# Transitory Impacts of Foreign Capital Flows

**Kanfitine Lare-Lantone**
University of Lome, Togo
Sheridan College, Ontario Canada

**Madow Nagou**
University of Lome, Togo

**Emmanuel Anoruo**
Coppin State University
2500 West North Avenue
Baltimore, MD 21216, USA

**Abstract**

*We estimated the transitory multipliers associated with remittances, FDI, and ODA to assess the influence the economic environment exerts on their indirect impact on growth in 37 countries over the period 1970-2021. While that influence is significant, income is the most significant of the transitory variables. The values of their associated transitory multipliers indicate that remittances and FDI are substitutes in 24 countries but complementary in 14, remittances and ODA are substitutes in 22 countries but complementary in 10 while FDI and ODA are substitutes in 22 countries but complementary in 10. Though FDI and ODA have equal stabilizing influences, ODA has a more destabilizing influence. Besides, FDI is the optimal foreign capital for the whole sample and 6 individual countries, remittances for 7, ODA for 4, remittances-FDI flows for 6, remittances-ODA flows for 4, and FDI-ODA flows for 7. The main conclusion is that a country can maximize the related gains if it only receives the optimal foreign capital(s) to induce the highest growth. Besides, the need for accommodative government policies, the choice of foreign capital(s) should account for the structure of its economy including the market size, labor productivity, production cycle, and potential growth.*

**Key words:** economic growth, foreign capital, indirect impact, transitory effect

**JEL Codes**: E61, F24, O40

## 1. Introduction

In this paper, we assessed the influence the economic environment exerts on the impact of foreign capital on economic growth. To that aim, we extended the assumption that the impact of remittances on growth is transmitted in direct and indirect segments to foreign direct investments (FDI) and Official Donor Assistance (ODA.) The direct impact reflects the change they generate contemporaneously in growth while the indirect impact cumulates incrementally overtime, as transitory effects, before transmuting to growth. Part of the cumulated transitory effect is channeled to growth over the long run as a direct effect while another part is channeled indirectly through consumption, income, and investments. But, before transmuting to growth, the total cumulated transitory effect gets influenced by the economic environment. The value of the transitory multiplier, which captures that influence, reflects the degree of conformity of the foreign capital to the structure and conditions of the hosting economy. It is sizeable if it conforms, and the conditions are favorable but negligible otherwise. Thus, for each economy, there exist at any given time optimal types and levels of foreign capital. With such information, a country can maximize the gains it derives from foreign capital by only receiving the optimal ones and adopting accommodative policies. Yet, the literature has not focused systematically on providing the basis for such strategy and related policy tools.

Against this backdrop, we assessed the transitory multipliers associated with remittances, FDI, and ODA in their growth impacting process in 37 countries over the period 1970 - 2021. Specifically, we estimated their values which were used to derive their interactions and identify the optimal flows. Our empirical results show that the economic environment influences the indirect impact of foreign capital on growth significantly. But income is the most significant of the transitory variables through which that indirect impact is channeled to growth. Besides, remittances and FDI are substitutes in 24 countries but complementary in 10. Remittances and ODA are substitutes in 22 countries but complementary in 10. FDI and ODA are substitutes in 22 countries but complementary in 10. Finally, it is shown that FDI is the optimal foreign capital for the whole sample countries. Across countries, remittances are the optimal ones for 7 countries, FDI for 6, ODA for 4, remittances-FDI flows for 6, remittances-ODA flows for 4, and FDI-ODA flows for 7. Finally, combined remittances and FDI flows are second-best to

optimal for the whole sample and 2 individual countries. Combined remittances and ODA flows are second-best for 7, and combined ODA and FDI flows for 2. Thus, a country can maximize the related gains if it only receives the optimal foreign capital to induce the highest growth. Besides, the need for accommodative government policies, the choice of foreign capital should account for the structure of its economy including the market size, labor productivity, production cycle, and potential growth.

The rest of the paper is organized in four subsequent sections. Section 2 reviews the literature, Section 3 introduces the methodology, Section 4 presents the empirical analysis, and Section 5 discusses findings and concludes.

## 2. Review of Literature

Analyses of the impacts that remittances, FID, and ODA flows exert on economic growth span the literature with findings that extend also to their interactions in the process. Kristjánsdóttir (2006) for example, investigated the substitution between ODA and FDI with a system of simultaneous inverse hyperbolic sine functions using the data of some heavily indebted poor countries over the period 1970-2004. The results, based on the sole case of Ghana, indicate that FDI and ODA are substitutes. However, they became complementary with Mozambique and Malawi added to Ghana, but shifted back to substitutes as the countries' incomes grew. Buch and Kuckulenz (2010) investigated whether remittances are similar in nature and share similarities with FDI and ODA in 87 developing countries over the period 1970-2000. They found a positive correlation between remittances and FDI for most countries in Europe and North America and a positive correlation between remittances and ODA for most countries in sub-Saharan Africa and the Middle East. In contrast, they found a negative correlation between remittances and ODA for most countries in Asia-Pacific. Besides, they found that remittances respond more to demographic variables while FDI respond more to macroeconomic conditions. Mallaye and Yogo (2011) adopted a simultaneous equation approach to test whether remittances, FDI and ODA are complementary or substitutes in 33 fragile States over the period 1995-2008. They found that FDI and ODA as well as remittances and ODA are complementary while remittances and FDI are substitutes. Yet, the complementarity between ODA and FDI and between remittances and ODA vanish progressively from a threshold level of GDP per capita while the substitution between remittances and FDI vanishes completely. Driffield and Jones (2013) investigated the relative contributions of FDI, ODA, and remittances to economic growth and the extent to which they depend on institutional quality. For, they estimated a system of simultaneous equations applying a 3-Stage Least Squares on an unbalanced panel data for the entire sample of developing countries over the period 1984-2007. The results indicate that FDI inflows are limited in countries with significant levels of ODA flows while remittances and ODA flows move synchronously. But, all three types of flows exert a positive and significant impact on growth when institutional quality is accounted for. Coon and Neumann (2018) investigated whether FDI and remittances act to complement or substitute each other in 118 countries over the period 1980–2010. After establishing that the causality between them runs from FDI to remittances, they applied a random effects Instrumental Variable (IV) model to the panel data. The results reveal that they are complementary rather than substitutes to mean that FDI flows do not crowd out remittance flows but instead tend to draw them in. The inclusion of ODA in the model to test whether it influences the remittances-FDI relationship did not alter the main results. They concluded that both foreign investors and migrants respond to investment opportunities in their home country. Garcia-Fuentes et al, (2016) reached the same conclusion earlier when they investigated the effect of remittances and market size on U.S. FDI flows to 15 Latin America and Caribbean (LAC) countries over the period 1983-2010. They estimated a model of a U.S. multinational firm's optimal level of capital at its foreign plant, applying a panel GMM to an unbalanced panel data. The results indicate a positive sign of the remittances-GDP per capita interaction, a suggestion that both exert a complementary effect on U.S. FDI flows. Besides, both coefficients of remittances and the interaction term are significant to mean that a threshold level of GDP per capita is required for remittances to exert a positive effect on U.S. FDI flows. Neagu and Schif (2009) went beyond the interactions between remittances, FDI and ODA flows to investigate their stability, cyclicality and stabilizing impact in 116 host countries over the period 1980-2007. They found that ODA is counter-cyclical with a stabilizing impact, remittances are mostly pro-cyclical with a destabilizing impact, and FDI is more pro-cyclical with a more destabilizing impact. As for their marginal contribution to the joint-stabilizing impact, adding ODA to the pair remittances-FDI increases the joint-stabilizing impact while adding remittances to the pair FDI-ODA and adding FDI to the pair REM-ODA decreases it. They, therefore, concluded that the stabilizing or destabilizing nature of the influence of any foreign capital type depends on its stochastic behavior but also on its share in GDP. It remains that, these studies and others overlooked the mechanism that engenders interactions between foreign capital in the process through which they impact growth. Yet, evidence exists that remittances impact growth directly and indirectly [Rao and Hassan (2011, 2012)] in a short and long-run process.

Thus, the contribution of this paper is threefold. It (i) generalizes the analysis of the mechanism through which remittances impact growth indirectly to FDI and ODA, (ii) estimates the values of transitory multipliers associated with each to appraise the influence economic environments exert on the process, and (iii) identifies optimal flows for the selected countries.

## 3. Methodology and Data

### 3.1 Methodology

To assess the influence an economic environment exerts on foreign capital's economic growth impacting process, we extended the model built on the assumption that remittances impact output growth directly and indirectly [Lare-Lantone (2016)] to FDI and ODA. The indirect segment cumulates incrementally overtime as a transitory effect with a part, channeled directly as a long-term effect, and another indirectly through income, consumption, and investments. Thus, the relationship between domestic output and any foreign capital is set as:

$$Y_{i,t} = Y_{i,t}\left(F_{i,t-j}, C_{i,t-j}, W_{i,t-j}, I_{i,t-j}, X'\right) \qquad (1)$$

*Y* is domestic output, *F* is foreign capital, *C* is households' consumption, *W* is households' income, *I* is investments, and *X'* a set of exogenously determined control variables. Assuming a linear functional form, *Y* is determined at time *t* as:

$$Y_{i,t} = \alpha_0 + \alpha_1 F_{i,t-j} + \alpha_2 C_{i,t-j} + \alpha_3 W_{i,t-j} + \alpha_4 I_{i,t-j} + \mu_t + \eta_i + \varepsilon_{i,t} \qquad (2)$$

$\mu$ is a time specific factor, $\eta$ an observed country specific effect, and $\varepsilon$ the error term. Taking the first difference of Equation (2) and making some transformations lead to:

$$\Delta Y_{i,t} = \varphi_0 + \varphi_1 \Delta F_{i,t} + \varphi_2[(W_{i,t-1} - F_{i,t-1}) - (I_{i,t-1} - C_{i,t-1})] + \varphi_3 \Delta F_{i,t-2} + \varepsilon_{i,t} \qquad (3)$$

$\Delta Y_{i,t}$ is the short term change in output, $\Delta F_{i,t}$ the short-term change in foreign capital, and $\Delta F_{i,t-2}$ the long-term change in foreign capital with the initial capital set as $F_{i,t-3}$. Thus, the total transitory effect (T) of the foreign capital on output captures the short-term disequilibrium relationship between foreign capital inflows, income, investments, and consumption as:

$$T_{i,t-1} = (W_{i,t-1} - F_{i,t-1}) - (I_{i,t-1} - C_{i,t-1}) \qquad (4)$$

*F*, *W*, *C*, and *I* are transitory variables determined in autoregressive processes as:

$$W_{i,t-1} = a_0 + a_1 W_{i,t-2} + \varepsilon_{1i,t-1} \quad (5)$$

$$F_{i,t-1} = b_0 + b_1 F_{i,t-2} + \varepsilon_{2i,t-1} \quad (6)$$

$$C_{i,t-1} = c_0 + c_1 C_{i,t-2} + \varepsilon_{3i,t-1} \quad (7)$$

$$I_{i,t-1} = i_0 + i_1 I_{i,t-2} + \varepsilon_{4i,t-1} \quad (8)$$

Substituting Equations (5), (6), (7), and (8) into (4) and making some transformations lead to:

$$T_{i,t-1} = \psi_0 + \psi_1 W_{i,t-2} + \psi_2 F_{i,t-2} + \psi_3 C_{i,t-2} + \psi_4 I_{i,t-2} + \nu_{i,t} \qquad (9)$$

Substituting equation (9) into equation (3) leads to:

$$\Delta Y_{i,t} = (\varphi_0 + \varphi_2\psi_0) + \varphi_1 \Delta F_{i,t} + \varphi_2\psi_1 W_{i,t-2} + \varphi_2\psi_2 F_{i,t-2} + \varphi_2\psi_3 C_{i,t-2} + \varphi_2\psi_4 I_{i,t-2} + \varphi_3 \Delta F_{i,t-2} + (\varepsilon_{i,t} + \varphi_2 \nu_{i,t}) \quad (10)$$

Or $$\Delta Y_{i,t} = \delta_0 + \delta_1 \Delta F_{i,t} + \delta_2 W_{i,t-2} + \delta_3 F_{i,t-2} + \delta_4 C_{i,t-2} + \delta_5 I_{i,t-2} + \delta_6 \Delta F_{i,t-2} + X' \quad (11)$$

### 3.2 Data

We derived the sample of countries studied by subjecting all world countries to 2 selection criteria using the World Bank World Development Indicators (WDI) data for the period 1970-2021. The first criterion sets the difference between the averaged remittances to GDP ratio and the averaged FDI to GDP ratio less than or equal to 2% in absolute terms to avoid that large gap in their relative economic importance bias cross-country comparisons. The second criterion imposes that countries have an ODA per capita less than US$50 to exclude those that are over-dependent on foreign aid. The main justification is that ODA has failed to channel funds directly to targeted beneficiaries but, over the years, fueled corruption and aid dependency in developing countries [Benmamoun and Lehnert (2013)]. Only 68 countries satisfied the first criterion, of which 40 satisfied the second one. Later, we eliminated 3 countries for insufficient data and tested the model on 37 countries panel and individual data (Table 1.)

## 4. Estimations and Results

For estimation purposes, we added combined foreign capital REMFDI (remittances-FDI), REMODA (remittances-ODA), and FDIODA (FDI-ODA) to REM, FDI, and ODA. We measured output with GDP, consumption with household final consumption expenditures, income with gross value added to labor force ratio, investments with gross fixed capital formation, remittances with personal remittances received to GDP ratio, FDI with FDI to GDP ratio, and ODA with ODA to GDP ratio. Control variables are financial development measured with domestic credit to private sector to GDP ratio, openness with the sum of import and export to GDP ratio, and price level with CPI.

### 4.1 Estimating the impacts of foreign capital on output growth

Given the definitions and specifications of the variables, Equation (11) is rewritten as:

$$\Delta \mathrm{OUT}_{i,t} = \delta_0 + \delta_1 \Delta FLOW_{i,t} + \delta_2 CONS_{i,t-2} + \delta_3 FLOW_{i,t-2} + \delta_4 WAGE_{i,t-2} + \delta_5 INVEST_{i,t-2} + \delta_6 \Delta FLOW_{i,t-2} + \delta_7 EXCH_{i,t-1} + \delta_8 GOV_{i,t-1} + \delta_9 OPEN_{i,t-1} + \delta_{10} FDEV_{i,t-1} + \delta_{11} CPI_{i,t-1} + \omega_{i,t} \quad (12)$$

We estimated Equation (12) on panel data using GMM and on country data using 3SLS method. The results from baseline and extended models on sample data are shown in Tables 2 and 3.

**Table 1. Countries selected based on the two criteria for the period 1970-2021**

| Country | FDI[1] | REM[2] | DIFF[3] | ODA[4] | Country | FDI | REM | DIFF | ODA |
|---|---|---|---|---|---|---|---|---|---|
| Algeria | 0.69 | 1.43 | -0.74 | 7.77 | Mexico | 1.92 | 1.70 | 0.22 | 2.48 |
| Argentina | 1.49 | 0.09 | 1.41 | 2.36 | Niger | 2.07 | 1.05 | 1.01 | 35.30 |
| Belarus | 1.99 | 1.07 | 0.91 | 10.84 | Nigeria | 1.45 | 2.41 | -0.96 | 7.34 |
| Bolivia | 2.39 | 1.94 | 0.45 | 49.65 | Paraguay | 1.07 | 1.28 | -0.20 | 15.86 |
| Brazil | 1.98 | 0.18 | 1.81 | 1.76 | Peru | 2.23 | 1.38 | 0.85 | 12.46 |
| Burundi | 0.31 | 1.07 | -0.76 | 34.99 | Saudi Arabia | 1.13 | 0.04 | 1.10 | 1.02 |
| Cameroon | 1.14 | 0.42 | 0.72 | 33.41 | Sierra Leone | 2.83 | 1.28 | 1.55 | 43.84 |
| Colombia | 2.27 | 1.24 | 1.03 | 10.82 | Slovenia | 2.03 | 0.88 | 1.15 | 29.18 |
| DR Congo | 1.87 | 1.95 | -0.08 | 20.99 | South Africa | 0.94 | 0.14 | 0.79 | 15.63 |
| Croatia | 3.70 | 4.32 | -0.63 | 35.58 | Sudan | 1.48 | 2.25 | -0.77 | 32.33 |
| Eswatini | 3.28 | 5.20 | -1.92 | 12.41 | Tanzania | 2.39 | 0.43 | 1.97 | 35.85 |
| Fiji | 3.69 | 3.50 | 0.19 | 19.86 | Thailand | 1.89 | 1.19 | 0.70 | 4.61 |
| Ghana | 2.60 | 1.66 | 0.94 | 33.68 | Tunisia | 2.20 | 4.20 | -2.00 | 39.82 |
| Guinea | 2.39 | 0.68 | 1.71 | 30.99 | Turkiye | 0.82 | 1.42 | -0.60 | 12.05 |
| India | 0.79 | 2.15 | -1.36 | 1.91 | Ukraine | 2.79 | 4.79 | -2.00 | 23.57 |
| Indonesia | 1.23 | 0.67 | 0.55 | 4.90 | Uruguay | 2.16 | 0.26 | 1.91 | 8.74 |
| Iran, Isl. Rep. | 0.49 | 0.89 | -0.39 | 1.58 | Venezuela | 0.99 | 0.03 | 0.95 | 2.01 |
| Kenya | 0.73 | 1.59 | -0.87 | 30.45 | Vietnam | 4.75 | 5.33 | -0.58 | 15.09 |
| Madagascar | 2.08 | 1.15 | 0.93 | 25.41 | | | | | |

Source: Authors own calculations based on data from the World Bank WDI.

1: Averaged FDI to GDP, 2: Averaged remittances to GDP, 3: (1) - (2), and 4: Averaged ODA per capita.

#### 4.1.1 The impact of individual foreign capital on output growth

Results from testing the baseline model on the sample data suggest that the short-run or contemporaneous change in remittances is a negative but non-significant determinant of their impact on output growth. However, based on results from testing the extended model, it is a significant determinant. The transitory variables long-run direct impact, consumption, investments, and income are all significant and negative. Government expenditure is the only control variable that is significant but positive (Table 2: columns 1 and 2). Results based on individual countries data indicate that the contemporaneous change in remittances is significant in Argentina, Guinea, Mexico, and Slovenia but weakly significant in Cameroon and Ukraine. The long-term direct impact is only significant in Croatia, Mexico, and Slovenia while consumption is only significant in Argentina and the DRC. It is in Argentina that income is also significant while investment is significant in Algeria and Mexico. Among the control variables, exchange rate is significant in 6 countries, government expenditure in 9, openness in 5, financial development in 9, and CPI in 9.

Results obtained from regressing the baseline and extended models on the sample data reveal that the long-run direct impact of FDI is significant and positive while income is significant and negative. Only the results obtained from the baseline model show the contemporaneous change in FDI to be significant but positive. Among the control variables, only government expenditure is significant but positive (Table 2: columns 3 and 4). Results based on individual countries data show that the contemporaneous change in FDI is significant in Belarus, Bolivia, Peru, and Slovenia but weakly significant in Guinea, Tanzania, and Ukraine. The long-run direct impact of FDI is significant in Belarus and Tanzania. Consumption is weakly significant in Belarus and the DR Congo while income is significant in Tanzania but weakly significant in Ghana. In none of the countries is investment significant. As for control variables, exchange rate is significant in 5 countries, government expenditure in 8, openness in 6, financial development in 5, and CPI in 9.

Results from regressing the baseline and extended models on sample data indicate that income is the only significant transitory variable while the results from the baseline model show the contemporaneous change in ODA to be strongly significant but negative. Control variables government expenditure and financial development are significant but when the first one is positive, the second one is negative (Table 2: columns 5 and 6). Results based

on individual countries data reveal that the contemporaneous change in ODA is significant in Saudi Arabia and Thailand but weakly significant in Croatia. The long-run direct impact of ODA is significant in the DR Congo but weakly significant in Nigeria. Consumption is significant in the DR Congo and Croatia but weakly significant in Thailand. Income is only significant in Croatia while investment is significant in Algeria but weakly significant in Turkiye. Among control variables, exchange rate is significant in 8 countries, government expenditure in 9, openness in 9, financial development in 6, and CPI in 8 countries.

**Table 2. Estimates of the impact of foreign capital flows on growth**

| | **REM** | | **FDI** | | **ODA** | |
|---|---|---|---|---|---|---|
| | **Baseline** | **Extended** | **Baseline** | **Extended** | **Baseline** | **Extended** |
| ΔREM | -0.26 | -1.54 | | | | |
| | (-0.94) | (-1.85) | | | | |
| ΔFDI | | | 0.18 | -0.10 | | |
| | | | (1.70) | (-0.79) | | |
| ΔODA | | | | | -80.01 | -7.02 |
| | | | | | (-3.43) | (-0.32) |
| REM(-2) | -0.27 | -0.02 | | | | |
| | (-1.61) | (-0.03) | | | | |
| FDI(-2) | | | 0.19 | 0.23 | | |
| | | | (1.69) | (2.91) | | |
| ODA(-2) | | | | | 87.54 | 7.63 |
| | | | | | (0.74) | (0.26) |
| ΔREM(-1) | -0.03 | 0.01 | | | | |
| | (-1.70) | (0.47) | | | | |
| ΔFDI(-1) | | | -0.44 | 9.93 | | |
| | | | (-0.17) | (1.23) | | |
| ΔODA(-1) | | | | | 0.67 | 0.60 |
| | | | | | (0.35) | (0.34) |
| CONS(-2) | -0.11 | -0.05 | -0.03 | -0.10 | 0.01 | -0.04 |
| | (-3.17) | (-0.52) | (-0.46) | (-1.19) | (0.11) | (-0.66) |
| VABOR(-2) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (-11.67) | (-4.57) | (-7.15) | (-3.76) | (-2.71) | (-5.27) |
| INVEST(-2) | -0.06 | 0.00 | 0.06 | -0.12 | -0.18 | -0.09 |
| | (-2.40) | (0.00) | (0.71) | (-1.00) | (-1.49) | (-0.98) |
| EXCH(-1) | | 0.00 | | 0.00 | | 0.00 |
| | | (1.11) | | (1.29) | | (0.14) |
| GOV(-1) | | 0.30 | | 0.47 | | 0.43 |
| | | (1.55) | | (3.24) | | (2.87) |
| OPEN(-1) | | 0.03 | | 0.06 | | 0.06 |
| | | (0.60) | | (1.36) | | (1.52) |
| FDEV(-1) | | -0.03 | | -0.01 | | -0.08 |
| | | (-0.91) | | (-0.20) | | (-2.02) |
| CPI(-1) | | -0.01 | | -0.01 | | 0.00 |
| | | (-1.48) | | (-1.17) | | (-0.23) |
| Sargan test: | 31.16 | 27.28 | 32.34 | 26.16 | 7.28 | 26.52 |
| Autocorrelation test (1): | -3.57 | -4.02 | -3.60 | -4.24 | -2.41 | -4.19 |
| Autocorrelation test (2): | -2.07 | -1.93 | -0.92 | -2.53 | -0.65 | -1.88 |
| Wald test : | 515.87 | 113.72 | 71.01 | 620.56 | 38.41 | 369.11 |
| Estimates from author's own computations using WDI data; Values in italics are t-statistic | | | | | | |

### 4.1.2 The impact of combined foreign capital on output growth

Results from estimating the baseline model on sample data suggest that the contemporaneous change in REMFDI, the combined remittances-FDI flows, is positive and significant. The long-run direct impacts of REMFDI, consumption and investment are all non-significant. While income is the only significant transitory variable, it is negative. Only openness and government expenditure are shown to be weakly significant (Table 3: columns 1 and 2).

Results based on individual countries data suggest that the contemporary change in REMFDI is significant in Peru and Slovenia, but weakly significant in India. The long-run direct impact of REMFDI is significant but negative in Burundi and Turkiye. However, it is significantly positive in the DR Congo, Ghana, and Uruguay. Consumption is significant and positive in Croatia but weakly significant in Turkiye. Income is only weakly significant in Thailand but very significant in Ghana and Sierra Leone. Investment is significant and negative in Algeria but positive in Sierra Leone. In India, it is weakly significant and positive but negative when control variables are added to the model. The control variable exchange rate is significant in 2 countries, government expenditures in 7, openness in 6, financial development in 5, and CPI in 6.

Results from estimating the baseline and extended models on sample data reveal that only income is significant but negative. But, results obtained solely from the baseline model suggest that the contemporaneous change in REMODA, the combined remittances-ODA flows, is non-significant (Table 3: columns 3and 4). Results based on individual countries data indicate that the contemporaneous change in REMODA is significant in Croatia, Fiji, and Saudi Arabia but weakly significant in Thailand. The long-run direct impact of REMODA is significant in Nigeria while consumption is weakly significant in Croatia and Sierra Leone. Income is significant in Croatia and Sierra Leone while investment is significant in Algeria, Sierra Leone, and Turkiye. The control variable exchange rate is significant in 7, government expenditure in 10, openness in 8, financial development in 5, and CPI in 9.

Results from estimating the baseline and extended models reveal that income is significant but negative. Furthermore, the results from the baseline model suggest that the contemporaneous change in FDIODA, the combined FDI-ODA flows, is not significant while its long-run direct impact is positive and very Significant (Table 3: columns 5 and 6). The results based on individual countries data reveal that the contemporaneous change in FDIODA is significant in Guinea and India but weakly significant in Fiji and Vietnam. The long-run direct impact of FDIODA is significant in Nigeria but weakly significant in Colombia and Ukraine while consumption is weakly significant in the DR Congo. Income is weakly significant in Turkiye while investment is significant in Sierra Leone and Turkiye. The control variable exchange rate is significant in 7 countries, government expenses in 7, openness in 6, financial development in 3, and CPI in 6.

### 4.2 Transitory effects of foreign capital flows on output growth

Given the estimated equation (12) the value of the total transitory effect can be derived as:

$$\bar{\bar{T}}_{i,t-1} = \bar{\delta}_2 CONS_{i,t-2} + \bar{\delta}_3 FLOW_{i,t-2} + \bar{\delta}_4 WAGE_{i,t-2} + \bar{\delta}_5 INVEST_{i,t-2} \quad (13)$$

with $\bar{\delta}_2 = \varphi_2\psi_1$, $\bar{\delta}_3 = \varphi_2\psi_2$, $\bar{\delta}_4 = \varphi_2\psi_3$, and $\bar{\delta}_5 = \varphi_2\psi_4$.

Thus: $\bar{\bar{T}}_{i,t-1} = \varphi_2(\psi_1 CONS_{i,t-2} + \psi_2 FLOW_{i,t-2} + \psi_3 WAGE_{i,t-2} + \psi_4 INVEST_{i,t-2})$ $(14a)$

Or $$\bar{\bar{T}}_{i,t-1} = \varphi_2 \bar{T}_{i,t-1} \ (14b)$$

Equations 14 state that the impact of foreign capital on output growth is the cumulated total transitory effect affected by $\varphi_2$, the transitory multiplier, which captures the influence the economic environment exerts on the growth impacting process. Thus, its value is obtained as:

$$\varphi_2 = \frac{\bar{\bar{T}}_{i,t-1}}{\bar{T}_{i,t-1}} \quad (15)$$

$\bar{\bar{T}}$ is the cumulated total transitory effect influenced by the economic environment and $\bar{T}$ is the cumulated total transitory effect free from that influence. In practice, $\bar{\bar{T}}$ and $\bar{T}$are the total transitory effects provided respectively by the estimated extended model and baseline model.

#### 4.2.1 Comparing transitory multipliers across foreign capital flows

We derived the value of the transitory multiplier ($\varphi_2$) for the whole sample of countries and for each individual country on the assumption that the higher it is, the stronger is the influence the local economic environment exerts on the growth impacting process generated by the received foreign capital. We subsequently assumed that foreign capital are substitutes when the value of the transitory multiplier associated with their combined flows is lower than the highest of the values of the transitory multipliers associated with their individual flows. Inversely, they are complementary when the value of the transitory multiplier associated with their combined flows is higher than the highest of the values of the transitory multipliers associated with their individual flows. As such, when substitute foreign capital flows are combined, the one associated with the lowest transitory multiplier destabilizes or depresses the one associated with the highest transitory multiplier to generate a comparatively lower combined transitory multiplier. Inversely, when complementary foreign capital flows are combined, the one associated with the highest transitory multiplier stabilizes or boosts the one associated the lowest transitory multiplier to generate a comparatively higher combined transitory multiplier. Table 4 reports the values of the transitory multipliers for the whole sample of countries and individual countries except for Iran, Malawi, and Thailand due to returned estimation errors for insufficient degrees of freedom.

It emerged that the transitory multiplier associated with remittances flows is positive for the whole sample of countries and 16 individual countries but negative for 18. The transitory multiplier associated with FDI flows is positive for the whole sample and 19 countries but negative for 15. The transitory multiplier associated with ODA flows is negative for the whole sample and 19 countries but positive for 15. Following, remittances and FDI flows are substitutes for the whole sample and in Algeria, Argentina, Belarus, Brazil, Burundi, Cameroon, Colombia, Croatia, the DR Congo, Fiji, Ghana, Guinea, India, Madagascar, Mexico, Paraguay, Sierra Leone, Slovenia, South Africa, Sudan, Tanzania, Tunisia, Uruguay, and Vietnam. They are complementary in Bolivia, Eswatini, Indonesia, Kenya, Niger, Nigeria, Peru, Saudi Arabia, Turkiye, and Ukraine. Remittances and ODA flows are substitutes for the whole sample and in Algeria, Belarus, Burundi, Colombia, Croatia, DR Congo, Fiji, Ghana, Guinea, India, Indonesia, Kenya, Madagascar, Mexico, Niger, Nigeria, Paraguay, Sierra Leone, Slovenia, South Africa, Tanzania, and Ukraine. They are complementary in Argentina, Bolivia, Brazil, Cameroon, Peru, Saudi Arabia, Tunisia, Turkiye, Uruguay, and Vietnam. FDI and ODA flows are substitutes for the whole sample and in Algeria, Argentina, Brazil, Croatia, DRC, Fiji, Ghana, Indonesia, Madagascar, Mexico, Nigeria, Paraguay, Peru, Saudi Arabia, Sierra Leone, Slovenia, South Africa, Tanzania, Turkiye, Ukraine, Uruguay, and Vietnam. They are complementary in Belarus, Bolivia, Burundi, Cameroon, Colombia, Guinea, India, Kenya, Niger, and Tunisia.

**Table 3. Estimates of the impact of combined foreign capital flows on growth**

| | **REMFDI** | | **REMODA** | | **FDIODA** | |
|---|---|---|---|---|---|---|
| | **Baseline** | **Extended** | **Baseline** | **Extended** | **Baseline** | **Extended** |
| Δ REMFDI | 0.04 | 0.06 | | | | |
| | (1.57) | (2.33) | | | | |
| ΔREMODA | | | -1.78 | -18.50 | | |
| | | | (-0.75) | (-1.17) | | |
| ΔFDIODA | | | | | 0.51 | -0.66 |
| | | | | | (0.72) | (-0.43) |
| REMFDI(-2) | 0.01 | 0.02 | | | | |
| | (0.35) | (0.66) | | | | |
| REMODA(-2) | | | -0.99 | 6.07 | | |
| | | | (-0.25) | (0.32) | | |
| FDIODA(-2) | | | | | 2.23 | 3.10 |
| | | | | | (3.33) | (1.22) |
| ΔREMFDI(-1) | -0.04 | 0.09 | | | | |
| | (-0.61) | (1.44) | | | | |
| ΔREMODA(-1) | | | 0.00 | 0.00 | | |
| | | | (0.78) | (0.36) | | |
| ΔFDIODA(-1) | | | | | 0.08 | 0.04 |
| | | | | | (0.65) | (0.51) |
| CONS(-2) | -0.01 | 0.04 | -0.09 | -0.03 | 0.02 | -0.09 |
| | (-0.14) | (0.26) | (-1.36) | (-0.77) | (0.22) | (-1.54) |
| VABOR(-2) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (-6.10) | (-3.70) | (-4.04) | (-2.82) | (-6.20) | (-6.79) |
| INVEST(-2) | 0.02 | -0.01 | 0.05 | -0.06 | 0.09 | -0.16 |
| | (0.20) | (-0.08) | (0.47) | (-0.53) | (0.64) | (-1.57) |
| EXCH(-1) | | 0.00 | | 0.00 | | 0.00 |
| | | (0.15) | | (1.39) | | (0.34) |
| GOV(-1) | | 0.26 | | 0.53 | | 0.54 |
| | | (1.75) | | (5.10) | | (4.22) |
| OPEN(-1) | | 0.05 | | 0.08 | | 0.07 |
| | | (0.92) | | (1.69) | | (1.94) |
| FDEV(-1) | | -0.04 | | -0.04 | | -0.05 |
| | | (-0.85) | | (-1.04) | | (-1.20) |
| CPI(-1) | | 0.00 | | -0.01 | | -0.01 |
| | | (-1.57) | | (-0.75) | | (-0.80) |
| Sargan test: | 34.24 | 27.51 | 32.97 | 26.91 | 32.33 | 25.42 |
| Autocorrelation test (1): | -3.61 | -3.85 | -3.35 | -2.91 | -3.58 | -3.95 |
| Autocorrelation test (2): | -1.81 | -2.03 | -1.19 | -0.94 | -0.33 | -2.66 |
| Wald test for coefficients: | 64.31 | 245.18 | 100.22 | 513.77 | 135.36 | 464.97 |
| Estimates from author's own computations using WDI data; Values in italics are t-statistic | | | | | | |

In terms of interactions, remittances exert a destabilizing influence on FDI for the whole sample of countries and in 12 individual countries (Algeria, Argentina, Brazil, Cameroon, Colombia, Croatia, DRC, Fiji, Paraguay, Sierra Leone, Tanzania, and Vietnam) and a stabilizing influence on them in 5 (Bolivia, Kenya, Nigeria, Peru, and Saudi Arabia). FDI exert a destabilizing influence on remittances in 11 countries (Belarus, Burundi, Ghana, Guinea, India, Madagascar, Mexico, South Africa, Sudan, Tunisia, and Uruguay) and a stabilizing influence on them in 6 (Eswatini, Indonesia, Niger, Slovenia, Turkiye, and Ukraine). Remittances exert a destabilizing power on ODA in 10 countries (Colombia, Croatia, DR Congo, Fiji, India, Indonesia, Kenya, Mexico, Slovenia, and Tanzania) and a stabilizing influence on them in 3 (Cameroon, Tunisia, and Vietnam). ODA exert a destabilizing influence on remittances for the sample and in 15 countries (Algeria, Belarus, Brazil, Burundi, Ghana, Guinea, Madagascar, Niger, Nigeria, Paraguay, Sierra Leone, South Africa, Ukraine, and Uruguay) and a stabilizing influence on them in 5 (Argentina, Bolivia, Peru, Saudi Arabia, and Turkiye). FDI flows exert a destabilizing influence on ODA in 8 countries (DR Congo, Fiji, Mexico, Peru, Saudi Arabia, Sierra Leone, Slovenia, and South Africa) and a stabilizing influence on them in 5 (Burundi, Cameroon, Guinea, Niger, and Tunisia). ODA flows had a destabilizing influence on FDI for the whole sample and in 13 countries (sample, Algeria, Argentina, Brazil, Croatia, Ghana, Indonesia, Madagascar, Nigeria, Paraguay, Tanzania, Turkiye, Ukraine, and Vietnam) and a stabilizing influence on them in 6 (Belarus, Bolivia, Colombia, India, Kenya, and Uruguay).

#### 4.2.2 Comparing the transitory multiplying effect across countries

We identified the optimal foreign capital as the one to which is associated the highest positive transitory multiplier. But, in case all transitory multipliers are negative, the foreign capital with the lowest negative transitory multiplier becomes the optimal one. Besides, given that a non-optimal foreign capital can provide other socioeconomic benefits than growth, we derived a second-best to the optimal foreign capital for some countries. Remittances, for example, serve to finance households' purchases of living necessities [Barajas et al. (2009)] and act as a social insurance. They help dampen the effect of consumption instability [Bettin et al. (2015)], reduce income disparities [Ebeke et al. (2014)], improve labor participation [Edwards and Ureta (2003)], and increase access to social services [Cox and Ureta (2003), Yang (2008).] Globally, the second-best to optimal foreign capital flows are combined substitute flows which generate a comparatively lower but positive transitory multiplier.

The optimal foreign capital for all 37 countries is FDI but across countries, remittances are the optimal one for 7 countries including Burundi, Ghana, Guinea, Madagascar, Sierra Leone, South Africa, and Sudan. FDI is the optimal one for 6 countries including Algeria, Brazil, Croatia, Paraguay, Tanzania, and Vietnam. ODA flows are the optimal ones for 4 countries including the DR Congo, Fiji, Mexico, and Slovenia. Remittances-FDI flows are the optimal ones for 6 countries including Bolivia, Eswatini, Indonesia, Nigeria, Turkiye, and Ukraine. Remittances-ODA flows are the optimal ones for 4 countries including Argentina, Peru, Saudi Arabia, and Uruguay. FDI-ODA flows are the optimal ones for 7 countries including Belarus, Cameroon, Colombia, India, Kenya, Niger, and Tunisia. Second-best to the optimal are remittances-FDI flows for the whole sample, Croatia and Sudan; remittances-ODA flows for Brazil, Burundi, Ghana, Madagascar, Paraguay, South Africa, and Vietnam; and ODA-FDI flows for Algeria and Fiji.

Comparing across regions, the countries with remittances as optimal foreign capital are all Sub-Saharan Africans and, except Ghana, low income countries. It is only for Tanzania and the DR Congo that the optimum foreign capital is respectively FDI and ODA. However, remittances-FDI flows are optimal for Eswatini and Nigeria while FDI-ODA flows are optimal for Cameroon, Kenya, and Niger. Among the Latin American countries, FDI is the optimal foreign capital for Brazil and Paraguay and ODA for Mexico. But, remittances-FDI flows are optimal for Bolivia, remittances-ODA flows for Argentina, Peru, and Uruguay, and FDI-ODA flows for Colombia. Among the Asian countries, FDI is the optimal foreign capital for Vietnam. However, remittances-FDI flows are optimal for Indonesia and FDI-ODA flows for India. For the East European countries, FDI is the optimal foreign capital for Croatia, and ODA for Slovenia. However, remittances-FDI flows are optimal for Turkiye and Ukraine, and FDI-ODA flows for Belarus. Globally, various combined flows of two foreign capital among remittances, FDI, and ODA are optimal for as many as 17 countries.

## 5. Discussions and Conclusion

### 5.1 Discussions

Our model is built on the assumption that the indirect impact cumulates incrementally overtime as a transitory effect with a part, channeled directly as a long-run direct impact, and another indirectly through income, consumption, and investments. The estimates obtained empirically from the extended models reveal that the long run direct impact and consumption, income, and investments through which the impact transmutes indirectly to growth to be statistically more significant than those obtained from the baseline models. The difference in these results suggests that the influence of economic environments on the growth impacting process captured through the control variables added to the baseline models is significant for the whole sample of countries. The direct implication for a country is to assure that its economic conditions are or will be favorable for hosting any specific

foreign capital. The direct impacts on growth caused by contemporaneous changes in remittances, FDI, ODA, or remittances-FDI are significant but more significant for ODA. It is an indication that the direct impacts on growth are transmitted in such a brief time that they cannot be altered by fluctuations in the economic environment. The results reveal also that income is the most significant transitory variable through which individual or combined foreign capital flows impact growth indirectly. Nevertheless, in the absence of control variables, consumption and investments are also significant transitory variables, providing a support to existing findings that remittances serve both consumption

**Table 4. Transitory effects of foreign capital flows on growth**

| Foreign Capital | REM | FDI | ODA | REMFDI | REMODA | FDIODA |
|---|---|---|---|---|---|---|
| All | 1.43 | 16.68 | -2.01 | 1.uch 36 | 1.32 | 1.35 |
| Algeria | 5.56 | 6.22 | 2.16 | 2.59 | 3.47 | 4.06 |
| Argentina | -19.09 | 46.87 | 7.56 | 33.19 | 1262.4 | 11.54 |
| Belarus | 8.87 | -62.24 | -524.4 | -20.52 | -439.5 | 148.06 |
| Bolivia | -0.35 | -1.45 | -0.33 | 1.88 | 1.57 | 0.22 |
| Brazil | -243.6 | 6.70 | -10.47 | 3.33 | 4.84 | -88.67 |
| Burundi | 17.52 | 0.68 | -0.07 | 0.98 | 1.39 | 0.86 |
| Cameroon | -2.07 | -1.51 | -3.35 | -1.76 | 5.11 | 24.24 |
| Colombia | 2.01 | 2.69 | 3.32 | 2.21 | 2.20 | 6.99 |
| Croatia | -0.62 | 13.54 | 3.63 | 5.53 | 2.95 | 8.29 |
| D. R. Congo | -2.47 | 0.07 | 1.20 | -0.83 | -364.3 | -0.04 |
| Eswatini | -32.26 | 4.07 | | 4.95 | | |
| Fiji | -35.92 | 9.10 | 26.68 | 6.11 | 13.41 | 8.31 |
| Ghana | 34.09 | 8.67 | -786.3 | 6.82 | 11.74 | -196.6 |
| Guinea | 8.48 | -1.44 | -23.22 | -1.40 | -6.75 | 2.38 |
| India | 4.93 | 2.67 | 11.19 | 3.44 | 3.44 | 13.21 |
| Indonesia | -10.44 | 41.53 | -3.89 | 58.54 | -10.07 | -20.50 |
| Kenya | 0.87 | -0.53 | 1.53 | 1.02 | 1.29 | 2.08 |
| Madagascar | 10.82 | 2.19 | 2.18 | 2.37 | 2.47 | -2.18 |
| Mexico | -0.05 | -3.01 | 3.12 | -1.41 | -0.17 | -0.10 |
| Niger | -0.27 | 0.42 | -1.79 | 2.16 | -0.97 | 7.96 |
| Nigeria | 4.37 | 3.70 | -0.02 | 9.05 | 1.32 | 1.23 |
| Paraguay | 35.01 | 93.63 | -77.30 | -2.83 | 31.81 | -110.4 |
| Peru | 1.00 | -9.38 | 3.40 | 1.48 | 4.35 | 0.23 |
| Saudi Arabia | -24.14 | -55.71 | -22.81 | -6.82 | -2.75 | -70.66 |
| Sierra Leone | -0.83 | -0.81 | -53.04 | -1.46 | -1.28 | -1.05 |
| Slovenia | -13.05 | -6.02 | 1.25 | 0.90 | -3.42 | -4.67 |
| South Africa | 4.72 | -0.57 | 4.43 | -0.78 | 1.92 | -0.75 |
| Sudan | 56.83 | 45.88 | 0.00 | 19.60 | 0.00 | 0.00 |
| Tanzania | -77.00 | 9.33 | -20.49 | -34.16 | -164.6 | -18.65 |
| Tunisia | -7.33 | -27.17 | -107.2 | -11.39 | 5.80 | 94.96 |
| Turkiye | -14.86 | -4.45 | -9.08 | 36.34 | -9.07 | -10.45 |
| Ukraine | -5.37 | -4.39 | -52.97 | 1.01 | -6.38 | -228.09 |
| Uruguay | 0.53 | -0.93 | -0.20 | -1.83 | 1.65 | -1.43 |
| Vietnam | 20.57 | 41.96 | 8.18 | 19.43 | 23.55 | -30.72 |

Estimates from author's computation of the model using WDI data.

and investment purposes [Coon and Neumann (2018)]. The long-run direct transitory impact of FDI is significant indicating that it takes comparatively a longer time for the total direct effect of FDI flows on growth to cumulate and become effective. It is also an indication that large shares of received investments do not finance short-run consumption but projects which mature over longer periods of time. Government expenditure is the control variable that catalyzes the foreign capital's growth impacting process most significantly, suggesting that the role of government policy in the hosting of foreign capital is crucial. Financial development is found to be a significant determinant of the impact ODA exert on growth, may be due to the fact that like remittances, when they reach the targeted beneficiaries, ODA increase financial inclusion [Anzoátegui et al. (2014), Bang et al. (2015)]. Openness is revealed to be a significant determinant of the impacts ODA, remittances-ODA and FDI-ODA flows exert on growth, to suggest that ODA increase imports, especially when donated funds are countercyclical to local production. Price is also significant as it affects receiving families' financial needs.

The values of the transitory multipliers associated with remittances are positive for the whole sample and 16 individual countries but negative for 18. The negative transitory multipliers may be attributed to two factors: either remittances flows are countercyclical to output production [Sayan (2006)] or they haven't reached the threshold level to sustain a positive impact on growth [Lare-Lantone (2018).] The transitory multipliers associated with FDI are positive for the whole sample and 19 countries but negative for 15. In this case, the negative transitory multipliers may be due to the narrowness of the receiving country's market [Garcia-Fuentes et al, (2016)] or the orientation of investment inflows towards less productive sectors [Minh (2020).] The transitory multipliers associated with ODA are negative for the whole sample and 19 countries but positive for 15. These negative transitory multipliers may result from the re-channeling of donated funds outside the receiving country and away from targeted beneficiaries [Benmamoun and Lehnert (2013).]

Comparisons of the interactions between the foreign capital reveal that remittances and FDI are substitutes for the whole sample and in 24 countries but complementary in 10. Remittances and ODA are substitutes for the whole sample and in 22 countries but complementary in 10. FDI and ODA are substitutes for the whole sample and in 22 countries but complementary in 10. Comparatively, ODA had the most destabilizing or depressing influence across countries for destabilizing remittances in 15 countries and FDI in 13 countries. FDI and ODA had the most stabilizing or boosting influence across: FDI stabilized remittances in 6 countries and ODA in 5 while ODA stabilized remittances in 5 countries and FDI in 6. Since ODA has equal stabilizing power as FDI, but a stronger destabilizing power, chances are higher for economic environments to be more accommodating to combined flows containing FDI flows than those containing ODA flows, supporting our findings on optimal flows. It resulted that FDI is optimal for the group of 37 countries, meaning that, together they will maximize their related gains if they only host FDI [Nagou (2017).] Remittances are optimal for 7 countries, FDI for 6, ODA for 4, remittances-FDI flows for 6, remittances-ODA flows for 4, and FDI-ODA flows for 7. It remains that remittances-FDI flows are second-best to optimal flows for the whole sample and 2 countries, remittances-ODA flows for 7 countries, and ODA-FDI flows for 2 countries.

While Sub-Saharan African countries make up all the countries with remittances as optimal foreign capital, they also make up half of the countries with FDI-ODA flows as optimal. However, counterintuitive is the fact that ODA is optimal for Mexico given that its ODA per capita is lower than $3. Also, while ODA is the optimal foreign capital for Fiji, one may doubt that remittances-ODA flows are optimal for Saudi Arabia. The fact is that Fiji has an ODA per capita of $19.86 while Saudi Arabia has the lowest ($1.02) and the second lowest remittances over GDP ratio among the selected countries.

### 5.2 Conclusions

We estimated the values of the transitory multipliers associated with remittances, FDI, and ODA to assess the influence economic environments exert on their indirect impact on growth over the period 1978-2015. Our empirical results show that influence to be significant. Income is revealed to be the most significant of the transitory variables through which the incrementally cumulated transitory impact is indirectly transmuted to growth. Based on the values of the transitory multipliers associated with each individually, remittances and FDI are substitutes in 24 countries and complementary in 14, remittances and ODA are substitutes in 22 countries and complementary in 10, and FDI and ODA are substitutes in 22 countries and complementary in 10. Though FDI and ODA had equal stabilizing influence across countries, ODA had more destabilizing influence, comforting the fact that FDI are the optimal foreign capital for the group of 37 countries. Across countries, remittances are optimal for 7 countries, FDI for 6, ODA for 4, remittances-FDI flows for 6, remittances-ODA for 4, and FDI-ODA flows for 7. Besides, the optimal foreign capital for 11 countries are second-best to optimal.

Globally, the influence the economic environment exerts on the foreign capital growth impacting process is significant to suggest that countries can maximize the related gains if they only receive the optimal one(s) to induce the highest growth. Since income is the most significant of the transitory variables through which the indirect impact is channeled to growth, accommodative measures should necessarily target increasing labor productivity and job creation. Besides emphasizing the need for accommodative government policies, the hosting of foreign capital should account for the structure of the economy including its market size, labor productivity, production cycle, and potential growth.

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