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The impact of the local SMEs sector on FDI and the mediating effect of IFRS adoption in developing economies: The case of Algeria

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ABSTRACT

The present paper aims to empirically explore the impact of SMEs on foreign direct investment inflows and analyses the effect role of IFRS adoption on the relationship between the SMEs sector and foreign direct investment inflows in short and long run in Algeria during the period of 1970-2017. This investigation intends to fill a major gap regarding empirical literature on FDI drivers in developing countries. Using the ARDL bounds testing approach, the findings show a positive association between SMEs and foreign direct investment inflows in Algeria in the long-run. However, in terms of the role of IFRS adoption in mediating the impact of SMEs on FDI inflows in Algeria, our findings report a negative contribution of IFRS adoption of the association between SMEs and FDI inflows in both long and short run. These findings provide significant implications for regulators and policymakers in developing countries improve the business environment of their countries, manager and foreign investors in assessing the business environment in host countries and for both developing countries and academic research.

1. Introduction

Investments are the focus of businessmen, capitalists and governments in many countries around the world, including Algeria, which seeks to attract foreign investments. The decision-makers in Algeria focused on enhancing the attractive investment environment for foreign direct investment (FDI) and seek to improve the investment climate and so attract investments. Algeria has restructured its economy and initiated legislative reforms to achieve greater economic openness. These include: Deregulation of the freedom of movement of capital, the development of its economy and the reliance on a productive economy adapted to foreign direct investments, and the development of local investments by focusing on the development of small- and medium-sized enterprises to complement foreign direct investment.

Small and medium sized enterprises are of great importance in all countries of the world. Especially

developing countries, taking into account the relatively large disparity with the small enterprises in the advanced industrial countries. Compared to the small enterprise in developing countries in terms of the size of capital, productivity and employment, in the United States, Japan and the European Union, the capital ceiling for small enterprises exceeds $20mn, while all small enterprises in developing countries have capital of between $20,000 and $100,000, reflecting the overall economic development in these countries. However, small enterprises have a positive and essential role in developing countries in terms of providing employment opportunities for all social groups. This is especially so for entrepreneurs, thus contributing to increasing income and partial self-sufficiency for some goods and services needed by society. The small enterprises spread in the fields of trade, industry, services and other economic sectors and encourage self-employment and knowledge dissemination as well as the rapid response to the variables with a small percentage of risk. Some countries are moving towards the development of small and medium sized enterprises through the preparation of an integrated strategy to fight poverty and unemployment and increase productivity. Small and medium-sized enterprises (SMEs) are a vital area of entrepreneurship, exploitation of local primary resources and redistribution of income.

Small-scale industrial enterprises must, therefore, be the focus of attention of the Palestinian Authority. It is seeking to try to enact the laws that protect these projects and support their progress in the development process, these projects represent more than 90% of the total number of projects.

Based on the findings of most of the studies on the relationship between FDI and the development of small and medium sized enterprises in host countries, there is a positive impact of FDI inflows on the performance of small and medium sized enterprises (Tülüce and Doğan, 2014). In light of the above, the added value of this research is to study the adverse impact on the Algerian economy in the period 1970-2017 through our response to the main problem of:

What role do SMEs play in attracting FDI under international accounting standards?

Since its establishment, the Algerian government has been interested in developing small- and medium-sized enterprises. Moreover, creating an environment suitable for them as an investment that can contribute to achieving high rates of economic growth and exploiting future technology by attracting foreign direct investment. Moreover, interfering with international institutions either by playing an integral role between them or through competition, in addition to creating jobs and reducing unemployment. This is what prompted us to choose the subject.

This study was based on the ARDL method to study the impact of both small- and medium-sized enterprises and the application of international accounting standards on foreign direct investment, which is concerned with studying the impact in the short and long term. The study concluded a positive impact on SMEs of FDI inflows in the long-run, and TOP (degree of economic openness) is associated positively with FDI inflows in the long-run. The coefficient of TINF (Telecommunications infrastructure) is negative and significant at 5% in the first model with a coefficient value of -0.015, implying that increasing telecommunications infrastructure is associated with a lower increase in FDI inflows in Algeria. The role of IFRS adoption in mediating the impact on SMEs of FDI inflows in Algeria; GDP has a negative impact on attracting FDI at 10%.

This paper is structured in the following way: First; introduction and previous studies, second; methodology, third; results, fourth; analysis of results and finally a discussion of results and conclusion.

2. Literature review

Investment is an essential variable in the economy, and foreign direct investment is not an exception. It is part of the investment. It has been looked at in many studies, including the study of its specificities, including studying it along with other economic variables, whether as a variable.

Therefore, we divided the previous studies into two groups, studies on the determinants of foreign direct investment, and studies related to economic variables.

For the first group, there were studies in several countries. Such as the study of Louail (2019) which addressed the determinants of foreign direct investment in the Arab countries during the period (1970-2016), and concluded that there is a positive and moral impact for both foreign direct investment for year t-1 and raw internal output GDP and economic openness on the flow of foreign direct investment in the Arab countries and the negative and moral impact of inflation in the year t-4.

The Jouili (2018) study, which focused on determinants on the maritime states of 71 countries, concluded that there was a positive and moral impact on both the SC liner, the LP performance and GDP, and the negative and moral impact of the real exchange rate. The study of Hunady and Orviska (2014), which addressed determinants in a group of European countries by focusing on corporate taxes, concluded that there is a positive and moral impact on economic openness, public debt and per capita income, and the negative and moral impact of both compensations costs overwork, labour costs and the global financial crisis.

There are those who have studied one country, including Anuchitworawong and Thampanishvong (2015) examining the determinants of FDI in Thailand: Are natural disasters important? It concluded that there was a significant positive effect for both real per capita income, real exchange rate and consumer price index and the negative impact of natural disaster servers for year t-1 was insignificant.

Second, the studies that dealt with the relationship of foreign direct investment with other variables, including studies that took the relationship between foreign direct investment and economic growth. Moreover, those who dealt with that relationship to a group of countries and in which they dealt in one country, and also those who considered it variable, including Gui-Diby (2014) and Sokhanvar (2019) most of which have resulted in a positive and significant impact of foreign direct investment on the economic growth of host countries. Including the study of Louail (2015), which concluded that there is a positive and moral impact of economic growth on the flow of foreign direct investment in Algeria. There are those who studied the causal relationship, including the study of Ciarmatori et al. (2018) and the study of Abdouli and Hammami (2017), most of which concluded a causal link between economic growth and foreign direct investment.

There are also some studies on the relationship of foreign direct investment to the application of international accounting standards. Moreover, the latter is considered specific to its determinants, including those who have found positive and moral

impact (Nejad et al., 2017; Pricope, 2017), but the study of Owusu et al. (2017) was found to be insignificant, while the study of Nnadi and Soobaroyen (2015) found a negative and moral impact.

The studies dealing with the relationship of foreign direct investment to small and medium sized enterprises, included Tülüce and Doğan (2014) which concluded that there was a positive impact of foreign direct investment on the development of small and medium-sized enterprises of the polarising states (Wach, 2008).

Thus, the gap for this research is that we are studying the impact of small and medium sized enterprises on foreign direct investment in the Algerian economy during the period (1970-2017), which is considered a recent period.

3. Research methodology

3.1. Data sources and research variables

The major purpose of this investigation is to explore the effect of SMEs on FDI inflows and the role of IFRS adoption in Algeria. The present study employs annual time series data of Algeria spanning the period from 1970 to 2017. The time span of this dataset is justified by the fact that the first annual FDI inflows was available in 1970. Data on SMEs are taken from the website of the Algerian MIM (2018). Annual time series data on other variables under study are collected from the World Bank's World Development Indicators (WBG, 2018).

In the present empirical research, net FDI inflows as a percentage of GDP is defined as a dependent variable in line with a number of prior empirical works (Jensen, 2003; Ahlquist, 2006; Saini and Singhania, 2018). The annual number of SMEs is recognized as an independent variable in this investigation following Esther et al. (2018). Based on the existing empirical literature, we expect the sign of the estimated coefficient of SMEs to make a positive effect on FDI inflows in Algeria.

In addition, this study uses a set of control variables acknowledged in several prior empirical studies as drivers of FDI inflows. In this respect, we consider three control variables in our empirical model. Firstly, the total value of exports and imports of goods and services to GDP ratio is used as a proxy for trade openness (Jabri et al., 2013; Jabri and Brahim, 2015; Khayat, 2017). Secondly, the number of fixed and mobile phone subscriptions per thousand of the population is adopted to capture for telecommunications infrastructure indicator (TINF) (Rudra et al., 2017; Suh and Khan, 2003). Third, Gross Domestic Product (GDP) annual growth rate is considered to proxy for market size (Sekkat and Veganzones, 2007; Moosa, 2009; Mina, 2012; Jabri et al., 2013; Jabri and Brahim, 2015; Abdouli and Hammami, 2017). All these control variables are expected to be more attractive for FDI inflows. The definitions of the variables and data sources are summarized in Table 1.

Table 1: Variable definitions and sources

Variable Type	Name	Label	Description	Data Source	Expected Sign*
Dependent variable	Foreign Direct Investment	FDI	FDI inflows to GDP ratio	WBG (2018)	
Independent variable	Small and Medium Enterprises	LnSMEs	natural logarithm of number of Small and Medium Enterprises	MIM (2018)	+
Control Variables	degree of economic openness	TOP	sum of exports and imports of goods and services to GDP ratio	WBG (2018)	+
	Telecommunications infrastructure	TINF	fixed telephone and mobile cellular subscriptions per 100 people	WBG (2018)	+
	Market size	GDPG	Gross Domestic Product annual growth rate	WBG (2018)	+

*: The probability of obtaining the result (positive or negative) after estimating the model

3.2. Model specification and estimation technique

The current paper aims to empirically examine the impact of SMEs sector on FDI inflows and the role of IFRS adoption in Algeria. Based on previous literature (Esther et al., 2018; Eze and Okpala, 2015), the basic regression equation of this empirical study can be specified as:

$$FDI_t = \alpha_0 + \alpha_1\,TOP_t + \alpha_2\,TINF_t + \alpha_3\,GDPG_t + \alpha_4\,LnSMEs_t + \varepsilon_t \qquad (1)$$

Where, Ln is natural logarithm, FDI is FDI inflows as a percentage of GDP, TOP is degree of economic openness as a percentage of GDP, TINF is the fixed telephone and mobile cellular subscriptions (per 100 people), $GDPG$ is Gross Domestic Product annual growth rate, $SMEs$ is number of Small and Medium Enterprises, α_0 is constant, α_i ($i = 1,2,3,4$) are slopes and t is time.

Moreover, Eq. 1, representing Model 1 in interaction term between IFRS adoption and SMEs as follows:

$$FDI_t = \alpha_0 + \alpha_1\,TOP_t + \alpha_2\,TINF_t + \alpha_3\,GDPG_t + \alpha_4\,LnSMEs_t + \alpha_5\,IFRS_t * LnSMEs_t + \varepsilon_t \qquad (2)$$

Where, $IFRS$ is a dummy variable equal to 0 for observations in pre-IFRS (before 2010); 1 for observations in post-IFRS, all others variables are explained above.

Eq. 2 represents Model 2 in our empirical study which include the interaction between IFRS adoption and SMEs in addition to the basic regression equation.

The Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration is used as an estimation technique in the current empirical research. The advantages of this technique, developed by Pesaran et al. (2001), can be stated in three major aspects. First, It enables analyzing both short- and long-run associations between dependent and independent variables and without regard to the order of integration of the regressors provided it does not exceed the order of one I(1) (Pesaran, 1997; Pesaran et al., 2001). Second, this approach is well suited in the case of small sample size since it provides reliable outcome (Pesaran and Shin, 1998). Third, under this technique variable can have different optimal lagged periods (Pesaran et al., 2001). Fourth, the long-term coefficients are unbiased even in the case of the endogeneity of the regressors.

Hence, according to Pesaran et al. (2001), Eq. 1 is tested by estimating the following unrestricted error correction model (UECM) as follows:

$$\Delta FDI_t = \vartheta_0 + \vartheta_1 FDI_{t-1} + \vartheta_2 TOP_{t-1} + \vartheta_3 TINF_{t-1} + \vartheta_4 GDPG_{t-1} + \vartheta_5 LnSMEs_{t-1} + \sum_{i-1}^{p} \rho_{1i} \Delta FDI_{t-1} + \sum_{j-0}^{q} \rho_{2i} \Delta TOP_{t-1} + \sum_{j-0}^{q} \rho_{3i} \Delta TINF_{t-1} + \sum_{j-0}^{q} \rho_{4i} \Delta GDPG_{t-1} + \sum_{j-0}^{q} \rho_{5i} \Delta LnSMEs_{t-1} + \mu_t \quad (3)$$

With respect to Model 2, Eq. 2 can also be expressed in UECM form as follows:

$$\Delta FDI_t = \vartheta_0 + \vartheta_1 FDI_{t-1} + \vartheta_2 TOP_{t-1} + \vartheta_3 TINF_{t-1} + \vartheta_4 GDPG_{t-1} + \vartheta_5 LnSMEs_{t-1} + \sum_{i-1}^{p} \rho_{1i} \Delta FDI_{t-1} + \sum_{j-0}^{q} \rho_{2i} \Delta TOP_{t-1} + \sum_{j-0}^{q} \rho_{3i} \Delta TINF_{t-1} + \sum_{j-0}^{q} \rho_{4i} \Delta GDPG_{t-1} + \sum_{j-0}^{q} \rho_{5i} \Delta LnSMEs_{t-1} + \sum_{j-0}^{q} \rho_{6i} \Delta IFRS * \Delta LnSMEs_{t-1} + \mu_t \quad (4)$$

Where, Δ is the first difference operator, ϑ_0 is constant intercept, μ_t is Gaussian white noise, the parameters $(\vartheta_1 - \vartheta_6)$ are the long-run coefficients, the parameters $(\rho_1 - \rho_6)$ represent the short-run parameters, (p, q) represent lag order on the regression variables, all others variables are explained above.

Even ARDL bounds testing approach to cointegration technique requires no pretesting for unit roots, this study conducts Augmented Dickey-Fuller (ADF) (Said and Dickey, 1984) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) (Kwiatkowski et al., 1992) unit root tests to determine the level of integration of variables, ensure that none of the variables is I(2) or beyond and, therefore, provide justification for suitability of our model estimation technique.

The second step involves examining the existing of long-run association among the variables stated in our models Based on the F- bound test procedure. For this, the null hypothesis of no cointegration to be tested in Eq. 3 is H$_0$: $\vartheta_2 = \vartheta_3 = \vartheta_4 = \vartheta_5 = 0$ and the alternate hypothesis of the presence of cointegration H$_1$: $\vartheta_2 \neq \vartheta_3 \neq \vartheta_4 = \vartheta_5 \neq 0$. The computed value of F-statistics is compared with upper and lower critical values proposed by Pesaran et al. (2001). The similar testing procedure is carried out for Eq. 4 under Model2. In the third stage, and after establishing the existence of long-run cointegration, long -term coefficients are estimated by applying the long-run ARDL models. Moreover, the error correction model (ECM) is estimated to get short-term coefficients and parameters of the short-run speed of adjustments to long-run equilibrium. In the fourth step, The Granger Causality test is performed based on Toda-Yamamoto Granger Causality (Toda and Yamamoto, 1995) methodology to test the causal relationship and identify the causality direction between SMEs FDI inflows. This testing approach has the advantage of being applicable and robust regardless of the integration and cointegration properties of the process and enabling to avoid spurious estimates (Oladipo, 2010; Alimi and Ofonyelu, 2013).

Finally, the goodness of fit of our dynamic ARDL models is checked by conducting a number of diagnostic and stability tests. Firstly, the estimated models are verified for Serial correlation, normality, functional form and heteroscedasticity connected with the selected model. Secondly, stability of the estimated coefficients is tested, in line with Pesaran et al. (2001), by using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares (CUSUMQ) test (Brown et al., 1975).

4. Empirical results

4.1. Descriptive statistics and the correlation matrix

Descriptive statistics summarized in Table 2 indicate that the normality assumption of all variables included in our sample is satisfied. In fact, the Jarque-Bera (JB) test reveal that the data used in this investigation is normally distributed as the corresponding p-value of JB for each variable is not significant at 5 per cent significance level.

Additionally, the results of the descriptive analysis show that the variable of FDI has a positive mean of 0.75 with a minimum value of –0.32 and a maximum value of 2.03 as shown in Table 2. The average value of the variable LNSMEs is 11.98 with a minimum of 9.91 and a maximum of 13.89. Besides, Table 2 reports that the statistic mean is positive for all control variables used in the model.

The results of correlation matrix for the time series variables, as shown in Table 3, point out that there should not be a major problem of multicollinearity among the independent variables used in our model since there is no correlation coefficient more than 85 percent (Chowdhury, 2017). Further, the results of the correlation matrix demonstrate a strong correlation between the dependent variable (FDI) and the explanatory variables (TOP, TINF, GDPG, LnSMEs). Table 4 provides information on the order of integration of all variables included in our study based on the results of Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests for unit root.

4.2. Unit root tests

The results show that the dependent variable (FDI) is integrated of order one I(1) and all other independent variables are integrated of different orders (I(0) and I(1)). Thus, both test (ADF and KPSS) demonstrate that none of the series is integrated of order two I(2). As a result, the Autoregressive Distributed-lag (ARDL) Bounds Testing procedure can be adopted to estimate our model.

Table 2: Descriptive statistics analysis

Variables	Mean		Maximum	Minimum	Jarque-Bera	Probability
TOP	56.908	11.046	76.685	32.685	0.885	0.642
TINF	42.845	49.255	128.281	2.380	4.906	0.086
GDPG	2.622	2.183	7.202	-2.100	0.801	0.670
LnSMEs	11.985	1.456	13.887	9.914	3.283	0.194
FDI	0.749	0.645	2.033	-0.324	1.510	0.470

Table 3: Correlation matrix

Variables	TOP	TINF	GDPG	LnSMEs	FDI
TOP	1				
TINF	0.619	1			
GDPG	0.492	0.163	1		
LnSMEs	0.785	0.835	0.523	1	
FDI	0.689	0.337	0.396	0.625	1

Table 4: Unit root tests results (ADF and KPSS)

		FDI	TOP	TINF	GDPG	LnSMEs
At level	ADF test	-2.433	-2.649***	-1.175	-4.248**	-2.744
	KPSS test	2.633	1.409	8.036	0.666*	0.375
at 1st difference	ADF test	-7.027*	-	-3.311***	-	-6.147*
	KPSS test	0.033*	0.055*	0.078*	-	0.051*
	Order of Integration	I(1)	I(1)	I(1)	I(0)	I(1)

Note: *, ** and *** indicate rejection of null hypothesis at 1 percent, 5 percent and 10 percent, respectively

4.3. Bounds tests for cointegration

Statistical findings for bound testing for each model are given in Table 5. The computed F-statistics for model 1 and model 2 (6.95 and 4.43 respectively) are higher than the corresponding upper bound critical value at 1 per cent level of significance for the first model (5.06) and at 5 per cent level of significance for the second model 2 (3.79). Thus, the null hypothesis of no cointegration is rejected, implying robust evidence of long-run cointegration relationships among all variables for both models.

Table 5: Computed F-statistic for Cointegration tests– ARDL Bounds tests

	Model 1	Model 2	conclusion
F-statistics	6.95*	4.43*	
Lower-upper bound (10%)	2.45-3.52	2.26-3.35	Co-integration
Lower-upper bound (5%)	2.86-4.01	2.62-3.79	Co-integration
Lower-upper bound (1%)	3.74-5.06	3.41-4.68	Co-integration
K	4	5	

Note: * denotes statistically significant at 1 %; ** denotes statistically significant at 5%; *** denotes. K represents the number of regressors included in the models

4.4. The long and short run estimation findings

The estimated coefficients of the long-run relationship are given in Table 6. With respect to model 1, the results indicate that LnSMEs has a very high significant impact on FDI inflows at 1 per cent level implying that a 1 % increase in LnSMEs leads to nearly 54% increase in FDI. In terms of control variables, the coefficient of trade openness (TOP) is significantly positive at 1 per cent. The coefficient of TOP implies that a 1% increase in TOP increases FDI inflows by about 4%. The coefficients of telecommunication infrastructure (TINF) and GDP growth (GDPG) make a negative and significant effect on FDI inflows at 1 per cent and 5 per cent respectively. The estimate of TINF indicates that a 1% increase in TINF is expected to increase FDI inflows by about 1.5%. Also, a 1% increase in GDPG leads to approximately 16.5% decrease in FDI inflows.

Table 6: Long-run coefficients estimation with ARDL Bounds test model

Variables	Model 1		Model 2	
	ARDL(1, 1, 1, 1, 0)		ARDL(3, 1, 0, 1, 0, 2)	
	Coeff.	p-value	Coeff.	p-value
Intercept	-6.958*	0.0001	-6.145*	0.0076
TOP	0.040*	0.006	0.019	0.2906
TINF	-0.015*	0.0008	-0.006	0.2752
GDPG	-0.165**	0.0237	-0.091	0.3245
LnSMEs	0.540*	0.0024	0.549**	0.0218
IFRS				
IFRS*LnSMEs			-0.079***	0.0655

Note: * denotes statistically significant at 1 %; ** denotes statistically significant at 5%; *** denotes statistically significant at 10%. Dependent variable is FDI

With regard to model 2, taking into consideration the interaction between LnSMEs and IFRS adoption, the findings show that the interaction term exerts negative and significant impact on FDI inflows at 10 per cent significance level, stating that a 1% increase in the interaction term (IFRS*LnSMEs) leads to about 7.9% decrease in FDI inflows. Furthermore, the coefficient associated with LnSMEs remains positive and statistically significant at 5 per cent. In

respect of control variables, the sign of all estimates are similar to those associated with the first specification (Model1) but all coefficients are reported statistically insignificant.

Table 7 presents the short-run results as well as the error correction mechanism of the selected ARDL models. The findings reveal that the speed of adjustment is negative (-0.88 in model 1 and -0.92 in model 2), significant at 1 per cent and does not exceed the value of one, hence the validity of the long-run equilibrium mechanism (Pesaran et al., 1999). This implies that the annual rate of adjustment toward full equilibrium in the long run rages from 88% in model 1 to 92% in model 2.

The short-run coefficients show that GDPG is found to be negative and significant at 10 per cent significance level in Model 1. The estimated coefficient of IFRSLnSMEs indicates that IFRSLnSMEs is positively and significantly related to FDI inflows at 10 per cent significance level in Model 2, stating that a 1% rise in (IFRS*LnSMEs) lag stimulates FDI inflows about 6% in short-run in Algeria. Moreover, the magnitude of the coefficient of (IFRS*LnSMEs) in the short-run is lower than that in the long-run (nearly 8%). Additionally, all other variables (TOP, TINF and LnSMEs) are appeared to be insignificant and their sings are similar to those of long-run estimations except TOP.

Table 7: Error Correction representation of ARDL Bounds test model

Variables	Model 1 ARDL(1, 1, 1, 1, 0)		Model 2 ARDL(3, 1, 0, 1, 0, 2)	
	Coeff.	p-value	Coeff.	p-value
Intercept	-6.092*	0.000	-5.685*	0.000
ΔTOP_t	-0.011	0.380	-0.023	0.117
$\Delta TINF_t$	0.002	0.835		
$\Delta GDPG_t$	-0.067**	0.025	-0.031	0.257
$\Delta IFRS_t$				
$\Delta IFRS_{t-1}$				
ΔFDI_{t-1}			-0.038	0.788
ΔFDI_{t-2}			-0.322**	0.032
$\Delta IFRS*LnSMEs_t$			-0.020	0.432
$\Delta IFRS*LnSMEs_{t-1}$			0.060**	0.052
ECT_{t-1}	-0.876*	0.000	-0.925*	0.000

Note: * denotes statistically significant at 1 %; ** denotes statistically significant at 5%; *** denotes statistically significant at 10%

4.5. Diagnostic and stability tests

The diagnostic Tests output of our two selected dynamic ARDL Models are displayed in Table 8. The results show that both model 1 and model 2 are free from any problem of serial correlation (correlated error terms) and heterosketasticity. The functional form and the Jarque-Bera normality tests are confirmed. The value of adjusted R^2 is about 56% in model 1 and approximately 64% in model 2.

Table 8: Results of diagnostic tests

Diagnostic Tests	Model 1 Value	p-value	Model 2 Value	p-value
Serial Correlation LM	0.036 (1)	0.850	0.060 (1)	0.81
Heteroscedasticity ARCH	0.678 (1)	0.410	1.770 (1)	0.183
Normality Jaque-Bera	0.619 (3)	0.733	0.951 (3)	0.621
Functional Form	1.931 (6)	0.131	1.211 (1)	0.86
Adj. R^2	0.56		0.642	

Note: ( ) is the order of diagnostic test (The lag order)

The stability of the estimated coefficients in model 1 and model 2 are also proved using CUSMUS and CUSMUSQ stability tests as shown in Fig. 1 and Fig. 2. In fact, Both figures indicate that the estimated models are within the 5% significance line, implying that the coefficients of the estimated models are stables.
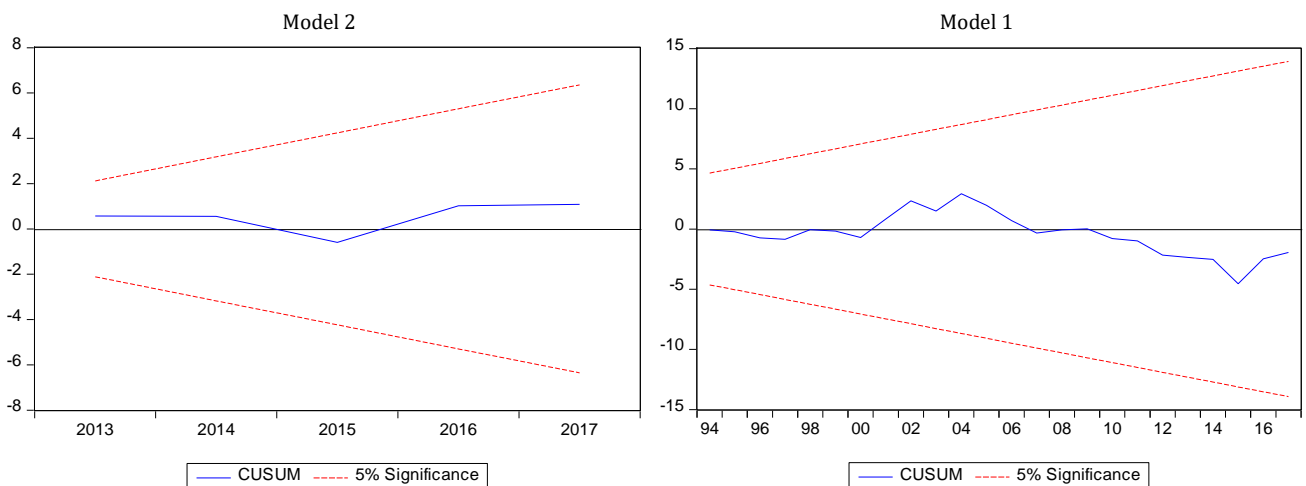

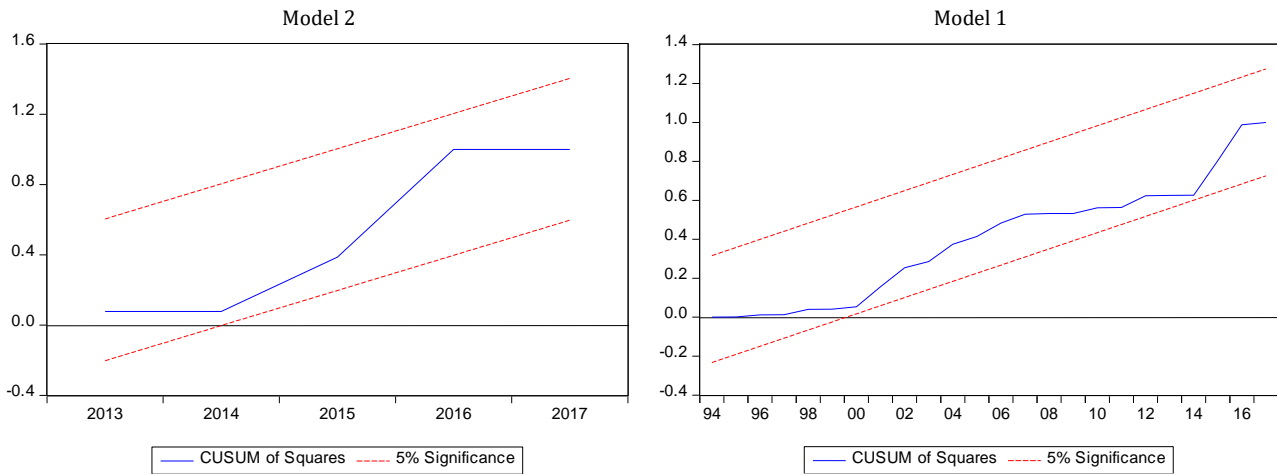**Fig. 1:** Model stability: Cumulative sum of recursive residuals (CUSUM)

Fig. 2: Model stability: Cumulative sum of squares of recursive residuals (CUSUM of squares)

4.6. Toda-Yamamoto granger causality test

The results of Toda-Yamamoto Granger Causality test are given in Table 9. A strong unidirectional Granger Causality from LnSMEs to FDI is detected at a 1 per cent level of significance, implying that LnSMEs Granger causes FDI inflows in Algeria. The unidirectional causal relationship is also found from TINF to FDI and from TINF to GDPG at 5 percent and 10 per cent significance level respectively.

Moreover, a strong bidirectional causal relationship is found between FDI and TOP at 1 percent significance level Furthermore, the findings reveal that TOP, TINF, GDPG and LnSMEs jointly Granger cause FDI inflows in Algeria on a 1% level of significance. Additionally, these findings provide empirical evidence of using FDI and LnSMEs as dependent and independent variables, respectively, in our dynamic ARDL model.

Table 9: Toda-Yamamoto granger causality analysis

Dependent variable	Direction of causality					
	FDI	TOP	TINF	GDPG	LnSMEs	All
FDI	-	12.874*	9.006**	3.155	4.781***	0.008*
TOP	10.773*	-	6.869**	2.041	0.304	0.014**
TINF	0.309	2.652	-	3.681	0.275	0.169
GDPG	1.858	3.704	4.926***	-	10.623*	0.0002*
LnSMEs	0.370	0.606	0.739	2.711	-	0.702

Note: * denotes statistically significant at 1 %; ** denotes statistically significant at 5%; *** denotes statistically significant at 10%

5. Discussion of results and conclusion

The present empirical research is an attempt to empirically examine the impact of SMEs on FDI inflows and analyses the effect role of IFRS adoption on the relationship between SMEs sector and FDI inflows in short and long run in Algeria during the period of 1970-2017. In this connection, this investigation aims to fill a major gap regarding empirical literature on FDI drivers in developing countries. Wherefore, to the best of our knowledge, this paper is the first to empirically asses the association between SMEs and FDI inflows in Algeria.

Using ARDL bounds testing approach to co-integration, the results reveal a positive impact of SMEs on FDI inflows in the long-run, implying that H1 is empirically supported. These findings are in line with some number of preceding empirical works (Afolabi, 2013; Opafunso and Adepoju, 2014; Esther et al., 2018). In fact, the empirical findings of Afolabi (2013) indicated a positive association between SMEs and economic development in Nigeria between 1980 and 2010 with a coefficient value of 0.92. Also, these results are consistent with those of Esther et al. (2018) who, reported a 1 % increase in SMEs growth rate leads to about 6.6 % increase in

economic growth in Nigeria over the period 1980-2016. Moreover, this outcome is in line with the findings of Opafunso and Adepoju (2014) who, documented a positive effect of SMEs on poverty reduction Ekiti State between 2006 and 2013.

However, in terms of the role of IFRS adoption in mediating the impact of SMEs on FDI inflows in Algeria, our findings report a negative contribution of IFRS adoption on the association between SMEs and FDI inflows in both long and short run at a 7% significance level. This outcome is consistent with some previous empirical investigations regarding the economic consequences of IFRS adoption in developing countries. In that regard, Nnadi and Soobaroyen (2015) found that IFRS adoption have a negative impact on FDI inflows in the African region with a coefficient value of −0.504 and significant at a 1% significance level. Also, Ugwu and Okoye (2018) confirmed that IFRS adoption has a negative effect on the relationship between FDI and Gross Domestic Product (GDP) in Nigeria during the period of 1999-2015 with a coefficient value of −0.50.

Additionally, for the control variables, our results of the first specification, our base model, show that TOP is associated positively with FDI inflows in the long-run. These results are in line with a large number of prior studies such as Chakrabarti (2001),

Sekkat and Veganzones (2007), Moosa (2009), Rogmans (2013), Jabri et al. (2013), Jabri and Brahim (2015), and Khayat (2017). The coefficient of TINF is negative and significant at 5% in the first model with a coefficient value of -0.015, implying that increasing in telecommunication infrastructure is associated with lower increase in FDI inflows in Algeria. This outcome contradicts with a number of prior empirical studies (Wheeler and Mody, 1992; Kumar, 1994; Loree and Guisinger, 1995; Lydon and Williams, 2005; Bahrini and Qaffas, 2019). This negative impact of TINF on FDI inflows can be attributed to the lack in the quality and efficiency in economic performance of telecommunication infrastructure (Bahrini and Qaffas, 2019). In fact, over-investment in terms of quantity, inadequate investment decisions or high cost of infrastructure development may not lead to higher increases in FDI inflows as noted by Égert et al. (2009). With respect to GDP, the findings, derived from the first specification, reveal that GDP has a negative impact in attracting FDI at 10%. This result is consistent with the argument of some past empirical works in developing countries (Wint and Williams, 2002; Jensen, 2003; Mina, 2007; Sekkat and Veganzones, 2007; Buchanan et al., 2012; Abdouli and Hammami, 2017). This negative impact could be explained by the scaling effect as reported by Jensen (2003). In fact, economies that experience growth rate in FDI inflows lower than the economic growth rate may encounter a decline in FDI as percent of GDP.

The findings of our present study have a number of major implications. Firstly, the findings of this study may assist regulators and policy makers in developing countries to improve the business environment of their countries in different areas to attract more FDI such as improvement of the local SMEs sector. Secondly, our study would be valuable for manager and foreign investors in assessing the business environment in host countries. In fact, based on signaling theory, the size of Local SMEs sector in the host country may be considered as an indication of a good or bad business environment for foreign investors. Thirdly, our findings have outstanding evidence for both developing countries and academic research by throwing light on local SMEs as a new determinant of FDI to emerging new markets.

The current study is not without limitations. This study was only conducted on one African country. Therefore, further investigation on other areas may provide a better understanding of the impact of SMEs sector on FDI inflows and the mediating effect of IFRS adoption. In addition, the present paper is limited to the impact of SMEs as a whole without considering SMEs by sectors. Accordingly, examining the impact of SMEs on FDI by sectors would provide precious insights about the relationship between SMEs and FDI inflows.

In conclusion, the above limitations could be used as venues for further research. Future research could conduct comparative studies among other African countries. Furthermore, Future studies are encouraged to replicate the study by economic sectors to verify whether the findings of the current study hold valid across different sectors.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

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