein & Horioka, 1980). While the F-H (1980) hypothesis has been veri-

fied by some researchers some others struggled to attain equivalent results. Contrary to expectations of increased capital flows Feldstein and Horioka (1980) obtained perplexing findings in terms of savings and investment relationship in sixteen OECD countries between 1960 and 1974. The authors find low capital mobility among OECD countries indicating that domestic investment was primarily determined by domestic savings.

This approach for measurement of capital mobility is not without its critics. Research that demonstrated substantial correlation between savings and investment in OECD countries suggested that international capital mobility is relatively low. Indeed, the debate about capital mobility in the context of the Feldstein and Horioka hypothesis has raised questions about the validity of assumptions of their analysis.

It implies that in a world of complete capital mobility savings and investment tendencies should not be correlated. It is true that there are arguments to support the use of the correlation between savings and investment as an indicator for measuring international capital mobility. Dornbusch (1989), concluded that even if international markets are highly integrated, if domestic capital markets are segmented it may result in low levels of international capital mobility.

Obstfeld (1986) and Tesar (1991) presented models in which there is a high correlation between savings and investment even in the presence of high capital mobility. These models suggest that while capital mobility may be unrestricted there are some other factors that may affect the relationship between savings and investment. For example, these factors include tax policies, institutional constraints or information asymmetries. On the other hand, Frankel (1991) highlighted that holding the F-H hypothesis requires certain demanding assumptions. The F-H hypothesis suggests that if a strong correlation between domestic savings and domestic investment exists there is a high correlation between domestic savings and domestic investment implying low international capital mobility. Frankel (1991) argued that this hypothesis holds good only under certain conditions and assumptions such as fixed exchange rates, capital flow restrictions or high adjustment costs. In fact, the ongoing debate raises the question as to whether the F-H puzzle leads to a contradiction between empirical research and the theoretical framework when it comes to the relationship between the savings rate and investment.

The studies validating the F-H results are existent but not very prevalent. Some authors such as: Sinn (1992), Obstfeld and Rogoff (1995), Coakley et al. (1996), Jansen (2000), indicate that for the presence of a long-term relationship (cointegration) between domestic savings and investments require the existence of long-term solvency of the local economy. The model with transaction costs for international trade in goods developed by Obstfeld and Rogoff (2000) indicates that the mere existence of frictions in commodity markets can prevent capital mobility between countries.

Following the example of these studies in OECD countries substantial efforts were directed at applying similar methodology for various markets around the world. Some contributors such as Payne and Kumazawa (2005), Yildirim and Yildirim (2020) found low capital mobility in emerging economies, Murthy and Ketenci (2020) in Latin America countries while Holmes (2005) and Midagu et al. (2020) found increased capital mobility.

From the research conducted by Sobański (2019), it follows that the U.S. has a privileged position in terms of foreign income from international investments compared to the group of 18 economies included in his research. This means that the U.S. achieves relatively higher rates of return on its foreign assets compared to other countries in the reference group. Also, the costs arising from its foreign obligations are relatively lower.

Besides the OECD and the developing countries there are studies on capital mobility specifically in the EU. For example, Syssoyeva-Masson and Sousa Andrade (2015), Ketenci (2014) investigated high capital mobility in EU countries while Masud-Alam and Rafiqul-Islam (2010) found that the savings-investment correlation varies between the old and new EU members.

Those studies are performed in various sets of countries over different time periods.

Taylor (1996) found substantial cross-country heterogeneity and towards the 1970s the group studied showed improved capital mobility.

Next Padawassou (2012) explored capital mobility in twenty-two countries in Africa suggesting that there exist both low and high capital mobility which challenges the previous results obtained for developing countries. Rocha (2006) concluded that the effect of savings on investment is small in the presence of some degree of capital mobility. However, out of the twenty-nine countries studied only nine have experienced capital immobility resulting in mixed results.

Ketenci (2014) examines existence of capital mobility in the OECD, EU-15, NAFTA, and G7 countries between 1970 and 2008. The obtained results indicate that the G7 countries are the only ones with low capital mobility. Bilas (2007) examines capital mobility among members of EU-15, ASEAN, MERCOSUR and NAFTA between 1960 and 2003. The findings are intriguing as the most mobile capital is in MERCOSUR, while ASEAN experiences the lowest capital mobility.

Kumar (2015) examines the relationship between investment and savings alongside FTAs between 1960 and 2012 using the sample of the following FTAs: AFTA (ASEAN FTA), EU, CARTAGENA, MERCOSUR and NAFTA. It indicates that capital mobility is similar in most countries and tends to increase in the post-integration period. In another study Kumar et al. (2014) found that the trade agreements slightly improved capital mobility by exploring twenty-five African member countries of different FTAs (COMESA, ECOWAS, SACU and UEMOA).

For the purposes of this study a saving-investment correlation framework was been adopted by using recent advances in panel data econometrics for long run analysis and quantile regression estimates to avoid the data and estimation problems outlined above. The goal of the study is to obtain a more accurate and efficient estimate of the savings-investment relationship for a group that covers four regionally based free trade agreements (FTAs). Therefore, the literature review section concludes that there is a gap in the literature and this paper contributes to this area.

2. Research data and method

In his research Frankel (1995) highlights four main theories for measuring capital mobility (using the Feldstein-Horioka definition, real interest rate parity, uncovered interest parity and covered interest rate parity). Initially this study utilizes the F-H definition of capital mobility which is considered to be the most widely of the methods for measuring capital mobility out of the four available. Decisions about variables which should be included in the model variance across different articles. The formal definition of gross domestic investment and gross domestic saving were clarified and sourced from the World Development Indicators through the World Bank database.

In line with a similar empirical analysis conducted by Feldstein and Bacchetta (1991), Payne and Kumawaza (2005), Kumar et al. (2014) and Kumar (2015) this study slightly extended the model to control for the degree of trade openness and the legal protection of investors. It aims to explain variations in capital mobility by examining the implications of a country's affiliation in FTAs, trade openness and the legal protection of investors. Equation (1) incorporates the set of variables as follows:

$$\left(\frac{I}{Y}\right)_{it} = \beta_0 + \beta_1\left(\frac{S}{Y}\right)_{it} + TRO_{it} + ROL_{it} + DA_{it} + I \times ROL_{it} + I \times TRO_{it} + \varepsilon_{it} \quad (1)$$

where: $\left(\frac{I}{Y}\right)$ – Gross domestic investment to GDP of a country i at time t, $\left(\frac{S}{Y}\right)$ – Gross domestic saving to GDP of a country i at time t, β_0 refers to the constant of equation; β_1 represents saving retention coefficient (with $\beta = 0$ for perfect capital mobility, $\beta = 1$ for perfect capital immobility and $0 < \beta < 1$ for imperfect capital mobility); TRO – measure trade openness of a country i at time t; to measure legal protection of investors Rule of Law (ROL) of a country i at time t is proxied; interaction variables: $I \times ROL$ (sum of I and ROL), $I \times TRO$ (sum of I and TRO) are introduced into the model in interac-

tion with investment (I) variable to capture their impact on the investment retention coefficient; D_{Ait} – dummy variable that takes the value of 0 in times when a country i had not joined the FTA and takes the value of 1 in times when a country is part of the FTA, while i and t stand for country specific and time specific, ε_{it} satysfing $N(0, \sigma)$ for all i and t.

Equation (1) assumes a long-term relationship between investment, savings and the control variables. Accordingly, it is necessary to ensure that the individual time series for all variables in equation (1) are nonstationary and integrated in the same order to form a cointegrated model.

The econometric tests are performed to understand what kind of model would suit this kind of data best. To examine cross-sectional dependency, the study employs the LM test by Breusch and Pagan (1980), bias-adjusted LM test by Pesaran et al. (2008), Pesaran (2004) CD test and slope homogeneity by Pesaran and Yamagata (2008). Then several unit root tests are employed to examine stationarity variables as follows: ADF (LLC) proposed by Levin, Lin and Chu (2002), Im, Pesaran and Shin W-stat (Im et al., 2003) as well as ADF-Fisher Chi-square and the PP-Fisher Chi-square tests that consider the heterogeneity across units. The null hypothesis assumes that the time series contains a unit root while the alternative hypothesis assumes that the time series are stationary.

The long run relationship among variables will be examined by employing three panel cointegration tests: the Johansen- Fisher panel Co integration Test (1988), the Pedroni Residual Cointegration Test (1999), and the Kao Residual Cointegration Test (1999).

To address endogeneity and serial correlation in cointegrating regressions and to ensure unbiased estimates of cointegration coefficients this study employs two methods: FMOLS (Phillips & Hansen, 1990) and DOLS (Stock & Watson, 1993). The reason for using the FMOLS method is to address deviations in standard fixed effect estimators. On the other hand, the DOLS method is used to solve endogeneity problems by introducing dynamic elements of the models and assessing the robustness of the FMOLS estimator. In addition, the Pairwise Dumitrescu-Hurlin panel causality tests (2012) are employed to examine causality between savings and investments where the null hypothesis of no causal relationship between savings and investment is tested. It excludes capital immobility if a causal relationship exists between investments and savings. The Pairwise Dumitrescu-Hurlin panel causality procedure (2012) is employed to account for heterogeneity in the cross-sections.

The panel quantile regression is utilized to examine the heterogeneity of impacts and run robustness checks of the models. The study compares the magnitude of the impact of trade regional integration, trade openness and legal protection on the level of capital mobility across different quantile distributions specifically the first quantile (q.25), second quantile (q.5) and third quantile (q.75). This type of empirical analysis provides information on the impact of

changes in independent variables on the interquartile difference and specifically on the distribution of the dependent variable. For robustness of the panel results the quantile regression developed by Koenker (2005), Koenker and Hallock (2001) is used. This approach allows the estimation of the effects that are heterogeneous across the conditional distribution of the response variable while also controlling for both individual and time-specific confounders.

The dataset used for the analysis consists of 483 observations between 2000 and 2020. All the data for the variables included in the model are sourced from the World Bank databases (2022). The study focuses on the following four regionally based free trade agreements (FTAs): EAEU (Eurasian Economic Union: Belarus, Kazakhstan, Russia, Armenia, Kyrgyzstan), CAFTA-DR (Central American and Dominican Republic Free Trade Agreement: United States of America, Dominican Republic, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua), CEFTA (Central European Free Trade Agreement: Albania, Bosnia and Herzegovina, North Macedonia, Moldova, Montenegro, Kosovo, Serbia), and the Pacific Alliance (Chile, Colombia, Mexico, and Peru).

To measure capital mobility, the empirical model should estimate the difference between savings rates and investment rates because capital is considered internationally mobile if foreign savings are used to finance domestic investments and vice versa. In this study for the measurement of the dependent variable of investment (I) the study deploys a proxy variable of gross capital formation. There are several different ways to measure a variable of investment (I) but this study employs gross capital formation as a proxy. It is referred to as fixed asset purchase minus the disposals made by inhabitant producers. The rationale to deploy this variable comes from the explanation that gross capital formation tends to behave less procyclically because it excludes the procyclical nature of inventories. The studies conducted by Bayoumi (1990), Isaksson (2001), Sinha and Sinha (2004), Payne and Kumazawa (2005) used the same proxy variable.

According to standard economic theory and in the absence of state regulation in the movement of international capital savings are expected to flow to the countries with the best investment opportunities seeking higher returns. More specifically the savings variable is included in the model due to its importance for financing investments in fixed capital which are necessary for countries to achieve a sustainable growth path. To measure savings (S) the study adopts a definition of saving as the difference between gross domestic product and final consumption expenditure. This variable has been one of the original variables used in many empirical models in interaction with investments to measure level of capital mobility (Feldstein & Bacchetta, 1991; Giannone & Lenza, 2004; Isaksson, 2001; Ketenci, 2014; Payne & Kumazawa, 2005; Taylor, 1996; Tesar, 1991; Yildirim & Yildirim, 2020).

Another variable widely accepted to play a role in the determination of capital mobility is trade openness. A theoretical background suggests that

capital mobility can be explained by the level of trade openness (Feldstein & Bacchetta, 1991; Giannone & Lenza, 2004; Isaksson, 2001; Ketenci, 2014; Payne & Kumazawa, 2005; Taylor, 1996; Tesar, 1991; Yildirim & Yildirim, 2020). The trade openness variable is specified as the sum of total trade to GDP to measure how changes in level of openness affect capital mobility. The above review of studies applied to the regions and countries suggest that if a country is more open to trade it stimulates capital mobility, attracts investors and promotes economic development. It is expected that the openness to international trade will have a positive impact on investment rates.

The rationale for the inclusion of a country's affiliation with FTAs as a dummy variable in the model is based on the complementarity between trade and capital flows as proposed by Markusen (1983). It is a fact that regional trade integration involving lowering of trade barriers could have spurred capital mobility in these countries. It assumes that when a country becomes a member of a trade bloc there is reduction in trade barriers that could support an increase in capital mobility. Matthews (2003) highlights several advantages with the pursuit of integration such as potential for investment and production growth, elimination of regulatory barriers, the exploiting of economies of scale and the emergence of intra-industry trade. Some of the previous research done by Kumar (2015), Kumar et al. (2014), Yersh (2022) confirmed the effects of a rise of post-integration flows on capital mobility.

The literature attributes positive effect of legal system protection to capital mobility. Inclusion of a Rule of Law (ROL) to be a proxy for legal protection system in the model is based on evidence related to a strong link between finance and law (La Porta et al., 1998) and better investment protection. It believes that a robust rule of law promotes better implementation of laws providing legal protection the investors and improves capital mobility. The complexity and dynamics of the legal system, including property rights, often create tensions between predictability and uncertainty. Institutional frameworks and the rule of law play a key role in balancing these two aspects in order to ensure the fairness and effectiveness of the legal system (Behar-Villegas, 2022). According to the study conducted by Shleifer and Wolfenzon (2002), countries with stronger investor protection have a larger share of investment capital generated from the foreign sources and a smaller share originates from internal funds. Accordingly, a variable of ROL is used as a proxy for the legal protection of investors. In addition, research done by Midagu et al. (2020) and Drakos et al. (2018) suggest that legal protection of investors promotes capital mobility.

Alongside the key variables of interest, the Rule of Law or (ROL) and Trade openness variables are included into the model in interaction with the investment (I) variable to capture their impact on the investment retention coefficient.

3. Research results

One of the first steps in the empirical analysis is the examination of multicollinearity issues in the upcoming regression. The results of correlation matrix are presented in Table 1.

Table 1. Correlation matrix

	I	S	DALL	ROL	TRO
I	1				
S	0.0483	1			
DALL	0.0227	–0.1361	1		
ROL	–0.1379	0.1414	0.1001	1	
TRO	0.5062	–0.2228	0.0421	–0.3192	1

Source: authors' calculations.

A variable of savings has a positive relationship with a variable of investments. A variable of the rule of law is negatively correlated to a variable of investment while trade openness is positively correlated to investment. The higher the magnitude of investment the lower the rule of law which is puzzling. The dummy variable of a country's affiliation with an FTA negatively correlated to savings while the rule of law is positively correlated. The rule of law is positively correlated to the dummy variable while positive and low correlation of trade openness is found. Lastly trade openness is negatively associated with the rule of law, indicating that as the rule of law increases trade openness decreases.

The LM test by Breusch and Pagan (1980) and the bias-adjusted LM test by Pesaran et al. (2008), Pesaran (2004) CD test are employed to examine cross-sectional dependency (Table 2). In the case of the LM test the null hypothesis of no cross-section dependence is rejected at 5% significance level. In the case of bias-adjusted LM test the null hypothesis is also rejected at 5% whereas CD LM the null hypothesis of cross-sectional independence is rejected at 1%. When it comes to data homogeneity the null hypothesis of homogeneity is rejected at 5% significance level indicating the presence of heterogeneity (Table 2).

Table 3 displays the results for the variables considered in the level and first difference. The study was not able to reject the null hypothesis for the variables in level: TRO and I × TRO for ADF – Fisher test, I × TRO for PP – Fisher test, I for LLC test and TRO for IPS test. However, when taken after the first difference the test statistics reject the null of non-stationarity in all specifica-

Table 2. Cross-sectional dependency and slope homogeneity tests

Cross-sectional dependency tests (H0: Cov(uit,ujt) = 0 for all t and i! = j)		
Test	**Statistics**	***p*-value**
LM (Breusch & Pagan, 1980)	517.5	0.0000
Bias-adjusted LM adj (Pesaran et al., 2008)	18.32	0.0000
Pesaran CD LM (Pesaran, 2004)	7.23	0.0000
Slope Homogeneity tests (Pesaran & Yamagata, 2008)		
Test	**Statistics**	***p*-value**
$\hat{\Delta}$ test	12.78	0.000
$\hat{\Delta}$ adj	15.13	0.000

Source: authors' calculations.

tions implying stationarity of all variables and integrated of an order one (I) at the 1% significance level.

After the examination of stationarity variables in the model the presence of long run relationships among variables is tested. Accordingly, the study employs three panel co-integration tests: Johansen-Fisher panel cointegration test (1988), Pedroni Residual Cointegration Test (Pedroni, 1999) and Kao Residual Co integration Test (Kao, 1999) to verify the (non) stationarity of the residuals and estimate the parameters of the long run relationship within the variables (Table 4).

Referring to the above mentioned tests the research finds that all four of the Pedroni's statistics including the Kao's statistic and Johansen Fisher trace and maximum eingevalue cointegration tests reject the null hypothesis of no cointegration between variables. It implies the presence of long run panel cointegration between the observed variables in the model.

Moreover, the study explores the long-run relationship by using the DOLS and the FMOLS estimators.

The findings from Table 5 reveal that an increase in savings positively affects investments in the long run while a one-unit increase in savings will lead to a 0.29-unit increase to investment in the long run. The closeness of values for the saving retention coefficients in the case of FMOLS (0.294) and DOLS (0.292) models confirming the robustness of the findings. This implies that a low correlation between savings and investments can provide evidence of high capital mobility. Similarly, both the dummy variable and the TRO have positive and significant (at 1% and 5% level) effects on investments.

In fact, it implies that membership in the FTA led to an increase in the level of investments. On the contrary a variable of ROL does not have long run

Table 3. Unit root tests

	I (0)				I(1) First difference			
	ADF – Fisher	**PP – Fisher**	**LLC**	**IPS**	**ADF – Fisher**	**PP – Fisher**	**LLC**	**IPS**
I	57.9679	70.1571**	–1.21363	–1.45341*	170.067***	366.453***	–8.04502***	–8.9408***
S	62.0962*	64.0505**	–1.63352*	–1.66533**	145.500***	253.148***	–4.71103***	–7.6958***
ROL	444.621***	224.040***	–18.791***	–12.586***	440.253***	1064.20***	–9.39083***	–21.151***
TRO	54.6791	60.6829*	–1.61833*	–0.74830	182.511***	361.760***	–7.37885***	–9.7485***
I*ROL	155.400***	165.563***	–8.9074***	–7.3962***	272.67***	776.52***	–4.9532***	–14.446***
I* TRO	57.5795	57.5219	–1.65684*	–1.20791	184.727***	498.304***	–9.00506***	–9.7931***

Note: ***, **, * signify 1%, 5% and 10% significance levels, respectively.

Source: authors' calculations.

Table 4. Panel cointegration tests results

Test	Null hypothesis		Name of the statistic		The values
Pedroni residual cointegration test	no cointegration	within dimension	panel ADF-statistic (0.0000)		–5.079369 0.0000
			panel PP-statistic (0.0041)		–2.642071 0.0000
		group dimension	group ADF-statistic (0.0000)		–5.101673 0.0000
			group PP-statistic (0.0000)		–5.35388 0.0000
Kao residual cointegration test	no cointegration		panel ADF-statistic 0.0000		–6.346513 (*t*-Statistic) 0.0000
Johansen-Fisher panel cointegration test	hypothesized	trace test	*p*-value	maximum eigenvalue test	*p*-value
	none	594.3	0.0000	525.8	0.0000
	at most 1	223.9	0.0000	149.2	0.0000
	at most 2	107	0.0000	77.18	0.0027
	at most 3	54.41	0.1850	29.42	0.9728

Source: authors' calculations.

statistically significant effect on level of investment but is significant in the panel quantile regression. Moving on to the interactive effect of investment on trade openness ($I \times$ TRO) in the long run the findings indicate that this variable is significant (1%) and improves the given level of investments. The legal protection system for the whole provided for the investors did not impact on the level of capital mobility.

In the models of Q1, Q2, Q3 pseudo-R squared in the quantile's regressions of 0.5936, 0.6825, and 0.7688 respectively are adequate (Table 5). The results of *F*-statistics are significant by rejecting equality of the estimated coefficients for the three quantiles (q.25, q.50, and q75). Moreover, the results show that the FTA members with a better ROL and higher trade openness can influence capital mobility within the region. On the contrary a dummy variable of DALL does not have significant effect across quantiles (q.25, q.50, and q.75).

The results presented in Table 6 for the CEFTA region reveal that the saving retention coefficients in the case of FMOLS and DOLS estimators are statistically insignificant with values of 0.05 and 0.08 respectively. Estimated dummy variable of CEFTA and trade openness are significant at 1% indicating that the current level of trade openness and country's affiliation with CEFTA incre-

Table 5. Whole sample – results for long run analysis and quantile regression estimates

Variables	Long run analysis		Panel quantile regression		
	FMOLS	DOLS	Q1 Regress	Q2 Regress	Q3 Regress
S	0.294895	0.292205	0.0246534	–0.0097317	0.0002501
	0.033843)***	(0.034069)***	(0.0146464)*	(0.0049331)**	(–0.003206)
DALL	4.701773	4.315180	0.4733129	0.1018105	0.0481084
	0.889482)***	(0.889448)***	(–0.3813246)	(–0.1088265)	(–0.0967001)
ROL	2.704918	2.837177	8.259125	7.205589	7.872.612
	(3.372560)	(3.335086)	(2.838906)***	(2.175663)***	(2.334127)***
TRO	0.084237	0.087171	–0.152853	–0.2211035	–0.2376273
	(0.033478)**	(0.033761)**	(0.0207234)***	(0.0155172)***	(0.0150562)***
I × ROL	–0.119643	–0.120895	–0.387814	–0.3230305	–0.3428673
	(0.152331)	(0.151094)	(0.1393505)***	(0.1003833)***	(0.1010295)***
I × TRO	0.004842	0.004958	0.0069799	0.0093848	0.0100619
	(0.001306)***	(0.001324)***	(0.0009104)***	(0.000626)***	(0.0006205)***
Observations	483	483	483	483	483
Pseudo R^2	–		0.5936	0.6825	0.7688

Note: ***, **, * signify 1%, 5% and 10% significance levels, respectively. Test for equality of Q1, Q2 and Q3 estimated coefficients: *I* × ROL – *F*-statistics = 0.27; *I* × EO – *F*-statistics = 14.37***; in the brackets are standards errors.

Source: authors' calculations.

ases investment. The variable of savings is shown as statistically insignificant in the long run and across the quantiles. Moreover the variables of $I \times$ ROL and $I \times$ TRO are statistically significant at 1% and have different effects on *I*. More precisely the interactive effect between investment and rule of law has an inverse relationship with *I*. The interactive effect between investment and trade openness has a positive effect on the level of investment. Moving onto quantile regression results in model Q1 variables are significant at 1%, except for variable of S which is insignificant.

In the low quantile regression, the dummy variable of CEFTA, ROL, $I \times$ ROL and $I \times$ EO have a significant positive correlation with a given level of investments. In the middle and upper quantiles the dummy variable of CEFTA is not shown as statistically significant. As the quantile increases the positive correlation of the interactive effect of investment and trade openness to level of investment has strengthened. The variables interaction of investment and rule of law and trade openness have an inverse relationship with investment level. It means when investments are low there is no significant sign of

Table 6. CEFTA – results for long run analysis and quantile regression estimates

Variables	Long run analysis		Panel quantile regression		
	FMOLS	DOLS	Q1 Regress	Q2 Regress	Q3 Regress
S	0.049319	0.086562	–0.0132286	0.0038773	97945
	(0.082202	(0.084970)	(–0.020174)	(–0.008381)	(–0.0084051)
DCEFTA	3.338500	2.895589	1.428416	0.9419655	0.083378
	(1.044133)***	(1.055864)***	(0.511297)***	(–0.629475)	(–0.1599487)
ROL	1.347629	2.173026	20.74062	2.372.839	1.439.134
	(2.799475)	(2.711077)	(2.41182)***	(3.859715)***	(1.223829)***
TRO	0.058880	0.066507	–0.0975525	–0.1324982	–0.201596
	(0.024943)**	(0.025797)**	(0.0257582)***	(0.0331056)***	(0.0110065)***
I × ROL	–0.734517	–0.624539	–0.9972873	–1.036915	–0.6179306
	(0.117947)***	(0.117771)***	(0.0658559)***	(0.1665304)***	(0.0517424)***
I × TRO	0.004822	0.005013	0.0058564	0.0065575	0.0088124
	(0.000936)***	(0.000979)***	(0.00072)***	(0.000787)***	(0.000275)***
Observations	147	147	147	147	147
Pseudo R^2	–	–	0.7333	0.764	0.8054

Note: ***, **, * signify 1%, 5% and 10% significance levels, respectively. Test for equality of Q1, Q2 and Q3 estimated coefficients: *I* × ROL – *F*-statistics = 3.73; *I* × EO – *F*-statistics = 4.17***; in the brackets are standards errors.

Source: authors' calculations.

a relationship between investment interaction, rule of law, trade openness and the level of investments (Table 6).

Over the period between 2000 and 2020 for the CAFTA-DR region the saving retention coefficients were 0.51 for FMOLS and 0.50 for the DOLS model at 1% level. It is higher than for the whole sample indicating that half of domestic savings stays in the region where the level of capital mobility is moderate for the sample of CAFTA-DR countries (Table 7). The variable of ROL is shown to have an inverse relationship with investment. The interactive effect of investment on trade openness (*I* × TRO) and rule of law (*I* × ROL) in the long run have a positive association with the investment. Estimated post integration effect measured by country's affiliation with DCAFTA-DR is seen as statistically significant in the determination of investments. As expected in the case of the models: panel quantile regression of Q1, Q2, and Q3 a variable of savings is statistically significant at 10% and 5% and has a positive relationship with investments. Next a dummy variable of DCAFTA-DR is only statistically significant at 5% in a model of Q3 and has an inverse relationship with investment indicating that is it not constant across all three quantiles.

Table 7. CAFTA-DR – results for long run analysis and quantile regression estimates

Variables	Long run analysis		Panel quantile regression		
	FMOLS	DOLS	Q1 Regress	Q2 Regress	Q3 Regress
S	0.515018	0.500512	0.0425873	0.0494812	0.0309193
	(0.083870)***	(0.084970)**	(0.0233087)*	(0.020128)**	(0.0163936)*
DCAFTA-DR	4.471846	3.587975	–0.5131176	–0.4725462	–0.6984027
	(1.130571)***	(1.189604)***	(–0.3941724)	(–0.202846)	(0.3437636)**
ROL	–12.36142	–9.890712	9.357.295	2.887.319	–0.8069263
	(6.054177)**	6.432136)	(4.132765)**	(3.69832)**	(–2.001092)
TRO	0.020339	0.032876	–0.1867322	–0.1713857	0.0076081
	(0.061577)	(0.066124)	(0.0360501)***	(–0.1787828)	(–0.0959669)
I × ROL	0.619964	0.508499	–0.4865366	–0.2391571	–0.2723696
	(0.293884)**	0.310588	(0.2140351)**	(0.02377)***	(0.014340)***
I × TRO	0.007173	0.007167	0.0074999	0.0098938	0.0116064
	(0.002694)***	(0.002884)**	(0.0018121)***	(0.0012794)***	(0.0008796)***
Observations	105	105	105	105	105
Pseudo R^2	–	–	0.7114	0.7648	0.8049

Note: ***, **, * signify 1%, 5% and 10% significance levels, respectively. Test for equality of Q1, Q2 and Q3 estimated coefficients: *I* × ROL – *F*-statistics = 4.96; *I* × EO – *F*-statistics = 3.54***; in the brackets are standards errors.

Source: authors' calculations.

The next two interaction variables: *I* × ROL and *I* × TRO are shown as statistically significant at 1% and 5%. The relationship is inverse in the case of effect interaction between investment and rule of law on investment (*ROL) and positive in the case of *TRO. Pseudo-R-squared indicate that the models were estimated correctly across quantiles (q.25, q.50, and q.75).

The coefficient of interactive effect between investment and TRO is positive and higher for the lower quantile (0.0009104) than the upper quantile (0.0006205).

The saving retention coefficients at level of 0.18 (FMOLS) and 0.20 (DOLS) obtained for the EAEU trade bloc indicate high capital mobility in the region. The estimated coefficients show that a one-unit increase in savings will lead to 0.18 units increase in investment for FMOLS estimator and 0.2 units increase in investment for DOLS estimator. However, the current level of trade openness, rule of law and country's affiliation are not shown as statistically significant in determination of investments (Table 8).

Table 8. EAEU – results for long run analysis and quantile regression estimates

Variables	Long run analysis		Panel quantile regression		
	FMOLS	DOLS	Q1 Regress	Q2 Regress	Q3 Regress
S	0.187230	0.202474	–0.0006036	0.001628	–0.0172063
	(0.073856)**	(0.073021)***	(0.022761)	(0.0133307)	(0.0206903)
DEAEU	3.935183	3.942861	0.2208101	–0.328866	–0.5335434
	(2.818292)	(2.798093)	(0.5484321)	(0.469809	(0.6649705)
ROL	–13.67277	–1.136111	3.525.208	3.110.738	0.0564676
	(23.92898)	(23.27081)	(5.831258)	(6.038325)	(4.827666)
TRO	–0.066221	0.015926	–0.2110758	–0.243353	–0.3043739
	(0.201267)	(0.198457)	(0.068566)***	(0.0732398***	(0.0674097)***
I × ROL	0.376859	–0.112584	0.1489065	–0.0946831	444937
	(0.993861)	(0.971853)	(0.2662965)	(0.2600997)	(0.2160978)
I × TRO	0.009622	0.006193	0.0082277	0.0095711	0.0116592
	(0.008298)	(0.008202)	(0.0027205)***	(0.0027603)***	(0.0025434)***
Observations	105	105	105	105	105
Pseudo R^2	–	–	0.7385	0.751	0.7682

Note: ***, **, * signify 1%, 5% and 10% significance levels, respectively. Test for equality of Q1, Q2 and Q3 estimated coefficients: *I* × ROL – *F*-statistics = 0.32; *I* × EO – *F*-statistics = 0.3036***; in the brackets are standards errors.

Source: authors' calculations.

As shown in Table 9 the saving retention coefficients estimated for Pacific Alliance (PA) countries were 0.92 (FMOLS) and 0.86 (DOLS) indicating low capital mobility. In the long run the results indicate that the current level of rule of law in the region is statistically significant but trade openness insignificant in long run. In the panel quantile regression two variables of TRO and ROL have statistically significance but an inverse relationship with investments.

The regression results for the Pacific Alliance imply that investments depend on savings as well as the rule of law. Accession to the Pacific Alliance improved capital mobility as the relationship between the dummy variable and investments is positive but capital mobility still remins very low. This is in line with Kumar (2015) who studied effect of trade integration on capital mobility.

Moreover, Dumitrescu-Hurlin (2012) panel causality tests are employed to examine the directions of causal relationship among the variables for causality (Table 10). The null hypothesis related to existence of no causality between investment and saving is rejected for both directions at 1% level in the case of the whole sample and unidirectional causality in the CAFTA-DR region at 10% level, the EAEU region at 1% level and the Pacific Alliance region at 1%

Table 9. Pacific Alliance—results for long run analysis and quantile regression estimates

Variables	Long run analysis		Panel quantile regression		
	FMOLS	DOLS	Q1 Regress	Q2 Regress	Q3 Regress
S	0.929878	0.862338	424139	0.0382598	261172
	(0.137460)***	(0.144683)***	(–0.0463217)	(0.0155418)**	(0.0188886)
DPA	2.364638	2.383942	1909649	0.060186	0.1662889
	(1.079790)**	(1.123671)**	(–0.2924877)	(0.1130958)	(0.1402758)
ROL	–15.11215	–10.97406	6.518.015	5.858.636	4.100.585
	(7.072987)**	6.796278	(1.629981)***	(1.248575)***	1.248888***
TRO	–0.158058	–0.160420	–0.4446159	–0.4506119	–0.4133085
	(0.124786)	0.129851	(0.0343008)***	(0.0289297)***	(0.0304873)***
I × ROL	0.562835	0.388293	–0.2857091	–0.2597289	–0.1846442
	(0.314502)*	(0.303685)	(0.0694499)***	(0.0547198)***	(0.0548466)***
I × TRO	0.006555	0.007860	0.0193579	0.0197796	0.0184963
	(0.004765)	0.004924	(–0.0013576)	(0.0010559)***	(0.0011234)***
Observations	84	84	84	84	84
Pseudo R^2	–	–	0.8334	0.8378	0.8347

Note: ***, **, * signify 1%, 5% and 10% significance levels, respectively. Test for equality of Q1, Q2 and Q3 estimated coefficients: *I* × ROL – *F*-statistics = 2.88; *I* × EO – *F*-statistics = 1.83***; in the brackets are standards errors.

Source: authors' calculations.

level. This implies that there is significant relationship between investment and savings. No causality relationship between investment and savings was found for the CEFTA region. A unidirectional causality was found between country affiliation in FTAs and investment in the whole sample, in the CEFTA region and the CAFTA-DR region, but no causal relationship was found for the EAEU and the Pacific Alliance regions. Furthemore, changes in trade openess significantly result in variations in investments in all the considered regions except in the EAEU while the rule of law does cause investment.

4. Discussion

The results for capital mobility presented in this study show that there are some variations in the savings-investment relationship for the group that covers four trade blocs. Generally, the saving retention coefficient is positive as

Table 10. Results of Pairwise Dumitrescu-Hurlin panel causality tests

Null Hypothesis	Zbar-Stat	Effect	Null Hypothesis	Zbar-Stat	Effect
Whole sample			**CEFTA**		
S ⇒ I	1.83081*	Bidirectional causality	S ⇒ I	1.31388	No causality
I ⇒ S	2.12007**		I ⇒ S	–0.49985	
DALL ⇒ I	31.5979***	Unidirectional causality	DCEFTA ⇒ I	51.0099***	Unidirectional causality
I ⇒ DALL	–0.39639		I ⇒ DCEFTA	–0.78377	
ROL ⇒ I	–0.76084	Unidirectional causality	ROL ⇒ I	–1.04357	Unidirectional causality
I ⇒ ROL	12.6083***		I ⇒ ROL	8.29498***	
DALL ⇒ S	2.65874***	Unidirectional causality	DCEFTA ⇒ S	51.0099***	Unidirectional causality
S ⇒ DALL	–1.01226		S ⇒ DCEFTA	–0.78377	
TRO ⇒ I	3.23303***	Bidirectional causality	EO ⇒ I	2.28080**	Unidirectional causality
I ⇒ TRO	7.70626***		I ⇒ EO	0.21801	
ROL ⇒ S	1.06690	Unidirectional causality	ROL ⇒ S	8.77506***	Unidirectional causality
S ⇒ ROL	9.95233***		S ⇒ ROL	–1.04357	
TRO ⇒ S	1.35397	Unidirectional causality	EO ⇒ S	–0.46627	Unidirectional causality
S ⇒ TRO	7.24785***		S ⇒ EO	8.29498***	
CAFTA DR			**EAEU**		
S ⇒ I	–0.47111	Unidirectional causality	S ⇒ I	–0.08832	Unidirectional causality
I ⇒ S	1.69729*		I ⇒ S	2.83770***	
DCAFTADR ⇒ I	7.59659***	Unidirectional causality	DEAEU ⇒ I	–1.30746	No causality
I ⇒ DCAFTADR	0.76346		I ⇒ DEAEU	–0.15231	
ROL ⇒I	–0.81541	No causality	ROL ⇒ I	0.58647	Unidirectional causality
I ⇒ ROL	0.66241		I ⇒ ROL	6.60390***	
DCAFTADR ⇒ S	1.97480**	Unidirectional causality	DEAEU ⇒ S	–0.81639**	Unidirectional causality
S ⇒ DCAFTADR	–0.84099		S ⇒ DEAEU	–0.76357	
TRO ⇒ I	3.35534***	Unidirectional causality	EO ⇒ I	2.01345	Unidirectional causality
I ⇒ EO	1.12592		I ⇒ EO	1.63219***	
ROL ⇒ S	–1.07895	No causality	ROL ⇒ S	–0.81068**	Bidirectional causality
S ⇒ ROL	2.77811		S ⇒ ROL	14.6089***	
TRO ⇒ S	2.07062	No causality	EO ⇒ S	4.78656*	Unidirectional causality
S ⇒ TRO	3.58546		S ⇒ EO	1.66324	

Null Hypothesis	Zbar-Stat	Effect
PACIFIC ALLIANCE		
S ⇒ I	3.37399***	Unidirectional causality
I ⇒ S	0.32705	
DPA⇒ I	–0.29820	No causality
I ⇒ DPA	–0.75334	
ROL ⇒I	–0.02093	Unidirectional causality
I ⇒ ROL	10.3657***	
DPA ⇒ S	1.65857*	Unidirectional causality
S ⇒ DPA	–0.74949	
TRO ⇒ I	1.67955	Bidirectional causality
I ⇒ TRO	4.19142***	
ROL ⇒ S	1.84308*	Bidirectional causality
S ⇒ ROL	7.73833***	
TRO ⇒ S	1.00175	Unidirectional causality
S ⇒ TRO	9.59438***	

Note: ***, **, * signify 1%, 5% and 10% significance levels, respectively.

Source: authors' calculations.

expected. The null of zero slope coefficients is rejected in the CAFTA-DR, the Pacific Alliance and the EAEU member countries except in the CEFTA region due to the slow capital liberalization in the transition period that affected their exchange rate regimes and financial systems. In the EAEU countries capital is more mobile than in the rest of considered regions implying that the region depends on foreign capital. The high correlation between saving and investment and low capital mobility is observed in the Pacific Alliance region where a high percentage of domestic savings turned into domestic investments. The results obtained in DOLS estimator are similar those obtained by FMOLS estimator confirming robustness of results. For the whole sample the study finds that most investments are financed by foreign savings implying high capital mobility. In addition, the findings provide evidence supporting the effect of trade integration on the savings-investment link.

The high value of β coefficient for Pacific Alliance region shows that countries from that region have better economic development by generating more domestic savings for financing domestic investments. On the contrary some considered trade blocs such as: CEFTA, EAEU and CAFTA-DR still use more foreign than domestic savings for financing domestic investments. This can be

explained by the fact that these are underdeveloped economies with insufficient savings available for domestic investment. In the CEFTA trade bloc the results show that the countries of the region do not have enough savings to finance investments while the relationship between savings and investments is not unique. The low level of the national savings rate amongst CEFTA members is the result of low economic growth during the transition period and stagnant productivity. The region suffers from a history of economic and political instability that has had a negative impact on investment opportunities discouraging local savings. Furthermore, the study suggests that a country's affiliation with a trade bloc contributes to an increase in capital mobility. In the EAEU region, the study finds an increase in capital mobility after the country-'s affiliation while the role of trade openness and the legal protection system in an increase in capital mobility is very limited. For the sample of CAFTA-DR trade bloc the findings indicate increase of capital mobility after a country's affiliation with a trade bloc while a positive interactive effect of investment on trade openness and the rule of law is found. The regression results for the Pacific Alliance imply that a country's affiliation with the trade bloc slightly improved capital mobility which still remins very low in the region.

Except for the EAEU region the statistical significance of the value of the dummy variable shows that a country's affiliation with a FTAs leads to an increased level of investments in the considered trade blocs. It is in the line with the study done by Kumar (2015). In the case of the other control variables: openness and legal protection system the study finds limited significance implying that both variables can have some limited impact on the saving – investment link.

The obtained results remain comparable for some transition and developing countries except for Pacific Alliance countries. The findings of the study confirm previous researches done by Kumar (2015), Kumar et al. (2014) for the most developing countries where a country's affiliation with a FTAs improved capital mobility. Thus there is capital mobility for the whole sample, CAFTA-DR members and EAEU members while there is a little evidence of this for the Pacific Alliance. Unidirectional causality between a country's affiliation with a FTAs and investment indicates that this affiliation tends to encourage investments.

Conclusions

Based on four trading blocs—the Eurasian Economic Union (EAEU), Central American and Dominican Republic Free Trade Agreement (CAFTA-DR), Central European Free Trade Agreement (CEFTA), and the Pacific Alliance—the study

seeks to empirically determine whether a higher level of trade openness and the presence of better legal protection for investors enhances the impact of trade bloc membership on capital mobility. The 483 observations made between the years 2000 and 2020 make up the dataset used for the analysis. In the majority of these trading blocs, there is statistical support for the idea that trade integration has a favourable impact on the link between saving and investment. The degree of capital mobility within them varies somewhat, though. It shows that establishing regional integration does not result in an equivalent degree of capital mobility among participating nations. According to Hypothesis 1, the study's findings statistically support that a country's affiliation with a trade bloc improves capital mobility in the whole group and the EAEU region and low capital mobility in the Pacific Alliance region and moderate to low capital mobility in the CAFTA-DR region but not in the CEFTA region.

Referring to the testing of Hypothesis 2 the study reveals that higher trade openness enhances the impact of a country's affiliation with a trade bloc on capital mobility in interaction with investment only in the CEFTA and CAFTA-DR regions but not in the EAEU region and the Pacific Alliance. It might be concluded that high trade openness alone does not necessarily lead to better capital mobility for the trading blocs studied.

In the case of hypothesis H3 the study demonstrates that better legal protection of the investor enhances the impact of trade bloc membership on capital mobility in interaction with investment in most of trading blocs except in the EAEU. The legal protection system alone for the whole group the CEFTA and EAEU trade blocs does not improve the level of capital mobility unless its interaction with investment is included.

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