

THE IMPACT OF CURRENCY DEVALUATION ON THE STOCK MARKET DEVELOPMENT AND FOREIGN INDIRECT INVESTMENT: EVIDENCE FROM EGYPT

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ABSTRACT

This paper examines the impact of the Egyptian pound devaluation on the Egyptian stock market performance, development, and foreign indirect investments for the period 2002-2018, mainly the 2003 and 2016 currency devaluations. An Autoregressive Distributed Lag (ARDL) cointegration analysis performed to test long-term and short-term relationships among variables. It was found that the devaluation of the Egyptian Pound had a significant positive impact on the Egyptian stock market development in terms of market capitalization and turnover. Furthermore, devaluation shows a significant and positive impact on the short term foreign indirect investments, while it has no impact on the long term foreign indirect investments. This paper question whether devaluations were a means of restoring the Egyptian stock market attractiveness for foreign investors or a means of injecting hot money into the Egyptian market for short term capital gain. Finally this paper questions how to implement proper capital control rules to limit hot money injections, especially when governments are planning to devalue its currency.

Keywords: Currency Devaluation; Stock Market Development; Stock Market Performance; Foreign Indirect Investment, Hot Money

INTRODUCTION

Since the 1970's, the term stock market performance (SMP) was well-received, defined, developed theoretically and tested empirically from many perspectives (Fama, 1970; Nelson, 1976; Stulz, 1981; Adler & Dumas, 1983; K. A. Froot & Stein, 1991; Bilson et al., 2001; Omran & Pointon, 2001). Since the 1990's till now, the Stock Market Development (SMD) received supplementary attention representing prominent area of research in the finance literature (Bruno & Easterly, 1998; Adam & Bevan, 2005; Falahati et al., 2014; Hajilee & Al Nasser, 2014). Additionally, Demirguc-Kunt & Levine (1996), Levine & Zervos (1998) initiated a well-founded theoretical and empirical base concerning SMD. The SMD is systematized in the general financial sector development (Adam & Tweneboah, 2011). According to Caporale et al. (2005), SMD plays a central role in increasing the nation wealth, prosperity and have been seen as a precondition for a country's economic growth.

According to Carrieri & Majerbi (2006), heterogeneous prospects could be proposed to international investors when investing in emerging stock markets. Meanwhile, a high probability of Exchange Rate (ER) volatility does exist in these markets, counting on the devaluation risk. In this context, the empirical analysis shows to what extent foreign investors were benefiting from such prospects and whether devaluation was taken as one of the Egyptian market merits or pushing away foreign investors. Accordingly, the paper's outcomes added to the debate whether devaluations have expansionary or contractionary effects on a country's economy from a new perspective which weren't tackled beforehand in Egypt.

Foreign Investments (FIs) in Egypt are mainly directed towards three main channels: Treasury bills, Treasury bonds, and listed shares in the Egyptian Stock Market (ESM). FIs contribution in the ESM are allowed to reach 30% of the value traded (Mohieldin et al., 2019). According to the Central Bank of Egypt (CBE) annual report 2003/2004, an improvement in Foreign Indirect Investments (FIIs) was achieved in terms of registering lower levels of outflows with US\$ 225.6 in 2003/2004 million compared to US\$ 405.2 in 2002/2003¹. However, in the same Fiscal Year, the inflows of FIIs reached US\$ 16.0 billion. In comparison, an outflow of US\$ 1.3 billion, which the biggest portion was directed towards treasury bills which reached US\$ 10.0 billion, while US\$ 6.8 billion in bonds and net purchases of US\$ 497.3 million in ESM securities². One of the reasons for this upward trend in both investments could be traced to the last devaluation; Egypt has become a more affordable investment destination than before, and the inflow of foreign currency increased. Meanwhile, these levels should continue even more when foreign investors feel that the US dollar to Egyptian Pound (USD: EGP) rate has reached stability and that the speculation/high volatility period is coming to an end. In case that devaluation serves to create and restore foreign investors' confidence, it will positively affect capital inflows. On the other side, if devaluation fails in building confidence, it will increase capital outflows and even speed them up, leading to a further decline in the currency's value (Bumgarner & Prime, 2000).

Currency devaluation considered a critical issue in the history of international economics and finance (Frankel, J. and Rose, 1996; Becker et al., 2000; Mohammed et al., 2015). The term fundamental disequilibrium could help in

¹FY 2004/2005 registered higher levels of FPIs achieving net inflows of US\$ 831.1 million compared to an outflow of US\$ 225.6 million in 2003/2004.

² Data derived from the CBE annual report 2016/2017.

explaining the reasons behind 2016's Egyptian currency devaluation. The decision taken in November 2016 was part of the economic reform in an attempt to stimulate the Egyptian economy by floating the Egyptian Pound (EGP); giving better opportunities for financial and economic growth after a long period of fixed ER regime and political, financial and economic instability (CBE annual report 2016/2017). By the end of the fiscal year 2016 the Egyptian budget deficit reached 12.2 % of the country gross domestic product, foreign reserves have fallen by nearly half since the Revolution of 2011, the deficit of the current account reached around \$40 billion since 2014. However, after announcing the liberalization of the EGP, macroeconomic indicators revealed that the devaluation decision has to be questioned. The main purpose of this paper is to investigate the devaluation impact on the ESM development along with the inflow of FIIs to the country.

LITERATURE REVIEW

It is argued in the literature that stock markets analysis is halved into two main areas; SMP and SMD. Both are related to each other; Dellas & Hess (2002) suggested that the behavior of asset returns is related to the properties of financial markets and the extent to which it is developed. Meanwhile, SMD could be used as a predicting tool that signals a future economic trend and an indicator for the overall financial health of that economy (Kmmcb, 2014).

The dynamic linkage between macro-economic variables and stock markets has fetched an increasing amount of attention in the finance and economic literature. Researchers focused mainly on testing the relationship between those variables and stock markets from a specific perspective and by considering the SMP like (Bilson et al., 2001; M. J. Cooper & Jr, 2004; Aydemir & Demirhan, 2009; Barakat et al., 2015). From the same perspective, and in

order to reach more reliable results, researchers started to be more focused on just picking one of these macro-economic variables and were analyzing the extent to which such variable in particular has an influence on the stock market performance. Examples of these studies were those performed to investigate the impact of money supply on the stock market performance like Nasr et al. (2018). Additionally, Omran & Pointon, (2001) were just focusing on analyzing the impact of inflation rate on the Egyptian SMP. While, Adjasi et al. (2008) investigated the impact of ER volatility on the SMP and Jorion (2014) examined the impact of ER volatility in the U.S. stock market.

Recently, more focus was directed towards analyzing the impact of macroeconomic variables from a new perspective by investigating its impact on SMD rather than performance, identifying the significant determinants and the most influencing factors that might affect the development of capital markets (Aydemir&Demirhan, 2009; Abdelbaki, 2013; Kmmcb, 2014; Toraman, 2014; Fauziah Wan Yusoff, 2015; Ho &Odhiambo, 2018). According to Joshi (2015), the debate concerning the relationship between SMD and macroeconomic variables is still difficult to solve. It is hard to pinpoint causality between both variables. Ho and Odhiambo (2018) found that SMD macro-economic determinants include but not limited to banking sector development, inflation rate, interest rate, ER and private capital flows, while institutional include corporate governance, financial market liberalization, stock market integration and trade openness. Concerning the link between ER volatility and SMD in the MENA region, Yusoff (2015) investigated the SMD determinants; findings indicated that ER is one of the significant factors influencing the development of stock markets, especially in Egypt, Tunisia and Saudi Arabia.

In the same context, Aydemir and Demirhan (2009) analyzed the SMD determinants suggesting that currency

appreciation leads to a higher level of domestic consumption and hence higher money supply, consequently leading to the elevation of stock market activities and its development. Empirically, few studies tackled the relationship between stock markets and devaluation; however, results indicated that devaluation significantly affected SMP, pointing out different measures that explain the relationship among both variables. For example, studies performed by (Glen, 2005; Patro et al., 2014; Bahar et al., 2018) analyzed the impact of foreseeable currency devaluation on stock prices by considering the cumulative abnormal returns provided mixed result. Glen (2005) and Patro et al. (2014) agreed that when local stock markets anticipate devaluations, significant negative cumulative abnormal returns exist one year prior to announcing the devaluation decision in both dollar and local currency terms, especially in the six months preceding the devaluation. In addition, the negative trend will continue for up one quarter following the announcement, and then normal stock returns will start to appear, followed by the positive trend. On the other side, Bahar et al. (2018) suggested that negative cumulative abnormal returns exist before announcing the devaluation, during the period of the announcement and even within the period followed by the devaluation adding that the observed impact could not be just a one-time negative surprise as it could be extended up to three years after announcing the devaluation.

Miller (2002) added that currency devaluation tends to affect stock market returns through three main channels, the first one is the level of currency devaluation, which has a negative impact on stock market return, and the second one is the level of volatility in the currency devaluation which has a positive impact on stock market return and finally the extent to which the stock market returns volatility respond to currency devaluation. Moreover, returns are significantly lower and tend to decline more around the announcement of devaluation in the following cases, (1) if foreign reserves are

low, (2) in case that ER has been depreciating over prior years, (3) if capital account is and still declining, and (4) in case that current account deficit has gone up and country's credit ratings have been deteriorating (Glen, 2005; Patro et al., 2014). Bahar et al. (2018) added two dimensions that can worsen the situation and are associated with higher probability of announcing the devaluation namely an exchange control associated with fixed ER regime and black markets running at large premiums over the official ER.

Other groups of studies analyzed the impact of macroeconomic variables, including ER volatility impact on countries SMD and the extent to which ER volatility can determine SMD (Hajilee & Al Nasser, 2014; Kmmcb, 2014; Fauziah Wan Yusoff, 2015). The case of depreciation was associated with a low turnover ratio and pushed investors to seek short-term profits in terms of hot money, which leads to short-term improvements rather than continuous developments in the stock markets. Furthermore, in the case of applying flexible ER regimes, the situation is much better as ER is adjusted flexibly, little volatility could be experienced, and the shock of announcing the devaluation decision won't exist. In this case, the stock market could be facing a greater degree of stability and hence its development. Moreover, relatively low turnover rates do exist due to the high volatility in both ER and inflation rate along with high deposit interest rate due to the little interest in investing in stock markets and bearing any risk.

Increasing the inflow of foreign capital either directly or indirectly is crucial for a country's economic and financial development. FIIs have a short time frame, and investors usually expect to realize a profit on their investments quickly; that's why it is known by the term "hot money". Accordingly, currency devaluation might have a short-term positive impact on this kind of investments. The short time frame enables investors to invest in countries experiencing stable economic conditions while taking the

benefit of pulling out their investments in case of facing any kind of unfavorable instability (Samman & GabAlla, 2020).

According to Kyereboah-Coleman & Agyire-Tettey (2008) ER risk comes on top of risks that investors could face when investing internationally. (Darby et al., 1999; Waqas et al., 2015) pointed out that ER volatility, whether devaluation or revaluation is one of the significant factors that tend to affect FIIs. The inflow of FIIs will increase the supply of foreign currency and ultimately help in reducing ER, taking it back to the equilibrium rate (Becker et al., 2000). In this context, the relationship between ER and FIIs was observed and analyzed in many studies (Levy & Sarnat, 1970; Froot & Stein, 1991; Bleaney & Greenaway, 2001; Ersoy, 2013).

According to the mentioned studies, FIIs is affected by currency devaluation directly and indirectly. Devaluation of host country currency motivates the foreigners to invest due to higher return (Bleaney & Greenaway, 2001). In addition, Waqas et al. (2015) added that ER volatility considered being one of the most macroeconomic variables that bring volatility in FIIs; that's why investors should regularly monitor such volatility before taking decisions. FIIs will be less volatile when the host country enjoys stable economic conditions in terms of high interest rate, lower inflation rate, high GDP and experiencing currency depreciation (devaluation). Brink & Viviers (2003) suggested that sudden devaluations in fixed ER will affect FIIs negatively and contribute to attracting uncertain and speculative capital flows in the form of injecting hot money to earn short-term gains instead of earning short-term gains sustained capital flows and FIs. However, (Ullah & Malik 2014) added that FIs inflow is one of the main sources of currency appreciation hence, helping in improving country's economic growth, adding that depreciation in currency is due to higher demand on the US dollar. Accordingly, FIs will increase the supply of foreign currency, leading to its

appreciation. Thus, FIs inflows will positively impact ER; if the outflow of FIIs is more than the inflow, such positive impact will turn to be negative, contributing to more significant currency depreciation.

RESEARCH METHODOLOGY

Variables, Proxies and Data

The SMD is mainly measured by using the Stock Market Capitalization as a percentage of Growth Domestic Product (SMC/GDP) and the Stock Market Turnover (SMT) ratio. The stock market performance is measured by using the Egyptian stock exchange main indices; EGX-30 and EGX-100 quarterly returns. Proxies of FIIs cover both investments in securities as well bonds. Finally, the nominal ER is used to test the devaluation impact on the SMC, SMT, and FIIs for the two devaluation events.

Empirically, Levine & Zervos (1998) Arcia & Iu (1999), Samy Ben Naceur et al. (2007), Yartey & Fund (2014) used SMC% GDP as the main proxy to measure stock markets development. According to Badr (2015), the total capitalization of the stock market as a whole provides a precise snapshot of the stock market and could be easily compared with other economic indicators. The other tool which is used to assess the development of stock markets is the stock market liquidity, in terms of the extent to which it is easy to trade securities on the stock exchange, as argued by El Wassal (2013), and represented in terms of the value traded in the stock market.

Studies by Levine & Zervos (1998), Arcia & Iu (1999), G. Bekaert et al. (2002), Demirguc-Kunt & Maksimovic (2005), Billmeier & Massa (2009) El-Masry & Badr (2020) showed that SMC wouldn't be enough in evaluating stock markets, pointing out the importance of considering stock market return. According to Demirguc-Kunt and Levine (1996), relying on SMC as the main proxy

to assess the SMP and SMD won't be enough, explaining that the free float percentage in some cases could prejudice the SMC. Hence, the ratio won't represent the extent to which the stock market is developed; accordingly, market indices were also suggested to be considered while assessing SMP as well development. Therefore, the EGX-30 index of large caps which is the leading indicator of the ESM, in addition to EGX-100 are used in this paper as proxies to the SMP. The proxies used to define both the size and the liquidity of the ESM to analyze how each of these measures was affected by the EGP devaluation. Finally, FIs cover FIIs net flows as well investments in bonds as well as in equity securities. Data were collected from the ESM official website, the Egyptian Ministry of Finance databases and the CBE for the variables of interest span from 2002 to 2018 for 68quarters.

Methodology

Descriptive statistics provide mean, median, maximum, minimum and standard deviation for both dependent and independent variables. It is worth mentioning that the devaluation variable is created as taking 1 using the quarters that happen in its devaluation, which are Q1 2003 and Q4 2016, in addition to three quarters before and three quarters after each of the above mentioned quarters while taking 0 otherwise. In order to do so, a dummy variable was incorporated in this part as a numerical variable used as a mean of distinguishing the devaluation impact on the research variables at different points in time. The basic idea associated with dummy variables is the inclusion of discrete numbers, mainly 0 and 1 representing two divergent groups, enabling the researcher to deal with these two groups within one equation, which turn various parameters on and off in an equation. In this paper, the stationarity of the data is tested using the Augmented

Dickey-Fuller (ADF) by calculating the respective statistics and p-values.

Table (1): ADF Unit Root Test

<i>Variables</i>	<i>ADF</i>	<i>P-value</i>
SMC/GDP	-1.566	0.494
Change in SMC/GDP	-6.184***	0.000
Turnover Ratio	-6.040***	0.000
Net Investment	-5.211***	0.000
Investments in Securities	-5.679***	0.000
Investments in Bonds	-6.437***	0.000
EGX30	-6.509***	0.000
EGX100	-9.178***	0.000
Inflation Rate	-3.022***	0.038

Note:*, **, *** denote significance levels of 90%, 95%, and 99% respectively.

Results shown by table (1) concluded that all variables are stationary at 95% confidence level, as their *P*-value less than 5%, except for SMC/GDP. As mentioned by Shrestha & Bhatta (2018), time series analysis requires different methodologies based on data stationarity. In this context, the main aim is to investigate the long-run and short-run relationships for each dependent variable and other determinants, and this can be done using cointegration analysis and the error correction model. However, the cointegration test and error correction model were used within an ARDL framework since the Johansen cointegration test cannot be applied directly if the variables of interest are not all (1). Using a simple linear transformation, a dynamic Error Correction Model (ECM) can be derived from ARDL. Also, the ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information and avoids problems such as spurious relationship resulting from non-stationary time series data, Shrestha, M.B. and Bhatta, G.R.(2018). Equation

(1) shows the ARDL modeling approach, while equation (2) shows the error correction version of the ARDL model

$$y_t = \alpha + \beta x_t + \delta z_t + u_t$$

..... (1)

$$\Delta y_t = \alpha_0 + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \sum_{i=1}^p \delta_i \Delta x_{t-i} + \sum_{i=1}^p \gamma_i \Delta z_{t-i} + \lambda_1 y_{t-1} + \lambda_2 x_{t-1} + \lambda_3 z_{t-1} + u_t$$

..... (2)

While β , δ and γ of equation (2) represent the short-run dynamics of the model, λ_1 , λ_2 , λ_3 represent the long-run relationship and μ_t is the error term. In equation (2), $\lambda_1 + \lambda_2 + \lambda_3 = 0$, indicated non-existence of a long-run relationship. The ARDL bounds test was used to test the null hypothesis that no cointegration exists. The final step includes the diagnostic tests to test the model robustness to identify spuriousness, examining to what extent the data were explained by the regression line, whether the overall model is significant or not and whether the serial correlation in residuals took place.

ANALYSIS OF DESCRIPTIVE STATISTICS

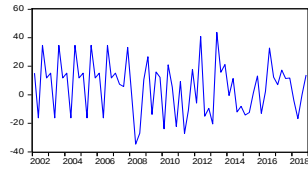
Table (2) presents the descriptive statistics of dependent variables. It is shown that EGX-30 and EGX-100 have, almost, the same volatility in terms of standard deviation over the study period from 2002-2018, with 18.56% and 18.58%, respectively as shown by table (2). Graphs (1) and (2) confirm results reported by table (2), but explain the behavior of the EGX-30 and EGX-100, where EGX-100 index return is more predictable than EGX-30 for most of the years included in the study with almost the same supporting (lower boundaries) and resistance (upper boundaries) levels. This can be explained by the dominant effect of EGX-30 on the EGX-100, where the market capitalization of EGX-30 represents 75%, on average, of the

EGX-100's market capitalization for the study period 2002-2018.

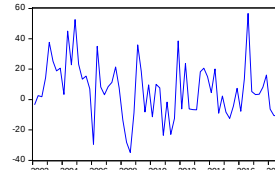
Additionally, it is shown by table (2) that investing in EGX-30 is more appreciated than investing in EGX-100, where one unit of risk of investing in EGX-30 index is compensated by 3.61 units of return, while the same unit of risk is compensated by 2.97 of return from investing in EGX-100, as explained by the sharp ratio. Due to the high risk of investing in stocks than in bonds, a one unit of risk from investing in stocks is compensated by 20.40 units of return, while it is compensated by 7.35 units of return in the case of investing in bonds.

Surprisingly, the SMC/GDP's volatility is higher than for the SMT, where the standard deviation of SMC/GDP and SMT counts for 21.9% and 1.7% respectively. These descriptive statistics of SMC/GDP and SMT reported by table (2) are interpreted by graphs (3) and (4) where the SMC/GDP showing sharp decline over time since the financial crises in 2008, while SMT maintained its level before and after the financial crises. This can be explained by the low free float rate, which is not less than 15% as per listing regulations. The high volatility of investing in bonds, 92.596%, than in stocks, 24.162%, is driven by the fact that almost 90% of the Egyptian capital market is related to the bond market as shown by table (2). Graph (5) shows heavy investment in the bond market, mainly Treasury bonds, after the 2016's economic reform by the Egyptian government. This can be interpreted as economic reform was perceived by investors as a risk program; therefore they shifted their investment from the stock market to the Treasury bond market. On the other hand, graph (6) showing two shocks to the investment in the stock market, first shock related to the 2008 financial crises and the second related to the economic reform took place in 2016.

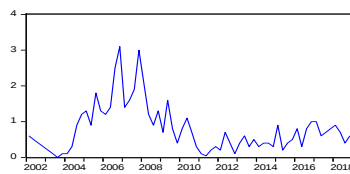
Graph (1): EGX-30



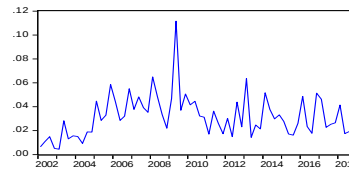
Graph (2): EGX-100



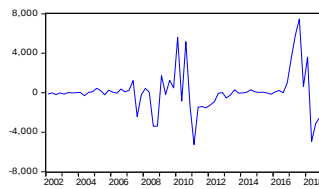
Graph (3): SMC/GDP



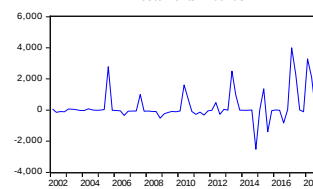
Graph (4): SMT



Graph (5): Investments in Bonds



Graph (6): Investment in stocks

**Table (2): Descriptive Statistics of dependent Variables for the Period 2002-2018**

	EGX30	EGX100	SMC/ GDP	SMT	Inv. Bonds	Inv. Stocks	Net Inv
Mean	6.731	5.466	0.379	0.031	-12.633	-1.276	2.724
Median	7.205	10.995	0.347	0.028	-0.683	-0.842	-0.714
Maximum	56.639	43.782	1.006	0.111	146.988	137.000	151.179
Minimum	-34.886	-34.627	0.125	0.004	-694.888	-123.238	-12.852
Std. Dev.	18.563	18.588	0.219	0.017	92.596	24.162	19.766
CV	277%	336%	58%	55%	13.6%	4.9%	13.6%
Sharp Ratio	3.6101	2.9762	1.7241	1.8182	7.3529	20.4082	7.3529
Jarque- Bera	1.416	1.504	13.172	89.447	5524.958	1609.029	6491.766

Note: Authors calculations.

ANALYSIS OF EMPIRICAL RESULTS

Reported results by table (3) indicate that the models explained around 91%, 71%, 93% and 39% of the variation in EGX-30, EGX-100 quarterly reruns, SMC/GDP and stock market turnover ratio as indicated by R^2 . Additionally, referring to both the given coefficients and P -values, it was obvious that the devaluation of the Egyptian pound had a significant positive effect on the four selected proxies. Statistics in tables (3) showed negative coefficients when considering the devaluation's impact on the stock market indicators indicating a significant positive effect at 5% confidence level on EGX30, EGX100 quarterly returns, SMC%GDP as well SMT, indicating that in the short run, the effect of devaluation had a positive impact on both indices as well both SMD proxies. Contradictory, statistical analysis showed that devaluation has an insignificant impact on the four selected proxies in the long run.

Table (3): Short-Run Dynamics Models' Results Using ARDL Approach:

Panel (1): EGX30 ($R^2 = 91\%$)	Coefficient	Std. Error	t-Statistics	Prob.
α (Constant)	10.183***	1.242	8.197	0.004
β (EGX30 _{t-1})	0.166***	0.055	-5.512	0.010
δ (Inflation Rate)	-0.307***	2.244	-6.767	0.006
γ (Devaluation)	-15.187***	0.037	4.420	0.015
Panel (2): EGX100 ($R^2 = 71\%$)	Coefficient	Std. Error	t-Statistics	Prob.
α (Constant)	11.877	48.511	0.244	0.300
β (EGX100 _{t-1})	-0.164***	0.016	-10.240	0.003
δ (Inflation Rate)	-0.835***	0.160	-5.212	0.011
γ (Devaluation)	-12.477***	2.022	-6.168	0.008
Panel (3): SMC/GDP ($R^2 = 93\%$)	Coefficient	Std. Error	t-Statistics	Prob.
α (Constant)	-0.258	0.212	-1.216	0.228
β (SMC/GDP _{t-1})	1.274***	0.126	10.078	0.000
β (SMC/GDP _{t-2})	-0.639***	0.187	-3.414	0.001
β (SMC/GDP _{t-3})	0.246**	0.125	1.959	0.055
δ (Inflation Rate)	-0.001***	0.001	-7.660	0.005
γ (Devaluation)	-0.009***	0.001	-6.278	0.007

Table 3, continued

Panel (4): SMT ($R^2 = 39\%$)	Coefficient	Std. Error	t-Statistics	Prob.
α (Constant)	-0.258	0.212	-1.216	0.128
β (SMT _{t-1})	0.102	0.121	0.842	0.403
β (SMT _{t-2})	0.102	0.126	0.811	0.421
β (SMT _{t-3})	0.088	0.130	0.677	0.501
β (SMT _{t-4})	0.239**	0.130	1.834	0.072
δ (Inflation Rate)	9.57E-05	0.001	0.175	0.861
γ (Devaluation)	-0.004***	0.007	-5.222	0.011
Panel (5): Investments in Bonds ($R^2 = 30\%$)	Coefficient	Std. Error	t-Statistics	Prob.
α (Constant)	5023.475**	6.431324	1.763043	0.0833
β (Inv-in-bonds _{t-1})	0.160	0.136417	1.174345	0.2452
β (Inv-in-bonds _{t-2})	-0.2567**	0.134134	-1.9141	0.0607
δ (Inflation Rate)	-6.6566***	0.807103	-8.2476	0.0046
γ (Devaluation)	-413.03***	69.155474	-5.97259	0.0087
Panel (6): Investments in stocks ($R^2 = 40\%$)	Coefficient	Std. Error	t-Statistics	Prob.
α (Constant)	5263.00	5605.019	0.938980	0.3521
β (Inv-in-stocks _{t-1})	0.15209	0.126627	1.201159	0.2351
β (Inv-in-stocks _{t-2})	0.22974**	0.126224	1.820126	0.0745
β (Inv-in-stocks _{t-3})	-0.14872	0.132354	-1.12368	0.2663
β (Inv-in-stocks _{t-4})	-0.22832	0.141282	-1.61610	0.1121
δ (Inflation Rate)	51.06185**	-9.7305	-5.24760	0.01115
γ (Devaluation)	-177.03***	25.3902	-6.972	0.00642
Panel (7): Net investments ($R^2 = 36\%$)	Coefficient	Std. Error	t-Statistics	Prob.
α (Constant)	11131.65**	5721.355	1.945631	0.0566
β (Net-inv _{t-1})	0.234543**	0.120624	1.944412	0.0567
δ (Inflation Rate)	60.7716***	7.6535	7.9403	0.0050
γ (Devaluation)	-684.844***	70.5384	-9.7088	0.0033

Note: ***, **, and*Significant levels at 99%, 95%, and 90%, respectively.

Stock Market Development measured by SMC/GDP in panel (3), and by SMT in panel (4). Stock Market Performance measured by EGX 30 in panel (1), and by EGX 100 in panel (2). Foreign Portfolio Investments measured by Investments in bonds in panel (5), Investments in stocks in panel (6) and net investments in panel (7).

Reported results by table (4) will show whether the calculated F- statistic is either lower than or between the lower and upper bounds (critical values) reported by (Peaseran, 2001). When the computed F-statistic is greater than the upper bound I (1), we reject the null hypothesis that no cointegration exists between the series. If the F-statistic is less than the lower bound I (0), we accept the null hypothesis that there is no cointegration between the series. Furthermore, if the F-statistic falls between lower I (0) and upper I (1), inconclusive results will be reported. After analyzing the long-run relationship among variables, an

estimated short-term ARDL model will be estimated for every dependent variable.

The f -calculated is between the lower bound and the upper bound for all significances levels, which means that at 95% confidence level, the null hypothesis “no long-run relationship exists” is not rejected, which means that only a short-run relationship exists between currency devaluation and the four indicators.

The significant positive effect on the selected proxies was consistent with studies suggesting that foreseen ER changes are priced instantly into share prices and tend to have a consequential impact (Bahr et al., 2018; Chen et al., 2004; and Glen, 2002). Nevertheless, the significant positive impact on SMC/GDP as well SMT ratio was inconsistent with the previously reached results by (Fauziah & Yussef; 2015; Hajilee and Al- Nasser, 2014), pointing out the negative impact of currency depreciation on SMD indicators suggesting that in case that currency depreciation was associated with low turnover ratio, this will push investors into seeking short term gains in terms of hot money, which lead to short term improvements rather than continuous developments in the stock markets.

Table (4): ARDL Bounds test for cointegration relationship

Panel(1): EGX30	Value	K	Significance	I0 bound	I1bound
F-stat	1.354	4	10%	2.45	3.52
			10%	2.86	4.01
			5%	3.25	4.49
			1%	3.74	5.06
Panel(2): EGX100	Value	K	Significance	I0 bound	I1bound
F-stat	1.354	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06
Panel(3):SMC/GDP	Value	K	Significance	I0 bound	I1bound
F-stat	2.324	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06
Panel (4):SMT		K	Significance	I0 bound	I1bound
Value					
F-stat	2.094	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06
Panel(5):Inv-bonds	Value	K	Significance	I0 bound	I1bound
F-stat	1.520	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06
Panel(6):Inv-stocks	Value	K	Significance	I0 bound	I1bound
F-stat	1.160	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06
Panel (7):Net-inv		K	Significance	I0 bound	I1bound
Value					
F-stat	1.121	4	10%	2.45	3.52
			5%	2.86	4.01
			2.5%	3.25	4.49
			1%	3.74	5.06

Note: Authors Calculation

Additionally, the hit that took place on the devaluation date was taken as a mean of explaining the positive impact of the devaluation in official reports at that time, ensuring that investments that took place during that time were a renewed confidence from the investors' side, as mentioned

in these reports and had contributed to the existence of the positive trend in the following quarters. In this context, the positive impact reached after conducting the analysis was consistent with what was mentioned by official reports, whether by the CBE or the ESM annual reports for the selected proxies. The SMC/GDP reached one of its minimum values before the devaluation directly registering 12.50% in Q3 2016. Meanwhile, the value was increasing in the following quarters and reached 28.10% in Q1 2018. However, there was no significant long term relationship between the devaluation and the selected proxies in the study on hand, while trends that took place in the three quarters prior to as well following the devaluations were partially consistent with (Glen, 2002; Patro et al., 2014) suggesting that negative trend will take place in the six months ahead of the devaluation and will continue for up one quarter following the announcement. Then normal stock returns will start to appear, followed by the positive trend.

Referring to EGX-30 quarterly returns, Q 1 2016 quarterly returns reached 7.4%, Q2 reached -7.7% while Q3 was 13% then it increased sharply to 56% in Q4 2016 then achieved 5%, 3% and 3% in Q1, Q2 and Q3 2017 respectively and were back within the normal range. The explanation for this could be supported by (Bahar et al. 2018), suggesting the point of the one-time surprise that could occur on the announcement date regardless of the negative or the positive trend that could happen before the devaluation and after it. Referring to EGX-100 quarterly returns, it increased sharply in Q4 2016 and reached 32.75% compared to 2.32 % in Q3 2016, associated with another decline in Q1 2017 reaching 12.34%, which was consistent to the case of EGX-30, which witnessed a sharp increase when the devaluation took place as well consistent with the significant reached results indicating a slight increase in the following quarters within the normal range.

However, by considering the 2003 devaluation,

EGX-30 quarterly returns were increasing steadily in the three preceding quarters then experienced an increase in Q1 2003, achieving a quarterly return of 14.34% compared to 1.82% in Q4 2002, which was followed by another increase and achieved quarterly return of 37.68 % in Q2 2003, then 25.24% in Q3 2003 and decreased in Q4 2003 reaching 18.91%. These results were not in lines with those reached by (Glen, 2002; Patro et al., 2014). By comparing the two devaluations as well trends in both EGX-30 and EGX-100 before as well after the announcement, the researcher can give some insights into the extent to which inventors and the Egyptian government expected these two devaluations. Previous studies pointed out that some factors could lead to the devaluation announcement, namely, the applied ER regime, the existence of the black market, the capital and current account, and the level of foreign reserves.

By checking these factors in the case of Egypt and more specifically in the last devaluation, the applied ER was a fixed ER regime in addition to the prosperity of the black market during that period. Accordingly, there was no other option than to announce the devaluation. The ER couldn't be adjusted according to the demand and supply forces that could occur when applying a flexible ER regime. Furthermore, while analyzing the association between devaluation and black markets, Kamin (1991) mentioned that continuous price inflation would push governments to undertake the devaluation decision associated with an increase in the premium of the black market.(The percentage by which the parallel ER exceeds the official ER). Meanwhile, black markets won't be affected by the devaluation. Nothing actually will change the fundamentals of the parallel exchange market premium, which will continue to rise steadily throughout the devaluation period, increasing the negative impact of the devaluation that was

actually the case in Egypt³. Comparing the circumstance surrounding both devaluations showed that 2016 was highly expected compared to the 2003 devaluation, justifying the trend before, within as well after both devaluations.

The relationship between the EGP devaluation and FIIs wasn't tested before in any previous studies; rather, the impact of ER volatility was investigated. Reported results by table (3) indicate that the models explained around 30%, 40%, 36% of the variation in investments in bonds, investments in securities and net investments as indicated by R^2 . Additionally, referring to both the given coefficients as well P-values results showed that the EGP devaluation at different points of time has a significant positive effect at 5% confidence level on FIIs. Contradictory, reported results by table (4) showed that devaluation has an insignificant impact on the four selected proxies in the long run. The f-calculated is between the lower bound and the upper bound for all significances levels, which means that at 95% confidence level, the null hypothesis "no long-run relationship exists" is not rejected, which means that only a short-run relationship exists between currency devaluation and the four indicators.

The second relevant point is the appearance of the conspicuous negative net FIIs in the year that followed the devaluation year (i.e. 2004 and 2018 since the 2016 devaluation took place in the fourth quarter). Referring to the reported figures in graphs (5) (6) and (7), the researcher can conclude that devaluation was expected, the EGP devaluation in 2016 witnessed a sharp decline in Q3 2016, registering negative net FIIs followed by an increase in Q4 2016 with an increasing trend in Q1, Q2 and Q3 2017

³In March 2016 the official exchange rate stood at 8.8 pounds to the US dollar while black market traders were selling it at a premium that reached 100% and the EGP devalued against the US dollar by 13%. After announcing the fully floatation of the EGP in November 2016 the US dollar exchange rate reached 15.2 EGP then jumped to 19.07 and by the end of 2016 it was 18.1EGP.

respectively then another sharp decrease registering negative net FPI in Q2, Q3 and Q4 2018. Comparing these results with net FIIs in 2002 and 2003 sequentially; a negative trend existed in the three quarters preceding the devaluation which has improved in Q 1 then followed by a sharp increase in the following quarter, then another decline in Q3, Q4 2003 as well year 2004 respectively. Thus, the common point among the two devaluations is the explicit increase in the same devaluation quarter and the following quarter.

In order to recognize whether the flow of FIIs was hot money injections or renewed investors' confidence, the researcher considered investments in bonds and securities. As a mean of analyzing FIIs inflows, both investments in securities as well bonds were analyzed. Referring to table (3), the EGP devaluation has a significant positive effect at a 5% confidence level on investments in bonds and investments in securities as the associated negative coefficients showed that devaluating the EGP value helped in increasing the level of FIIs. However, by considering the 2016 devaluation and referring to the reported figures, both investments dropped sharply in Q3 2016, registering negative FIIs in both securities and bonds; nevertheless, the bonds had witnessed a greater decrease. On the other side, Q4 2016 recorded a sharp increase, by comparing both investments; the increase was much higher in securities, indicating hot money injections during the devaluation quarter.

By considering the three quarters following Q4 2016, investments in securities witnessed a sharp increase, followed by another sharp decline starting from Q4 2017 and continued even till Q4 2018, registering negative FIIs in securities. Referring to investments in bonds, a sharp increase took place in Q1 2017, followed by a moderate then negative trend. Results were also consistent with (Ullah & Malik, 2014; Waqas et al., 2015), suggesting higher levels

of FIIs in case of ER undervaluation, especially in the months following the devaluation announcement as well the suggested link with the performance of the stock market and flows of FIs suggesting that investments around as well during the devaluations might represent hot money flows rather than renewed investors confidence.

DIAGNOSTICS TESTS RESULTS

After analyzing the long-run and short-run relationship among variables, the final step includes the diagnostic tests as a mean of testing the model robustness to and to identify spuriousness examining to what extent the data were explained by the regression line, whether the overall model is significant or not significant and whether serial correlation in residuals took place. The research will mainly rely on the R- squared, the adjusted R squared, and the Durbin Watson (DW). The type of diagnostic test depends upon the modeling technique being utilized. According to the previously mentioned models and the reported results in table (5) diagnostic tests showed no serial correlation as the Durbin Watson value was near two. Furthermore, there was no serial correlation from Q-statistics probabilities as the p-value was greater than 0.05 for all models.

Table (5): Diagnostics Tests results

Panel (1): EGX30	Adj-R ²	D.W
	0.8875	2.08
Panel (2): EGX100	Adj-R ²	D.W
	0.7150	1.96
Panel (3): SMC/GDP	Adj-R ²	D.W
	0.9283	1.97
Panel (4): SMT	Adj-R ²	D.W
	0.2159	2.00
Panel (5): Inv-in-stocks	Adj-R ²	D.W
	0.2685	2.09
Panel(6):Net-inv	Adj-R ²	D.W
	0.2766	1.98
Panel(7):Inv-in-bonds	Adj-R ²	D.W
	0.1940	2.12

Note: Authors Calculations

CONCLUDING REMARKS

Given the findings of this paper, key recommendations could be summed up in the following points. First, theoretically as well empirically, Cooper (1969); Acar (2000); Bird & Rajan (2004) were pointing out the devaluation inferior side, which part of it was proved and illustrated by the researcher. In this framework, the positive impact of the devaluation should appear in the long run; this could be obvious on some selected variables after the 2003 devaluation in terms of actual figures showing a noticeable improvement. However, when governments decide to announce such a decision given the short term negative consequences, the choice is mainly associated with the hope of macro-economic improvements, which might be affecting positively country's financial and economic system. In this context, devaluation could be highly recommended in some cases, which was the case in Egypt, especially when

referring to the 2016 devaluation. The vital point that the researcher needs to highlight is the importance of considering the timing and the surrounding circumstances before announcing such a decision to try as much as possible to avoid the short term drawbacks.

Second, by referring to the economic literature, devaluation is highly recommended when facing a balance of payments crisis. Hence, from an economic perspective, multiple dimensions should be considered when devaluing the country's currency and from the same economic perspective, in some cases, the devaluation decision could be seen as the only option that should be taken regardless of the negative outcome. However, from a financial point of view, what matters could be summarized in two major points; the first one is identifying whether the trends in the ESM were going within the normal trend and the extent to which the devaluation impacted the major proxies. The second one mainly focused on FIs trends trying to spot to what extent devaluations affected FIs, especially around devaluations.

After conducting the theoretical as well empirical analysis and concerning these points, the researcher can conclude that even though the devaluation had a significant positive impact on all the proxies as well averages before devaluations are generally lower than after devaluations, proofing that the decision should have been taken by the Egyptian government taking into consideration any negative consequences that could take place in the short term and won't exist in the long run when focusing on stock market responses and local investors activities in the exchange.

Concerning the second point, the significant positive impact associated with the link between devaluation and FIs and the reported figures gave a sign of hot money injections. However, this hot money could be considered as a major drawback that should take place after devaluating country's currencies; in this context, whenever devaluation takes

place, hot money injections will also take place, the point was also supported by (Ullah & Malik, 2014; Waqas et al., 2015) suggesting higher levels of FIIs in case of ER undervaluation especially in the months following the devaluation announcement suggesting that investments around as well during the devaluations represented hot money flows rather than renewed investors confidence when experiencing the poor stock market performance. The key question that could be imposed regarding this point is how to implement proper capital control rules to limit these injections, especially when governments are planning to undertake such a decision.

Furthermore, most previous studies pointed out the devaluation long term positive impact; however, ARDL analysis didn't prove any associations between devaluation and stock markets response which could be investigated in future studies. Taking the research even further, it will be highly recommended to test the devaluation impact on listed firms that are highly engaged in exporting as well importing activities, analyzing whether positive or negative cumulative abnormal returns were taking place around the EGP devaluation, adding another crucial dimension in the finance literature and more especially in the case of Egypt which is the efficiency of the ESM and which efficiency form is the Egyptian stock market following for the current time being. According to the previously mentioned recommendations, the current paper could be taken as grounds for future studies to build on whether by considering the case of Egypt as well as other stock markets.

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