The Effect of Operational Efficiency on Firm Capital Structure. Applied on the Real Estate Sector

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Abstract

The study examines the impact of operational efficiency *(OE)* on the firm's capital structure *(CS)* through some moderating variables applied to the Real Estate sector in Egypt. A panel data has been conducted to analyze and test 28 most active real estate companies in the Egyptian stock exchange (EGX) during the period 2016 to 2022 using descriptive, correlation and regression methods. The study findings showed that there is a significant negative effect of fixed asset turnover *(FAT)* on debt-to-assets through the operating cash flow *(OCF)*. Furthermore, there is a significant negative effect of Rec. turnover on debt-to-assets. And a negatively significant effect of TAT on debt-to-capital occurred as well. On the contrary, there is a positive effect of OCF on debt-to-assets. While the effect of all activity measures of operational efficiency on debt-to-equity, equity multiplier, and proprietary ratios found insignificant. The board of directors should establish a proper agreement with the shareholders about the firm's financing methods before applying any efficiency processes. Also, to avoid spending money anonymously before checking the country's rules and regulations first.

The study recommends further investigation on the effect of operational efficiency on firms' capital structure on different sectors, also should include more variables such as; liquidity, profitability, firm size, and firm performance.

Keywords: Operational Efficiency, Capital Structure, Cash Conversion Ratio, Operating Cash Flow, Real Estate sector.

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"تأثير كفاءة التشغيل على هيكل رأس مال الشركة: التطبيق على قطاع العقارات"

الملخص

على هيكل رأس مال الشركة *(OE)* تبحث الدراسة في تأثير الكفاءة التشغيلية من خلال بعض المتغيرات المعتدلة المطبقة على قطاع العقارات في مصر. *(CS)* تم إجراء لوحة بيانات لتحليل واختبار 28 شركة عقارية من أنشط الشركات العقارية في البورصة المصرية خلال الفترة من 2016 إلى 2022 باستخدام أساليب الوصف والارتباط والانحدار.أظهرت نتائج الدراسة أن هناك تأثير سلبي كبير على نسبة الدين إلى الأصول من خلال التدفق *(FAT)*لدوران الأصول الثابتة علاوة على ذلك، هناك تأثير سلبي كبير للتوصية. *(OCF)* النقدي التشغيلي دوران الديون على الأصول. كما حدث تأثير سلبي كبير لقانون تات على نسبة على OCFالدين إلى رأس المال. على العكس من ذلك، هناك تأثير إيجابي لـ نسبة الدين إلى الأصول. في حين أن تأثير جميع مقاييس النشاط الخاصة بالكفاءة التشغيلية على نسبة الدين إلى حقوق الملكية ومضاعف حقوق الملكية ونسب الملكية كان ضئيلاً. يجب على مجلس الإدارة التوصل إلى اتفاق مناسب مع الشركة المساهمين حول طرق تمويل الشركة قبل تطبيق أي عمليات كفاءة. وأيضًا لتجنب إنفاق الأموال بشكل مجهول قبل التحقق من القواعد واللوائح المعمول بها في الدولة أولاً. توصي الدراسة بإجراء المزيد من البحث حول تأثير الكفاءة التشغيلية على هيكل رأس مال الشركات على القطاعات المختلفة، كما ينبغي أن تشمل المزيد من المتغيرات مثل؛ السيولة والربحية وحجم الشركة وأداء الشركة.

الكلمات المفتاحية : كفاءة التشغيل , هيكل رأس المال , نسبة التحويل النقدي , التدفق النقدي التشغيلي , قطاع العقارات

1. Introduction

In theory capital structure is considered a massive interesting topic that had been discussed differently in various past studies starting with Modigliani and Miller (1958). Actually, if an investment is financed by an equity, then the benchmark of a cost of capital should base its financing on the cost of equity, while if an investment is financed by pure debt, then the cost of capital should reflect to the cost of debt and the equity capital may be needed as a collateral; based on the firm's targeted capital structure it might be difficult for a firm to assume what source of fund should be used for a particular investment (Dahlström & Persson, 2010).

By definition, capital Structure is a mixture of debt and equity that used in the firm's operations at which measures the firm's leverage ratios. Mainly, firms can use either debt or equity from its capital to finance their assets and operate its day to day operations (Shubita & Alsawalhah, 2012).

On the other hand, operational efficiency is defined as the extent that measures the activity ratios (profit) earned from the operating cost. Not only, to generate the highest return, but also to achieve the lowest cost. Efficiency is conducted to the changes of cash conversion cycle by determining the firm's ability to prevent possible risks on operating expenses towards the firm's revenue (Gill, Singh, Mathur, & Mand , 2014).

After that, several studies have conducted this subject by trying to find the effect of capital structure on several factors as; firm performance, operational efficiency, profitability, firm size. However, this research is conducting the opposite about how operational efficiency affects firm's capital structure; applied on the easiest, most profitable and a very trustworthy investment that is traded in various stock exchanges which is the Real Estate sector.

2. Literature Review

2.1. Capital Structure and Operational Efficiency

Based on the MM theories by Modigliani and Miller (1958) this research assured that firms distinguish between equity and debt financing according to its firm value, so the decisions taken by the management add no value to the firm's financing. Therefore, there are several studies have developed explaining the capital structure theories used by companies which are; *the Trade-off theory, the Pecking order theory, the Market timing theory , the Agency theory, and the Signaling theory* (Hussein, Sakr, & Abdel Barie, 2019).

First; the trade-off theory, recognizes the existence of an optimal level of debt at which the cost of debt is lower than the cost of equity (Jahanzeb, Ur-Rehman, Bajuri, Karami, & Ahmadi, 2013). ***Second; the pecking order theory*** (POT) predicts the issuance of equity as a last alternative source of funding (Culata & Gunarsih , 2012). ***Third; the market timing theory*** allows large corporations to decide which financing source is the most appropriate to use in their investments (Abdeldayem & Assran, 2013). ***Fourth; the agency cost theory*** arises when an employee or a manager places his own benefit or personal interests or goals ahead of the organization's benefits and corporate goals (Gitman, Zutter, Elali, & Al Roubaie, 2013). ***Fifth; the signaling theory*** describes the behavior between two parties in the organization having access to different information. There are multiple signals sent by various entities within the firm that involved two parties the signaler and the receiver. (Connelly, Certo, Ireland, & Reutzel, 2011).

The term ***"Efficiency"*** is viewed in both industrial and strategic management that determined by factors as management skills, innovation, cost control and market share, all these factors are important to ensure firm's stability and increase its profitability. Operational efficiency plays a vital

role in improving the current and the future level of firm's performance. It explains the firm's operating cash flow, describes the amount of assets used to generate sales, and shows how firm size and operating risk affect the firm's performance***Invalid source specified.***.

Evidently, dynamic markets meant to be efficient in every single way, with fully operative information that guide large corporations to be beneficial among their competitors. Efficient market hypothesis (EMH) is a market theory stated to activate share prices reflecting all relevant market information efficiently***Invalid source specified.***. Efficiency conducts a lot of rules and regulations for any organization, also follows governmental policies according to the country's monetary, financial policies and economic stability that comprises the key drivers of the organizational achievement (EFERAKEYA & ERHIJAKPOR, 2020).

After that several studies have conducted this subject by trying to find the effect of capital structure on several factors as; firm performance, operational efficiency, profitability, firm size. As (Abbadi & Abu-Rub , 2012) found that leverage has a negative effect on bank profits and total deposit to assets increase bank efficiency. also found that leverage has a negative effect on market value of the bank, a positive and strong relationship between market value and ROA and bank deposits to total deposits.

While, (Riaz , 2015) tested that total debt ratio and short-term debt-to-assets have significant negative impact on firm performance, a positive relation between ROA and times interest earned occurred. However, an insignificant effect between the debt-to-equity and the long-term debt to assets appeared on ROA.

On the other hand, (HUYEN, QUYEN, & MY, 2018) found that there's a strong positive significant correlation between debt-to-equity ratio and operational efficiency. At last, (Abdel Megeid, Abd-Elmageed, & Riad, 2020) investigated the effect of operational efficiency and financial performance on capital structure using earnings managements as a moderator variable found that ROE, gross profit margin and firm size have a positive significant impact on company' capital structure, while operational efficiency, ROA, Tobin's Q ratio and all liquidity ratios have a significant negative relationship with capital structure. Also, the firm' operational efficiency, gross profit margin and Tobin's Q ratio have a positive significant impact on company' earnings management, while ROA, ROE and all liquidity ratios have a significant negative relationship with earnings management. Finally, earnings management, Tobin's Q ratio and firm size have a significant negative relationship with the capital structure of the firm

2.2. Overview on Real Estate in Egypt

The Egyptian market is now one of the emerging markets in real estate investment, over 100 million citizens increased the demand on real estate and housing market *(Ross, Kirkham, & Abdulai, 2009)*. The real estate, the housing market, and the construction sectors all are considered the backbone upholding markets that serve the Egyptian economy, as developers are reliably preserving their investment in those sectors (Osman, 2015).

Many literature studies concentrated on such variables as; the capital structure, the growth strategies, the corporate governance; however, studies as (Beracha, Hardin, & Feng, 2019), (Hardin, Feng, & Beracha, 2017), and (Alafifi, Boussabaine, & Almarri, 2022) investigated some issues related to real estate economies of scale defining the efficiency measurements to profit and value the firm's assets in the market. It is important for

investors to study the market of any industry; as for the real estate industry it was assured by studies as (Sengupta, 2003) and (Christersson, M.,, Vimpari, J., & Junnila, S., 2015) that measuring the efficiency of investments occur by the discounted cash flow of the firm while it was reported that measuring by the capital asset pricing model (CAPM) that considered inadequate to study the efficiency of real estate.

On the other hand, studies as (Osagie, 2018) and (Carstens & Wesson, 2019) focused on using financial instruments as capital (CAPEX) and operational (OPEX) expenditures to accurately measure and study the efficiency of real estate.

Two main ways are conducted to invest in the real estate sector. First; through state-owned enterprises with a clear purpose of real estate development; The other way is through the investment portfolios of the state-owned banks and insurance companies, many of which have small stakes, and a minority own large stakes in many real estate development projects *(Savills-Egypt-property report, 2021).* The revenue of this industry increases about 20% of its ownership activity of the GDP for years 2019/2020. The total state-owned institutions approximately 89.3 billion pounds. As the private companies reach approximately 43.8 billion pounds, and the gross product of real estate ownership reaches approximately 446.5 billion pounds *(Shawkat & Elmazzahi, 2023)*.

The most important state-owned companies operating in the real estate sector, and the government percentage is 100%.

Figure 1. Some state-owned institutions operating in the real estate sector for the 2019/2020 fiscal year

Company Name اسم الشركة	Controlling Party الجهة المسيطرة	% of GVT نسبة الحكومة	Institution type نوع المؤسسة	Primary activity النشاط الأساسي
Misr Real Estate Asset Management مصر لإدارة الأصول العقارية	القابضة للتأمين	100%	شركة	مدير أصول
Maadi for Development and Construction المعادي للتنمية والتعمير	القابضة للتشييد	100%	شركة	مطور عام
Al-Nasr for Housing and Development النصر للإسكان والتعمير	القابضة للتشييد	100%	شركة	مطور عام
The Egyptian Real Estate Assets and Investment Management المصرية لإدارة الأصول العقارية والاستثمار	بنكي مصر والأهلي	100%	شركة	مدير أصول
Misr Reconstruction مصر للتعمير	وزارة الإسكان	100%	شركة تابعة	مطور

Source: Shawkat, Y. & Elmazzahi, D. (2023). Estimating the Size of Public Sector Real Estate in Egypt. (تقدير حجم القطاع العقاري العام في مصر). The Built Environment Observatory.

The real estate sector in Egypt represents master developer companies and state-owned banks that are surprisingly dominant by the state as real estate development demonstrates explicitly about 3.6% of the real estate GDP for public companies and one-third of its private companies (Shawkat & Elmazzahi, 2023). The role of banks is considered the most widely discussed in organizing and financing the real estate sector in Egypt.

As El- Ahli Bank, Banque Misr, Housing & Development Bank, etc… Since that the Central Bank launched real estate financing initiatives for low-income people with reduced interest rates of 3% and 8%, these initiatives have witnessed great demand and grabbed an opportunity for those who wish to acquire a housing unit (Hussein D. , 2023). Summarily, any firm has to ensure its stability by measuring the interrelation of operational efficiency and its impact on the firm's capital

structure. Thus; this research proposed the following hypotheses:

H₁: *There is a significant impact of operational efficiency on firm's capital structure.*

H₂: *There is a significant relation between the operational efficiency and the firm's capital structure through the cash conversion and the operating cash flow as moderating measures.*

3. Research Methodology

3.1. Data sampling and society

The research is testing the effect of operational efficiency on firm's capital structure using the quantitative approach for testing the most active publicly listed 28 real estate companies in the EGX during the period from 2016 to 2022. The data have been collected from the annual financial statements of the real estate companies.

3.2. Conceptual Framework

Figure 2. Impact of O.E. on C.S.

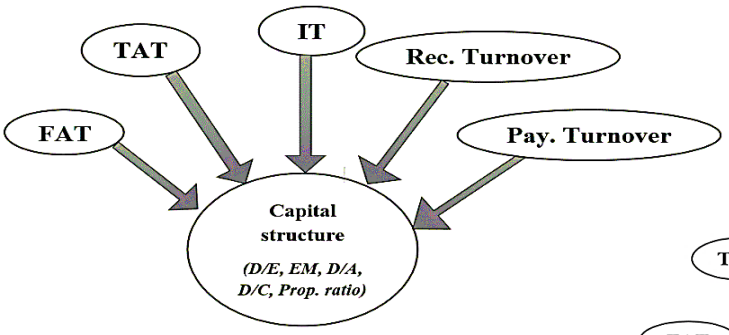
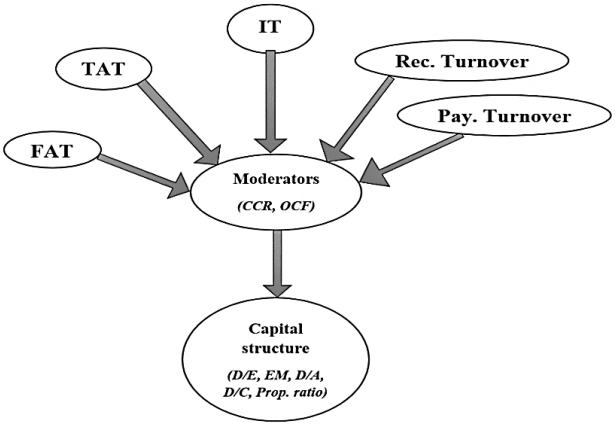


Figure 3. Impact of O.E. on C.S. through the moderators



3.3. Variables

The variables conducted in this research are;

3.3.1. Independent Variable (Operational Efficiency)

3.3.1.1. Fixed Asset Turnover (FAT)
3.3.1.2. Total Asset Turnover (TAT)
3.3.1.3. Inventory Turnover (IT)
3.3.1.4. Receivables' Turnover (Rec. turnover)
3.3.1.5. Payables Turnover (Pay. Turnover)

3.3.2. Moderator Variables

3.3.2.1. Cash Conversion ratio (CCR)
3.3.2.2. Operating Cash flow (OCF)

3.3.3. Dependent Variable (Capital Structure)

3.3.3.1. Debt-to-Equity (D/E)
3.3.3.2. Equity Multiplier (EM)
3.3.3.3. Debt-to-Assets (D/A)
3.3.3.4. Debt-to-Capital (D/C)
3.3.3.5. Proprietary ratio (Prop. ratio)

4. Data analysis and Interpretation

To examine the hypotheses for the impact of operational efficiency using (activity measures) on capital structure using (leverage measures): an empirical study applied on Real Estate sector in Egypt. A statistical software package (STATA) in processing the following statistical techniques and tests in data analysis:

- Descriptive statistics
- Correlation analysis
- Linear and Multiple Regression

4.1. Descriptive analysis

For each of the dependent and independent measures showing that highest mean is the receivable and the payable turnover. While, the lowest mean is the debt-to-assets. as shown in *Table 1*. the data measures are scattered as highest standard deviation the receivable and the payable turnover at which indicates more data spread out. While, the lowest standard deviation is the debt-to-capital indicates more tight data around its mean and the rest of the measures resulted that the moderator variables the CCR of 17.415 standard deviation is lower than the OCF of 20.627 by 3.21%.

The rest of the measures resulted a minimum value range between 0.01 and 1.01, and a maximum value range between 914.1 and 0.91.

Table 1. shows the descriptive statistics conducted for the study.

Variable	Indicators	Mean	Std. Dev.	Min.	Max.
Dependent variable Capital structure	D/E	0.819	1.31944	0.01	7.97
	EM	1.819	1.31944	1.01	8.97
	D/A	0.254	0.39332	0.01	3.58
	D/C	0.259	0.20969	0	0.91
	Prop.	0.554	0.76399	0.03	9.71
Moderating variables	CCR	5.2734	17.415	-33.2	160
	OCF	3.6689	20.627	-44.07	179.19
Independent variable Operational Efficiency	FAT	10.283	16.707	0.01	90.03
	TAT	3.1796	17.706	0.01	172.48
	IT	14.1448	69.868	0.01	914.1
	Rec. turnover	340.145	230.86	0.06	960.92
	Pay. turnover	341.544	238.74	-332.2	960.91
No. of observations (Obs.) = 196					

Source: Prepared by the researcher

4.2. Correlation analysis

As shown in *Table 2*. A positive significant relation occurred between the OCF and the FAT. While a negative significant relation appeared at first; between the CCR and the FAT, then the D/C, the TAT and the IT, then the D/C and the Pay. turnover. Also, the correlation analysis resulted an insignificant effect of FAT, TAT, IT, Rec. turnover, Pay. turnover, CCR and OCF on debt-to-equity, equity multiplier, debt-to-assets, debt-to-capital, proprietary ratio.

Table 2. shows the descriptive statistics conducted for the study

Variable		Dependent variable: Capital structure Leverage Measures					Moderator Measures	
Independent variable Operational Efficiency		**D/E**	**EM**	**D/A**	**D/C**	**Prop. Ratio**	**CCR**	**OCF**
Fixed asset turnover (FAT)	Correl.	-0.1107	-0.1107	-0.0857	-0.0481	-0.0692	-0.1210	0.1315
	Sig.	0.1223	0.1223	0.2326	0.5035	0.3350	**0.0911**	**0.0662**
Total asset turnover (TAT)	Correl.	-0.0934	-0.0934	-0.0723	-0.1465	0.0858	-0.0292	-0.0169
	Sig.	0.1930	0.1930	0.3142	**0.0404**	0.2320	0.6842	0.8143
Inventory turnover (IT)	Correl.	-0.0628	-0.0628	-0.0511	-0.1323	0.0296	-0.0348	-0.0223
	Sig.	0.3816	0.3816	0.4766	**0.0644**	0.6806	0.6279	0.7559
Receivables' turnover	Correl.	-0.0569	-0.0569	-0.1106	-0.0105	-0.1005	-0.0081	0.1037
	Sig.	0.4286	0.4286	0.1228	0.8837	0.1609	0.9108	0.1479
Payables' turnover	Correl.	0.0040	0.0040	0.0233	-0.1178	0.0613	-0.0426	-0.0834
	Sig.	0.9556	0.9556	0.7455	**0.1002**	0.3931	0.5528	0.2452
Moderator Measures								
Cash conversion ratio (CCR)	Correl.	-0.0042	-0.0042	-0.0651	-0.0552	-0.0020		
	Sig.	0.9536	0.9536	0.3644	0.4421	0.9776		
Operating cash flow (OCF)	Correl.	-0.0203	-0.0203	0.1026	0.0404	0.0108		
	Sig.	0.7780	0.7780	0.1522	0.5740	0.8806		

Source: Prepared by the researcher

4.3. Regression analysis

Table 3. shows the regression analysis of D/A conducted for the study

Part 1: Model 1						
Model	Regression					Dependent variable (Y)
Independent variable (X)	**Constant**	**Significance P > |t|**	**Coefficients**	**R squared**	**Significance Prob. > F**	
FAT	0.357	0.087	- 0.0029266	0.0402	0.0483	Debt to Assets
Rec. turnover		0.049	- 0.0002433			
OCF		0.064	0.0025515			
Part 2: Model 1						
Model	Regression					Dependent variable (Y)
Independent variable (X)	**Constant**	**Significance P > |t|**	**Coefficients**	**R squared**	**Significance Prob. > F**	
FAT	0.3367	0.216	- 0.0021338	0.0742	0.0114	Debt to Assets
Rec. turnover		0.093	- 0.0002088			
OCF		0.007	0.0093879			
Interaction 1 OCF & FAT		0.028	-0.0001479			
Interaction 2 OCF & Rec. turnover		0.253	-6.61			

Source: Prepared by the researcher

As shown in *Table 3.* divided into two parts:

- **Part 1**. Testing the effect of FAT, Rec. turnover and OCF on D/A. It shows by testing individually the FAT of 0.087*, the Rec. turnover of 0.049** has a negative significant effect and the OCF of 0.064* have positive significant effect on D/A.
- Furthermore, the whole model is significant with 0.0483**, with 0.0402 R^2 indicates 4% variation of y explained by only two out of five Xs from the leverage measures (FAT and Rec. turnover) and one of the moderator variables (OCF).[3]

$$Y_1 = 0.357 - 0.0029\,FAT - 0.00024\,Rec.turnover + 0.0025\,OCF + e$$

If the significance level is (less than) < 0.01*, or < 0.05**, or < 0.10*[3]**

Where;

Y_1 = represents the debt-to-assets (D/A)
FAT = represents the fixed asset turnover
Rec. turnover = represents the receivables turnover
OCF = represents the operating cash flow
e = represents the model error term

- **Part 2.** Also, shows alternative assumption of the regression model on D/A, as a negative significant effect occurred with Rec. turnover of 0.093*, and a positive significant effect with OCF of 0.007*** on D/A, and an insignificant effect occurred with FAT of 0.216 more than 0.10.
- Moreover, the study conducted two assumptions to analyze more which activity measure has the best effect on D/A. The first assumption conducted is an interaction between the FAT and D/A through the OCF has a negative significant effect of 0.028**, while the second assumption is an interaction between the Rec. turnover and D/A through OCF has an insignificant effect of 0.253 more than 0.10.

Therefore; the whole model is significant with 0.0114** and with 0.072 R^2 indicates 7.42% variation of (Y) the dependent variable explained by (X) the independent variable through (M) the moderator variable.

$$Y_1 = 0.3367 - 0.00213\,FAT - 0.000208\,Rec.turnover + 0.0093\,OCF - 0.000147\,INT1 - 6.61\,INT2 + e$$

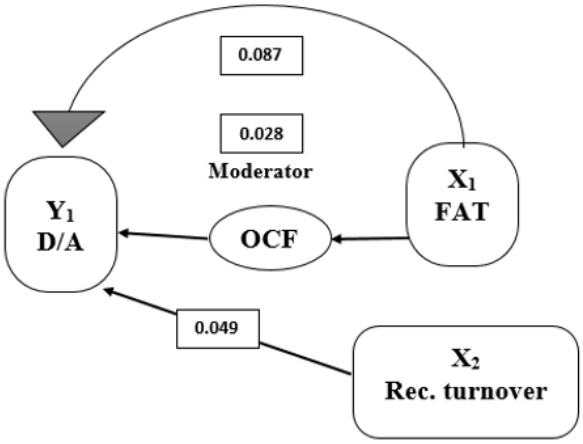
Where;

Y_1 = represents the debt-to-assets (D/A)
FAT = represents the fixed asset turnover
Rec. turnover = represents the receivables turnover
OCF = represents the operating cash flow
INT_1 = represents the interaction between OCF & FAT

INT_2= represents the interaction between OCF & Rec. turnover

e = represents the model error term

Figure 4. The impact of FAT on D/A through OCF, and the impact of Rec. turnover on D/A



Source: Prepared by the researcher

Table 4. **illustrates the regression of the debt-to-capital measure (D/C).**

Assumption 1						
Model	Regression					Dependent variable (Y)
Independent variable (X)	Constant	Significance P > |t|	Coefficients	R squared	Significance Prob. > F	Debt to Capital
FAT	0.2722	0.713	- 0.003367	0.0354	0.0737	
TAT		0.087	- 0.0014931			
IT		0.100	- 0.0003553			
Assumption 2						
Model	Regression					Dependent variable (Y)
Independent variable (X)	Constant	Significance P > |t|	Coefficients	R squared	Significance Prob. > F	Debt to Capital
FAT	0.2722	0.633	- 0.004416	0.0399	0.0985	
TAT		0.088	- 0.0014904			
IT		0.093	- 0.0003639			
CCR		0.347	-0.0008113			
Assumption 3						
Model	Regression					Dependent variable (Y)
Independent variable (X)	Constant	Significance P > |t|	Coefficients	R squared	Significance Prob. > F	Debt to Capital
TAT	0.27313	0.062	- 0.0015856	0.0387	0.0549	
IT		0.099	- 0.0003546			
CCR		0.373	- 0.0007615			
Assumption 4						
Model	Regression					Dependent variable (Y)
Independent variable (X)	Constant	Significance P > |t|	Coefficients	R squared	Significance Prob. > F	Debt to Capital
TAT	0.2675	0.067	- 0.0015606	0.0360	0.0700	
IT		0.108	- 0.0003464			
OCF		0.616	0.0003619			

Source: Prepared by the researcher

As shown in Table 4. Four assumptions have been conducted:

- First assumption clarifies the regression analysis of D/C with FAT, TAT, and IT; resulting an insignificant effect occurred with FAT and IT on D/C, except for TAT of 0.087* has a negative significant effect on D/C. Therefore; the whole regression model is significant of 0.0737*, with 3.5% R^2 as data fits poorly to the model.[4]

$$Y_2 = 0.2722 - 0.000336\,FAT - 0.00149\,TAT - 000355\,IT + e$$

Where;

Y_2 = represents the debt-to-capital (D/C)
FAT = represents the fixed asset turnover
TAT = represents the total asset turnover
IT = represents the inventory turnover
e = represents the model error term

- Second assumption states the regression analysis of D/C with FAT, TAT, IT using the moderating measure the CCR; though resulting a negative significant effect between both TAT and IT on D/C, while an insignificant effect occurred between the FAT and the CCR on D/C. Therefore; the whole model is significant with 0.0985*, 3.9% R^2 variation greater than the first assumption so, the data fits perfectly.

$$Y_2 = 0.2722 - 0.0004416\,FAT - 0.00149\,TAT - 000363\,IT - 0.000811\,CCR + e$$

Where;

Y_2 = represents the debt-to-capital (D/C)
FAT = represents the fixed asset turnover
TAT = represents the total asset turnover
IT = represents the inventory turnover
CCR = represents the cash conversion ratio

[4] If the significance level is (less than) < 0.01***, or < 0.05**, or < 0.10*

e = represents the model error term

- Third assumption, that clarifies the regression analysis of D/C with TAT, IT, and CCR; after excluding the FAT measure the model results a negative significant effect of both TAT and IT on D/C, and an insignificant effect of CCR on D/C. As a matter of fact, the whole model finds significant of 0.0549, with 3.87% variation greater than the first assumption and less than the second one.

$$Y_2 = 0.2731 - 0.0015856\,TAT - 0003546\,IT - 0.0007615\,CCR + e$$

Where;

Y_2 = represents the debt-to-capital (D/C)
TAT = represents the total asset turnover
IT = represents the inventory turnover
CCR = represents the cash conversion ratio
e = represents the model error term

- Fourth assumption, that clarifies the regression analysis of D/C with TAT, IT, and OCF; after excluding the FAT and exchanging the OCF instead of the CCR measure the model results a negative significant effect of TAT on D/C, but an insignificant effect of IT and OCF on D/C. Although, the whole model results a significant effect of 0.0700*, with 3.60% data variation

$$Y_2 = 0.2675 - 0.0015606\,TAT - 0003464\,IT - 0.0003619\,OCF + e$$

Where;

Y_2 = represents the debt-to-capital (D/C)

TAT = represents the total asset turnover
IT = represents the inventory turnover
OCF = represents the operating cash flow
e = represents the model error term

5. Conclusion

The aim of this paper is to examine the research variables on 28 publicly listed real estate sector for 7 consecutive years. The findings can be useful to the companies' board of directors who are concerned about high quality of capital structure as well as operational efficiency. Moreover, it may influence the decision making of these companies' management by setting proper agreement between the owners, the board of directors and the shareholders about the company's financing methods before applying any efficiency. Though, based on 196 observations, it was found that 3 capital structure measures which are the D/E, the EM, and the proprietary ratio measures have insignificant effect with all operational efficiency measures. While, 2 measures of the capital structure have slightly negative effect with the assets' turnover, inventory turnover and receivables' turnover.

In fact, when the study got supported by some moderating variables the significance among variables appeared clearly. To sum up the regression analysis of the D/A and the D/C both are the best measures of the capital structure, towards their effect with the FAT, TAT, IT, Rec. turnover through the moderators measures the CCR and the OCF.
Further, the best models for the D/A (Y_1) and the D/C (Y_2) according to the R^2 of 7.42% [5]and 3.99%[6] respectively are;

As shown in table 3. [5]

As shown in table 4. [6]

$$Y_1 = 0.3367 - 0.00213\,FAT - 0.000208\,Rec.turnover + 0.0093\,OCF - 0.000147\,INT1 - 6.61\,INT2 + e$$

$$Y_2 = 0.2722 - 0.0004416\,FAT - 0.00149\,TAT - 000363\,IT - 0.000811\,CCR + e$$

- ✓ *The FAT has a significant effect on D/A, through the OCF. On the other hand, D/A has significant effect with receivables' turnover without any moderators.*
- ✓ *Also, the FAT, the TAT, and the IT have a significant effect on D/C, through both moderating variables the CCR and the OCF.*

Therefore; **H_1:** There is significant impact of operational efficiency on firm's capital structure.**is rejected**, and **H_2:** There is a significant relation between the operational efficiency and the firm's capital structure through the impact of the cash conversion and the operating cash flow ratios as moderating variables. **is accepted.**

6. Limitations and Recommendations

This study took a different turn while testing the effect and the relation between variables as; the sample taken was limited with its time interval starting from 2016 till 2022, as before the year 2016 a lot of data was not available. Further, some measurable items were not included in the statements though; it was crucial to calculate some ratios to be accurately measured for the main variables.

Future researchers may investigate and expand more on examining the effect of operational efficiency on firms' capital structure. They should include more variables such as; liquidity, profitability, firm size, firm performance ... etc. while testing.

Additionally, they must investigate on a clear selected sample not only in Egypt but also can provide an effective comparison in MENA region countries for instance; to compare the state of Egyptian real estate and the real estate in the Emirates or Jordon or KSA or Oman etc. to reinforce the study itself, knowing that potential investors select their projects based on what is published to reach for proper investment.

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