The Impact of Cost of Capital, Operating Profits, and Invested Capital on The Economic Value Added in the Materials' Sector in the Egyptian Market

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This paper examines the long-term effect of the main direct variables on the growth rate of economic value added in the materials' sector in the Egyptian market for the period from 2011 to 2019. The study uses Auto-Regressive Distributed Lag ARDL analysis to demonstrate that the long-run main direct variables (cost of capital, growth of capital, and net operating profit after tax) are significant in the growth rate of economic value-added GEVA. The results showed that these variables are positively related to the GEVA, with a different size of impact, except the cost of equity which reveal a negative correlation with GEVA, and this indicates the existence of neglect of this cost when calculating the cost of capital by financial managers. Thus, the study recommends paying attention to the cost of equity when calculating the GEVA and relying on the study model to predict the long run of GEVA.

INTRODUCTION

Economic value added still has received much attention in recent years, due to the uniqueness of this measure in covering a very critical shortcoming in other financial performance measures, where the economic value-added takes into account the cost of equity when measuring the added value of corporate wealth and not like other measures which calculate only the cost of debt.

Economic value added is defined mathematically as the difference between the net operating profit after tax and the cost of capital and it has many possible uses in the field of management. In addition to use the economic value added as a financial performance measure, it can be used as incentive system and decision-making mechanism. (Zhang, Aboud, 2019. Ali, 2018).

But in spite of the existence of many studies that dealt with the uses of the economic value added, and the effect of the economic value added on many variables, the determinants of the economic value added remain one of the aspects that need more studies.

Previous studies in this field can be divided into two main types, the first type: deals with studies in which the economic value added represents a tool for measurement and evaluation or an independent variable that affects other variables. The second type: deals with studies in which the economic value added represents a dependent variable influenced by other variables. This study belongs to the second type because it examines the effect of net operating profit after tax, cost of debt, cost of equity, and growth of invested capital on the economic value added.

LITERATURE REVIEW

Mustaruddin Saleh, Giriati Zahirdin, and Ellen Octaviani studied the impact of ownership structure on firm performance, expressed in terms of economic value added, and Tobin Q and also investigate a set of controlling variables (company size, debt ratio, and systemic risk) on EVA. The results of the study revealed that there is a statistically significant effect of both institutional and managerial ownership as two independent variables on the economic value added as a dependent variable and the study also found an important effect for control variables (firm size, debt ratio, systematic risk) on EVA (Saleh, Zahirdin, Octaviani, 2017).

Henryani & Kusumastuti, also examined the effect of the ownership structure on the economic value added, by studying the different types of ownership structure (managerial ownership, public ownership, institutional ownership, government ownership), and the results showed that the mentioned types of ownership structure together have a positive significant effect on EVA, although the effect of each type is different. (Henryani, Kusumastuti, 2013).

Issham & Et al, examined the effect of the size of the company; the presence of government ownership and foreign ownership were also studied, and the results show that the government owned

companies have a low EVA, especially companies with a large size and diversified business. whereas foreign owned companies have a high EVA. (Issham & Et al, 2008).

Also, the study introduced by Stehel & Vochozka, show that the inland companies have EVA less than foreign companies in the transport sector (Stehel, Vochozka, 2016).

While the study of Izhar, Alam & Yameen, dealt with the effect of current ratio, liquid ratio, the gross profit margin ratio, net profit margin ratio, debt to equity ratio, and interest coverage ratio on the economic value added, the results show that the gross profit ratio, net profit ratio, debt to equity ratio, and interest coverage ratio have a significant impact on EVA (Ahmad, Alam, Yameen, 2019).

While the study of Kijewska, dealt with the effect of operating profit margin after taxes (NOPAT/S), the rotation of capital invested (IC/S), weighted average cost of capital (WACC) and invested capital (IC), on change on EVA and the results of the study showed that the determining factors of change in the EVA vary from one period to another according to the company's financial condition (Kijewska, 2016).

The study of Zhang & Aboud, showed a difference in the effect of the examined factors on the economic value added; some of these factors had a positive effect (credit risk, operational efficiency and the degree of innovation), some had a negative effect (capital management), and others had no effect (board size and independent directors) (Zhang, Aboud, 2019).

Another study dealt with the effect of applying Enterprise Risk Management on the value of the company represented in the economic value added and its components; the results showed that Enterprise Risk Management represents a very important factor in enriching the value of the company by increasing the net operating profit after tax, and the rate of return on invested capital, and reducing the weighted average cost of capital (Lai, Shad, 2017).

Alagidede & Mangenge, tried to identify the basic determinants of the economic value added in the life insurance sector in South Africa; the results indicated that the asset management, the opportunity costs of shareholder and profitable strategic investments are the main drivers for EVA (Alagidede, Mangenge, 2016).

Through a review of previous studies, it is clear that these studies are divided into two types of studies: studies that dealt with the effect of some financial determinants on the economic value added, and studies that dealt with some non-financial determinants; it also appears that the financial determinants that were studied were mostly dealing with indicators that do not represent main financial determinants that compose the economic value added measure (the net operating profit after taxes, the cost of capital, and the growth of invested capital)

Therefore, this study seeks to measure the degree of the impact of each of the net operating profit rate of return after taxes, the cost of equity and cost of debt as two main components of the cost of capital, and the growth rate of capital on the growth rate of the economic development in value added for the materials' sector companies in the Egyptian market, as this sector is characterised by a high degree of stability due to its lack of exposure to rapid technological developments; this enables the process of measuring the value creation to be more accurate, and this sector has a strong relationship with real growth factors in the economy in terms of urban expansion and infrastructure projects. The financial statements of companies in this sector are of a traditional nature (typical), which enables the studying of the relationship between the independent variables and the dependent variable in this study to be seen more clearly.

Bennett Stewart and G Bennett, III Stewart indicate that the improvement in performance and wealth creation is included in the main components of the measure of economic value added, and these components are represented in the ability to increase the net operating profit after tax, either by increasing or lowering revenues or by reducing operational costs; the ability to achieve profitable capital growth through capital growth (increase in invested capital) in projects with a return that exceeds the cost of invested capital (Stewart, G Bennett & III Stewart, 2013).

Therefore, each increase in the net operating profit after tax must lead to an increase in the economic value added, and also every increase in the growth rate of capital will lead to an increase in the economic value added, provided that this growth is in projects that achieve a rate of return which exceeds the cost of invested capital. In light of the above, the main hypotheses of this study are represented in the following four hypotheses:

Research Hypothesis

Depending on the aim of the research, the study model can be illustrated in Fig.1 as follows:
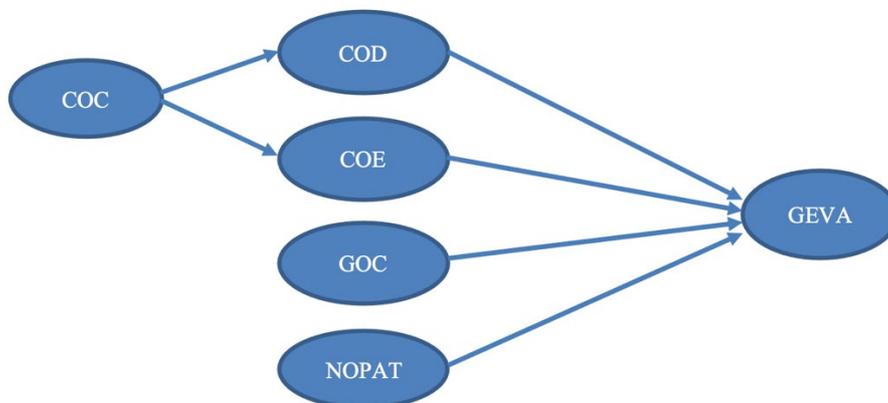

Figure1: The Study model.

According to the figure 1, the research hypotheses can be summarised as follows:

H1: There is a negative, statistically significant effect of the *cost of debt* on the growth rate of economic value added in the materials sector in the Egyptian market.

H2: There is a negative, statistically significant effect of the *cost of equity* on the growth rate of economic value added in the materials sector in the Egyptian market.

H3: There is a positive, statistically significant effect of the *growth of capital* on the growth rate of economic value added in the materials sector in the Egyptian market.

H4: There is a positive, statistically significant effect of the *net operating profit after tax* on the growth rate of economic value added in the materials sector in the Egyptian market.

RESEARCH METHODOLOGY

This study used the Autoregressive Distributive Lag (ADRL) model to determine the long-term impact of total direct variables on the growth rate of economic value-added in the materials sector in Egypt using quarterly data from 2011 to 2019 for companies listed on the market, where the number of companies reached 22 after excluding companies that have no published financial data or have recently gone out of the market, and the data collection process was used by Bloomberg database.

This study used cost of capital (COC) represented by: cost of debt (COD), cost of equity (COE), growth of capital (GOC), and net operating profit after tax (NOPAT) as main direct variables that effect growth rate of economic value-added (GEVA), to show the magnitude and direction of each of these variables on GEVA.

In this study, the ARDL model analysis involved three phases adopted from Kouakou (2011). First, the variables are determined and calculated using unit root test, then the co-integration relationship among the variables was tested through the bounds test. Lastly, the causality test of Ganger was determined to examine and determine the relationship between variables.

Table 1
Unit Root Tests

Variables	ADF	
	L	FD
COD	-	-4.01***
COE	-	-3.96***
GOC	-	-4.30***
NOPAT	-	-5.34***
GEVA	-3.88***	-

Note: The null hypothesis represents no stationarity and the significance levels of *** represent stationarity at 1% .

The results of the unit root stationarity for the variables are tabulated in Table 1. The table shows that all variables are stationary at first using the ADF test. As such, the suitable analytical technique to be utilised is the ARDL model.

The previous step is followed by the examination of the bound test (refer to Table 2). From the table, F-statistics values of GEVA exceeded the upper bound of 1% in significance, indicating significant co-integration relationship between variables at the significance level of 1%.

Table 2
Bound Test Result

Dependent Variable	F-statistics	I(0) (10%)	I(1) (10%)	I(0) (5%)	I(1) (5%)	I(0) (1%)	I(1) (1%)
GEVA	**12.05**	2.2	3.09	2.56	3.49	3.29	4.37

Note: * denotes 10%, ** denotes 5% and *** denotes 1% significance levels. The null hypothesis represents no co-integration. Critical values were adopted from Pesaran et al. (2001).

The linked test results indicated a long-term relationship between COD, COE, GOC and NOPAT as independent variables and GEVA as the dependent variable and this was represented by the following model:

GEVA= + 0.0276* + 0.3264 COD* – 0.7842 COE*** + 0.3206 GOC** + 1.6319 NOPAT*.. (1)**

The diagnostic test results for long-run equilibrium model are presented in Table 3.

Table 3
DIAGNOSTIC TEST RESULTS

Test Statistic	GEVA Model
	Prob
Serial Correlation	0.11
Heteroscedasticity	0.39
Normality	0.39

The diagnostic test results show that the model doesn't suffer from any of Serial correlation, Normality and Heteroscedasticity problems and the lag order for GEVA (2.2.1.1.1), respectively on the basis of the Akaike information criterion.

The ECM coefficients for GEVA models are negative and significant at 1 percent significant level (-0.22). This reinforces the idea of the existence of a long-run relationship among the variables. Also, model R^2 is around 96% which provide accepted explanatory power.

Results and Discussion

Based on the long-run analysis of the materials sector data in the Egyptian market, and upon examining the study hypotheses, the following is revealed:

H1: The results indicate not to accept of the hypothesis that there is a negative significant effect of the cost of debt on the growth rate of economic value added in the materials sector in the Egyptian market.

H2: The results indicate acceptance of the hypothesis that there is a negative significant effect of the cost of equity on the growth rate of economic value added in the materials sector in the Egyptian market.

H3: The results indicate acceptance of the hypothesis that there is a positive significant effect of the growth of capital on the growth rate of economic value added in the materials sector in the Egyptian market.

H4: The results indicate acceptance of the hypothesis that there is a positive significant effect of the net operating profit after tax on the growth rate of economic value added in the materials sector in the Egyptian market.

The results in Equation 1 indicate the strength and significance of the effect of the basic variables on GEVA, as there was a positive relationship to net operating profit after tax of low significance* as the rate of impact reached 1.6319, which is the most influential factor in the rate of growth economic value added; it was found that there is a negative relationship with the cost of equity, as the rate of impact reached 0.7842 at a level of high significance***, and it was found that there is a positive relationship to the growth of capital, as the rate of impact reached 0.3206 at the level of medium significance**; it was also found that there is a positive relationship to the cost of debt, as the rate of impact reached 0.3264 at the level of low significance*.

In these results, NOPAT was the most influencing variable, followed by COE in second place in terms of affecting GEVA, while the cost of equity is the most important variable affecting GEVA, followed by GOC in second place.

From these results, it is evident that cost of equity is the most important component with a higher impact rate and thus it can be said to be the main component of predicting the size of GEVA.
We note that there is a good use of COD due to its positive effect on GEVA, while the negative effect of COE on GEVA is due to the neglect of this variable in the calculation of the cost of capital (COC).

CONCLUSION

The main purpose of this study was to clarify the effect of the main direct variables on the growth of economic value added in the materials sector in the Egyptian market. The main results indicate that a negative effect for the cost of equity on the growth rate of the economic value added, and this may be attributed to the lack of attention to this aspect of the cost of financing.

Those interested in knowing the growth in the economic value-added in this sector, whether at the level of financial management of these companies or investors in the long-run, should pay attention to the cost of equity and take it into account while calculating the cost of financing; they can also rely on the study model in the process of forecasting the growth in economic value added in the long-run.

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