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Mike Onder Kaymaz*
Clarion University

Ilker Yilmaz**
Dhofar University

Ozgur Kaymaz***
Turkish Airlines

THE IMPACT OF INTANGIBLE FACTORS ON PROFITABILITY: EVIDENCE FROM CORPORATIONS TRADED AT MUSCAT SECURITIES MARKET IN OMAN

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* Contact information: okaymaz@clarion.edu, Clarion University, Department of Accountancy, COBAIS (College of Business Administration and Information Sciences), 840 Wood St. Clarion PA, 16214, U.S., phone:+1 814 393 2628; ORCID ID: https://orcid.org/0000-0001-9875-537X.

** Contact information: iyilmaz@du.edu.om, Dhofar University, Department of Accounting, P.O Box: 2509, Salalah, OMAN, phone: +968 2323 7416; ORCID ID: https://orcid.org/0000-0001-8501-9664.

*** Contact information: okaymaz@thy.com, THY (Turkish Airlines Inc.) Eğitim Başkanlığı (Directorate of Education), Ataturk Havalimanı B Kapısı Yanı, Yeşilköy-Bakırköy, Istanbul, Turkey, phone: +90 212 463 63 00; ORCID ID: https://orcid.org/0000-0003-1287-7873.

Abstract: The objective of this paper is to determine whether corporate financial performance may be influenced from intangible assets owned by a company and some special incurring expenditures benefiting the intangible value of the company even though such items could also be technically expensed contrary to getting capitalized. Combining the intangibles reported on the corporate balance sheets with the expenditures such as R&D, staff and advertising expenses, a variable called *Calculated Value of Intangible Factors (CVIF)* is specifically generated and is examined as to whether intangibles alone might potentially have a significant effect on corporate profitability ratios, and if so to what extent. The sample consists of non-financial public companies traded at Muscat Securities Market in Oman and the sampling period covers the time window from 2013 until 2017. Two regressors are used to capture the effect of intangible factors; meaning *CVIF* and *CVIF/Total Assets (CVIFTA)* respectively, the latter of which is a relative measure. Four (4) profitability measures, namely *Gross Profit Margin (GPM)*, *EBIT Margin (EBITM)*, *Net Profit Margin (NPM)* and *Return on Assets (ROA)* are developed as proxies to indicate for corporate financial performance. Considering all the resulting eight (8) models each, panel data regression analyses are performed separately to specifically document the linkage between corporate intangibles and corporate financial performance. Results provide a strong evidence by showing that intangibles do have a significant and a positive effect on corporate financial performance, except when ROA is regressed by CVIFTA rather than CVIF. This effect on and the linkage with financial performance is documented to be the most robust once GPM and NPM are to indicate the performance in the forms of *CVIF* and *CVIFTA* respectively.

Introduction

Financial performance of companies has always been a main-stream topic in accounting and finance literature, having been an inspiration to world-wide scholars or practicing researchers. Several factors have been analyzed whether they could affect or be getting affected by corporate financial performance. Those factors have ranged from miscellaneous financial characteristics of companies to several non-financial features that encompass human resource management, reputation, corporate governance, board structure or size, corporate social responsibility, transparency, and many more.

One of the highly salient factors which might potentially influence the financial performance is intangible assets owned by the companies, whether financial or non-financial, or whether public or private ones. More clearly, the weight of intangible assets to total assets and the growth in intangible assets could be the attributes that can affect or be related to corporate financial performance. This is especially the case for manufacturing companies that may tend to have a good deal of intangibles in their asset portfolios, which translates into a more intangible-stressed balance sheet composition and asset quality. An intangible asset is defined as an identifiable non-monetary asset without physical sub-

stance. Manufacturing companies have a special place in this because they usually need to have research & development (R&D) units in their organizations.

Such examples among the intangibles may be given in International Accounting Standard (IAS) 38 as patented technology, computer software, databases and trade secrets, trademarks, internet domains, customer and supplier relationships and marketing rights. The point which makes intangible assets considerable is not just their monetary values, meaning not the amount reported on the balance sheets, but their unique characteristics that can provide companies with a competitive advantage or a meaningful edge otherwise. Resource-Based View (RBV) is a dominant approach to explain the differences of performance among competing firms, postulating that the determining factor in the performance of any organization is the resources it owns. As the resources supply companies with efficiency and effectiveness expected to buffer up, they become valuable and therefore valuable resources become a source of competitive advantage (Barney, 1991) themselves. The role of intangible assets can be investigated in this context.

Main hypothesis of this paper may be posed such that intangibles (intangible factors) which are reported on corporate financial statements affect corporate financial performance positively. The paper makes a significant contribution to the existing body of literature by presenting a concrete empirical evidence on the relationship between intangibles and corporate financial performance. In this paper, the word "intangibles" are used in the meaning of "intangible factors" which include but are not limited to intangible assets. This paper has also important practical implications for managers who make investment decisions, suggesting that they should also take the impact of intangibles into consideration as regards the financial returns of the investments.

The remainder of this paper is hence organized as follows. In the next section, section 2, prior related literature is reviewed. In the third section, data and methodology is presented. In the fourth section, results are provided and discussed. Finally, in the fifth section being the last one, conclusions are drawn.

Prior related literature

The impact of intangible factors, besides intangible assets, has been examined in many scholarly works hitherto. Some of them focused on all intangible factors including intellectual capital, meaning all the probable attributes regardless of whether they may be reported on the corporate balance sheet or not.

Despite being uncommon, some studies rather focused on the intangible assets on the balance sheet. Interestingly, although some papers contain 'intangible asset' in their titles, deep down inside, they happen to be about intellectual capital. For this reason, it is necessary to make a distinction between intangible assets and any other attribute that may create a value difference between book value and market value of a company. Intangible factors can be classified in different ways. One of these ways works through dividing them into two categories; (a) *visible intangible assets* that are legitimized in accounting standards and thus reported on the corporate financial statements, and (b) *hidden intangible assets* that might be unidentifiable and uncontrollable, therefore could not be reported in the corporate balance sheets (e.g. Nevado and Víctor (2002), Ciprian, Valentin, Madalina and Lucia, (2012) etc.).

Technically speaking, we are aware that intangibles-financial performance linkage can be of two-way. As presented by our hypothesis cited above already, since we argue that it is the intangible that may affect corporate financial performance rather than the other way around, we give our concentration specifically to the examinations doing so. Accordingly; for instance, Chiarello, Pletsch, Da Silva and Da Silva (2014) explored the relationship among financial performance, intangible assets disclosure and value creation, using the data from Brazilian and Chilean information technology companies. They found a positive relationship in between and that Chilean companies tend to disclose more intangible assets and thus sustain up to a greater value through better financial performance.

Gamayuni (2015) tested the relationship among intangible assets, financial policies, and financial performance with the firm value at public companies listed in Indonesia. He found that although intangible assets have no effect on corporate financial policies (e.g. debt policy, dividend policy etc.), it has a significant effect on financial performance and firm value though.

De Luca, Maia, da Costa Cardoso, de Vasconcelos and Cunha (2014) studied a sample of 137 Brazilian companies for a four-year period from 2007 to 2010 in order to explore the relationship among investments in intangible assets, superior and sustained performance. They segregated assets following Brooking's classification (1996) and discovered a significant relationship between performance and mean investments in intellectual property and infrastructure assets. However, they did not obtain similar results for market assets, other intangibles or total intangible assets.

In a recent study, Tahat, Ahmed and Alhadab (2018) investigated the impact of intangible assets on the current and future financial performance as well as market performance by using a sample of 150 non-financial firms listed at FTSE (The Financial Times Stock Exchange). They pointed out the importance of R&D and goodwill regarding the enhancement of performance and the sustainability of earnings. They found a positively strong result, contending that intangibles assets play a key role in improving future financial performance and market performance.

Jaffe and Chappell (2016) examined the interrelationships among firm characteristics, intangible investment and firm performance, employing both survey and administrative data belonging to approximately 13,000 firms for the period 2005–2013. They found that growth strategies and 'soft' performance objectives of a firm are associated with the investment in intangible assets, however productivity and profitability are not.

Tudor, Dima, Dima and Ratiu (2014) used *intangibles-to-total assets* ratio as the variable which represents the level of intangible assets and examined the relationship of this ratio with several profitability measures. They used a sample of 562 large companies from London and Frankfurt Stock Exchanges and documented a relatively steady relationship for the full sample. However, they captured some structural differences and scale effects when analyzed on market or sector basis.

Omil, Lorenzo and Liste (2011) categorized Spanish firms into two groups as *high-profitability firms* (HPF) and *non-high-profitability firms* (n-HPF) for two different time periods and investigated the linkage between intangibles and profitability. In their study, a firm in their study is considered as HPF if its ROA is higher than 25 % for three consecutive years while intangibles are measured on the basis of three attributes; human, structural, and relational factors. They documented that HPFs are more focused on the management of intangible factors than are n-HPFs.

In some scholarly investigations about the intangibles-profitability relationship, some items which are expensed according to accounting standards or legislations are used as a proxy to indicate intangibles. For instance, R&D expenditures can be recognized in the income statement or can be capitalized as an intangible asset in the balance sheet. It is an alternative way to use all such expenses instead of only using intangible assets value from the balance sheet. Li and Wang (2014) for instance used three types of expenditures to represent intangible assets, namely *R&D cost*, *employee benefit expense* and *sales training*

cost. As the measure of performance (profitability), they used ROA. They found a significant relationship for R&D and sales training, meaning that these expenditures contribute to corporate financial performance; however employee benefit expense was found to have no impact over profitability. Some studies rather used information technology (IT) investment as the proxy for intangibles and examined the linkage between the level of IT investment and financial performance.

Among the others, Beccalli (2007) used a sample of 737 European banks from 1993 through 2000 and looked at the investment in IT under three subgroups; i.e., hardware, software and other IT services. The scholar researched the effects on both accounting ratios as well as other cost and profit efficiency measures. They documented some light relationship between total IT investment and performance, while describing the results of their study as a paradox. The main reason was that when IT services are received from external providers such as consulting, training etc., there happens to be a positive effect on profitability; however when banks themselves acquire hardware and software, the effect on bank performance turns out to be negative.

Some examinations instead employed a different approach developed Stewart (1995) called *Calculated Intangible Value (CIV)* to explore the effect of intangibles. Even though it is a stepwise (seven-step) calculation, CIV method basically follows that the value of intangibles can be determined as the difference between *company value* which is calculated by discounting future free cash flows to the present and *book value* of tangible assets. Volkov and Garanina (2008) studied the role of intangibles in value creation and applied the CIV method to Russian companies for two different periods, 2001–2005 and 2001––2006. According to results of the study, they concluded that the role intangibles play is not as significant as that of tangible assets for Russian companies.

A similar approach to CIV is to use Tobin's q to measure the level of intangibility of a firm. Villalonga (2004) used it to test the relationship between the intangibility of firm resources and the sustainability of its competitive advantage. By using the panel data encompassing 1641 US firms for the period ranging from 1981 to 1997, it was shown that the measures such as competitive advantage or value creation tend to be relevant in the context of firm performance since they are the underlying factors. The results also showed that the intangibility of firm resources is positively related to the sustainability of firm-specific earnings, which is consistent with the RBV approach. The next section presents data and methodology.

The research methodology and the course of the research process

The sample used in this study consists of 54 non-financial sector companies, traded at Muscat Securities Market in Oman. While being the largest one, Muscat is the Oman's capitol. The data were obtained from the website of the stock exchange and annual reports of companies and cover the financial statements of the companies from 2013 to the beginning of 2017. The financial statements used in this examination are prepared (reported) in concordance with International Financial Reporting Standards (IFRSs) set which is legally compulsory for Oman-listed (public) companies. We employed consolidated financial statements, rather than solo ones, to make sure that the financial highlights of the sampled public firms could be captured in the best way possible.

Some companies were excluded from the sample owing to two major reasons; some of them were missing in the series in some years, and some of them did not report the details of the expenses in that it could not be possible to extract such items as R&D costs and advertising expenses. Therefore, number of observations in this examination has been recorded at 216 in total. The next subsection presents the empirical variables.

1. Empirical variables

We follow the examinations cited in the previous section (e.g. Stewart (1995), Brooking (1996), Beccalli (2007), Volkov and Garanina (2008), Omil et al. (2011), Chiarello et al. (2014), Tudor et al. (2014), Li and Wang (2014), De Luca et al. (2014), Gamayuni (2015), Jaffe and Chappell (2016), etc.) to construct the variables to be embedded in to our empirical model. The details are given below.

Dependent (Regressed) Variables: Definition

The dependent variables employed in the study are *profitability measures* and four ratios may be defined as follows:

i. Gross Profit Margin (GPM) = Gross Profit (Income or Margin) / Sales
ii. EBIT Margin (EBITM) = Earnings Before Interest and Taxes / Sales
iii. Net Profit Margin (NPM) = Net Profit or Income After Tax [NPAT] / Sales
iv. Return on Assets (ROA) = Net Profit After Tax [NPAT] / Total Assets

For all the above-given dependent variables which are four (4) different proxies to capture different profit layers for non-financial companies (especially public ones), our model is built and tested. Two sets of regressors are individually construed and specified.

Independent Variables: Regressors: Definition

Balance sheets cannot reflect the actual value of a company at all times and this is a fundamental reason underlying the differences between market and book values. Accounting and financial reporting standard sets require some contingencies to recognize any item as an asset on the balance sheet – mandatory cases.

In both international standards and most of the national accounting legislation, we see that some items cannot be recognized as an asset due to the fact that they do not meet all recognition criteria, even though they benefit the company. In addition, in discretionary cases, most companies might not be willing to measure the value of some economic resources and to recognize them on the balance sheet.

For instance, in today's technological environment, websites serve as an important channel to generate revenues for the companies; however it is very rare to see a website as an intangible asset on a balance sheet. Therefore, when intangible value of a company is analyzed, it would be compulsory to take into account more factors along with classical balance sheets.

As cited before, since public companies in Oman have adopted and follow IFRSs, we consider however IFRSs define intangibles out there those companies have been implementing thus far. Therefore, for the consistency purposes, the independent variables run in this examination attempted to generate an intangible value by incorporating three types of items in to the intangible assets and goodwill reported on the balance sheet. These items are expensed normally, but they actually add value to the company; namely staff expenses, R&D costs, and advertising expenses. Goodwill deserves a special attention in this context. According to IFRS, only goodwill resulting from a business combination (e.g. acquisition) can be recognized as an asset and it represents the excess value over the aggregate (fair) value of net identifiable assets. This excess value may arise from such factors as name, reputation, image, brand value, location, customer portfolio and so on. In a typical acquisition transaction for instance, the additional purchase price acquirer may be willing or eager to pay

will therefore be the value of the goodwill itself. In parallel to the Calculated Intangible Value (CIV) variable developed by Stewart (1995), we created a variable. This calculated (composite or aggregated) value is the first independent variable, it is dubbed Calculated Value of Intangible Factors (CVIF) and it can be presented as follows:

Calculated Value of Intangible Factors (CVIF) (in $) = Intangible Assets + Goodwill + Staff (Personnel) Expense + R&D Expense + Advertising Expense

Therefore, CVIF is the variable generated to represent and capture the intangible factors benefiting the corporation. Intangible assets, goodwill in particular, meet the recognition criteria of IFRS, however, since the expenses mentioned above do not meet the criteria they are rather expensed as period costs (unlike product costs). These expenses enhance the corporation both in short and long term, hence they do have an impact on the financial performance. As a result, following a holistic approach, the use of CVIF has aimed to reflect all intangible factors rather than to take into account intangible assets alone.

The second independent variable is a ratio to capture the relative weight of the Intangible Value with respect to total assets. The purpose of this second variable is to measure the effect of intangibles taking the size effect into consideration and is given as *Calculated Value of Intangible Factors / Total Assets (CVIFTA) (in %)*.

These combine to suggest that one unique independent variable is exclusively used in the first and the second groups to solely examine any direct effect of intangibles on the corporate financial performance. The next subsection presents the empirical model.

2. Empirical model

Panel data regression model that synchronously processes the time-series and the cross-sectional data in combination is selected to be constructed to estimate the effect of intangibles on the financial performance of the companies in the sample. For each dependent variable, two groups of regressions with each independent variable are run. CVIF and CVIFTA, as was just implied before, are used as the exclusive independent variable in the first and the second group respectively to examine any direct effect of intangibles on the financial perfor-

mances of the companies. Models that are of univariate setups for this reason are summarized in the following table, table 1.

Table 1. Models: Variables Construction

Model	Dependent Variable: Y: Profitability	Independent Variable: X: Intangibles
1	Gross Profit Margin (GPM)	Calculated Value of Intangible Factors (CVIF)
2	EBIT Margin (EBITM)	
3	Net Profit Margin (NPM)	
4	Return on Assets (ROA)	
5	Gross Profit Margin (GPM)	Calculated Value of Intangible Factors / Total Assets (CVIFTA)
6	EBIT Margin (EBITM)	
7	Net Profit Margin (NPM)	
8	Return on Assets (ROA)	

S o u r c e : authors' collection.

In all the presented models, we have incorporated two control variables; the first one is the industry dummy variable (i.e. inddm) which is designated as *1 for industrial companies* and as *0 for service companies*; the second one is debt/equity ratio (i.e. der) which shows the financial leverage of sample companies. In order to test the significance of the models, panel data regressions are run. Panel data is defined as a data set encompassing repeated cross sections over time. With a balanced panel, the same units are observed in each time period. With an unbalanced panel, some units do not appear in each time period, often due to attrition (e.g. Wooldridge, 2002). The dataset used in the study is therefore a balanced panel and the software that is used is Stata to perform the empirical analyses. It is important to also keep in mind that Stata does a good job of smoothing the observations and thereby enhances the data quality as well as the relevance and significance of the statistical analyses.

For each of the (univariate) models, panel regressions with fixed effects and panel regression with random effects are run to measure and understand the relationship between corporate intangibles and financial performance. The panel regression models are specified as:

1. $$Y_{it} = \psi_0 + \psi_i X_{it} + \varepsilon_{it}$$

2. $$Y_{it} = \psi_{0i} + \psi_i X_{it} + \varepsilon_{it}$$

(1) and (2) statements above predict fixed and random-effects panel regression models respectively, wherein all the denoted terms have obvious meaning.

In addition to these tests, pooled OLS regressions are also performed. Depending on the results, those regressions are compared to each other in order to determine which model may be the best fit and therefore should be eventually adapted. Hausman test is thereby performed in order to decide between fixed and random effects.

In the regression models, the assumption that the variance of the error term is constant is known as homoscedasticity. If the error terms do not have constant variance, they are said to be *heteroscedastic*. Errors may increase as the value of an independent variable increases. Therefore, in an effort to eliminate any chances of heteroscedasticity, Breusch-Pagan / Cook-Weisberg (estat hottest) test is also designed to detect any linear form of heteroscedasticity that might be extant in our models. In other words, the opted-for model is also tested for the sake of assurance of the elimination of any heteroscedasticity that might be involved. The next section provides the analysis results with details.

Analysis results

1. Descriptive Statistics

We start with the presentation of the descriptive statistics. Descriptive statistics for all the variables used in this investigation are summarized in the following table, table 2.

As can be seen in the below-given table, table 2, CVIF values of the sample companies range from 0.17 to 97.64 as for overall population. The numbers (mean, standard deviation, min and max) as for CVIF's raw down there are in millions of OMR (Omani Riyal). OMR is a fixed currency which is pegged to the USD at about 1 OMR= 2.60 USD.

The other measure of intangibles, CVIFTA, ranges from 0 to 63 percentages (%s) overall. It is important to remember that CVIFTA by definition takes into consideration the relative size of the company. It is also important to note that for financial performance ratios depicted below, there are wide gaps between the extreme points, suggesting that the values set between lower (minimum) and upper (maximum) bounds significantly vary. Here, it is seen that CVIF is the one with the higher deviation, documenting that the group CVIF differences among the listed firms are higher than those in CVIFTA.

A similar situation exists also for the dependent variables that are regressed on CVIF and CVIFTA each. It is seen that the gaps between the minima and maxima for them are wide such that the minima take negative values in all. It is also observed that NPM is the one with the highest deviation, suggesting that the group differences among the traded firms are the highest out there. Next subsection presents the empirical test results.

Table 2. Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
firm	*overall*	27.5	15.62199	1	54	N =216
	between		15.73213	1	54	n =54
	within		0	27.5	27.5	T =4
year	*overall*	2014.5	1.120631	2013	2016	N =216
	between		0	2014.5	2014.5	n =54
	within		1.120631	2013	2016	T =4
gpm	*overall*	25.56019	17.50578	-14	85	N =216
	between		15.98045	-6.5	72.5	n =54
	within		7.391935	-18.4398	76.81019	T =4
ebitm	*overall*	9.060185	17.58173	-89	57	N =216
	between		15.55301	-67.5	33	n =54
	within		8.402173	-40.4398	58.56019	T =4
npm	*overall*	7.037037	18.19784	-89	84	N =216
	between		15.92623	-69	35.75	n =54
	within		9.0031	-21.963	70.03704	T =4
roa	*overall*	5.949074	9.404215	-43	63	N =216
	between		7.491092	-17.5	19.5	n =54
	within		5.753765	-24.3009	49.44907	T =4
cvif	*overall*	7.21	13.97077	0.17	97.64	N =216
	between		13.93604	0.1725	82.94	n =54
	within		1.918112	-7.21	21.91	T =4

Table 2. Descriptive...

Variable		Mean	Std. Dev.	Min	Max	Observations
cvifta	*overall*	14.98611	11.34101	0	63	N =216
	between		10.7288	0	62.25	n =54
	within		3.888115	0.236111	56.23611	T =4
inddm	*overall*	0.685185	0.465520	0	1	N =216
	between		0.468803	0	1	n =54
	within		0	0.685185	0.685185	T =4
der	*overall*	1.51458	3.26928	-6.36	23.71	N =216
	between		3.031227	-4.935	14.89	n =54
	within		1.275955	-5.1454	13.2420	T =4

S o u r c e : authors' calculation based on the statistical analyses.

2. Test Results of the Models

The test results for the models may be summarized in the following table, table 3.

Table 3. Test Results

Panel A. Independent Variable (Models 1 through 4): CVIF

	Model 1	Model 2	Model 3	Model 4
Dependent Variable	GPM	EBITM	NPM	ROA
Intercept	21.520	7.270	5.894	6.981
	(0.000)	(0.004)	(0.023)	(0.000)
Coefficient	0.498	0.236	0.214	0.084
	(0.000)***	(0.007)***	(0.018)**	(0.071)*
Industry dummy (inddm)	1.632	-.496	0.0765	-1.376
	(0.506)	(0.851)	(0.978)	(0.328)
Leverage (der)	-0.446	0.2823	-0.3004	-0.457
	(0.193)	(0.443)	(0.433)	(0.020)**
F-test (*Wald-Chi^2)	13.64	2.89	2.18	3.35

Table 3. Panel A. Independent Variable...

	Model 1	Model 2	Model 3	Model 4
P-value for the model	(0.0000)***	(0.0365)**	(0.0913)*	(0.020)**
rho	-	-	-	-
R^2	0.1618	0.0393	0.0299	0.0453
Observations	216	216	216	216

Panel B. Independent Variable (Models 5 through 8): CVIFTA

	Model 5	Model 6	Model 7	Model 8
Dependent Variable	GPM	EBITM	NPM	ROA
Intercept	24.363	1.799	-0.853	13.209
	(0.000)	(0.507)	(0.769)	(0.000)
Coefficient	0.221	0.463	0.514	-0.481
	(0.039)**	(0.006)***	(0.004)***	(0.000)***
Industry dummy (inddm)	-2.164	omitted	omitted	omitted
	(0.407)	-	-	-
Leverage (der)	-0.423	0.208	0.116	-0.271
	(0.255)	(0.682)	(0.769)	(0.936)
F-test (*Wald-Chi^2)	2.15	3.92	4.17	9.48
P-value for the model	(0.0953)*	(0.0217)**	(0.0171)**	(0.000)***
rho	-	0.752	0.74	0.675
R^2	0.0295	0.0468	0.0496	0.1059
Observations	216	216	216	216

***, **, *: significant at 1%, 5%, and 10% confidence levels respectively.

S o u r c e : authors' calculation based on the statistical analyses.

Significance levels are shown in parentheses. F-test is reported for the models which have produced significant results under pooled OLS regression. Wald-Chi^2 is also reported for the models which fixed effects or random effects regressions produced significant results and they represent the overall significance of the model. Therefore, the panel regression models may be specifically estimated, as given below.

2.1. When CVIF is the regressor

MODEL 1. THE LINKAGE BETWEEN GROSS PROFIT MARGIN AND CALCULATED VALUE OF INTANGIBLE FACTORS

In this model that CVIF might have a significant effect on gross profit margin of the companies is tested. Pooled OLS regression has produced significant results in that it was run with the robust option for standard errors.

Panel A in table 3 shows that the resulting regression equation for the model may be predicted as: GPM (Y) = 21.520 + 0.498*CVIF + 1.632*INDDM -0.446*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a positive relationship between CVIF (regressor) and GPM (dependent) and that every hundred-unit increase (decrease) in the CVIF results in a 49-unit increase (decrease) in GPM base. Results in this vein also indicate that (1) CVIF (coefficient) significantly (1%) accounts for the changes in the level of GPM and (2) the model overall (p-value) is also significant at 1%, suggesting a very high degree of robustness. This model is the best fit among the models 1 through 4 where CVIF is given to be the factor predicted to explain corporate financial performance.

Regarding the contribution of intangible factors, positive significant relationship between CVIF and GPM can happen for at least two reasons. First, intangibles may increase sales while they may also have some cost reduction effects. Both of these possible effects alone may help contribute improving gross profit margin.

MODEL 2. THE LINKAGE BETWEEN EBIT MARGIN AND CALCULATED VALUE OF INTANGIBLE FACTORS

In this model, whether CVIF might have a significant effect on EBIT margin of the companies is tested. Since both random effects and pooled OLS regressions have produced significant results in this case, Breusch and Pagan Lagrangian Multiplier (BP LM) test was performed to pick the right fit between the two regressions. It has been revealed that pooled OLS regression is a better alternative for this model and therefore is the better fit.

Panel A in table 3 shows that the regression equation may thus be predicted as: EBITM (Y) = 7.270 + 0.236*CVIF – 0.496*INDDM + 0.282*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a positive relationship between CVIF (regressor) and EBITM (dependent) and

that every hundred-unit increase (decrease) in the CVIF results in a 23-unit increase (decrease) in EBITM base. Results in this vein also indicate that (1) CVIF (coefficient) significantly (1%) accounts for the changes in the level of EBITM and (2) the model overall (p-value) is also very robust with 1% significance level. In other words, this model is also a good fit to estimate the corporate financial performance.

Similar to the previous model, the extant positive relationship signifies the contribution of intangible factors to the operating performance of the company. However, compared to gross profit, the relationship is relatively weaker. This is probably because in the calculation of EBIT, all operating expenses are cleared and not all those expenses have a direct relationship with intangibles.

MODEL 3. THE LINKAGE BETWEEN NET PROFIT MARGIN AND CALCULATED VALUE OF INTANGIBLE FACTORS

In this model, that CVIF might have a significant effect on net profit margin of the companies is tested. Fixed effects and random effects regressions yielded insignificant results at a first run. Hausman test then has been performed to compare the fitness of fixed and random effects regressions. It has showed that random effects must be opted for. For this reason, random effects regression has been run again with a robust option controlling for standard errors, and the result has been found significant. In addition, pooled OLS regression has also produced significant results, and therefore BP LM test was applied. Test results have documented that OLS regression is a better fit in this case, similar to Model 2 above.

Panel A of table 3 shows that the regression equation may thus be built as: NPM (Y) = 5.894 + 0.214*CVIF + 0.0765*INDDM – 0.3004*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a positive relationship between CVIF (regressor) and NPM (dependent) and that every hundred-unit increase (decrease) in the CVIF results in a 21-unit increase (decrease) in NPM base. Results in this vein also indicate that (1) CVIF (coefficient) significantly (5%) accounts for the changes in the level of NPM and (2) the model overall (p-value) is also robust with 5% significance level. In other words, this model is also a good fit to estimate the corporate financial performance.

Results in this model also show that, even though the regression results are significant, as we go down in the income statement, the level of relationship decreases. This is because net income or profit is calculated after adding and

deducting all non-operating items, interest expenses and taxes. Therefore, reduction in the coefficient of regression analysis as well as the one in the entire model with a univariate setup is an expected result.

Model 4. The linkage between return on assets and calculated value of intangible factors

Differently from the previous models in all of which sales revenue has been in the composition, the fourth model has instead employed a profitability measure based on total assets, which is ROA, and tested whether CVIF might have a significant effect on return on assets ratio of the companies. Similar to the model 3, both fixed effects and random effects regressions produced insignificant results. Hausman test was performed to compare the fitness of the fixed and random effects regressions. It showed that random effects must be chosen. Random effects regression has been therefore run again with a robust option to control for standard errors, and the results have proved to be significant.

In addition, similar to the previous model being Model 3, BP LM test was conducted. Test results showed that pooled OLS regression produce significant results, suggesting that OLS is a better fit compared to the random effects and therefore better be chosen.

Panel A of table 3 shows that the regression equation may be given as: ROA (Y) = 6.981 + 0.837*CVIF – 1.376*INDDM – 0.457*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a positive relationship between CVIF (regressor) and ROA (dependent) and that every hundred-unit increase (decrease) in the CVIF results in a 8.3-unit increase (decrease) in ROA base. Results in this sphere also indicate that (1) CVIF (coefficient) significantly (5%) accounts for the changes in the level of ROA and (2) the model overall (p-value) is also significant at 5%, implying a high degree of robustness. In other words, this model is also a good fit.

However, results here also document that this model is of the least explanatory power to estimate corporate financial performance among all the four (4) models which are displayed in panel A of table 3 and are regressed by CVIF. This is probably because ROA is measured as the division of net profit by total assets, leading the coefficient in ROA model as well as the degree of fitness of the model itself to be the lowest.

Overall results in this category, as presented in panel A of table 3, document that Model 1 is the best model where CVIF is the contributing factor and GPM is the proxy to capture corporate financial performance. The next subsection dis-

cusses the results once CVIFTA is chosen to be the univariate factor estimating the corporate financial performance.

2.2. When CVIFTA is the regressor

MODEL 5. THE LINKAGE BETWEEN GROSS PROFIT MARGIN AND CALCULATED VALUE OF INTANGIBLE FACTORS / TOTAL ASSETS

Model 5 is the first model in the second group in which CVIF/Total Assets is used as an independent variable. This group of models takes size effect into consideration by computing the independent variable as a ratio of CVIF and total assets.

This model tests whether CVIF/Total Assets ratio might have a significant effect on gross profit margin of the companies. Fixed effects and random effects regressions had produced insignificant results at a first run and Hausman test needed showed that random effects regression model must be chosen. Random effects regression was run again with a robust option for standard errors, and the result has been this time significant. As pooled OLS regression has produced significant results as well, BP LM test was performed. Test results have suggested that OLS is a better alternative. As given in panel B of table 3, the regression equation may thereby be presented as:

GPM (Y) = 24.363 + 0.221*CVIFTA – 2.164*INDDM -0.423*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a positive relationship between CVIFTA (regressor) and GPM (dependent) and that every hundred-unit increase (decrease) in the CVIFTA results in a 22.1-unit increase (decrease) in GPM base. Results in this vein also indicate that (1) CVIF (coefficient) significantly (5%) accounts for the changes in the level of GPM and (2) the model overall (p-value) is also significant at 5%, documenting a high degree of robustness. In other words, this model is also a good fit.

The result of this model is similar to that of Model 1. It was *ex ante* predicted that CVIFTA must have more explanatory power. However, the coefficient in this model is lower compared to Model 1 (being significant at 5% versus 1%).

MODEL 6. THE LINKAGE BETWEEN EBIT MARGIN AND CALCULATED VALUE OF INTANGIBLE FACTORS / TOTAL ASSETS

This model tests whether CVIF/Total Assets ratio might have a significant effect on EBIT margin of the companies. Fixed effects and random effects regres-

sions had produced significant results while pooled OLS regression had produced insignificant results over here. In order to make a choice between fixed and random effects, Hausman test was run and it has showed that fixed effects must be chosen. Fixed effects regression has been run again with a robust option to gauge standard errors and the result has proven to be also significant.

Panel B of table 3 shows that the regression equation may be estimated as: EBITM (Y) = 1.799 + 0.463*CVIFTA + 0.208*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a positive relationship between CVIFTA (regressor) and EBITM (dependent) and that every hundred-unit increase (decrease) in the CVIFTA results in a 46-unit increase (decrease) in EBITM base.

Results in this sphere also indicate that (1) CVIF (coefficient) significantly (5%) accounts for the changes in the level of EBITM and (2) the model overall (p-value) is also significant at 5%, suggesting a high degree of robustness. In other words, this model is also a good fit.

It was expected that as we go down through the income statement, the effect of intangibles on different profitability measures would shrink. Contrary to that however, the coefficient in this model is higher than the previous one. This is probably because intangible factors may also affect operating expenses.

MODEL 7. THE LINKAGE BETWEEN NET PROFIT MARGIN AND CALCULATED VALUE OF INTANGIBLE FACTORS / TOTAL ASSETS

This model tests whether CVIF/Total Assets ratio might have a significant effect on net profit margin of the companies. Similar to the previous model; both fixed effects and random effects regressions had yielded significant results. However pooled OLS regression had generated insignificant results. Hausman test showed that fixed effects regression model better be opted for. Fixed effects regression has been run again with a robust option controlling for standard errors and the result has been also significant over here.

Panel B in table 3 documents that the regression equation may be constructed as: NPM (Y) = -0.853 + 0.514*CVIFTA + 0.116*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a positive relationship between CVIFTA (regressor) and NPM (dependent) and that every hundred-unit increase (decrease) in the CVIF results in a 51-unit increase (decrease) in NPM base. Results in this sphere also indicate that (1) CVIF (coefficient) very significantly (1% being the highest) accounts for the changes in the

level of NPM and (2) the model overall (p-value) is also very robust (highest indeed) with 1% significance level.

MODEL 8. THE LINKAGE BETWEEN RETURN ON ASSETS AND CALCULATED VALUE OF INTANGIBLE FACTORS / TOTAL ASSETS

Similar to Model 4, this model uses the return on assets ratio as independent variable and it tests whether CVIF/Total Assets ratio might have a significant effect on return on assets ratio of the companies. Fixed effects and random effects regressions produced significant results, however pooled OLS regression produced insignificant results. Hausman test showed that fixed effects must be chosen. Fixed effects regression was run again with a robust option for standard errors and the result was also significant.

As presented in panel B of table 3, the regression equation may be provided as: ROA (Y) = 13.209 - 0.481*CVIFTA -0.271*DER + u_i where all the terms and the numbers have obvious meaning. This suggests that there is a negative relationship between CVIFTA (regressor) and ROA (dependent) and that every hundred-unit increase (decrease) in the CVIFTA results in a 48-unit decrease (increase) in ROA base. Results in this group also indicate that (1) CVIF (coefficient) significantly explains the changes in the level of ROA and (2) the model overall (p-value) is also significant at 5%.

The factor (CVIFTA) coefficient in this case is negative, implying a negative relationship between the relative level of intangibles and return on assets ratio. It is the only (univariate) model with a negative coefficient among all the eight (8) models. This may probably be attributable to the capitalization of expenses such as R&D costs into the assets instead of getting expensed.

Overall results in this group, as provided in panel B of table 3, document that model 7 is the best fit among all the four (4) models 5 through 8 where CVIFTA is given to be the sole contributing factor and NPM is given to be the proxy to indicate corporate financial performance. The next section concludes this paper.

Conclusion

Business environment is getting more and more competitive and many factors including globalization and technological developments affect companies. In order to survive, companies need to build a competitive advantage, improve

their resources and invest in intangibles. The aim of this article has been to determine whether intangibles have a significant effect on the financial performance of companies *inter alia*.

In addition to intangible assets reported on corporate balance sheets, companies tend to have many intangible attributes which help them out to improve financial and organizational performance. Some of those attributes may not get capitalized, in other words, not recognized as assets. Instead they may be directly expensed, for example staff (personnel) expenses that need to get debited in the books. However, it should not be dismissed that such expenditures cannot be treated expenses alone since they add long-term value to the companies and therefore it does not make sense to limit them to one-time (or at least short-term) benefit.

Some other factors are difficult to measure also and they are not recognized as assets under routine business conditions. They can be recognized only in case of a business combination (such as M&A) as given in the case of "goodwill" being the term covering all such elements.

For these reasons, this paper has built two sets of variables (factors or regressors) called "*Calculated Value of Intangible factors (CVIF)*" (given in nominal currency amounts) and "*Calculated Value of Intangible Factors/Total Assets (CVIFTA)*" (given in relative [%] terms) designed them in a way to engulf the value of the expenditures which may be both recognized as an asset (capitalized) and an expense (expensed). Therefore, it has covered the composite of intangible assets and goodwill, if any, and such expenses as R&D, staff and advertising cost items. In so doing, differences or any conflicts, sometimes major ones, in between rules-based accounting (such as GAAPs) and principle-based accounting (such as IFRSs), were also targeted to be eliminated or at least be kept at a minimum.

To proxy to capture corporate financial performance, four dependent variables have been developed, including *gross profit margin (GPM)*, *EBIT margin (EBITM)*, *net profit margin (NPM)* and *return on assets (ROA)*. Two independent variables are regressed with each of these profitability measures, so eight different models have been tested to determine whether intangibles may have a significant effect on financial performance of companies. Listed companies traded in Muscat Securities Market of Oman were sampled in the empirical analyses with 216 observations. And panel data regression models were applied in these examinations to control both the time series and cross-sections simultaneously.

The results of regression analyses which were run in the models have produced significant results. The models have been divided into two groups over here; in the first group, the independent variable is *CVIF* being *Calculate Value of Intangible Factors*. This group of models has yielded significant results under pooled OLS regressions. The second group of models has employed *CVIFTA* being *Calculate Value of Intangible Factors / Total Assets* as the independent variable and therefore took relative size effect into consideration. These models have generated significant results under random or fixed effects regressions except model 5 where GPM is the preset indicator for corporate financial performance. Regardless of OLS or random or fixed regressions, all the models have revealed significant outcomes, if not very robust.

The results show that intangibles do have a significantly positive impact on corporate financial performance, except when ROA is regressed by CVIFTA. This effect on and the linkage with financial performance is documented to be the most robust once GPM and NPM happen to become indicators to capture the performance in CVIF and CVIFTA respectively.

In conclusion; the results of the models have clearly documented that there is a positive linkage between corporate intangibles and financial performance since expenditures (investment in) made towards having intangibles do affect financial performance of companies positively. They suggest that in order to improve profitability ratios (meaning enhance financial performance), companies must invest more in intangible assets and in the venues that would likely deliver competitive advantage to them in the long term.

References

Beccalli, E. (2007). Does IT investment improve bank performance? Evidence from Europe. *Journal of Banking and Finance*, 31(7), 2205-2230. http://dx.doi.org/10.1016/j.jbankfin.2006.10.022.

Brooking, A. (1996). Intellectual capital: core asset for the third millennium enterprise. Boston, USA: Thomson Publishing Inc.

Chiarello, T.C., Pletsch, C.S., Da Silva, A., & Da Silva, T.P. (2014). Financial Performance, Intangible Assets And Value Creation In Brazilian And Chilean Information Technology Companies. *Economic Review of Galicia*, 23(4), 73-88.

Ciprian, G.G., Valentin, R., Madalina, G.A., & Lucia, V.M. (2012). From Visible to Hidden Intangible Assets. *Procedia-Social and Behavioral Sciences*, 62, 682-688. http://dx.doi.org/10.1016/j.sbspro.2012.09.116.

De Luca, M.M.M., Maia, A.B.G.R., da Costa Cardoso, V.I., de Vasconcelos, A.C., & da Cunha, J.V.A. (2014). Intangible assets and superior and sustained performance of inno-

vative Brazilian firms. *Brazilian Administration Review*, 11, 407- 440. http://dx.doi.org/10.1590/1807-7692bar2014130012.

Gamayuni, R.R. (2015). The Effect Of Intangible Asset, Financial Performance And Financial Policies On The Firm Value. *International Journal of Scientific & Technology Research*, 4(1), 202-212.

Jaffe, A.B., & Chappell, N. (2016). Intangible Investment and Firm Performance. *Motu Working Paper 16-14*, Motu Economic and Public Policy Research.

Li, H., & Wang, W. (2014). Impact of Intangible Assets on Profitability of Hong Kong Listed Information Technology Companies. *Business and Economic Research*, 4(2), 98-113. http://dx.doi.org/10.5296/ber.v4i2.6009.

Nevado, Domingo y López, & Víctor, R. (2002). *El capital intelectual*. *Valoracion y evaluacion*. Madrid: Pearson Educacion.

Omil, J.C., Lorenzo, P.C., & Liste, A.V. (2011). The power of intangibles in high- profitability firms. *Total Quality Management*, 22(1), 29-42. http://dx.doi.org/10.1080/14783363.2010.529642.

Stewart, T. (1995). Trying to grasp the intangible. *Fortune Magazine*, 52-69.

Tahat, Y.A., Ahmed, A.H., & Alhadab, M.M. (2018). The impact of intangibles on firms' financial and market performance: UK Evidence. *Review of Quantitative Finance & Accounting*, 50(4), 1147-1168. http://dx.doi.org/10.1007/s11156-017-0657-6.

Tudor, A.T., Dima, S., Dima, B., & Ratiu, R.V. (2014). The linkage between intangibles and profitability. *Annales Universitatis Apulensis*: *Series Oeconomica*, 16(1), 283-293.

Villalonga, B. (2004). Intangible resources, Tobin's q, and sustainability of performance differences. *Journal of Economic Behavior and Organization*, 54(2), 205-231. http://dx.doi.org/10.1016/j.jebo.2003.07.001.

Volkov, D., & Garanina, T. (2008). Value Creation in Russian Companies: the Role of Intangible Assets. *The Electronic Journal of Knowledge Management*, 6(1), 63-74. http://dx.doi.org/10.1016/j.jebo.2003.07.001.

Wooldridge, J.M. (2002). *Introductory Econometrics*: *A Modern Approach*. *2nd Edition*. Boston: Thomson Learning.

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