The Impact of Assets Structure and the Components of Cash Conversion Cycle on the Egyptian SMEs Financial Failure Predictability

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Abstract: This study investigates determinants of Egyptian SMEs financial failure predictability based on a sample of 32 failure SMEs and 28 non-failure SMEs for the period 2013 and 2019. The determinants of SMEs financial failure are categorized into four groups; Working Capital, Asset Structure, Liquidity, and Leverage. The factor and logistic regression analysis are employed to identify the most significant independent variables that classify between failure and none-failure Egyptian's SMEs and determine the driver of SMEs financial failure. Our findings significantly show that failing SMEs suffer from long cash conversion cycles resulting from long inventory holding period, average collection period, and short average payment period, in addition to lower liquidity, excessive use of debt to assets, and lower fixed assets percentage, in contrast to non-failure Egyptian's SMEs.

Keywords: SMEs, Financial Failure, Working Capital, Leverage, Liquidity, Asset Structure, Factor Analysis, and Logistic Regression.

1. Introduction and Literature Review:

Small and Medium-sized Enterprises (SMEs) represent key players in the economic development of both developed and developing economies. This is a direct result of their crucial role in the economic development process as an engine of growth, poverty reduction, and job creation; as they are considered a focal source of entrepreneurship and innovation, as mentioned by Pais & Gama, 2015. Singh & Kumar (2017) pointed out that SMEs are vital for economic development as an engine for innovation and job creation. It is thought that SMEs are of critical importance to develop the Egyptian economy. However, the dilemma lies within the scarcity of academic research and literature that tackles the subject of SMEs in Egypt. This is a direct result of a shortage of sufficiently published and available resources regarding SMEs, Elbadry (2018). Usually, traditional academic studies concentrate on business problems concerning large corporations, ignoring the challenges faced by SMEs in order to survive, Fouad (2013). One of the most crucial goals to be achieved by the Egyptian Ministry of Industry (EMS) is to help the 2.5 million SMEs; which employ 75% of the total Egyptian labor; to compete, persist, and overcome failure. Paired with the fact that Egypt's population exceeds 102 million people as of 2020, it is evident that creating more employment opportunities is crucial. This can be achieved by encouraging SMEs to meet employment growth.

This reinforces the need to provide policymakers with more sufficient and adequate information regarding SMEs. As a result, informed decisions can be taken to better support SMEs in facing challenges, with a particular focus on financial failure problems (Purves & Niblock, 2018; Niblock & Sloan, 2015). Financial failure is the last stage experienced within the SME life cycle. Sharing similarities with death, this stage removes failed businesses from the economy. In the aftermath of this stage, various implications can be experienced by the SME workforce, business owners, government, and society. As employees lose their jobs, owners lose their investments and liquidate some assets to meet their obligations required by creditors who may receive partial or no repayment for their debts, which leads to Government agencies receiving lower taxes to establish funds that support the unemployed. (Gupta, J et al., 2018). Financial failure occurs when business liabilities exceed the assets owned by a business, leading to a permanent failure to meet payment obligations, consequently forcing businesses into bankruptcy and liquidation process (Khailfa, 2017). It may occur voluntarily or by force due to lender pressure. In addition, financial failure could occur

suddenly due to external elements like political, social, and economic factors or gradually as a result of continued poor performance through various business cycles (Gitman et al., 2012).

Indicators that can be used to provide evidence that a business is possibly suffering from financial failure include; poor management of production and revenue collection, a decrease in market share and asset turnover, an inability to satisfy creditors obligations, reporting continuous negative returns for two continuous years, a lowered rate of return in comparison to capital costs, and a sole dependence on debt as a principal fund of finance (Niblock & Sloan, 2015; Rowlings D, 2016). Typically, SMEs suffer from higher probabilities of financial failure, some as high as fifty percent for newly established SMEs within their initial 18-month period (Baporikar et al., 2016; Andersen & Samuelsson, 2016; Quader et al., 2016).

Egypt has approximately 2.5 million SMEs, also comprising 75% of total jobs as point out by Elbadry (2018) and Ministry of Industry's strategy (2016/2020). However, one of the main goals included within the Egyptian Ministry of Industry's strategy is to help SMEs overcome the failure challenge. In Egypt, industrial small enterprises categorized as businesses with sales revenues below 10 million Egyptian pounds, employing between 5 to 49 workers, and having accumulated a total asset worth below 5 million Egyptian pounds. Whereas, medium businesses employed between 50 to 99 workers, accumulated sales revenues up to 20 million Egyptian pounds, and accumulated a total asset worth below 10 million Egyptian pounds. Additionally, small service businesses were found to employ from 5 to 9 employees, have sales revenues up to 1 Million Egyptian pounds, and assets below 0.5 million Egyptian pounds. Meanwhile, medium service entities employ from 10 to 19 staff, have sales revenues up to 4 million Egyptian pounds, and assets with 2 million Egyptian pounds. Furthermore, there are a variety of Egyptian laws and regulations that tackle SME concepts and definitions issues. However, Law No. 141 (2004) define SMEs as entities that employ up to 50 employees, and have capital range from 50,000 up to 1 million Egyptian pounds (Elbadry, 2018). The Nile Stock Exchange (NILX) which is a specialized exchange for SMEs consider entities with a capital range higher than 1 million Egyptian pounds, but below 200 million Egyptian pounds as SMEs (NILX Listing Rules, 2018).

Yet, there is a scarcity that tackles SME's financial challenges. Commonly seen, traditional finance research focuses more on large corporations. Thus, this study aims to help financial managers, business owners, creditors, financial institutions, and policy makers make more

informed decisions to overcome SMEs financial failures. Thus, increasing productivity and developing the economy's ability to create jobs for the Egyptian people, which have staggeringly exceeded a population of 102 million individuals in 2020. This paper aims to indicate the different implications of working capital management, liquidity, leverage, and asset structure on the SMEs' financial failure. Therefore, this paper intends to answer the following question "What are the determinants of financial failures for Egyptian SMEs?"

2. Theoretical Framework and Hypotheses Development:

SMEs represent a key issue in today's business world, for their critical role as a principal source of innovation, creativity, and job creation; consequently, participating within the economic growth of developed and emerging economies. Interestingly, there is a lack of a general unique concept to define SMEs globally. Due to this, definitions and concepts have arisen, varying from one country to another based on numerous criteria, including the number of employees, value of assets, revenues, and capital as documented by Auzzir et al., 2018; Baidoun et al., 2018; Gupta & Gregoriou; 2017, Quader et al.; 2016, and Nasr & Pearce; 2012. Sitharam & Hoque (2016), Elagmal, Elmaghrabi (2001) and Mansour (2001), classified SMEs in different ways according to the type of products the entity aims to produce paired with the related use of technologies, sources of finance and risk exposure. Similarly, Auzzir et al. (2018), Karadag H. (2015) and Fouad (2013) show that most SMEs share common characteristics which include a general involvement in entrepreneurial and innovative activities, having an owner management structure and a relatively small market share.

The SMEs usually pass through several stages within their lifecycles. Starting with the introduction, followed by growth stage through research and development that bears the required resources to produce new products and services, which leads to entity maturity, and finally, a decline phase where the SME entity could be liquidated. However, with careful monitoring of financial matters and effective planning activities this final stage can be avoided, Gitman et al. (2012). Interestingly, Quevedo et al. (2018) illustrated that the business decision of exiting the market was not necessarily a negative decision but rather one that may be deemed crucial. Similarly, Mostafa (2014) indicates that a lack of adequate financial planning accompanied by administrative problems could accelerate SME's decision to exit the market. This would be due to poor performance that leads to a rise in financial problems, which

causes a reduction in business cash flow, and profits. This results in a complete failure due to the entity's inability to continue and meet its liabilities. SMEs are usually exposed to a higher probability of risk of financial failure, and thus are found to have relatively short lifecycles that range from 4 to 14 years. This is also due to a high rate of failure, more than 50%, prior to the fifth year of the SME's life cycle that occurs to the entity's inability to overcome challenges.

Therefore, based on the literature review regarding Working Capital Management (WCM) measured by Cash Conversion Cycle (CCC), Average Inventory Holding Period (INV), Average Collection Period (ACP), Average Payment Period (APP). Liquidity measured by Current Ratio (CR), and Quick Ratio (QR). Leverage measured by Debt to Equity (D/E), and Debt to Assets (D/A). In addition to asset structure measured by Fixed Assets as a percentage of Total Assets (FA/TA), and their implications regarding SMEs financial failure. Our research hypotheses are as follows:

H_1: *There is a significant difference between failures and non – failures SMEs in terms of CCC, INV, ACP, APP, CR, and QR, D/E, D/A, and FA/TA.*

H_2: *There is a significant relationship between CCC, INV, ACP, APP, CR, and QR, D/E, D/A, FA/TA, and SMEs financial failure.*

However, many academics tackle the issue of working capital management and its related effects on the company's performance. Nevertheless, the majority of these studies were applied to large firms. Similarly, Tauringana & Afrifa (2013), shed light on studying WCM and profitability issues for large firms while ignoring their implications regarding SMEs, especially within the Egyptian business environment. Whereas, the majority of SME cash flow is driven from short term finance sources, due to various challenges accessing these finances. Therefore, in order for these entities to survive, strategic business decisions should balance profitability and liquidity objectives. Focusing solely on achieving profitability in the absence of balance with liquidity required to meet business obligations could lead to financial failure and bankruptcy.

Elbadry (2018) argues that businesses should carefully manage their working capital to proceed and survive within their respective complex business environments. Oddly, most traditional researchers pay more attention to long term financing issues for corporations related to valuations, investments decisions, and capital structure. Afrifa & Padachi (2016) clarify that WCM decisions have higher impertinence on SMEs than large corporations, as they usually depend on working capital as a main source of finance. Baporikar et al. (2016) claim that efficient WCM develops SMEs

ability to mitigate business risks, adapt to change, reduce costs, ultimately increase profitability, and reinforce their reputation.

Usually, SMEs suffer from limited access to finance. Thus, they involve themselves in a tradeoff between various financial decisions to reach the optimal level of working capital that reduces business costs to maximize their profitability within an acceptable level for liquidity required to meet business obligations and survive. This is found true, especially to SMEs within the manufacturing sector that typically have higher levels of accounts receivable and inventory in comparison to SMEs in the service sector, Singh & Kumar (2017). Thus, WCM is crucial for a SMEs' profitability as; Tauringana & Afrifa (2013) discuss the relationship between SMEs' WCM that is comprised of accounts receivable, inventory, accounts payable, and their relationship within the profitability of SMEs. Additionally, they found that *ACP* is the most crucial factor, followed by APP, and finally INV. In the same context, Pais & Gama (2015) discuss the relationship of WCM and the SME's profitability, they report that reducing CCC, and inventory is required to enhance SME's profitability. Therefore, effective WCM is vital to develop business productivity, revenues growth, profitability, and ensure survival. In 2016, Afrifa, Padachi examined the relationship between WCM and an SME's profitability. They report an optimal level for business working capital level that maximizes a firm's profitability. It was found that profitability increases as working capital increases to a certain level, before an ensuing decline. Furthermore, there is a debate regarding the ideal management strategy that businesses should follow to manage their working capital to maximize profitability, following either a conservative or aggressive strategy. Elbadry (2018) found that conservative WCM strategy, leads to low business risks and ultimately lowered returns.

Whilst, Pais and Gama (2015) claim that the aggressive management strategy, which holds lower levels of working capital, enhances business's profitability. However, most SME support programs aim to enhance SMEs access to financial tools, which include providing access to fixed capital, loans, besides working capital (Kersten et al., 2017). Generally, SMEs face different challenges regarding accessing finance, especially related to debt tools, Mazanai & Fatoki (2011). Some scholars argue that reliance on this type of finance as a principal source indicates a signal for business failure. Kwaning et al. (2015) argue that SMEs suffer from high-interest rates associated with the lending process. Jahur & Quadir (2012) indicate that business failure occurs due to poor liquidity, and high cost of finance. Gupta, J, et al. (2018) indicates that liquidity and leverage represent key indicators

that assess business risk and are used to predict financial failure. Ahmed, Rahmah (2012) argues that relying on debt, as a main source of financial failure is a business failure indicator. As financial indicators related liquidity, leverage, interest coverage, fixed asset ratios are the major indicators to predict failure. Many researchers like Kwaning et al. (2015), Fouad (2013), and Elbadry (2018) show a link between excess debt and business failure due to higher loan costs. Also, Mostafa (2009) investigates key financial indicators that predict SMEs failure. Results show that leverage is the prime key indicating in failure prediction, as failed SMEs were dependent on excessive debt as a source of finance.

Dambolena & Khoury (1980) claim that business failure is related to financial leverage and poor liquidity. Additionally, Khailfa (2017) reported that financial leverages and fixed assets size could be used to predict business failure. Moreover, Kosmidis & Stavropoulos (2014) illustrate that failed businesses are highly leveraged, while Gunsel, N. (2010) show that failed businesses have a low asset quality. Elbadry (2018) investigates the determinants of successful WCM, report a significant negative effect of SMEs leverage and assets structure on working capital. This paper investigates the determinants of Egyptian SMEs financial failure.

3. Research Methodology:

This study conducts a comparative statistical analysis between failure and non–failure of SMEs. The significant differences between both groups is tested by T-test and NPar Mann-Whitney tests, followed by a logistic regression analysis to build up a probability classification model to identify the most significant independent variables that differentiate between the two groups. Finally, a factor analysis is conducted to reduce number of variables to a lesser number of surrogated variables and removing redundancy within data. This study is carried over the period 2013-2019 based on the annual financial statements of the research sample made up of 60 SMEs.

3.1. Research Population and sample

The population for this research consists entirely of Egyptian SMEs that continue to operate within the industrial sector for the periods of 2013-2019, with a capital range between 1-200 million Egyptian pounds satisfying all listing rules for the Nile Stock Exchange (NILX) on SME classification. Taking into consideration the previous requirements, a convenience sample size of 60 Egyptian SMEs has been selected and consisted of two groups;

the first group consists of 28 non-failure SMEs listed in NILX which report positive returns, and the second group consists of 32 failure SMEs which report continuous negative returns that exceeds half of their capital. According to Article no. 69 of firms' law no. 159 for 1981, a firm considered financially failure and should be liquidated if it reports losses exceeding more than half of its capital.

3.2. Research Model:

This study applies a quantitative model developed by Elbadry (2018), Kate Creighton (2017), Tauringana & Afrifa (2013), and Lyn M. Fraser (2010) using a logistic regression model consisting of failure SMEs that report negative returns for two consecutive years and non-failure SMEs that report positive returns and listed in the NILX as a dependent variable, while independent variables measured by; WCM (CCC, INV, ACP, and APP), Liquidity (CR and QR), Leverage (D/E and D/A), and assets structure (FA/TA).

3.3. Statistical Data Analysis and Results:

We have conducted statistical analysis for the data collected from the research sample to detect statistical differences between both groups using t-test and NPar Mann-Whitney to compare CCC, APP, ACP, INV, D/E, D/A, CR, QR, and FA/TA for failure and non-failure SMEs. In addition, logistic regression analysis was applied to develop a probability classification model by identifying the most significant independent variables that distinguished differences between both groups showing the power of the model to classify the SME's status correctly. Finally, factor analysis is implemented to indicate the variable patterns and for the removal of redundancy.

3.3.1. Descriptive Statistics

Table (1) shows means, Std. error, minimum and maximum of CCC, APP, ACP, INV, CR, QR, D/E, and D/A for failure, non-failure, and the whole sample of SMEs. Descriptive statistics reported by Panels (A) and (B) of table (1) reveals that failure of SMEs are driven by longer CCC, APP, ACP and INV holding period. Also, it was shown by Panels (A) and (B) of table (1) that Failures of SMEs have lower CR and QR than non-failure

SMEs. Finally, it was shown that the failures of SMEs have higher leverage in terms of D/E and D/A ratios and lower capital allocation in fixed assets.

Table (1): Descriptive Statistics for Failure and Non-Failures **Egyptian SMEs**

		CCC	APP	ACP	INV	CR	QR	D/E	D/A	FA/TA
Panel (A): Non- Failure SMEs	N	145	145	145	145	145	145	145	145	145
	Mean	131.047	99.931	151.122	79.797	6.932	5.199	0.305	0.141	0.427
	Std. Error of Mean	16.009	10.404	13.955	7.667	1.160	0.789	0.043	0.024	0.047
	Minimum	-381	0	0.29	0	0.02	0.02	0	0	0
	Maximum	950.64	767.11	951.14	331.35	98.46	57.34	2.36	1.94	5.69
Panel (B): Failure SMEs	N	123	123	123	123	123	123	123	123	123
	Mean	263.634	347.027	434.115	176.279	2.007	1.52	0.328	1.180	0.324
	Std. Error of Mean	30.112	35.294	43.719	18.399	0.202	0.179	0.900	0.175	0.036
	Minimum	-196	36.55	21.11	3.52	0.13	0	-15	-5.4	-0.35
	Maximum	1,462.13	1,757.09	2,554.90	1,435.30	9.58	8.43	96.68	13.17	3.37

Source: Authors calculations

Thus, descriptive statistics reported by table (1) can conclude that failed SMEs have poor working capital management in terms of high CCC, APP, ACP, INV holding period; lower liquidity in terms of CR and QR; higher levels of leverage in terms of D/E and D/A, and lower levels of fixed assets as they reported by the rate of FA/TA.

3.3.2. T-Test:

The similarity of the two groups of SMEs' average performances in terms of CCC, APP, ACP, INV, CR, QR, D/E, D/A, and FA/TA is investigated using T-test are reported by table (2). As shown by table (2), there are significant differences in the averages of both groups since $\alpha \leq 0.05$. This reflects that non-failures successfully manage their working capital by reducing their CCC, APP, ACP, and INV; which increase liquidity in terms of CR and QR, in addition to lower levels of leverage as measured by D/E and D/A; and the ability to invest more in fixed assets. In contrast, the failure SMEs poorly managed their working capital, liquidity, debt level, in addition to lower investment fixed assets, which is consistent with descriptive statistics shown in table (1).

Table (2): Results of f-test for Equality of Variances and t-test for Equality of Means

Variables	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	T	Df	Sig. (2-tailed)

CCC	Equal variances	17.925	.000*	-4.052	266	.000
	No Equal Variances			-3.888	187.990	.000*
APP	Equal variances	57.100	.000*	-7.182	266	.000*
	No Equal Variances			-6.715	143.205	.000*
ACP	Equal variances	79.996	.000*	-6.580	266	.000
	No Equal Variances			-6.167	146.836	.000*
FA/TA, D/A, and CR	Equal variances	10.257	.002*	-5.111	266	.000
	No Equal Variances			-4.840	163.857	.000*
CR	Equal variances	37.759	.000*	3.865	266	.000
	No Equal Variances			4.181	152.727	.000*
QR	Equal variances	43.738	.000*	4.214	266	.000
	No Equal Variances			4.546	158.683	.000*
D/E	Equal variances	15.237	.000*	-.028	266	.978
	No Equal Variances			-.025	122.567	.980
FIX	Equal variances	4.561	.034*	1.705	266	.089
	No Equal Variances			1.753	258.059	.081
D/A	Equal variances	43.865	.000*	-6.373	266	.000
	No Equal Variances			-5.889	126.789	.000*

* 95% Significant level, where $\alpha \leq 0.05$.

3.3.3. NON-Parametric Mann-Whitney test

As shown by table (3), the NON-Parametric Mann-Whitney's results are consistent with the results of the t-test in regards to the existence of significant differences between failures and non-failures SMEs in terms of all variables at 95% level except FA/TA, which is not statistically significant at any level. The insignificant FA/TA could be explained by the low usage of fixed assets by SMEs.

Table (3): Mann-Whitney Test Statistics				
Variables	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
CCC	6787.000	17372.00	-3.369	.001*
APP	3225.000	13810.000	-9.003	.000*
ACP	4893.500	15478.500	-6.364	.000*
INV	5096.000	15681.000	-6.060	.000*
CR	5985.500	13611.50	-4.637	.000*
QR	5415.000	13041.00	-5.539	.000*
D/E	5856.000	13482.00	-4.903	.000*
D/A	2746.500	13331.50	-9.898	.000*
FA/TA	8031.500	15657.50	-1.401	.161

* 95% Significant level, where $\alpha \leq 0.05$.

3.3.4. Logistic Regression for Classification Analysis

While the Binary Logistic Regression (BLR) is a semi parametric classification statistic that generalizes logistic regression to binary nominal

problems (e.g., failure or non-failure outcomes), Multiple Linear Regression (MLR) predicts the probabilities of the different outcomes of a categorically distributed dependent variable using a series of any class for independent variables (e.g. continuous, ordinal, binary). In this study, we apply the MLR to predict group membership via the log odds ratio $\ln(p/((1-p)))$ rather than probabilities and an iterative maximum likelihood method rather than a least squares method to fit the final model. We capitalize on the assumptions of MLR where: each independent variable (CCC, APP, ACP, INV, QR, CR, D/A, D/E and FA/TA) should have a single value for each case (failure or non-failure); Multicolinearity assumed to be relatively low, though not necessarily completely independent; and independence of irrelevant alternatives, defines the odds of preferring one class over another, regardless of the presence of other unrelated and irrelevant alternatives. While (1-p) is the probability that the organization of the failure type, the proportion $p/((1-p))$ is the probability of correctly classifying between non-failure and failure SMEs. The fitted model considers $\ln(p/((1-p)))$ as the dependent variable (SMEs status failure or non-failure) while CCC, APP, ACP, INV, QR, CR, D/A, D/E and FA/TA and their pairwise interactions are the independent variables.

As shown in Table (4), our model is able to correctly classify failure and non- failures SMEs in 91.1%, and 95.2% of the cases, respectively. The Overall probability of correct classification for the model is 93.3%, which is an acceptable level of probability.

Table (4): Probability of Correct Classification			
	Failure	Non-Failure	Percentage Correct
Failure	112	11	91.1%
Non-Failure	7	138	95.2%
Overall Percentage	--	--	93.3%

Additionally, Table (5) presents the Logistic Regression Parameters. All parameters remained in the model, as they are significant and were able to ensure the power of these predictors to classify between the failure and non-failure SMEs. Table (5) shows that CCC, APP, and INV have significant and negative impact on the financial failure of SMEs, while APP has significant positive impact. Also, Table (5) shows the interaction effects between APP-CCC, INV-CCC, APP-INV, ACP-INV, FA/TA-D/A, and CR-D/A. It is shown by Table (5) that there is a statistically significant negative interaction between the assets structure (FA/TA) and leverage (D/A) as well as between liquidity (CR) and leverage (D/A). Table (5) clearly reveals that the main reason of SMEs' financial failure is fixed assets which financed through debt.

Table (5): Logistic Regression Parameters

The independent Variable	B	S.E. B	Wald	Df	P-value	eB
Main Effects						
CCC	-0.035	0.008	20.373	1	0.000***	0.966
APP	-0.054	0.010	31.127	1	0.000***	0.947
ACP	0.043	0.009	25.128	1	0.000***	1.044
INV	-0.043	0.009	20.967	1	0.000***	0.958
Interaction Effects						
APP-CCC	0.000	0.000	7.444	1	0.006***	1.000
CCC-INV	0.000	0.000	27.695	1	0.000***	1.000
APP-INV	0.000	0.000	29.320	1	0.000***	1.000
ACP-INV	0.000	0.000	29.858	1	0.000***	1.000
FA/TA-D/A	-2.328	1.042	4.988	1	0.026***	0.097
CR-D/A	-0.707	0.218	10.472	1	0.001***	0.493
Constant	7.318	1.234	35.140	1	0.000***	1506.571

***,**,* Represent 99%, 95%, and 90% significant level

As shown by Table (6), our model is able to classify correctly 79.3%, 38.2% of the relationship between the CCC and failures and non-failure SMEs, respectively. Also, Table (6) shows that our model is able to classify correctly 84.1%, 48.8% of the relationship between failures and non-failure SMEs and APP, respectively. In term of ACP, Table (6) reveals that our model is able to classify correctly 83.4%, 43.1% of the relationship between the ACP and failures and non-failure SMEs, respectively. In term of INV, Table (6) shows that our model is able to classify correctly 75.9%, 46.3% of the relationship between the ACP and failures and non-failure SMEs, respectively. Moreover, Table (6) presents the overall power of correct classification between failure and non-failure firms. APP has the highest power of classification between both groups with 67.9% probability of correct classification, then ACP, INV, CCC with 64.9%, 62.3%, and 60.4% probability of correct classification.

Table (6): Classification Table

Variable		Classification Predicted Code		Percentage Correct
		Failure	Non Failure	
CCC	Failure	47	76	38.2%
	Non Failure	30	115	79.3%
	Overall Percentage			60.4%
APP	Failure	60	63	48.8%
	Non Failure	23	122	84.1%
	Overall Percentage			67.9%
ACP	Failure	53	70	43.1%
	Non Failure	24	121	83.4%
	Overall Percentages			64.9%
	Failure	57	66	46.3%

INV	Non Failure	35	110	75.9%
	Overall Percentages			62.3%
Authors Calculations				

3.3.5. Factor Analysis for Classification

This study utilizes factor analysis to identify any pattern that may exist between the independent variable for both failure and non- failure SMEs and for the entire sample. Panel (A) of Table (7) shows that variables for the non-failure SMEs were classified into four groups, where liquidity as measured by CR and QR considered the most important factors for non-failure SMEs, followed by financial leverage as measured by D/E and D/A, and working capital as measured by CCC and ACP, and finally by APP. The INV and assets structure as measured by FA/TA did not show in any impact on the financial performance of the non-failure SMEs.

In regards to failure SMEs, Panel (B) of Table (7) classifies variables that effect SMEs into three groups; liquidity measured by CR and QR as the most important factors for failed SMEs, followed by working capital as measured by CCC, APP and ACP, where financial leverage as measured by D/A and assets structure as measured by FA/TA comes at last. The INV did not show any impact on the financial performance of the failed SMEs.

Table (7): Factor Analysis - Rotated Component Matrix

Variables	Panel (A): Non-Failure SMEs				Panel (B): Failure SMEs		
	G-1	G-2	G-3	G-4	G-1	G-2	G-3
CCC			0.895			0.650	
APP				0.966		0.832	
ACP			0.917			0.967	
INV							
CR	0.978				0.972		
QR	0.977				0.970		
D/A		0.929					0.847
D/E		0.885					
FA/TA							0.690

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations.

Additionally, Factor Analysis of non-failure SMEs, as shown by Panel (A) of Table (8) reveals that first group includes liquidity variables (CR and QR) explain 28.28%, second group includes leverage measures (D/A and D/E) explain 24.083%, third group includes working capital variables (CCC and ACP) explains 23.566%, and APP explains 18.368% while INV and assets structure did not appear to have any impact on the financial performance of non-failure SMEs. Whereas, Panel (B) of Ttable (8) shows

that variable patterns for failure SMEs classified in liquidity group (QR and CR) explains 31.808%, working capital group (CCC, APP, ACP) explains 30.474%, while assets structure as measured by FA/TA and leverage as measured by D/A explains 18.230%.

Table (8): Factor Analysis for Non-Failures and Failures SMEs

Panel (A): Total Variance Explained For Non-Failure SMEs								
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
G-1	2.521	36.009	36.009	2.521	36.009	36.009	1.980	28.280	28.280
G-2	1.740	24.858	60.867	1.740	24.858	60.867	1.686	24.083	52.363
G-3	1.272	18.172	79.039	1.272	18.172	79.039	1.650	23.566	75.928
G-4	1.068	15.258	94.297	1.068	15.258	94.297	1.286	18.368	94.297
Panel (B): Total Variance Explained For Failure SMEs								
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
G-1	2.413	34.465	34.465	2.413	34.465	34.465	2.227	31.808	31.808
G-2	2.057	29.381	63.846	2.057	29.381	63.846	2.133	30.474	62.281
G-3	1.167	16.665	80.511	1.167	16.665	80.511	1.276	18.230	80.511

Extraction Method: Principal Component Analysis.

Therefore, failure SMEs has poor liquidity QR&CR, due to poor managing working capital CCC, APP, and ACP; in addition to a reliance on debt (D/A) to finance fixed assets (FA/TA). As opposed to, non-failure SMEs that do not rely on fixed assets to survive. These reported a lower level of debt D/A, D/E, and were dependent on internal sources of finance to effectively manage their working capital CCC, ACP in order to enhance liquidity QR, CR.

4. Conclusion

Since business failure has various forms, including a reduction in assets turnover and market share, poor productivity, excessive use of debt, inability to cover costs and creditors obligations, and a report negative returns for two consecutive years; as argued by Gupta et al. (2018), Mostafa (2014) and Khaled (2013). The most crucial factor that was used within this research was found to be that report losses exceed the firm's half capital and consequently should be liquidated according to firm's low no 159 for 1981. Thus, this study aims to investigate financial failure determinants of using a sample of 60 Egyptian SMEs consisting of two groups; 28 non-failure SMEs listed in NILEX and 32 failure SMEs that reported losses for two or more

consecutive years and exceeds half of their capital, for the period 2013 to 2019. Our model comprises of SMEs status (failure and non-failure) as dependent variable, and (CCC, APP, ACP, INV, D/A & D/E, CR, QR and FA/TA) as independent variables to test the research hypotheses. Followed by a comparative analysis between both groups applying T-test and NPar Mann-Whitney to examine significant differences between both groups, then logistic regression analysis used to construct a probability classification model. Moreover, factor analysis is implemented to investigate variable patterns. Results report the existence of significant differences between failure and non-failure SMEs related to working capital management, liquidity, leverage, and assets structure. Since the statistical comparative analysis results show significant differences between the two groups regarding (CCC, APP, ACP, INV, D/A & D/E, CR, QR and FA/TA). It was found that failure SMEs suffer from significant levels of (CCC, APP, ACP, INV, D/A, and D/E) and significantly poor rates for (CR, QR, and FA/TA). In contrast to non-failure SMEs those enjoy higher significant levels of (CR, QR, and FA/TA) and lower significant rates for (CCC, APP, ACP, INV, D/A, and D/E). Additionally, the Logistic Regression model report a significant relationship between CCC; APP; ACP; and INV and the interaction effects between APP&CCC, INV&CCC, APP&INV, ACP&INV, FA/TA&D/A, CR&DA and financial failures of SMEs. Interestingly, as shown by table (6) APP shows the highest power of correct classification with 67.9% between both groups of SMEs. Then, independent variables ACP, INV, CCC report correct classification of 64.9%, 62.3%, and 60.4%, respectively. Furthermore, the factor analysis for non-failures SMEs shows that variable patterns are classified within four groups: liquidity (QR and CR), leverage (D/A and D/E), working capital (CCC, ACP), and (APP), while fixed assets did not appear within this classification. However, failures SMEs grouped into liquidity (QR and CR), working capital (CCC, APP, and ACP), and (FA/TA and D/A). Therefore, non-failure SMEs rely more on their internal sources of finance drive from working capital (especially related to CCC, ACP) leads to improve liquidity (QR, CR) besides higher ability to meet payables obligations (APP) without resorting to debt, thus, lower D/E and D/A. While failure SMEs depend on long-term debt (D/E and D/A) to finance fixed assets due to poor management of working capital (CCC, APP and ACP) leading to lower liquidity (CR and QR). Our findings are consistent with Quadir (2012), Ahmed Rahman (2012), Kwaning et al. (2015), and Elbadry (2018).

5. Recommendations, Limitations, and Future Research:

The Research findings reflect the need to adopt innovative finance solutions to help SMEs face financial challenges. Through the encouragement for SMEs to better utilize their internal source of finance, especially in retained earnings. Through diversifying the finance tools available for SMEs by expanding the role of non-banking sector, especially venture capital, to finance SMEs activities resulting in a lowered total cost of finance. There are research limitations related to sample size and time horizon. Thus, there is still a need for future research to expand the research sample and time horizon to classify failure determinants by sectors and regions.

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