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Does Financial Openness Matter for International Capital Mobility in ECOWAS? Feldstein-Horioka Puzzle Revisited

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Abstract

Low savings mobilization in Economic Community of West African States (ECOWAS) nations negatively affects their ability to fund domestic investments. Looking beyond the domestic savings to fund the high demand for domestic investments in ECOWAS countries, this study investigated the influence of financial openness on international capital mobility in ECOWAS countries from 1986 to 2023. The model framework was based on the Feldstein-Horioka saving-investment correlation technique for measuring international capital mobility. Using the augmented mean group (AMG), the study found that de jure financial openness has an increasing influence on international capital mobility in ECOWAS, while de facto financial openness has an insignificant effect. The country-specific results show that de jure financial openness has an increasing effect on international capital mobility in Senegal, Sierra Leone, and Togo but a discouraging influence in Nigeria. The de facto financial openness exhibited an increasing influence on international capital mobility in Côte d'Ivoire and Sierra Leone and a discouraging influence in Benin. The study recommends that ECOWAS countries strengthen their de jure financial openness to increase their access to foreign capital for domestic investment financing. The increase in de jure financial openness should be implemented cautiously to minimize unanticipated negative consequences.

JEL Classification: F21, F31, F36, F41

Keywords: *Financial Openness, International Capital Mobility, Feldstien-Horioka, AMG, ECOWAS.*

1. Introduction

The primary goal of government policies towards encouraging international capital mobility in developing countries is to boost foreign direct and portfolio investment inflows. The flow side of the neoclassical economic efficiency argument shows that the demand for investment levels that are higher than the savings rates in developing countries keeps their interest rates above the global rates. Investors from all over the world will shift their savings to finance investments in developing countries that do not restrict capital movement due to the expected high returns. The elimination of capital controls and the resulting rise in capital inflows will boost domestic investment, capital accumulation, and economic growth in developing nations (Palley, 2009; Ahmad, 2022). The Committee on the Global Financial System (2021) report shows that after the global financial crisis of 2007–2009, most of the emerging economies have developed the necessary financial institutions and macroeconomic fundamentals that will mitigate the negative effects of abrupt stops in capital inflows.

Periods after 1970 witnessed increased capital mobility all over the world. The increased capital mobility is a result of the implementation of liberalization policies by many countries and increased global savings seeking high investment returns across borders (Obstfield and Taylor, 2002; Behera, 2017; Dash, 2019). The Economic Community of West African States (ECOWAS) benefited from the global increase in capital mobility. Table I shows that, on average, ECOWAS nations experienced a low savings rate of 10.32% compared to an investment rate of 18.80%. It implies that domestic savings account for 54.89% of ECOWAS nations' domestic investment, with capital inflows accounting for the remaining 45.11%. The current account shows that, on average, ECOWAS countries use budget deficits to finance domestic investment. The country-specific average showed that Guinea-Bissau recorded the highest deficit, while Nigeria and Cote d'Ivoire had surpluses. The United States, Australia, and Canada are among the developed countries that consistently use large current account deficits to fund domestic investment.

International capital mobility and financial market integration are often used interchangeably since international capital mobility is a prerequisite for financial market integration (Moosa, 1996). ECOWAS, as an economic integration entity, has developed some economic policies and programs that will enhance the integration of the financial markets in the region through increased capital mobility within their economies. In 1987, the ECOWAS Monetary Cooperation Programme (EMCP) was established to create a single currency system for ECOWAS member countries that would facilitate their achievement of macroeconomic convergence. The program requires that ECOWAS countries have common external tariffs, free trade policies among themselves, liberalize their financial and capital accounts, and establish a common clearing and payment settlement system (ECOWAS Commission, 2018; Fwangkwai, 2014).

Table I: Country-specific average savings and investment in ECOWAS (1986–2023)

Country	Savings	Investment	Current Account
Benin	11.687	18.579	-6.892
Burkina Faso	9.047	19.111	-10.064
Cote d'Ivoire	18.780	16.652	2.128
The Gambia	3.579	15.584	-12.005
Ghana	9.082	18.985	-9.903
Guinea	11.691	20.178	-8.487
Guinea Bissau	1.374	18.420	-17.046
Mali	8.578	19.251	-10.673
Niger	10.722	18.956	-8.234
Nigeria	37.087	30.842	6.245
Senegal	9.053	20.522	-11.469
Sierra Leone	-0.183	11.998	-12.181
Togo	3.685	15.314	-11.629
Average for all	10.322	18.799	-8.478

Source: Authors' calculation and tabulation from World Development indicators, 2023, 2026 data.

Note: Savings = gross domestic saving as % of GDP, Investment = gross domestic investment as % of GDP, Current account = Savings minus Investment.

ECOWAS reviewed Article 53 of its treaty in 1993 to encourage the trading of companies' securities across their borders. The revision intends to create a situation that will allow investors in ECOWAS member countries to invest in securities of any company of their choice within ECOWAS, and companies can be listed in any of the stock markets without unnecessary hindrances (West African Monetary Agency (WAMA), 2011). In 2013, the West African Capital Markets Integration Council (WACMIC) was created to facilitate the integration of financial markets within the region. Its main objective is to remove the inherent fragmentation in the West African stock exchange markets by unifying their legislation on asset trading and issuance and creating a common platform where cross-border financial assets are listed and traded. In spite of the above efforts by ECOWAS to integrate the financial markets in their member countries, capital mobility still remains imperfect across the ECOWAS nations.

Low savings rates and imperfect capital mobility in ECOWAS nations negatively affect their ability to fund domestic investments. To determine how to fund the high demand for domestic investments in ECOWAS countries without depending on low savings rates, this study investigated the influence of financial openness on international capital mobility in ECOWAS countries from 1986 to 2023, using the Augmented Mean Group (AMG) estimator. The empirical literature review showed that none of the African-specific studies that used the Feldstein-Horioka (1980) hypothesis to measure international capital mobility considered the influence of financial openness on capital mobility. Studies by Younas (2011), Baltaci and Ayaydin (2013), and Younas (2010) that compared the impact of financial openness on capital mobility in developed and developing countries did not use the Augmented Mean Group (AMG) estimator for their analysis. The AMG is efficient in the face of heterogeneity, cross-section dependency, and non-stationary variables (Bond and Eberhardt, 2013; Eberhardt, 2012). Panel estimators that do not account for cross-section dependence in heterogeneous panel data will produce deceptive results.

To fill the above literature gaps, the following research questions were addressed by this study: (1) What is the effect of de jure financial openness on international capital mobility in ECOWAS? (2) What is the impact of de facto financial openness on international capital mobility in ECOWAS? Following the research questions, the objectives of the study are (1) to examine the effect of de jure financial openness on international capital mobility in ECOWAS and (2) to assess the impact of de facto financial openness on international capital mobility in ECOWAS. The rest of the paper is structured as follows: Section two covers the literature review. The methodology is discussed in Section 3. The results and their discussion are presented in Section 4. The conclusion and policy implications are covered in Section 5.

Literature Review

Feldstein and Horioka's (1980) cross-sectional seminal work in 16 OECD nations pioneered the application of the saving-investment correlation technique in estimating the level of international capital mobility. They argue that savings and investment should not have a close relationship in a small open economy with perfect capital mobility. Domestic savings leave the country in quest of greater investment returns, while domestic investment is financed by the pool of global savings. They interpreted the correlation values of 0.87 and above in OECD countries as an indication of capital immobility. Their finding that capital is immobile in OECD countries is termed the mother of all puzzles in international economics (see Obstfeld and Roof, 2000).

Many panel studies exist in the literature that utilize savings-investment correlation to measure the extent of international capital mobility in Africa. Adeniyi and Egwaikhide (2013), Payne and Kumazawa (2005), Bangake and Eggoh (2012), Kumar, Sen, and Srivastava (2014), De Wet and Van Eyden (2005), Hassan (2016), and Midagu, Kwela, and Kazadi (2020) found moderate capital mobility in their African sample studies using different panel data estimation techniques. Specifically, Adeniyi and Egwaikhide (2013) reported that financial development variables discourage capital mobility in sub-Saharan African nations. Kumar, Sen, and Srivastava (2014) found that the economic integration bodies in Africa have insignificant effects on capital mobility. Midagu, Kwela, and Kazadi (2020) revealed that corruption control and political stability encourage capital mobility in Africa. They also found that international capital mobility is higher among the northern and western African nations compared to other regions. Raheem, Ajide, and Adeniyi (2015) found that governance substantially increased the saving retention coefficient in sub-Saharan Africa.

Using a dynamic panel GMM estimator for the period 1970–2004, Younas and Nandwa (2010) evaluated the influence of financial openness on international capital mobility in a panel of 104 nations. Measuring financial openness with the Chinn-Ito *de jure* index, they found a significant increasing influence between financial openness and international capital mobility in 80 developing nations and an insignificant effect between them in 24 OECD nations. Younas (2011) utilized net foreign capital flow as a percent of GDP to proxy *de facto* financial openness in a GMM study of 24 OECD and 77 developing nations for the period 1970–2004. He found a significant impact between *de facto* financial openness and international capital mobility in developing nations and an insignificant impact in OECD countries. Similarly, Baltaci and Ayaydin (2013) proxied financial openness with net foreign direct investment as a percent of GDP (*de facto*) in a panel GMM analysis for G-20 and CEE countries that covered 1990 to 2011. They discovered a significant increase in the effect of financial openness on capital mobility in CEE nations but no significant influence in G-20 nations.

Younas (2015) found that terrorism increased the size of the saving retention coefficient, while international openness lowered it in a sample of 123 developing nations using dynamic panel data estimators for the 1976–2008 periods. Dzhumashev and Cooray (2017) revealed that financial deepening supports capital mobility in a sample of 161 nations. They found higher capital mobility at regional levels compared to the whole panel. Bibi and Jalil (2016) utilized the CCEMG estimator to check the effects of legal regulations, governance, financial development, globalization, and the business environment on capital mobility in a sample of 88 nations for the period 1980–2015. They reported the existence of capital immobility and the increasing effects of macroeconomic variables on capital mobility. Using dynamic CCEMG, Ozdemir (2022) found capital immobility among 29 high-income nations for the period 1980–2019. He also found that financial development, government spending, and political globalization increased capital mobility.

Revisiting the saving-investment relationship across fourteen EU nations, Drakos, Koureta, and Vlamis (2018) reported increasing capital mobility in the EU from 1970 to 2015. They believe that the EU nations' intertemporal solvency restrictions persist, despite the intermediate capital mobility between them. Using the ARDL model, Dash (2019) found high capital mobility in high-income nations and moderate capital mobility in middle- and low-income nations. In the PMG model, he reported moderate capital mobility in middle-income nations and perfect capital immobility in high- and low-income nations. Yardimci (2021) examined the Feldstein-Horioka puzzle in a panel of England, Spain, Germany, Italy, and

France and found high capital mobility among the countries. Mishra and Mishra (2020) verified the Feldstein-Horioka puzzle in SAARC nations with the twin deficit hypothesis and found increased capital mobility in the region during the post-reform period. Alakbarov and Bayar (2021) revisited the saving-investment relationship in 21 emerging market economies from 1994 to 2016 and discovered high capital mobility. Chu (2017) argued that the developing countries' low savings retention coefficients are caused by poor data collection processes and should not be misinterpreted as high capital mobility.

The empirical literature review showed that none of the African-specific studies that used the Feldstein-Horioka (1980) hypothesis to measure international capital mobility dwelled on the nexus between financial openness and capital mobility. Studies by Younas (2011), Baltaci and Ayaydin (2013), and Younas (2010) that compared the effect of financial openness on capital mobility among developed and developing countries used the standard GMM estimator. The standard GMM estimator is inefficient in a heterogeneous model with cross-sectional dependency problems (Sarafidis, Yamagata, and Robertson, 2009). Panel estimators that fail to account for cross-sectional dependency in heterogeneous panel data will yield misleading results. In order to fill the identified gaps in the literature, this study examined the effect of de jure and de facto financial openness on international capital mobility in ECOWAS using an augmented mean group (AMG) estimator. The AMG is very efficient in solving the problems of cross-section dependence, heterogeneity, and non-stationary variables in panel data (Bond and Eberhardt, 2013; Eberhardt, 2012).

Methodology

Theoretical Framework

The study's theoretical underpinning is based on Feldstein and Horioka's (1980) savings-investment correlation model. The model was chosen because it is simple and theoretically obvious in describing the scope of international capital mobility. It is largely acknowledged empirically as a reliable indicator of international capital mobility. In panel form, the Feldstein-Horioka model is stated as follows:

$$\left(\frac{I}{Y}\right)_{it} = \alpha_i + \beta\left(\frac{S}{Y}\right)_{it} + v_i + \mu_{it} \dots\dots\dots (1)$$

Where I represents domestic investment, S represents domestic savings, Y represents gross domestic product (GDP), and α and μ represent the constant term and random disturbance. The observation time is t, the cross section (country) is i, and v captures the fixed effect. The savings retention coefficient (β) is a measure of the proportion of an increase in domestic savings that is invested at home. When the savings retention coefficient (β) is close to zero, it shows perfect capital mobility and indicates perfect capital immobility when it is close to one.

Model Specification

The study used the Augmented Mean Group (AMG) estimator developed by Eberhardt and Teal (2010) for the analysis. AMG solves cross-sectional dependency problems using a common dynamic process. The common dynamic process generates the common dynamic effect variable by estimating a pooled OLS model augmented with year dummies at first difference. The common dynamic effects are the coefficients of the first difference year dummies, which represent the level-equivalent average development of unobservable common factors across all panel units. The generated common dynamic effect variable is either included in the model as one of the regressors, with linear trend terms that account for omitted idiosyncratic processes, or subtracted from the dependent variable to remove the

cross-sectional dependency problems. In this study, we used the second option by imposing the common dynamic effect on each panel group with a unit coefficient in the Stata command. Pesaran and Smith's (1995) mean group (MG) estimator and Driscoll and Kraay's (1998) fixed effect that accounts for cross-section dependence in a homogeneous panel model were used for the robust check.

Model one

Model one captures the effect of de jure financial openness on international capital mobility. Augmenting the Feldstein-Horioka (1980) model with the de jure financial openness variable, its interaction with domestic savings, and the control variables, model one is stated as follows:

$$I/Y_{it} = \alpha_{0i} + \alpha_{1i}S/Y_{it} + \alpha_{2i}DJF_{it} + \alpha_{3i}(DJF * S/Y)_{it} + \alpha_{4i}FAD_{it} + \alpha_{5i}TOP_{it} + \varepsilon_{it} \dots\dots\dots (2)$$

Where I/Y = gross fixed capital formation (gross domestic investment) as a percent of GDP, S/Y = gross domestic savings as a percent of GDP, DJF = de jure financial openness (Chinn-Ito financial openness index (KAOPEN)), FAD = net official development assistance received as a percent of GNI (foreign aid), TOP = trade openness (export + import/GDP), i = country, t = time, α_0 = constant, and ε = disturbance term. The a priori expectations are: $\alpha_1 > 0$, $\alpha_2 > 0$, $\alpha_3 < 0$, $\alpha_4 > 0$, $\alpha_5 > 0$, $\alpha_6 > 0$ or < 0 .

The interactive variable ($DJF * S/Y$) measures the influence of de jure financial openness on international capital mobility. A negative value for the interactive term implies that de jure financial openness reduces the savings-investment correlation, indicating an increase in international capital mobility. The partial effect of savings on investment (PESI), which measures the actual savings retention coefficient at a given value of de jure financial openness, will be computed at the highest value; thus, $PESI = \partial(I/Y) / \partial(S/Y) = \alpha_1 + \alpha_3DJF$ (see Younas and Nandwa, 2010; Younas, 2011; Baltaci and Ayaydin, 2013; Bibi and Jalil, 2016).

Model Two

Model two captures the effect of de facto financial openness on international capital mobility.

$$I/Y_{it} = \beta_{0i} + \beta_{1i}S/Y_{it} + \beta_{2i}DFF_{it} + \beta_{3i}(DFF * S/Y)_{it} + \beta_{4i}FAD_{it} + \beta_{5i}TOP_{it} + \varepsilon_{it} \dots\dots\dots (3)$$

Where, as in equation (3), I/Y , S/Y , FAD , TOP , and ε_{it} remain the same. DFF is de facto financial openness (proxied by net foreign direct investment inflows as a percent of GDP), and the interactive term ($DFF * S/Y$) will capture its influence on international capital mobility. The a priori expectations are: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 < 0$, $\beta_4 > 0$, $\beta_5 > 0$, $\beta_6 > 0$ or < 0 . The PESI at the maximum value of de facto financial openness becomes $\partial(I/Y) / \partial(S/Y) = \beta_1 + \beta_3DFF$ (see Younas and Nandwa, 2010; Younas, 2011; Baltaci and Ayaydin, 2013; Bibi and Jalil, 2016).

Justification for the variables

Gross domestic savings and investment are the core variables of Feldstein and Horioka's (1980) seminal work that pioneered the application of the saving-investment correlation technique in estimating the level of international capital mobility. The de jure and de facto financial openness variables are the research variables. The inclusion of foreign aid and trade openness is in line with the works of Younas and Nandwa (2010), Baltaci and Ayaydin (2013), Younas (2015), Adeniyi and Egwaikhide (2013), and Ojike et al. (2025). They support the opinion that foreign aid considerably complements domestic savings in funding

domestic investment in developing nations, and its absence from the model will create a downward bias in the savings-investment correlation.

Data

A balanced panel data set that spanned from 1986 to 2023 was used for the study. As a result of data paucity, thirteen out of fifteen ECOWAS member nations were involved. They are Nigeria, Ghana, Burkina Faso, Sierra Leone, Mali, Gambia, Benin, Senegal, Togo, Guinea-Bissau, Niger, Guinea, and Cote d'Ivoire. Data for the 2021 update of the Chinn-Ito (2006) financial openness index, KAOPEN (de jure financial openness), were sourced from Econbrowser (2026). The index starts from -2.66 (complete capital restriction) to 2.66 (total capital liberalization) (Chinn-Ito, 2008). Among the various capital flow measures, net foreign direct investment inflows as a percentage of GDP were used to capture de facto financial openness. The data for gross domestic saving as a percent of GDP, gross fixed capital formation as a percent of GDP, net official development assistance received as a percent of GNI, net foreign direct investment inflows as a percent of GDP, and trade openness (export + import/GDP) were sourced from the World Development Indicators (2023, 2026).

Results

Descriptive statistics

Descriptive statistics are used to assess the variation of variables by taking into account their mean, standard deviation, maximum, and minimum values.

Table 2: Descriptive statistics for the variables

Variable	Obs	Mean	Std. Dev.	Min	Max
I/Y	494	18.799	8.207	-2.424	54.948
S/Y	494	10.322	11.656	-20.164	68.808
DJF	494	-0.941	0.956	-1.939	2.281
DFE	494	2.184	3.385	-28.624	32.414
FAD	494	10.561	10.116	0.109	78.707
TOP	494	53.731	16.487	9.136	131.485

Source: Authors' computation

The mean gross domestic investment as a percent of GDP in ECOWAS countries is 18.8, with a maximum of 54.95, a minimum of -2.42, and a standard deviation of 8.21. A negative domestic investment rate signifies a poor state of development. The mean, maximum, minimum, and standard deviation values of domestic savings as a percentage of GDP are 10.32, 68.81, -20.16, and 11.67, respectively. Negative savings indicate that the economy depends entirely on foreign capital for domestic investment. The mean de jure financial openness for ECOWAS countries is -0.94, with a maximum of 2.28, a minimum of -1.93, and a standard deviation of 0.95. The mean de jure financial openness of -0.94 indicates that ECOWAS countries have a high level of restrictions on capital movement.

The mean de facto financial openness is 2.18, with a maximum of 32.41, a minimum of -28.62, and a standard deviation of 3.39. On average, foreign direct investment inflows into ECOWAS countries are very low. ECOWAS countries received an average of official development assistance (ODA) as a percent of GNI of 10.56 within the study period, with a maximum of 78.71, a minimum of 0.11, and a standard deviation of 10.12. The average shows that the foreign aid flow to ECOWAS countries is insufficient. ECOWAS countries

had a mean trade openness of 53.73 from 1986–2023. It shows a moderate level of trade protection. The maximum trade openness is 131.49, while the minimum is 9.14. The standard deviations of gross domestic investment as a percent of GDP, official development assistance (ODA) as a percent of GNI, and trade openness are lower than their mean. This indicates a cluster of values around the mean and low volatility among the variables. The standard deviations of domestic savings as a percentage of GDP, de jure financial openness, and de facto financial openness are higher than their mean, indicating that the variables have high volatility. The descriptive statistics showed sufficient differences in the variables across ECOWAS countries.

Slope heterogeneity test

Pesaran and Yamagata's (2008) test for homogeneity in panel data was used to check for slope heterogeneity. The statistically significant results of the delta and delta adjusted in Table 3 show that the slope coefficients are heterogeneous.

Table 3: Slope heterogeneity test results

Test	Statistic
Delta	17.738*
Adj. Delta	19.639*

Source: Authors' computation.

Note: * shows significance at 1% level

Cross-sectional dependence test

To check if the variables' innovations (shocks) are cross-section independent, the Pesaran (2004) cross-sectional dependency (CD) test was used. The p-value of the CD test results in Table 4 shows that all the variables have a cross-sectional dependency problem.

Table 4: Cross-sectional dependence test results

Variable	CD-Test	p-value	Mean ρ	Mean abs (ρ)
I/Y	5.885	0.000	0.11	0.33
S/Y	5.221	0.000	0.10	0.36
DJF	5.139	0.000	0.09	0.49
DFE	12.055	0.000	0.22	0.28
FAD	20.276	0.000	0.37	0.43
TOP	4.254	0.000	0.08	0.27

Source: Authors' computation.

Notes: Under the null hypothesis of cross-section independence, $CD \sim N(0,1)$

P-values close to zero indicate data are correlated across panel groups.

Panel Unit root test

Since all the variables exhibit cross-section dependence, the Pesaran (2007) panel unit root test is used to determine their stationarity. The truncated version of Pesaran's (2007) incorporates cross-sectional dependency and reduces the overbearing impact of extreme values in short time panels. De facto financial openness, foreign aid and trade openness are integrated of order zero, while gross domestic investment as a percentage of GDP, gross domestic savings as a percentage of GDP, and de jure financial openness are integrated of order one (see Table 5).

Table 5: Unit root test results

Variable	With constant		With constant & trend		Order of integration
	Z-Statistic	P-value	Z-Statistic	P-value	
I/Y	0.256	0.602	0.530	0.702	
Δ I/Y	-9.957	0.000	-9.033	0.000	I(1)
S/Y	-0.425	0.335	-0.499	0.309	
Δ S/Y	-10.728	0.000	-9.123	0.000	I(1)
DJF	3.062	0.999	5.574	1.000	
Δ DJF	-3.974	0.000	-2.899	0.002	I(1)
DFF	-3.435	0.000	-2.956	0.002	I(0)
Δ DFF	-11.112	0.000	-9.844	0.000	
FAD	-5.109	0.000	-3.741	0.000	I(0)
Δ FAD	-13.115	0.000	-12.075	0.000	
TOP	-2.288	0.011	-1.566	0.059	
Δ TOP	-11.906	0.000	-10.485	0.000	I(0)

Source: Authors' creation.

Note: Δ = First difference

Cointegration test

The Westerlund (2007) panel cointegration tests in Table 6 were conducted with bootstrapping (100). The robust p-values show that, in a cross-section dependency situation, the dependent variable (I/Y) is not cointegrated with any of the independent variables. The asymptotic p-values show that the dependent variable (I/Y) is cointegrated with savings rate, foreign aid, and trade openness for the panel as a whole and for at least one of the panel members in a cross-sectional independence assumption. Conclusively, long-run relationships exist in the study models.

Table 6: Co-integration test results

Dependent variable: I/Y

Null Hypothesis: No cointegration

Covariates	G_t			G_a			P_t			P_a		
	Z-value	p-value	Robust p-value	Z-value	p-value	Robust p-value	Z-value	p-value	Robust p-value	Z-value	p-value	Robust p-value
S/Y	-3.28	0.00	0.21	-2.31	0.01	0.22	-4.81	0.00	0.20	-4.50	0.00	0.16
DJF	-1.01	0.16	0.67	-0.62	0.27	0.63	-0.88	0.19	0.67	-1.04	0.15	0.60
DFF	-1.27	0.10	0.73	0.04	0.51	0.89	0.09	0.54	0.95	0.15	0.56	0.97
FAD	-1.89	0.03	0.51	-0.87	0.19	0.63	-1.89	0.03	0.61	-1.93	0.03	0.50
TOP	-2.16	0.02	0.46	-0.97	0.17	0.62	-1.58	0.06	0.66	-2.03	0.02	0.39

Source: Authors' creation

Model one result

With a saving-investment correlation coefficient of 0.414, the FH model in Table 7 reveals that capital is moderately mobile in ECOWAS. It shows that domestic savings finance 41% of domestic investment in ECOWAS countries, whereas international capital mobility funds 59% of domestic investment. The FH model outcome is consistent with most of the African studies findings (see Adeniyi and Egwaikhede, 2013; Kumar, Sen, and Srivastava, 2014; Midagu, Kwela, and Kazadi, 2020).

The inclusion of de jure financial openness and its interaction with the domestic savings rate, foreign aid, and trade openness in the FH model reduced the savings-investment correlation coefficient from 0.414 to 0.155, indicating an increase in capital mobility in ECOWAS. It shows that the explanatory variables jointly encourage capital mobility in ECOWAS. The de jure financial openness variable has a negative but insignificant influence on domestic investment, showing that ECOWAS countries still maintain a high level of financial restrictions. The interesting term in model one is the interactive term DJF*S/Y, which measures the influence of de jure financial openness on international capital mobility in ECOWAS nations. The interaction term's significant negative result conforms to a priori expectations. It shows that an increase in de jure financial openness will enhance international capital mobility by 26.8% in a year.

Table 7: Model one results.

Dependent variable: I/Y

Variable	FH AMG	Model one AMG	Robust check MG	Robust check DKF
S/Y	0.414* [0.107]	0.155 [0.150]	0.174 [0.169]	0.338* [0.051]
DJF		-0.135 [2.001]	1.128 [1.902]	-1.209 [0.699]
DJF*S/Y		-0.268* [0.077]	-0.361* [0.105]	-0.093** [0.038]
FAD		0.067 [0.153]	0.019 [0.143]	0.184* [0.044]
TOP		0.068 [0.060]	0.076 [0.070]	0.085** [0.035]
CONS	12.091* [1.747]	7.447* [2.668]	8.732* [2.656]	6.627* [2.133]
CD test on residual		-1.72	1.068	
PESI at maximum DJF		-0.456	-0.649	0.126

Source: Authors' creation

Note: Standard errors are in parentheses. FH = Feldstein-Horioka (1980) model. DKF = Driscoll-Kraay fixed effect. Maximum value of DJF is 2.281. *, and **, shows $p < 0.01$, and $p < 0.05$. PESI=Partial effect of savings on investment.

The computed PESI (-0.456) at the highest value of the de jure financial openness indicates that saving-investment correlation reduces substantially as ECOWAS countries lower controls on cross-border capital movement. It shows that ECOWAS countries can achieve perfect capital mobility at a de jure financial openness index of less than 2.299. The implication is that ECOWAS nations do not have to completely liberalize capital transactions to achieve perfect capital mobility. The finding is consistent with the work of Younas and Nandwa (2010). The Pesaran and Smith (1995) MG and Driscoll and Kraay (1998) fixed effect robust check results are consistent with the finding that de jure financial openness has an increasing influence on capital mobility in ECOWAS.

Foreign aid's insignificant influence on domestic investment in model one contradicts the results of Younas and Nandwa (2010) that foreign aid considerably complements domestic savings in funding domestic investment in developing nations. The result corroborates the Heintz and Ndikwumana (2010) observation that the volume of official development

assistance to African countries is on the decline. Trade openness also exhibited an insignificant influence on domestic investment in ECOWAS countries.

The country-specific results of model one show that de jure financial openness has an increasing effect on international capital mobility in Senegal, Sierra Leone, and Togo but a discouraging influence in Nigeria (see Table 8).

Table 8: Model one individual country results.

Dependent variable: I/Y

Model one (AMG)		
Country	Coefficient of DJF*S/Y	Std. Error
Benin	-0.153	0.155
Burkina Faso	-0.066	0.247
Cote d'Ivoire	-0.239	0.296
The Gambia	-0.410	0.307
Ghana	-0.432	0.433
Guinea	0.116	0.794
Guinea Bissau	-0.674	1.575
Mali	-0.249	0.173
Niger	-0.530	0.455
Nigeria	0.306**	0.131
Senegal	-0.603**	0.269
Sierra Leone	-0.277**	0.134
Togo	-0.280*	0.046

Source: Authors' creation

Note: *, and ** shows $p < 0.01$, and $p < 0.05$.

Model two result

Table 9: Model two results.

Dependent variable: I/Y

Variable	FH AMG	Model two AMG	Robust check MG	Robust check DKF
S/Y	0.414* [0.107]	0.470* [0.111]	0.491* [0.118]	0.556* [0.061]
DFE		1.208 [0.842]	0.465 [0.578]	1.148* [0.177]
DFE*S/Y		-0.030 [0.045]	0.002 [0.034]	-0.026 [0.017]
FAD		0.015 [0.153]	0.013 [0.145]	0.270* [0.052]
TOP		-0.007 [0.047]	-0.006 [0.054]	0.020 [0.029]
CONS	12.091* [1.747]	9.184* [2.014]	8.988* [1.594]	7.143* [1.466]
CD test on residual		-1.200	1.835	
PESI at maximum DFE		-0.502	0.556	-0.287

Source: Authors' creation

Note: Standard errors are in parentheses. FH = Feldstein-Horioka (1980) model. Maximum value of DFF is 32.414. *, and ** show $p < 0.01$, and $p < 0.05$. DKF = Driscoll-Kraay fixed effect. PESI=Partial effect of savings on investment.

Table 9 reveals that including de facto financial openness and its interaction with the domestic savings rate, foreign aid, and trade openness in the FH model increased the savings-investment correlation coefficient from 0.414 to 0.470, as against the 0.155 achieved in model one. The implication is that de facto financial openness discourages cross-border capital movement in ECOWAS compared to de jure financial openness. The interaction of de facto financial openness with the savings rate (DFF*SY) that captures the influence of de facto financial openness on international capital mobility is negative and statistically insignificant. It shows that de facto financial openness is ineffective in influencing capital mobility in ECOWAS countries. The result is inconsistent with the findings of Younas (2011) and Baltaci and Ayaydin (2013) that de facto financial openness has a significant impact on capital mobility in developing nations. Corroborating the insignificant influence of de facto financial openness on international capital mobility, the estimated PESI at the highest point of de facto financial openness indicates a minimal drop in saving-investment correlation coefficients compared to that of de jure financial openness. De facto financial openness, foreign aid, and trade openness exhibit an insignificant influence on domestic investment in ECOWAS in model two. The robust check results confirmed the ineffectiveness of de facto financial openness for cross-border capital movement in ECOWAS.

The individual country results in Table 10 show that de facto financial openness encourages international capital mobility in Côte d'Ivoire and Sierra Leone and discourages it in Benin.

Table 10: Model two individual country results.

Dependent variable: I/Y

Model two (AMG)		
Country	Coefficient of DFF*S/Y	Std. Error
Benin	0.111**	0.043
Burkina Faso	0.236	0.123
Cote d'Ivoire	-0.474*	0.174
The Gambia	-0.044	0.062
Ghana	0.071	0.045
Guinea	-0.029	0.035
Guinea Bissau	0.037	0.196
Mali	-0.021	0.040
Niger	-0.161	0.052
Nigeria	-0.021	0.042
Senegal	0.0009	0.033
Sierra Leone	-0.036**	0.016
Togo	-0.057	0.031

Source: Authors' creation

Note: *, and ** shows $p < 0.01$, and $p < 0.05$.

Conclusion and Policy Implications

The study discovered that de jure financial openness has an increasing influence on international capital mobility in ECOWAS, while de facto financial openness has an insignificant effect. The study also found that de jure financial openness, de facto financial openness, foreign aid, and trade openness have an insignificant effect on domestic investment

in ECOWAS. The country-specific results show that de jure financial openness has an increasing influence on international capital mobility in Senegal, Sierra Leone, and Togo but a discouraging influence in Nigeria. De facto financial openness exhibited an increasing effect on capital mobility in Côte d'Ivoire and Sierra Leone. It discourages capital in Benin. The Feldstein-Horioka (FH) traditional model showed that capital mobility in ECOWAS is moderate. In conclusion, by increasing their de jure financial openness, ECOWAS countries can gain better access to global capital markets for borrowing. It will stimulate domestic investment without relying on low domestic savings mobilization. The savings retention coefficient of 0.414 shows that, in line with Mundell (1961), ECOWAS countries have satisfied one of the conditions for the establishment of the Optimum Currency Area (OCA). It is an indication that monetary policy will be less effective in stabilizing the economies of the ECOWAS countries in the long run. The study suggests an improvement in de jure financial openness in ECOWAS countries to increase their access to foreign capital for domestic investment funding. The increase in de jure financial openness should be with caution to avoid unintended negative consequences.

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