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The Saving–Investment Relationship Re-visited: Capital Mobility and Current Account Deficit Sustainability

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Abstract

The study examines the degree of current account deficit (CAD) sustainability and capital mobility for a panel of 97 countries over the period 1980–2020. To this end, the study adopts a novel interpretation of the Feldstein–Horioka coefficient in the context of CAD sustainability and examines the relationship between savings and investment using the Dynamic Common Correlated Effects Mean Group (DCCEMG) estimator. The findings reveal that all country groups exhibit "weakly" sustainable CADs. The estimates of the short-run coefficients reveal that short-run capital mobility is high in all country groups, whereas long-run capital mobility is relatively moderate or low. The rolling-window analysis shows that the 2007–2008 global financial crisis caused a significant drop in both capital mobility and CAD sustainability. In the post-crisis period, short-run capital mobility and CAD sustainability remained on a downward trend in most regions, whereas long-run capital mobility started slowly recovering. By providing a comprehensive regional analysis across six major world regions, this study contributes to the literature by shedding light on the evolving dynamics of international capital flows and regional variations in external balance sustainability.

Keywords: saving–investment relationship, capital mobility, current account sustainability, Feldstein–Horioka puzzle, DCCEMG

JEL: C30, F21, F32, F34, F40

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Introduction

Capital mobility and current account deficits (CAD) are critical macroeconomic issues that significantly impact policymaking, investment strategies, and financial stability. Investment, a key driver of economic growth, relies heavily on savings as its primary source of funding. In a closed economy, domestic investment relies solely on domestic savings, whereas in an open economy, it is financed by both domestic and international savings. The degree of capital mobility influences how easily countries can fund domestic investment and address external imbalances, shaping their ability to sustain consumption and implement effective fiscal and monetary policies (Dash 2019). High levels of capital mobility enable countries to tap into international savings to finance investment, mitigating concerns about crowding out private investment during periods of expansionary fiscal policy. Conversely, low capital mobility amplifies the risks associated with prolonged CADs, such as capital flight or currency crises (Pata 2018).

A key framework for assessing capital mobility is the saving–investment relationship introduced by Feldstein and Horioka (1980). Their empirical study of OECD countries found a surprisingly strong correlation between domestic savings and investment, contradicting the expectation that higher capital mobility would weaken this link. This paradox sparked extensive research into the implications of the saving–investment coefficient. More recent studies, including Yersh (2024), have reinterpreted this coefficient within the context of CAD sustainability, arguing that it serves as both a measure of solvency and an indicator of the sustainability of external imbalances. Building on this approach, this study employs a unified framework to assess both capital mobility and CAD sustainability, utilizing the Dynamic Common Correlated Effects Mean Group (DCCEMG) estimator (Chudik and Pesaran 2015). This methodology accounts for cross-sectional dependence and allows for heterogeneous short- and long-run dynamics across regions.

This study contributes to the literature in three ways. First, it utilizes Chudik and Pesaran's DCCEMG estimator, which produces consistent estimation results in the presence of cross-sectional dependence. This method also allows for heterogeneous short- and long-term dynamics across different cross-sections. Second, the study evaluates both CAD sustainability and the degree of capital mobility in diverse country samples grouped by region. Third, it conducts a sub-period analysis to trace how capital mobility and CAD sustainability have evolved over time.

The findings indicate that CADs are weakly sustainable in most regions, with high short-run capital mobility but moderate long-run mobility in developed economies and lower mobility in less developed ones. The 2007–2008 global financial crisis significantly disrupted both capital mobility and CAD sustainability. Long-run mobility showed gradual recovery post-crisis, while short-run mobility and CAD sustainability remained on a declining trend in many regions.

The remainder of this study is organized as follows. A brief overview of related literature is presented in Section 2. Section 3 lays out the econometric methodology, while Section 4 describes the data. The results, including sub-period analysis and policy implications, are summarized in Section 5. The final section concludes the study.

Literature review

Feldstein and Horioka (1980) introduced the idea that the saving–investment relationship reflects capital mobility, hypothesizing that with high capital mobility, domestic savings and investment should be unrelated, as international savings would fill any gap. They tested this by regressing the ratios of gross domestic capital formation to GDP on the ratios of gross domestic savings to GDP for 16 OECD countries. The coefficient on savings was interpreted as the share of domestic savings financing domestic investment. A coefficient close to zero would indicate perfect capital mobility, while a coefficient near one would suggest limited mobility. Contrary to expectations, the results showed a strong saving–investment correlation, indicating low capital mobility.

This finding, dubbed "the mother of all puzzles" (Obstfeld and Rogoff 2000), sparked extensive debate and generated a large body of literature. The prevailing explanation, based on the intertemporal current account approach, views the saving–investment relationship as reflecting the solvency condition rather than capital mobility. Scholars argue that the current account, defined as the difference between savings and investment, must be stationary in the long run to prevent debt accumulation. This implies that savings and investment should form a cointegrating vector, with coefficients close to (1; –1) (Coakley, Kulasi, and Smith 1996). Numerous studies provide evidence of the binding solvency condition (Nasiru and Haruna 2013; Drakos et al. 2017; Murthy and Ketenci 2020a), though some authors continue to interpret deviations from unity as evidence of long-run capital mobility (Drakos, Kouretas, and Vlamis 2018; Kaur and Sarin 2018; Pata 2018; Tursoy and Faisal 2019; Murthy and Ketenci 2020b; Patra and Mohanty 2020; Camarero, Muñoz, and Tamarit 2021; Yilanci and Kilci 2021). This study avoids the ambiguous interpretation of the saving–investment coefficient by focusing on CAD sustainability as proposed by Yersh (2024).

Taylor (2002) argued that a sustainable current account is a stationary process, meaning that a country can satisfy its solvency constraint in the long run without drastic policy intervention. Conversely, a non-stationary current account implies that the CAD is unsustainable and, consequently, a country runs a risk of defaulting on its international borrowing. CAD sustainability analyses typically rely on unit root testing or cointegration analysis of exports and imports. However, unit root tests are often criticized for their inconclusive results, while cointegration tests fail to fully account for current account dynamics (Dash 2020).

In a recent study, Dash (2020) pointed out that the main limitation of existing approaches for studying CAD sustainability is their inability to account for current account dynamics. He overcomes this limitation by estimating an error-correction model that allows for studying short- and long-run dynamics of the current account along with its speed of convergence to the long-run equilibrium. For this purpose, the study applies the Pooled Mean Group (PMG) estimator introduced by Pesaran, Shin, and Smith (1999). The findings revealed that while exports and imports are non-stationary, they are cointegrated, indicating that CADs are weakly sustainable across the analyzed panels of countries. However, the study's primary drawback is the PMG estimator's reduced estimation power when the residuals are characterized by cross-sectional dependence.

Yersh (2024) overcame this limitation by adopting the DCCEMG estimator, which accounts for cross-sectional dependence and captures heterogeneous dynamics. Similar to Yersh's (2024) study, this paper utilizes the DCCEMG estimator to analyze CAD sustainability across various regions, focusing on both short- and long-run capital mobility, as well as the degree of CAD sustainability.

Research methodology

Background and methodological approach

According to Husted (1992), the intertemporal budget constraint for a given country is represented by the following equation:

$$X_t = \alpha_0 + \alpha_1 M_t + \varepsilon_t, \tag{1}$$

where X_t and M_t are exports and imports, respectively. Under the null hypothesis, the intertemporal budget constraint is satisfied. Therefore, α_1 should be equal to 1 ($\alpha_1 = 1$), and ε_t should be a stationary process. Alternatively, X_t and M_t should be non-stationary and cointegrated, forming a cointegrating vector of (1, –1).

Following Dash (2017) and Yersh (2022; 2024), this study employs an alternative definition of the intertemporal budget constraint based on the saving–investment relationship. Similar to the conventional model, the economy satisfies its intertemporal budget constraint when β_1 is equal to 1, and the error term is a stationary process. Alternatively, (I / Y) and (S / Y) should be non-stationary processes and form a cointegrating vector of (1, –1).

Most studies on CAD sustainability use Dynamic OLS (DOLS) or Fully Modified OLS (FMOLS) estimators (e.g., Wu, Chen, and Lee 2001), but these fail to capture short- and long-term dynamics or convergence rates. Dash (2020) addresses this by using an error-correction model with the PMG estimator. However, as previously mentioned, the PMG estimator has a significant limitation in that it performs poorly when residuals are cross-sectionally dependent. Therefore, this study employs the DCCEMG estimator, which offers several advantages over these estimators. First, it explicitly accounts for unobserved common factors, providing consistent estimates even in the presence of cross-sectional dependence. Second, the DCCEMG estimator captures both short-run and long-run relationships while allowing for complete parameter heterogeneity across countries. This is particularly relevant given the heterogeneous nature of the regional sub-samples.

The DCCEMG estimator relies on several key assumptions. First, the estimator assumes that cross-sectional dependence arises through unobserved common factors, which can be approximated using cross-sectional averages of the dependent and independent variables, given that the asymptotic properties are met. Second, the method also requires that individual time series are integrated of order one, that a cointegrating relationship exists between saving and investment, and that the error-correction term is stationary. Third, the approach assumes weak exogeneity of regressors, meaning they may be correlated with current-period innovations but not with future ones.

Estimation model

Following Pesaran (2006), the relationship between national investment and saving is modeled as:

$$\left(I/Y\right)_{it} = \beta_{0i} + \beta_{1i}\left(S/Y\right)_{it} + u_{it}, \tag{2}$$

$$u_{it} = \gamma_i^{'} \boldsymbol{f}_t + \varepsilon_{it}, \tag{3}$$

where $\boldsymbol{f}_t$ are the unobserved common factors and $\gamma_i^{'}$ are the heterogenous factor loadings. Cross-sectional dependence may arise if these factors correlate with the explanatory variable. To address this, Pesaran (2006) suggests approximating unobserved factors using the cross-sectional means of the explained and explanatory variables and incorporating them into the model.

After augmenting equation 2 with the cross-sectional means of saving ($\overline{S/Y_t}$) and investment ($\overline{I/Y_t}$), the following error-correction model is constructed to evaluate the short- and long-run dynamics simultaneously:

$$\Delta\left(\frac{I}{Y}\right)_{it} = \lambda_i((I/Y)_{i,t-1} - \beta_{0i} - \beta_{1i}\left(S/Y)_{i,t-1} - \sum_{I=0}^{p_T}\gamma_{i,I}^{LR}\overline{Z}_{t-I}\right) + \delta_i\Delta(S/Y)_i + \sum_{I=0}^{p_T}\gamma_{i,I}^{SR}\overline{Z}_{t-I} + \varepsilon_{it}, \tag{4}$$

where λ_i is the speed of convergence of the current account to the long-run equilibrium or the indicator of long-run capital mobility, β_{1i} is the measure of current account sustainability, and δ_i is the measure of short-run capital mobility. $\overline{Z}_t$ includes the cross-sectional averages of domestic saving as a share of GDP, ($\overline{S/Y_t}$), and domestic investment as a share of GDP, ($\overline{I/Y_t}$). The lagged dependent variable is not strictly exogenous and, thus, correlated with the residuals. Consequently, the model estimates are no longer consistent. However, as noted by Chudik and Pesaran (2015), consistency of the estimates can be achieved when the number of lags for the cross-sectional averages is set according to the equation: $p_I = \sqrt[3]{T}$.

The convergence parameter λ_i indicates the degree of capital mobility in the long run. If the degree of capital mobility is perfect, the imbalance of the current account or the difference between saving and investment should persist for a longer period without immediately reversing to its long-run value of zero; in other words, the coefficient λ_i should be close to zero. If capital mobility is low, the current account will quickly revert to its long-run value of zero; in other words, the coefficient λ_i should be equal or close to minus one.

The degree of CAD sustainability is measured by β_{1i}. If β_{1i} is estimated to be equal to one, then the saving and investment series are cointegrated with a vector of (1, –1). In this case, it can be concluded that the current account is a stationary process, oscillating around its long-run value of either β_{0i} (if β_{0i} is statistically different from zero) or zero (if β_{0i} is not statistically different from zero). In both cases, the economy satisfies its intertemporal budget constraint, and the CAD is strongly sustainable.

If β_{1i} is estimated to be different from one, then the saving and investment series form a cointegrating vector of $(1, -\beta_{1i})$. Consequently, it can be concluded that the current account is a non-stationary process, meaning the country is unable to meet its solvency constraint, and the CAD is weakly sustainable. The closer β_{1i} is to zero, the more weakly sustainable the CAD is. If β_{1i} is found to be equal to zero, it can be concluded that the CAD is strongly unsustainable.

The coefficient δ_i measures short-run capital mobility and represents adjustments to various short-run shocks in the economy. A coefficient near zero indicates high short-run mobility, while values closer to one suggest low short-run mobility.

Data

The data set consists of 97 countries spanning the period 1980–2020. The data on both gross domestic saving as a percentage of GDP (S/Y) and gross capital formation as a percentage of GDP (I/Y) come from the World Bank's World Development Indicator database. For ease of reading, this study will address gross domestic saving as a percentage of GDP as "saving" and gross capital formation as a percentage of GDP as "investment".

Following the World Bank classification, the data set is split into sub-samples based on countries' regions. The list of regions, along with the countries included in each region, is summarized in Table 1. While the classification is geographic, the use of these groupings also had an economic rationale. Countries within each region often share similar institutional structures, trade linkages, exposure to common shocks, and common policy challenges. Regional groupings also reflect stronger spillovers and contagion effects, as seen during the 2007–2008 financial crisis.

Table 1. Regions' description

Region	Countries
East Asia and Pacific (EAP)	Australia, China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, Mongolia, New Zealand, Philippines, Singapore, Thailand, Vietnam. *Number of countries = 13.*
Europe and Central Asia (ECA)	Albania, Austria, Belgium, Bulgaria, Cyprus, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Turkey, United Kingdom. *Number of countries = 22.*
Latin America and Caribbean (LAC)	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay. *Number of countries = 19.*
Middle East and North Africa (MENA)	Algeria, Bahrain, Egypt, Israel, Jordan, Kuwait, Malta, Morocco, Oman, Saudi Arabia, Tunisia. *Number of countries = 11.*
South Asia (SA)	Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka. *Number of countries = 6.*

Region	Countries
Sub-Saharan Africa (SSA)	Angola, Benin, Botswana, Burkina Faso, Cameroon, Comoros, Democratic Republic of the Congo, Eswatini, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Madagascar, Mali, Mauritania, Niger, Nigeria, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Uganda. *Number of countries = 26.*

Source: World Bank, World Development Indicators 2022a; 2022b.

The statistical properties of saving, investment, and CAD for each group are presented in Appendix A. The Middle East and North Africa (MENA), together with East Asia and the Pacific (EAP), show the highest current account surpluses of 1.32% and 0.86% of GDP, respectively, whereas Sub-Saharan Africa (SSA), along with Latin America and the Caribbean (LAC), shows the highest CADs of 6.48% and 4.01% of GDP, respectively. Additionally, the cross-sectional averages have been plotted against time and are shown in Figure 1. LAC, along with SSA, exhibit persistent CADs, whereas EAP have been experiencing a persistent current account surplus since 1997. Saving and investment in the other three regions move in tandem with each other, and the current account is characterized by short periods of surplus followed by short periods of deficit and vice versus.

Figure 1. Average gross domestic saving and investment, as a percentage of GDP

Source: own calculations, World Bank, World Development Indicators 2022a; 2022b.

Results

Diagnostic tests

Before proceeding to panel estimation, the saving and investment series are checked for the presence of cross-sectional dependence and unit roots. To this end, the study estimates the cross-sectional dependence (CD) statistic developed by Pesaran (2014) for the former and Pesaran's (2007) Cross-sectionally augmented Im-Pesaran-Shin (CIPS) test for the latter. The results are presented in Table 2. The CD statistic strongly rejects the null hypothesis of weakly cross-sectionally dependent residuals in all the analyzed country groups. Since cross-sectional dependence has been detected, this study employs the CIPS unit root test, which produces unbiased and consistent results in the presence of cross-sectionally dependent error terms. While the results reveal that both saving and investment series are non-stationary in levels, they become stationary in first differences.

Table 2. Diagnostic test results

	S/Y	I/Y	$\Delta S/Y$	$\Delta I/Y$
Europe and Central Asia				
CD-statistic	8.78***	2.91***	4.53***	4.81***
$CIPS_{\mu}$	– 2.41**	– 2.32**	– 2.86***	– 2.86***
$CIPS_{\mu,t}$	– 2.50	– 2.25	– 2.87**	– 2.91**
East Asia and Pacific				
CD-statistic	6.39***	19.88***	15.36***	28.01***
$CIPS_{\mu}$	– 1.46	– 1.69	– 2.63***	– 3.04***
$CIPS_{\mu,t}$	– 1.78	– 2.19	– 2.68***	– 3.05***
Latin America and Caribbean				
CD-statistic	7.38***	11.78***	2.29**	15.92***
$CIPS_{\mu}$	– 2.56***	– 2.44***	– 3.13***	– 3.17***
$CIPS_{\mu,t}$	– 2.55	– 2.35	– 3.17***	– 3.14***
Middle East and North Africa				
CD-statistic	3.42***	7.38***	4.56***	2.12**
$CIPS_{\mu}$	– 1.85	– 1.72	– 3.35***	– 3.67***
$CIPS_{\mu,t}$	– 2.49	– 2.36	– 3.31***	– 3.68***
South Asia				
CD-statistic	4.75***	4.42***	0.27	0.96
$CIPS_{\mu}$	– 2.01	– 2.92***	– 2.45**	– 2.78***
$CIPS_{\mu,t}$	– 1.58	– 2.81*	– 2.86**	– 2.74*
Sub-Saharan Africa				
CD-statistic	4.96***	6.61***	0.39	2.27**
$CIPS_{\mu}$	– 2.04	– 2.20**	– 3.18***	– 3.37***
$CIPS_{\mu,t}$	– 2.44	2.37	– 3.31***	– 3.48***

*, ** and *** denote 10%, 5% and 1% significance levels, respectively. Pesaran's (2014) CD test null hypothesis assumes weak cross-sectional dependence. $CIPS_{\mu}$ tests for a unit root with an intercept while $CIPS_{\mu,t}$ includes a trend. Lag length is set at $T^{1/3} \approx 3$.

Source: own calculations.

Since saving and investment are found to be non-stationary, the next step is to check for cointegration. To this end, this study estimates Westerlund's (2007) four panel cointegration tests, which are found to produce consistent estimation results in the presence of cross-sectional dependence. The results are summarized in Table 3. The results indicate that the null hypothesis of no cointegration is strongly rejected in all the sub-samples. Thus, it can be concluded that there exists a long-run relationship between domestic saving and investment. In other words, the cointegration test results indicate that the current account is sustainable in the analyzed panels of countries.

Table 3. Westerlund's panel cointegration tests results

	Panel statistic		*Group-mean statistic*	
	P_τ-Statistic	P_α-Statistic	G_τ-Statistic	G_α-Statistic
Europe and Central Asia	– 7.79	– 10.24	– 2.69*	– 12.27*
East Asia and Pacific	– 10.49	– 9.55*	– 2.08*	– 9.94*
Latin America and Caribbean	– 14.73***	– 17.49***	– 3.43***	– 17.65***
Middle East and North Africa	– 9.68**	– 13.63**	– 2.84**	– 13.82**
South Asia	– 7.61	– 18.06***	– 2.81*	– 12.85
Sub-Saharan Africa	– 13.58**	– 11.92**	– 2.94***	– 14.23***

*, ** and *** denote 10%, 5% and 1% significance levels, respectively. Each test equation includes an individual intercept and trend.

Source: own calculations.

Panel estimation results

The DCCEMG panel estimation results for the analyzed groups of countries are presented in Table 4. The long-run coefficients are statistically significant and lie between 0.35 and 0.57, implying weakly sustainable CADs in the analyzed regions. Additionally, the Wald statistic has been estimated to check whether the long-run coefficients are statistically different from one. The estimates confirm the presence of a weakly sustainable CAD in four regions: Latin America and the Caribbean (LAC), Middle East and North Africa (MENA), Sub-Saharan Africa (SSA), and South Asia (SA). The results for LAC confirm the previous findings of Dash (2020) and Yersh (2024), who found a weakly sustainable CAD in the panels of Latin American and Caribbean countries. The findings for MENA are in line with the results of Bousnina, Redzepagic, and Gabsi (2021), who examined 12 countries from the MENA region using the DOLS approach. The authors obtained a long-run coefficient different from one, which they interpreted as weakly sustainable current balances. The results of this study also confirm the previous findings of a weakly sustainable CAD in the Sub-Saharan African region obtained by Dash (2020). However, for Europe and Central Asia (ECA) and East Asia and the Pacific (EAP), the Wald statistic fails to reject a unit coefficient, suggesting strongly sustainable CADs. There is a notable inconsistency between the long-run estimates and Wald statistic results in the ECA and EAP regions. For clarification purposes, individual coefficients have been estimated and reported in Appendix B. In both regions, the majority of long-run estimates are relatively low and lie below or close to the MG results. Only a few countries reveal a relatively high long-run coefficient, implying a strongly sustainable CAD. Therefore, one can conclude that in both regions, CADs are weakly sustainable, with a few exceptions among individual countries.

Table 4. DCCEMG panel estimation results

	Long-run coef. (β_1)		Short-run coef. (δ)		EC term (λ)		Intercept (β_0)	
	Value	*S.E.*	*Value*	*S.E.*	*Value*	*S.E.*	*Value*	*S.E.*
ECA	0.43***	0.18	0.20***	0.05	– 0.28***	0.04	0.12	0.15
	(*WD* = 2.14)							
EAP	0.57**	0.25	0.08	0.12	– 0.32***	0.04	0.0	0.17
	(*WD* = 2.95*)							
LAC	0.35***	0.09	0.18***	0.07	– 0.46***	0.03	– 0.04	0.08
	(*WD* = 47.26***)							
MENA	0.40***	0.09	0.06	0.08	– 0.34***	0.06	0.07	0.11
	(*WD* = 44.93***)							
SA	0.39**	0.15	0.38**	0.18	– 0.38***	0.08	0.04	0.06
	(*WD* = 43.87***)							
SSA	0.45***	0.13	0.26***	0.05	– 0.41***	0.03	0.03	0.10
	(*WD* = 18.27***)							

*, ** and *** denote 10%, 5% and 1% significance levels, respectively. WD stands for the Wald statistic, which checks the following null hypothesis: β_1=1.

Source: own calculations.

While all regions exhibit weak sustainability, the underlying reasons for this are different. Developing and middle-income regions (LAC, MENA, SSA, and SA) face structural challenges stemming from limited export diversification, dependence on volatile commodity prices, and underdeveloped domestic financial markets (Mania and Rieber 2019; Zarach and Parteka 2023; Andreev et al. 2024). In contrast, the mixed results for developed economy regions (ECA and EAP) reflect heterogeneity within these groups. While some countries achieve strong sustainability through export competitiveness and financial market depth, others face cyclical imbalances.

Table 4 also summarizes the estimates of the short-run coefficients, which measure the degree of capital mobility in the short run. The coefficients reveal distinct regional patterns driven by different economic structures and institutional frameworks. At one extreme, EAP and MENA demonstrate perfect short-run capital mobility (coefficients statistically insignificant), though for different reasons. EAP's perfect short-run mobility reflects the region's status as a global manufacturing hub, which comprises complex production networks requiring flexible, short-term financing along with the region's developed financial markets, which enable rapid capital reallocation in response to global demand shocks (Huang and Guo 2006). In the case of MENA, perfect short-run mobility is likely driven by oil revenue volatility, which induces large and sudden capital flow reversals, as well as political and economic instability that triggers episodes of rapid capital flight. Alzoubi and Kasasbeh (2021) similarly report high capital flows in MENA, attributing their findings to the region's persistent economic and political volatility.

In contrast, ECA, LAC, and SSA exhibit similar short-run coefficients (0.20, 0.18, and 0.26, respectively), yet the underlying drivers are different. ECA's relatively high mobility reflects the region's advanced financial market infrastructure and institutional frameworks, particularly the benefits of EU integration, which have eliminated barriers to capital flows and strengthened investor confidence (Camarero, Muñoz, and Tamarit 2023). LAC's short-run result likely stems from the region's financial market integration, constrained by higher sovereign risk premiums and periodic sudden stops in capital flows (Gomez-Gonzalez, Valencia, and Sánchez 2021). This finding is in line with the results of Murthy and Ketenci (2020a), who analyzed the degree of capital mobility in 20 Latin American and Caribbean countries using the DCCEMG estimator. SSA's high degree of short-run capital mobility is comparable with the results of Murthy and Ketenci (2020b), who also found a reasonable degree of short-run capital mobility in 27 African countries. However, our finding should be interpreted with caution as it might primarily reflect commodity price fluctuations and foreign aid inflows rather than sustained financial integration (Ilorah 2008; International Monetary Fund 2018). Finally, South Asia stands apart with a moderate level of short-run mobility (0.38), reflecting the region's persistent financial market constraints relative to other emerging market regions.

Table 4 also presents the values of the error-correction terms, which reflect the extent of long-run capital mobility. All the estimated coefficients are negative and statistically significant. The error-correction terms of −0.28 and −0.32 indicate that 28% and 32% of the disequilibrium are corrected within the first year in ECA and EAP countries, respectively. Interestingly, the relatively slower speed of adjustment implies higher long-run capital mobility. This reflects the ability of these economies to sustain external imbalances over extended periods, supported by access to deep and liquid international capital markets. In the MENA and SA regions, 34% and 38% of the disequilibrium are adjusted during the first period, respectively. The adjustment coefficients of −0.41 and −0.46 indicate that almost 50% of the disequilibrium is resolved within the first year in the SSA and LAC regions. The faster adjustment in these regions reflects lower long-run capital mobility due to financial market constraints that force quicker current account corrections when external imbalances become unsustainable. The estimates indicate that the longest adjustment process is in ECA and EAP countries, whereas the shortest correction period is found in the SSA and LAC regions. The results imply that the former two regions exhibit the highest degree of long-run capital mobility. This finding aligns with economic theory as these regions, comprising mostly developed economies, are characterized by lower capital constraints, better integrated financial markets, stronger institutional frameworks, and higher investor confidence (Younas and Chakraborty 2011; Ketenci 2013; Dash 2019).

The panel error-correction model has also been re-estimated using alternative approaches: Mean Group (MG), Pooled Mean Group (PMG), and Dynamic Fixed Effects (DFE) estimators. The results are presented in Appendix C. Given the results in Tables 4 and 7, it can be concluded that the coefficients estimated with the alternative approaches are generally higher than the coefficients obtained with the DCCEMG estimator. However, the former results should be treated with caution since the alternative approaches are not able to properly account for cross-sectional dependence. Table 8 summarizes the estimates of the CD test applied to the residuals of the four models estimated with the DCCEMG and three alternative approaches. The results indicate that none of the alternative approaches can account for cross-sectional dependence. On the other hand, the CD-statistic results for the DCCEMG model imply that the originally chosen estimator is able to account for cross-sectional dependence. Thus, the results further confirm the choice of the DCCEMG estimator over the traditional estimators.

Rolling-windows analysis

A rolling-window analysis was conducted to examine how both capital mobility and CAD sustainability have evolved over the analyzed period. Figure 2 presents DCCEMG panel estimation results with 30-year rolling windows. Both short- and long-run capital mobility follow a similar trend in the analyzed regions. Capital mobility decreases or remains relatively low in the 1980s, which is later followed by a steady increase in the 1990–2000s. This evolution reflects the era of financial globalization, which was characterized by capital account liberalization, financial innovation, and the development of new instruments that enabled better risk distribution (Quinn 2003). Both short- and long-run capital mobility reached their peaks prior to the financial crisis of 2007–2008. Moreover, regions comprising mostly developed economies (ECA and EAP) performed relatively better than the rest of the regions. This finding reflects their deeper financial markets, stronger institutional frameworks, and better integration into global financial networks (Nasreen et al. 2020; Nasreen, Mbarek, and Atiq-ur-Rehman 2020).

The results are in line with the stylized facts formulated by Lane and Milesi-Ferretti (2007) and Milesi-Ferretti and Telli (2011), who examined the evolution of financial globalization for 145 economies over the period 1970–2004. They found that starting from the 1990s, there was a rapid increase in the scale of gross asset trade with a noticeable acceleration in the speed of financial deepening in the 2000s. Lane and Milesi-Ferretti (2007) further showed that developed economies experienced greater capital mobility intensity than developing economies. Drakos et al. (2017) and Khan (2017) arrived at a similar conclusion about the evolution of capital mobility over time. They found that the saving-retention coefficient declined prior to the crisis of 2007–2008, signaling an increase in the degree of capital mobility.

The rolling-window results for short-run coefficients and error-correction terms show a significant decrease in both short- and long-run capital mobility between 2008 and 2009. The decrease in capital flows can be attributed to the reduction in the proportion of assets invested abroad and a retrenchment towards domestic assets (Lane and Milesi-Ferretti 2018). In the post-crisis period, short-run capital mobility continued to decrease in all regions. The explanation for a continuous drop in capital flows lies in the increased risk aversion, which resulted in a stronger home bias and more capital controls (Lane and Milesi-Ferretti 2018). Similar findings by But and Morley (2017) and Duran and Ferreira-Lopes (2022) linked decreased short-run capital mobility with rising home bias in investor portfolios.

In contrast, the estimates of the error-correction term suggest that long-run capital mobility had started recovering by the end of the analyzed period, except for MENA and SA. These findings could reflect the effects of policy responses taken by domestic and international entities, including currency swaps between central banks, the use of foreign exchange reserves, and loans from multilateral organizations (Milesi-Ferretti and Telli 2011).

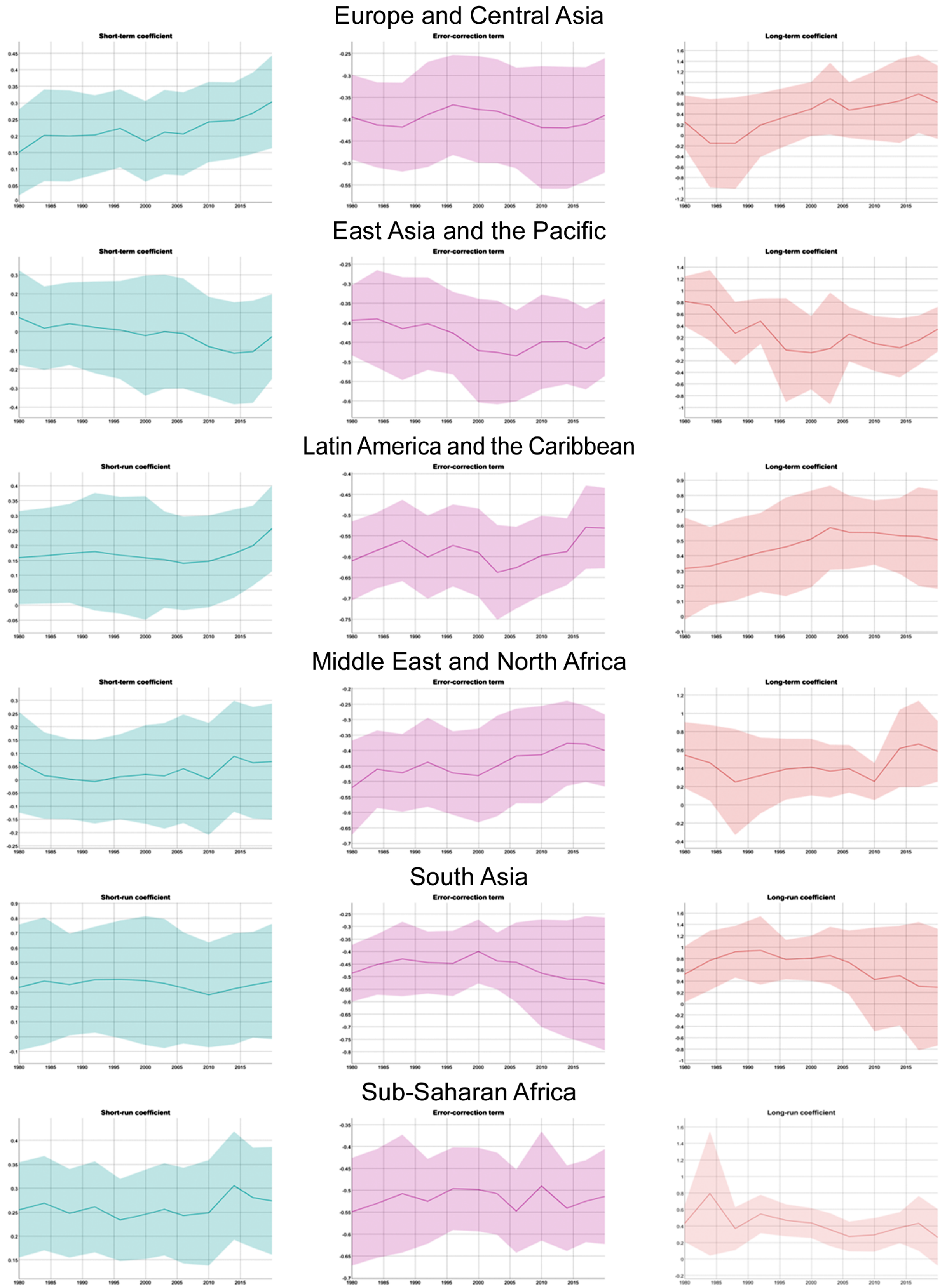

Figure 2. Rolling-window analysis

Source: own calculations.

The degree of CAD sustainability follows a similar trend to that of capital mobility. Prior to the financial crisis of 2007–2008, CAD sustainability steadily increased in all regions, reaching a peak in 2007–2008. Post-crisis, all country groups experienced a significant decrease in CAD sustainability, which was later followed by a moderate improvement in the long-run coefficient (ECA and EAP) or a continuous decline in CAD sustainability (LAC, MENA, SA, and SSA). This divergence could reflect the fact that advanced regions (ECA and EAP) have stronger institutional frameworks and diversified economies while developing regions face persistent constraints from limited export diversification, institutional weaknesses, and continued dependence on volatile external financing sources.

Policy implications

The prevalence of weak CAD sustainability across most regions, combined with varying capital mobility patterns, constrains macroeconomic policy space. Weak sustainability constrains policy space by limiting fiscal policy flexibility, as additional government borrowing could push external imbalances beyond sustainable levels, particularly in high-deficit regions like Sub-Saharan Africa and Latin America and the Caribbean (Reinhart and Rogoff 2010). It also forces central banks to balance domestic objectives with external stability concerns (Rey 2015).

Policy approaches should be regionally tailored, given the heterogeneous nature of sustainability and capital mobility patterns. Developed economies with high capital mobility (Europe and East Asia) should implement countercyclical capital buffers and flexible exchange rate frameworks while using selective capital controls during excessive inflow episodes (Ostry et al. 2010; Frost, Ito, and van Stralen 2020). Emerging markets in Latin America, the Middle East and North Africa, and South Asia should deepen domestic bond markets, improve governance structures to attract stable capital flows, and build adequate foreign exchange reserves as buffers during periods of stress (Milesi-Ferretti and Telli 2011; Filip, Momferatou, and Parraga Rodriguez 2025). Meanwhile, low-income regions like Sub-Saharan Africa should prioritize export diversification to reduce commodity dependence, selective capital account liberalization favoring foreign direct investment over volatile portfolio flows, and policies aimed at increasing domestic savings (McIntyre et al. 2018; Delechat et al. 2024).

Across all regions, improving CAD sustainability requires fiscal rules that incorporate external balance targets, managed exchange rate flexibility, and macroprudential tools to manage capital flow volatility (Ghosh, Ostry, and Qureshi 2015; Frost, Ito, and van Stralen 2020). Countries must diversify their exports to reduce the effects of commodity price fluctuations, develop domestic financial markets to boost local savings, and strengthen institutions to improve investor confidence (Kose et al. 2017; McIntyre et al. 2018; Tang, Zhou, and Liu 2020). Experience from past crises shows the importance of implementing macroprudential regulations to control volatile capital flows, maintaining sufficient foreign exchange reserves, and establishing early warning systems for emerging vulnerabilities (Lane and Milesi-Ferretti 2018; Frost, Ito, and van Stralen 2020).

Conclusions

This study investigated the degree of capital mobility and current account sustainability across six regional groups of countries using the DCCEMG estimator. The findings reveal that current account deficits are only weakly sustainable in all regions, with long-run coefficients ranging from 0.35 to 0.57. In the short run, capital mobility is perfect in the East Asia and Pacific and Middle East and North Africa regions, while it is only moderate in others. Over the long run, capital mobility is highest in Europe and Central Asia, along with East Asia and the Pacific.

The rolling-window analysis reveals that the 2007–2008 global financial crisis significantly reduced both capital mobility and current account sustainability across all regions. The post-crisis recovery has been uneven: while long-run capital mobility has gradually improved in developed regions, it remains weak in emerging markets, and short-run capital mobility has continued to decline overall.

Given these heterogeneous patterns, policy implications need to differ across regions. High-mobility economies (Europe and East Asia) should use countercyclical capital buffers and flexible exchange rates. In contrast, emerging markets (Latin America, the Middle East, and South Asia) would benefit from deeper domestic bond markets and higher foreign exchange reserves. Low-income regions (Sub-Saharan Africa) should diversify exports and prioritize foreign direct investment over volatile portfolio flows.

Building on these findings, future research should extend the analysis to conduct country-specific studies within regions to explain intra-regional heterogeneity. Additionally, it should explore the effectiveness of specific capital control measures on the estimated coefficients.

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Appendix A

Table 5. Properties of saving, investment and CAD (% of GDP) for each category

Categories	S/Y	I/Y	CAD/Y
East Asia and Pacific (EAP)	29.92%	29.06%	0.86%
Europe and Central Asia (ECA)	22.24%	23.22%	– 0.98%
Latin America and Caribbean (LAC)	17.54%	21.55%	– 4.01%
Middle East and North Africa (MENA)	26.43%	28.21%	1.32%
South Asia (SA)	26.34%	28.06%	– 1.72%
Sub-Saharan Africa (SSA)	15.29%	21.77%	– 6.48%

Source: own calculations, World Bank, World Development Indicators 2022a; 2022b.

Appendix B

Table 6. Individual long-run coefficients results

Country	Value	Country	Value	Country	Value	Country	Value
Europe and Central Asia							
Albania	0.65	Finland	0.12	Italy	0.14	Romania	0.45
Austria	0.24	France	0.77	Netherlands	0.48	Spain	0.37
Belgium	0.40	Germany	0.44	Norway	0.33	Sweden	0.75
Bulgaria	0.75	Greece	0.53	Poland	0.47	Turkey	0.63
Cyprus	0.43	Hungary	0.02	Portugal	0.52	United Kingdom	0.11
Denmark	0.12	Iceland	0.14				
East Asia and Pacific							
Australia	0.47	Japan	0.80	Mongolia	1.09	Singapore	0.56
China	0.88	South Korea	0.44	New Zealand	0.72	Thailand	0.64
Hong Kong	0.52	Malaysia	0.68	Philippines	0.01	Vietnam	0.09
Indonesia	0.53						
Latin America and Caribbean							
Argentina	0.11	Costa Rica	0.52	Haiti	0.53	Panama	0.38
Bolivia	0.12	Dominican Republic	0.23	Honduras	0.54	Paraguay	0.02
Brazil	0.48	Ecuador	0.54	Jamaica	0.26	Peru	0.22
Chile	0.49	El Salvador	0.50	Mexico	0.17	Uruguay	0.43
Colombia	0.51	Guatemala	0.58	Nicaragua	0.04		
Middle East and North Africa							
Algeria	0.27	Israel	0.44	Malta	0.50	Saudi Arabia	0.29

Country	Value	Country	Value	Country	Value	Country	Value
Bahrain	0.58	Jordan	0.23	Morocco	0.71	Tunisia	0.57
Egypt	0.45	Kuwait	0.13	Oman	0.21		
South Asia							
Bangladesh	0.35	India	0.57	Pakistan	0.20	Sri Lanka	0.50
Bhutan	0.28	Nepal	0.46				
Sub-Saharan Africa							
Angola	0.25	Eswatini	0.31	Mali	0.58	South Africa	0.53
Benin	0.59	Gambia	0.57	Mauritania	0.46	Sudan	0.63
Botswana	0.38	Ghana	0.42	Niger	0.25	Tanzania	0.52
Burkina Faso	0.61	Guinea	0.26	Nigeria	0.62	Togo	0.40
Cameroon	0.59	Guinea-Bissau	0.43	Senegal	0.32	Uganda	0.36
Comoros	0.30	Kenya	0.38	Seychelles	0.44		
Congo	0.42	Madagascar	0.47	Sierra Leone	0.55		

Source: own calculations.

Appendix C

Table 7. Robustness check: MG, PMG and DFE panel estimation results

	MG	PMG	DFE
Europe and Central Asia			
Long-run coef. (β_1)	0.67*** (*WD* = 0.5)	0.67*** (*WD* = 22.9***)	0.64*** (*WD* = 25.9***)
Short-run coef. (δ)	0.34***	0.33***	0.29***
EC term (λ)	−0.21***	−0.19***	−0.21***
Intercept (β_0)	0.01	0.02***	0.03***
East Asia and Pacific			
Long-run coef. (β_1)	0.50*** (*WD* = 12.6***)	0.70*** (*WD* = 13.8***)	0.40*** (*WD* = 15.8***)
Short-run coef. (δ)	0.19***	0.21***	0.15***
EC term (λ)	−0.23***	−0.20***	−0.17***
Intercept (β_0)	0.03***	0.02***	0.03***
Latin America and Caribbean			
Long-run coef. (β_1)	0.48*** (*WD* = 29.9***)	0.48*** (*WD* = 124.8)	0.46*** (*WD* = 0.7)
Short-run coef. (δ)	0.22***	0.21***	0.22***
EC term (λ)	−0.40***	−0.35***	−0.36***
Intercept (β_0)	0.05***	0.05***	0.05***

	MG	PMG	DFE
Middle East and North Africa			
Long-run coef. (β_1)	0.49*** (*WD* = 21.2***)	0.34*** (*WD* = 162.5***)	0.06 (*WD* = 435.0***)
Short-run coef. (δ)	0.1	0.08	−0.06***
EC term (λ)	−0.34***	−0.30***	−0.30***
Intercept (β_0)	0.04	0.05***	0.07***
South Asia			
Long-run coef. (β_1)	0.69*** (*WD* = 5.9**)	0.68*** (*WD* = 27.6***)	0.49*** (*WD* = 27.9***)
Short-run coef. (δ)	0.46***	0.44***	0.36***
EC term (λ)	−0.30***	−0.25***	−0.27***
Intercept (β_0)	0.03*	0.03***	0.04***
Sub-Saharan Africa			
Long-run coef. (β_1)	0.47*** (*WD* = 20.5***)	0.86*** (*WD* = 10.4***)	0.54*** (*WD* = 41.9***)
Short-run coef. (δ)	0.26***	0.29***	0.21***
EC term (λ)	−0.37***	−0.27***	−0.30***
Intercept (β_0)	0.05***	0.02***	0.04***

*, ** and *** denote 10%, 5% and 1% significance levels, respectively. WD stands for the Wald statistic, which checks the following null hypothesis: β_1=1.

Source: own calculations.

Table 8. CD test results

	DCCEMG	MG	PMG	DFE
ECA	1.21*	15.87***	15.92***	16.43***
EAP	−0.78	6.83***	7.41***	6.45***
LAC	−0.65	11.50***	11.55***	11.71***
MENA	−0.67	2.12**	1.99**	2.16**
SA	1.83*	2.87***	2.86***	2.36**
SSA	−0.88	1.12	1.70*	2.21**

*, ** and *** denote 10%, 5% and 1% significance levels, respectively. Pesaran's (2014) test for cross-sectional dependence (CD) follows a standard normal distribution and checks the null hypothesis of weakly cross-sectionally dependent errors.

Source: own calculations.

Związek oszczędności i inwestycji na nowo: mobilność kapitału a trwałość deficytu na rachunku obrotów bieżących

Celem artykułu jest analiza trwałości deficytu na rachunku obrotów bieżących oraz mobilności kapitału na podstawie danych z panelu obejmującego 97 krajów w latach 1980–2020. W badaniu przyjęto nowatorską interpretację współczynnika Feldsteina-Horioki w kontekście oceny trwałości deficytu, jednocześnie analizując relację między oszczędnościami a inwestycjami przy użyciu estymatora Dynamic Common Correlated Effects Mean Group (DCCEMG). Wyniki wskazują, że we wszystkich analizowanych grupach krajów deficyt na rachunku obrotów bieżących cechuje się jedynie „słabą" trwałością. Szacunki krótkookresowych współczynników sugerują wysoką mobilność kapitału w krótkim okresie, podczas gdy w perspektywie długookresowej mobilność ta pozostaje umiarkowana lub niska. Analiza z wykorzystaniem metody okna ruchomego wykazała, że w trakcie kryzysu lat 2007–2008 nastąpił istotny spadek zarówno mobilności kapitału, jak i trwałości deficytu. W okresie pokryzysowym krótkookresowa mobilność kapitału oraz trwałość deficytu wykazywały tendencję spadkową w większości regionów, podczas gdy mobilność kapitału w długim okresie stopniowo się odbudowywała. Przeprowadzona analiza regionalna, obejmująca sześć głównych obszarów świata, wnosi istotny wkład do literatury, ukazując zmieniające się uwarunkowania międzynarodowych przepływów kapitałowych oraz różnice regionalne w zakresie równowagi zewnętrznej.

Słowa kluczowe: zależność między oszczędnościami a inwestycjami, mobilność kapitału, trwałość rachunku obrotów bieżących, zagadka Feldsteina-Horioki, DCCEMG