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Foreign Direct Investment and Exports Nexus: Cointegration and Causality Evidence from Cote d'Ivoire

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Abstract
This paper examines the relationship between foreign direct investment (FDI) and exports in Cote d'Ivoire using data covering the period 1970 to 2007. The residuals-based test of Gregory and Hansen (1996) shows that the two variables are cointegrated. The Granger causality tests reveal a long-run causal relationship running from exports to FDI, whereas no short term causal link has been found.
Keywords: Exports; Foreign direct investment; Cointegration; Granger causality

1. Introduction

Foreign Direct Investment (FDI) has become an area of research of intense debate in both theoretical and empirical literatures since the emergence of endogenous growth theory. It is argued that in addition to the direct increase of capital formation, FDI induces positive externalities on growth through the diffusion of advanced technological and managerial practices from leaders to developing countries (De Mello, 1997, 1999; Durham, 2004; UNCTAD, 2006). Other channels through which FDI increases growth include higher exports in host country (Markusen and Venables, 1999). Openness to FDI enhances international trade thereby contributing to the integration of the host country into the world economy. UNCTAD (2006) asserts that FDI has the potential to exports and contribute to the long-term economic development of the world's developing countries. Another strand of the literature suggests that exports can increase FDI arguing that the extent to which FDI contributes to growth depends on the quality of environment of the recipient country. In particular, host countries with open trade regime would benefit from increase FDI to their economies (Basu *et al.*, 2003). An outward orientation facilitates a better environment for FDI and enables further integration with the global economy.

Based on these arguments, an increasing number of developing countries including African and Asian countries have attempted to design policy measures to facilitate access to and attract new flow of foreign capital. These policies include administrative facilities, privatization of state monopolies, capital market liberalization, tax concessions and removal of trade restrictions[1]. Many observers have identified openness or outward trade orientation as an explanation for the Asian countries' enviable development performance (see World Bank, 1993; Stiglitz, 1996; Dowling and Ray, 2000; Sharma, 2000). Despite the burgeoning literature on FDI, however, there are few studies analysing the causal link between FDI and host country's export performance.

This paper contributes to the empirical literature by examining the case of Cote d'Ivoire, a Sub-Saharan African country that has made some progress in attracting foreign direct investment. FDI inflow to Cote d'Ivoire increased from US$ 48.43 million in 1990 to US$ 234.7 million in 2000 and US$ 426.9 million in 2007 (UNCTAD, 2008). This is welcome news for Cote d'Ivoire. At the same time, the country shows a substantial increase in exports as share of GDP from 31.6 % in 1990 to 40.4% in 2000 and 47% in 2007 (WDI, 2010).

Apart from filling the gap in the empirical literature, this study uses recent developments in time series modelling. First, we undertake a thorough investigation of the unit root properties of the data. To this end, apart from using standard unit root tests, we also employ the Zivot and Andrews (ZA, 1992). Second, we apply the residual-based cointegration test developed by Gregory and Hansen (GH, 1996) to examine the existence of a long-run relationship between the variables. The appealing aspect of the ZA and GH tests is that they allow one to establish the unit root and cointegration properties of the data in the presence of structural breaks. An associated advantage of these tests is that they search for break endogenously.

The rest of the paper is organized as follows. Section 2 reviews the literature regarding the causal relationship between export and foreign direct investment. Section 3 describes the econometric methodology. Section 4 analyses the empirical results. Finally, Section 5 provides summary and gives some policy implications.

2. Literature Review

The relationship between FDI and exports has been examined extensively in the theoretical and empirical literature. *A priori*, it is common to expect two-way linkages between FDI and exports (Aizenman and Noy, 2006). This stems from the fact that higher foreign direct investment increase the host country's export capacity

[1] See Rodrik (1998), UNCTAD (1999), and Hanson (2001) for a discussion of policy measures undertaken by some African countries to attract more FDI.

and higher trade openness attracts more foreign direct investment inflows for faster growth. On the one hand, as FDI inflow brings additional capital, new technology and better management and marketing strategies, it can stimulate export growth, improve total factor productivity and help a country integrate into global economic networks (Rodriguez-Clare, 1996; Goldberg and Klein, 1998; Pacheco-Lopez, 2005). It is due to these critical roles played by FDI that developing countries across the world have attempted to design policy measures to facilitate access to and attract more foreign capital. On the other hand, firms' ability to successfully export may justify their making more permanent investment in the host country. Multinational corporations look for more trade and more open economies for resource-seeking operations, especially as they integrate their global production with vertical and horizontal value-chain linkages. This integration is particularly important when corporations seek a base to serve regional markets (Blomstrom and Kokko, 1997). When multinational corporations become competitive and profitable in the exports markets, they will tend to grow from reinvested internal profits and newly borrowed funds along with new technology, superior management and marketing strategies (Pacheco-López, 2005). This implies exports stimulate FDI. However, the theoretical linkage between FDI and trade is a matter of dispute. FDI and trade can be substitutes or complements depending on the incentives behind foreign investment decisions, and on the character and nature of the multinational corporations involved in most of FDI flows. The traditional view (Mundell, 1957) stated, in the context of the Heckscher-Ohlin trade model, that FDI as a factor of production is a substitute of commodity trade. However, Schmitz and Helmberger (1970) and Markusen (1983) developed models where capital movements and trade are complements. The "new trade theory" predicts FDI and trade are complimentary between asymmetric countries and substitute between symmetric countries (Markusen and Venables, 1998). They also depend on whether FDI is market-seeking (substitutes) or efficiency-seeking (compliments) (Gray, 1998)[1]. Hsiao and Hsiao (2006) assert that exports increase FDI by paving the way for FDI by gathering information of the host country that helps to reduce investors' transaction costs. Also FDI may reduce exports by serving foreign markets through establishment of production facilities there.

The empirical evidence about the relationship between trade and FDI is also ambiguous. Many studies evidence a beneficial impact of FDI on exports. For instance, in their study on Asian and Latin American countries, de Mello and Fukasaku (2000) find that FDI leads to trade in the case of Latin American countries, whereas, in the case of Southeast Asia, trade leads to FDI. Also, using Spanish data over the period 1977-1992, Bajo and Montero (2001) find evidence pointing to the existence of a relationship of complementarity between exports and FDI, with Granger-causality running from outward FDI to exports, and bilateral causality in the long run. Zhang and Song (2000), and Liu *et al.* (2001) show that FDI have contributed significantly to China impressive export expansion and economic growth. However, results obtained by Zhang and Felmingham (2001) and Liu *et al*. (2002) reveal that there is a two – way causality between inward FDI and Exports in China.

Aitken *et al.* (1997) provide statistical evidence consistent with the role of foreign firms as catalysts for domestic exporters. Using a two-stage probit model on Mexican manufacturing plants, they find that the probability a domestic plant exports is positively related to proximity to multinational firms. This comes from that foreign investors directly or indirectly provide information and distribution services. Alguacil *et al.* (2002) examine the causal relationships between FDI, exports and domestic income in Mexico during the period 1980–1999. They find a positive causal relationship from FDI to exports. This provides further insight into the role played by FDI in the effectiveness of the export-oriented policy followed by this country. Metwally (2004) tests the relationship between FDI, exports and economic growth in three countries (Egypt, Jordan and Oman) during the period from 1981 to 2000 by using a simultaneous equation model. The result suggests that the export of goods and services is strongly influenced by the inward FDI in these three countries. Dritsaki *et al*. (2004) investigate the relationship between Trade, Foreign Direct Investment (FDI) and economic growth for Greece over the period 1960-2002. In the long-run FDI has a positive effect on exports. Results from Granger causality show a unidirectional causality from foreign direct investments to exports. Cuadros *et al.* (2004) examine the causal relationship between trade, inward FDI and output in Argentina, Brazil and Mexico from the middle seventies to 1997. Although they do not find evidence about the exports-led growth hypothesis, their results suggest a significant impact of FDI on export expansion in these countries. This confirms the idea that most of multinational firms investment in these countries is an export-oriented investment, as they seem to have benefited from an FDI-led export growth. In so doing, FDI has served to integrate national markets into the world economy far more effectively than could have been achieved by traditional trade flows alone. Pacheco-Lopez (2005) reports a bi-directional causality between exports and FDI for Mexico over the period 1970 to 2000. Wong and Tang (2007) explore the causation between FDI and electronics exports by using Malaysia's top five electronics exports. They find a bi-directional causality between FDI and exports of semiconductor devices in the short run. This implies that FDI inflows to Malaysia can promote the exports of semiconductor devices.

[1] See Schmitz and Helmberger (1970), Markusen (1983), Helpman (1984), Helpman and Krugman (1985) and Markusen and Venables (1998) for more discussion.

Asiedu (2002) uses a comprehensive dataset of 71 developing countries over the period from 1988 to 1997 to examine the determinants of FDI to developing countries. He finds that openness to trade promotes FDI flows to both Sub-Saharan African and non Sub-Saharan African countries, however the marginal benefit from increased openness is less for Sub-Saharan African. These results imply that Africa is different suggesting that policies that have been successful in other regions may not be equally successful in Africa. Hsiao and Hsiao (2006) apply the panel data causality analysis on the eight rapidly developing East and Southeast Asian economies (China, Korea, Taiwan, Hong Kong, Singapore, Malaysia, Philippines, and Thailand) from 1986 to 2004. They find that FDI has unidirectional effects on GDP directly and also indirectly through exports, and there also exists bidirectional causality between exports and GDP for the group. Dhakal *et al*. (2007) identify the factors that determine FDI inflows in Central and the Eastern European countries–the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. Using panel data from 1995 to 2004, trade openness has been found to be positively related to FDI inflows in these countries. Samsu *et al*. (2008) investigate empirically the causal relationship between FDI inflows and exports in Malaysia for the 1970-2003. Their results suggest that the FDI and GDP influence Malaysian exports in the long run. Balasubramanyam *et al.* (1996) examine the relationship FDI and Growth in the context of differing trade policy regimes. Using cross section data for 46 developing countries over the period 1970-1985, they present results indicating that FDI is correlated with growth mainly in export-oriented countries, and not in import-substituting countries. Basu *et al.* (2003) emphasise trade openness as a crucial determinant for the impact of FDI on growth, as they find two-way causality between FDI and growth in open economies, both in the short and the long run, whereas the long run causality is unidirectional from growth to FDI in relatively closed economies.

Many other studies do not find evidence of a significant link between FDI and exports. For instance, Goldberg and Klein (1999) do not find evidence to support a significant link between FDI and aggregate exports in Latin America. According to them, the trade-promoting effects of FDI appear to be weak or insignificant with regard to Latin American trade with the United States and Japan. Their results also fail to find a systematic linkage between sectoral trade and FDI in Latin America. Khan and Leng (1997) examine the interactions among inward FDI, exports and economic growth for Singapore, Taiwan and South Korea, at the aggregate level during the period from 1965 to 1995. They claim that there is no evidence to support the causal relationship between FDI and Exports in Taiwan and South Korea. Moreover, a one-way causal relationship which flows from exports to inward FDI is found in Singapore. Using annual data for 1970-1998, Sharma (2000) investigate the determinants of export performance in India in a simultaneous equation framework. Results suggest that foreign investment does not have statistically significant impact on export performance although the coefficient of FDI has a positive sign. Findings obtained by Ahmad *et al.* (2003) do not suggest a kind of FDI-led export growth linkage in Pakistan. This would confirm the idea that the most of multinational firms investment in Pakistan is not an export-oriented investment. Jayachandran and Seilan (2010) examine the causal relationship between trade, FDI and economic growth for India over the period 1970-2007. According to their results, there is no causality relationship from FDI to exports. They also find that FDI and exports affect economic growth and not the reverse, suggesting that the high or low economic growth rate does not have an effect on FDI inflows and exports in India.

This survey of recent empirical literature shows that the causality relations vary across countries with the period studied as well as the econometric methods used. This paper contributes to the existing literature by employing cointegration and causality tests to depict the temporal causality between FDI and exports for Cote d'Ivoire over the period 1970 to 2007. The econometric methodology is outlined below.

3. Econometric Methodology

3.1 Model specification

To examine the FDI–exports correlation, we apply the generic long-run relationship which has the following form:

$$\log(FDI_t) = \alpha_1 + \beta_1 \log(X_t) + \mu_t \tag{1}$$

where FDI is real foreign direct investment inflows, X real exports, and μ_t is the disturbance term assumed to be purely random.

The relationship between FDI and exports described by Eq. (1) could be subject to "the spurious regression phenomenon". The problem of spurious regression arises because various time series data exhibit non-stationary tendencies. Furthermore, if we allow for short-run dynamics in right-side variables behaviour, the analysis would also suggest that past changes in exports could contain useful information for predicting the future changes of FDI. These implications can be easily examined using the techniques of cointegration and

Granger causality.

3.1 Unit root test

A preliminary step in our analysis is to assess the order of integration of the series. Prior to Perron (1989), most empirical studies used the standard Augmented Dickey-Fuller and Phillip-Perron unit root tests. A problem with these tests is that in presence of structural changes they fail to reject the null hypothesis of a unit root (Perron, 1989; Zivot and Andrews, 1992). Since the work by Perron (1989), several tests have been developed to account for structural changes in order to avoid bias in favour of a unit root hypothesis. Some of these include Banerjee *et al.* (1992), Zivot and Andrews (1992), Perron (1997), Lumsdaine and Papell (1997), and Saikkonen and Lutkepohl (2002)[1]. Here, we apply the Zivot and Andrews (ZA, 1992) one-break test. This test has the advantage of not requiring the *a priori* specification of the possible timing of structural breaks. The break dates are endogenously determined within the model. We use two versions of the ZA (1992) sequential trend break model. Model A allows for a change in intercept, while model C allows for a change in both the intercept and slope. Model A involves running the following regression:

$$\Delta H_t = \mu + \beta t + \theta DU_t + \alpha H_{t-1} + \sum_{t=1}^{k} c_j \Delta H_{t-j} + e_t \qquad (2a)$$

Model C takes the following form:

$$\Delta H_t = \mu + \beta t + \theta DU_t + \gamma DT_t + \alpha H_{t-1} + \sum_{t=1}^{k} c_j \Delta H_{t-j} + e_t \qquad (2b)$$

where Δ is the first difference operator, DU_t and DT_t are dummy variables for a mean shift and a trend shift defined as: $DU_t = 1$ if $t > T_b$ and 0 otherwise; $DT_t = t - T_b$ if $t > T_b$ and 0 otherwise. The *k* extra regressors are included to address the problem of autocorrelation in the error term e_t. A test of the unit root hypothesis has the null $\alpha = 0$. The alternative hypothesis is that the series H_t is trend stationary with a structural break in the trend function. The searching for breakpoint (T_b) is performed by running a set of regressions and by choosing the breakpoint for which the *t*-statistic t_α for α is minimized. The lag length *k* is selected using the general-to-specific approach proposed by Perron (1989), *i.e.* we use a critical value of 1.60 to determine the significance of the t-statistic on the last lag. Given that our sample size is relatively small (38 observations) we set k_{max}=4. Whilst asymptotic critical values are available, Zivot and Andrews (1992) warn that with small sample sizes the distribution of the test statistic can deviate substantially from this asymptotic distribution. To circumvent this problem, we calculate exact critical values for the test following the methodology recommended in Zivot and Andrews (1992: 262). In assuming that the errors driving the data series are normal ARMA(p,q) processes, we estimate an ARMA(p,q) model for each ΔH_t, with *p* and *q* selected according to the Akaike Information Criterion (AIC). The implied ARMA process is then used as the data generating process for generation of 5000 sample specific series under the null hypothesis of a unit root with no break. We then follow Zivot and Andrews (1992) in determining *k*, and obtain a minimum ADF statistic for each of the 5000 series. The critical values are then constructed from this empirical distribution.

3.2 Cointegration test

Once the order of integration of each variable is determined and variables are found to be I(1), the concept of cointegration pioneered by Engle and Granger (1987) is used to examine the existence of cointegrating relationship among the variables. Several standard tests for cointegration have been developed in the econometric literature. The power of these tests may be substantially reduced when applied to series which experience structural changes in their long-run cointegrating relationship. Applying the similar approach by Zivot and Andrews (1992), Gregory and Hansen (1996a, b) revise the Engle and Granger model to consider the regime shift via residual-based cointegration technique. The technique is to test the null hypothesis of no cointegration against the alternative of cointegration with regime shifts in the trend as well as the slope

[1] For a survey of these tests see Glynn J., Perera N. and Verma R. (2007), "Unit Root Tests and Structural Breaks: A Survey with Applications", *Journal of Quantitative Methods for Economics and Business Administration*, June, 63-79.

coefficients. Gregory and Hansen (1996a, b) present four models for testing cointegration:

Model C: Level shift: $y_t = \mu_1 + \mu_2\varphi_t + \alpha x_t + e_t$ (3a)

Model C/T: Level shift with trend: $y_t = \mu_1 + \mu_2\varphi_t + \beta t + \alpha x_t + e_t$ (3b)

Model C/S: Regime shift: $y_t = \mu_1 + \mu_2\varphi_t + \alpha_1 x_t + \alpha_2\varphi_t x_t + e_t$ (3c)

Model C/S/T: Regime and Trend Shift: $y_t = \mu_1 + \mu_2\varphi_t + \beta_1 t + \beta_2 t\varphi_t + \alpha_1 x_t + \alpha_2\varphi_t x_t + e_t$ (3d)

where φ_t is the dummy variable which introduces the structural change, and defined as $\varphi_t = 0$ if $t \le \tau$, and $\varphi_t = 1$ otherwise; τ denotes the timing of the change point. In the general model C/S/T, μ_1, β_1 and α_1 represent the cointegrating coefficients before the regime shift, and μ_2, β_2 and α_2 denote the changes in the coefficients at the time of the shift. As in Zivot and Andrews tests, τ is determined using a grid search procedure, with all values in the central 70% of the sample being considered. For each value of τ, the above models are estimated with the resulting residuals $\hat{e}_t(\tau)$ saved and employed to compute the $ADF(\tau)$ statistic. The break point is determined by finding the minimum values for the $ADF(\tau)$ statistics across all possible breaks. Asymptotic critical values are provided in Gregory and Hansen (1996a, 1996b).

3.3 Granger-causality test

The cointegration analysis is only able to indicate whether or not the variables are cointegrated and a long-run relationship exists between them. Although evidence of cointegration implies the existence of causality, at least in one direction, it does not indicate, however, the direction of the causal relationship. Hence, to shed light on the direction of causality, we perform the Granger causality test. Following Granger (1969), a variable Y_t is said to be "Granger-caused" by a variable X_t if the information in the past and present values of X_t helps to improve the forecast of Y_t, *i.e.*, if $MSE(Y_t|\Omega_t) \prec MSE(Y_t|\Omega_t^*)$, where MSE is the conditional mean square root of the forecast of Y_t, Ω_t denotes the set of all relevant information up to time *t*, and Ω_t^* excludes the information in the past and present values of X_t. In the presence of cointegration, Granger-causality test requires the inclusion of a lagged error correction term within an error correction model in order to capture the short-run dynamics. Accordingly, Granger- causality analysis involves estimating the following models:

$$\Delta FDI_t = \varphi_1 + \sum_{j=1}^{p}\beta_{1j}\Delta FDI_{t-i} + \sum_{j=1}^{p}\gamma_{1j}\Delta X_{t-j} + \alpha_1\hat{\mu}_{t-1} + e_{1t} \quad (4a)$$

$$\Delta X_t = \varphi_2 + \sum_{j=1}^{p}\beta_{2j}\Delta FDI_{t-i} + \sum_{j=1}^{p}\gamma_{2j}\Delta X_{t-j} + \alpha_2\hat{\mu}_{t-1} + e_{2t} \quad (4b)$$

where the parameters α_k are the adjustment coefficients, $\hat{\mu}_{t-1}$ is the cointegrating vector. An error correction model enables one to distinguish between long-run and short-run Granger causality. The long-run non-causality (or weak exogeneity) is performed by testing the significance of the coefficient on $\hat{\mu}_{t-1}$, while the short-run non-causality examines the significance of the lagged dynamic terms through Wald-tests.

4. Data and Empirical Results

The study uses time-series data covering the period 1970 to 2007. All data are sourced from the *World Development Indicators* of the World Bank (WDI, 2010). Data are in real terms and are expressed in US dollars. All variables are converted into natural logarithms so that they can be interpreted in growth terms after taking first difference.

Before we proceed to cointegration tests, we have to test for the order of integration of the variables. This step is necessary to avoid spurious analysis results in cointegration tests. Furthermore the Gregory and Hansen (1996) test is applicable for I(1) processes. To test the stationarity properties of the series, we begin through applying the unit root tests of Dickey and Fuller (1979), Phillips and Perron (1988) and Elliott *et al.* (1996). These tests are denoted as ADF, PP and DF-GLS respectively. The DF-GLS test is a simple modification of the augmented Dickey-Fuller (ADF) *t*-test as it applies generalized least squares (GLS) detrending prior to running the ADF test regression. Compared with the ADF test, the test has the best overall performance in terms of sample size and power (Elliott *et al.*, 1996). The three tests have been performed under the models with constant and with constant and trend. The results reported in Table 1 reveal that the series are non-stationary in their levels but become stationary after taking the first difference.

Table 1: Standard tests for unit root

Series	Level			First-difference		
	ADF	PP	DF-GLS	ADF	PP	DF-GLS
Model I: drift and no trend						
X	-1.263	-1.299	0.069	-6.395*	-6.718*	-6.486*
FDI	-2.147	-1.956	-2.186	-8.193*	-8.633*	-6.891*
Model II: drift and trend						
X	-2.472	-2.490	-2.445	-6.352*	-6.792*	-6.503*
FDI	-3.083	-3.016	-2.920	-8.095*	-8.704*	-7.891*
Critical values 5%						
Model I	-2.943	-2.943	-1.950	-2.945	-2.945	-1.950
Model II	-3.536	-3.536	-3.190	-3.540	-3.540	-3.190

Notes: ** (*) denotes rejection of the null hypothesis at the 10% (5%) level.

Given the inability of standard unit root tests to capture structural breaks, we apply the ZA sequential one-break test. The test statistics together with the exact critical values are reported in Table 2. Clearly, the tests results do not show evidence against the existence of a unit root even when breaks are allowed.

Table 2: Zivot and Andrews test for unit root

	Export		FDI	
	Model A	Model C	Model A	Model C
Tb	1990	1990	1992	1992
α	-0.607* **(-3.829)**	-0.651* **(-3.823)**	-0.855* **(-5.682)**	-0.961* **(-5.802)**
β	0.033 (3.756)	0.038 (3.474)	-0.026 (-1.839)	-0.042 (-2.352)
θ	-0.220 (-2.824)	-0.226 (-2.865)	1.778 (4.261)	1.802 (4.383)
γ	-	-0.005 (-0.744)	-	0.050 (1.430)
k	2	2	0	0
Exact critical values				
1%	-5.611	-5.981	-7.427	-8.138
5%	-4.880	-5.262	-6.518	-7.115
10%	-4.541	-4.880	-6.114	-6.618

Note: * denotes statistical significance at 5%.

Given that all the variables are I(1), we can now proceed to testing for the presence of a long-run relationship between them. Before we test for cointegration with structural break, we test for parameter stability of the long-run relationship using the three statistics provided by Hansen (1992) — SupF, MeanF and L_c—which have the null hypothesis that the parameters are stable. When calculated probability values are greater than 0.05 then the null hypothesis is accepted. Results reported in Table 3 reject the null hypothesis, implying instability of the long-run parameters.

Table 3: Hansen (1992) tests for parameter stability

Test statistic	Dependent variable	
	FDI[a]	X[b]
SupF	174.289* (0.010)	43.766* (0.010)
MeanF	74.052* (0.010)	23.026* (0.010)
L_C	9.737* (0.010)	2.951* (0.010)

Note: [a] The model is estimated without trend. [b] The long-run model includes a time trend variable. Figures in parentheses are *p*-values. * denotes that the null hypothesis of parameter stability is rejected at the 5% level.

We next apply the Gregory and Hansen test to accommodate a structural break in the long-run

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relationship. Results of Table 4 indicate that the no cointegration null hypothesis can be rejected under any of the four models when FDI serves as dependent variable. The estimate break date marks a significant change in the economic history of the country with the devaluation of the currency F CFA that has contributed to increase exports[1]. This recovery followed a number of stimulatory reforms including more liberalized trade and foreign investment policies.

Table 4: Gregory and Hansen Cointegration test results

Model	Dependent variable X_t	FDI_t	Critical values 5%	10%
Level shift (C)	-3.082 (1993)	-6.664* (1993)	- 4.61	-4.34
Level shift with trend (C/T)	-4.514 (1987)	-6.647* (1993)	- 4.99	-4.72
Regime shift (C/S)	-3.083 (1976)	-6.551* (1993)	- 4.95	-4.68
Regime and Trend Shift C/S/T	-4.623 (1986)	-6.544* (1993)	-5.50	-5.24

Note: Critical values are obtained from Gregory and Hansen (1996a, p: 109) and Gregory and Hansen (1996b, p: 559). Figures in parentheses are break dates. * denotes that the null hypothesis of no-cointegration is rejected at the 5% level.

We report in Eq.(5) the long-run relationship between FDI and exports allowing a level shift. As can be observed, exports have a negative long-run effect on the level of real foreign direct investment. This result is not consistent with our expectation that exports play an important role in attracting foreign direct investment or that FDI contribute to expand exports of the host country.

$$FDI_t = \underset{(5.798)}{30.353} + \underset{(7.751)}{1.848} d_{93} - \underset{(-2.412)}{0.584} X_t + ecm_t \quad (5)$$

To investigate the direction of causality between the variables, we perform causality tests following the model described in the previous section. Results are displayed in Table 5. The significance of the coefficient on the error correction term confirms the evidence that there is long-run causality running from exports to FDI. The results also show that in the short-run there is no causal relationship between the two variables. These findings suggest that all else equal trade reforms are less effective in attracting FDI to Cote d'Ivoire.

Table 5: Granger causality test results

Dependent variable	Causal variable (*p-value*) ΔFDI	ΔX	ECM_{t-1} (t-statistics)
ΔFDI	-	2.475 (0.115)	-0.975* (-4.196)
ΔX	1.755 (0.185)	-	0.034 (0.647)

Notes: For short-run causality figures reported are F-statistics with *p-value* in (.). For long-run causality figures reported are the coefficients on the error correction term with *t*-statistics in (.). The asterisks * and ** denote statistical significance at the 5% and 10% levels, respectively.

A plausible explanation for the short-run non-response of FDI to exports is that foreign investors always perceive trade reforms in Africa as transitory and non credible. Most of the time, Sub-Saharan African countries embark on reforms as part of aid conditionality, where a donor, such as the World Bank or European Union, offers temporary aid or facilities during reforms. Once aid and facilities end, there is little incentive for these countries to continue reform, and most countries do abandon reforms. Even when the conditions for FDI are favourable, foreign investors may have powerful incentives to adopt a wait-and-see attitude as they perceive reforms as transitory and therefore subject to reversal. When foreign investors anticipate that trade reforms are not sustainable, they do not increase investments when trade liberalization occurs.

5. Conclusion and policy implications

In this study, the relationship between the foreign direct investment and exports in Cote d'Ivoire has been

[1] Cote d'Ivoire the world's largest cocoa producer with a market share that grew from 23 percent in 1980 to 40 percent in 2005-2006. Since 1996, cocoa has usually contributed some 35 to 40 percent of exports, 15 percent of GDP, and more than 20 percent of government income (McIntyre and Varangis, 2001).

examined with the data covering the period 1970 to 2007. The econometric methodology made use of the residual-based test of Gregory and Hansen (1996) in a bivariate framework. The results show that the two variables are cointegrated. Granger causality tests have been performed to determine the causality aspect of the relationship. The results reveal a long-run causal relationship running from exports to FDI, whereas no short term causal link has been detected. The policy implications are the following. To enhance FDI inflows, the country should not only make the home environment competitive and conducive to FDI by reducing the cost of doing business, but also diversify its exports shifting from primary commodities to secondary and tertiary sectors. The diversification of the economy will enable the country to cushion the adverse effects of external shocks and reduce country risk, which, in turn, will increase its attractiveness to FDI in the secondary and tertiary sectors. Furthermore, the full benefits of trade policies will be realized only if investors perceive reforms as credible and not subject to reversal. As a consequence, Ivorian government should develop mechanisms to enhance the credibility of the reform process.

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