Financial and tax risks modeling of a multinational company

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Abstract

This study sought to find out the management practices employed by multinational companies in controlling the financial and tax risks they are exposed to. It also assessed the management practices used by multinational companies in the recent financial crisis. This study is relevant since multinational companies located in developing countries operate under different business environments. Hence, multinational companies in developing countries should control financial risk by using management practices conducive for the environment they operate in. Chevron Corporation was used as a case study. Data were obtained from its annual financial statement published on their website covering the period of year 2009-2018. Based on the result of the Stepwise regression analysis we identified the significant predictors in conditions of the economic environment to estimate the corporate prosperity and profitability measure of Chevron Corp.

Introduction

Hedging policies are used by multinational company to manage risks. Multinational companies are exposed to different types of risks such as country exchange rate, operational risk, political risk etc. The transformation of a firm to multinationals occurs when it begins planning, production, marketing and the financing of its activities on a global basis. Future projections are the basis by which Firms hedge their risks. Hedging policies is strategic for the survival of multinational companies. The aim of Firms in international market is to increase revenue which is achieved by increased production and sales as well as penetration into new markets. Companies use hedging to minimize their investment risk and other risks that are related to the future.

Multinational companies can be classified based on their ownership management and their structural and strategic components with the basic goal of producing goods and services and make profits globally; they enter potential markets to achieve their goal. Products of Multinational corporations are often domiciled in various country currencies. The breakdown of the Bretton Woods system of fixed exchange led to dramatic increase in exchange rates volatility (Smith *et al.*, 1990), the vulnerability of multinational corporations to exchange risk is also occasioned by short term movements in exchange rates which is also often followed by offsetting differences in prices in the corresponding countries (Shapiro *et al.*, 1992).

Financial risk thus implies the possibility of losses that corporate organizations may be exposed to especially when it may not have adequate amount of cash to meet its financial obligations. It can also have been seen as the uncertainty of returns. Risk shows there is a possibility that there won't be the expected

return on an investment. The objective of this study is to consider some events in business transactions which may involves some kind of risks and the required steps necessary to resolve them. In additional, the financial contracts can be used by cooperation to manage risk exposure are also explored.

Literature Review

A number of finance scholars and practitioners have discussed how firms could utilize financial instruments to hedge financial price risk see among others, (Giddy, Ian H., 1983) also (Shapiro *et al.*, 1992). Market imperfections, as seen in taxes, agency problems, asymmetric information, dead-weight costs related to financial distress, may provide leverage for corporations to hedge exchange risk (Dufey et al., 1983). Financial hedging helps alleviate the agency problem associated with the firm's outstanding debt and moves equity owners to closer to the first best operating policy. (Mello *et al.*, 1995) analyze a model in which exchange rate movements are the only source of risk. In such a setting, production

Flexibility enhances firm's value but may not confer a hedging benefit. There are a good number of studies on financial risk measurement; its connection with imprecise probabilities has been mostly overlooked. Risk measures can be viewed as instances of upper (or lower) previsions, thus letting us apply the theory of inaccurate provisions to them (Vicig, P., 2008). A detailed view to risk measurement in financial management can be referenced (Chobot, M, 1994). Apart from well known risk initiatives, not excluding value at risk or coherent and turned in risk measures, there are also other techniques that researcher's employs to assess financial risks. (Su, J. and Furman, E. A., 2017) uses a form of multivariate Pareto distribution to assess financial risks. Spatial financial time series models were also initiated by (Blasques, F *et al.*, 2016).

Kessler in his study gave an implementation systematic approach strategy for risk, the approach is to have the risk management focus and to manage and mitigate the risk around-loss causes (Campos, R. *et al.*, 2004). Attention on the usefulness of innovative soft-computing techniques usage can help to identify correctly the default of a company by adequate financial credit risk projection. (Chai, Y. and Xia, E., 2008) put call attention to that to survive and develop in a significantly viable market, business entities should be in control of possible financial risks and acknowledge their future financial development (using prediction models).

Following the first prediction model made by (Fitzpatrick), a number of studies have emerged, and many predictors have been identified to fore tell the future condition of the business entities, e.g., (Beaver model, Altman model, Springate model) , etc. The accuracy of bankruptcy forecast in different industries is of a great interest to business partners either as investors or creditors, as this can lead to reduction of creditors' risk. The methodical analysis of bankruptcy prediction models is expressed in (Alaka, H.A. *et al.*, 2018). The analysis show that there exist two groups of fashionable and capable tools within the bankruptcy prediction models research area, i.e., statistical tools (multiple discriminate analysis and logistic regression) and artificial intelligence tools as expressed in decision trees, neural networks, etc.

In this study, we test the use of a quite simple classifier, linear regression approach for modeling the relationship between a scalar dependent variable and more explanatory variables (financial indicators) as it performs reasonably well in bankruptcy prediction, as proved by Jones et al. Regression analysis is notably used for bankruptcy forecast, this assertion is supported by the study in (Tudorache, I.C, 2017) or studies done in Romania and Lithuania, which suggest regression models for bankruptcy prediction. In Asia, Europe and America A practical framework of regression was used to make predictive bankruptcy models, the results confirmed the superiority of the global model compared to regional models. (Ben Javeur, S., 2017) claims that regression model shows the opportunity to consider all the indicators in predicting financial distress. (Hwang, R.C. and Chu, C.K., 2018) highlighted a new procedure to estimate

the loss that can arise using logistic regression. (Li, M and Miu, P, 2010) shows a prediction model with dynamic loading on accounting ratio-based and market-based information using a regression approach.

Few researchers have, however, considered the relevance of taxation as part of the change in the Risk-management ideology. Tax remains a 'resultant' determined 'simply' by applying the applicable tax rate to the taxable incomes determined in accordance with the respective jurisdiction's tax rules (International Accounting Standards Board (IASB), 2012). In the context of hectic financial markets, swift alterations in domestic and international tax laws and an enlarged proclivity for tax authorities to engage in aggressive tax administration and collection policies (Weinberger, M *et al.*, 2012) this viewpoint is no longer suitable (Elgood *et al*, 2014) Tax risk-management (TRM) can have substantial propositions for the capacity of organizations to generate commonly responsible and sustainable returns in the short, medium and long term, making it a highly pertinent part of the corporate governance paradigm (Leitch, M., 2003).

Comprehensive system of risk identification and management are now in prominence as mechanism that practically address tax-related risks (consider Institute Of Directors (IOD), 2009; Integrated Reporting Committee of South Africa (IRC), 2011; Loots, 2012).Thus the need to consider the company's overall commercial strategy, the potential impact on stakeholders and the need for improved simplicity and accountability (Organization for Economic Co-operation and Development (OECD), 2006). Corporate governance research has, however, largely ignored the importance of effective TRM (Demidenko, E. & McNutt, P., 2010).

Materials and Methodology

The objective of this study is to examine the formation of the management strategies of financial and tax risks for multinational companies. Chevron Corporation is an American multinational oil company it is active in more than 180 countries. Fourteen (14) financial and accounting variables were utilized as components. Eleven years data from 2009 to 2018 were collected from the Chevron Corporation online report and presentation data bank, and www.annualreports.com. A stepwise regression model is used as a statistical tool to formulate a model to determine the risk involved and on how to manage it. The method of multiple linear regression models was used to create the model. Multiple linear regression models have the dependent variable as a linear combination of independent variables and an intercept:

$$y_i = \beta_o + \sum_{j=1}^{k} \beta_j x_{ij} + \epsilon_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where:

y_i = dependent variable

x_{ij} = independent variable(s)

β_o, β_j = unknown parameter of the model

ϵ_i = error term

Parameters β_j are considered as unknown numerical constant, β_o is an absolute number. The parameter β_j explains the variations in the value of the dependent variable y_i, if the j-th independent variable x_{ij} changes of one unit, provided that the value of other independent variables stays unchanged.

Testing the significance of the model create.

Write the equation of the regression model.

Summary of Findings

The descriptive statistics (Mean, variance and standard deviation) are summarized in table 1 below.

Table 1.   Descriptive Statistics

Variables	Mean	Std. Deviation
GDP Per Capital	4.73834	.046001
Inflation Rate	1.573	1.0041
Total Liability	4.98176	.062563
Total Equity	5.13366	.075759
Total Debt	4.41552	.345394
Interest Expense	2.14491	.492062
EBIT	4.21545	.434704
Total operating cost	5.19843	.079607
Income Tax Expense	3.55320	.889906
Total Asset	5.36712	.068677
Net income	3.97463	.524472
Total expenditure	4.42814	.126614
Total revenue	5.25076	.113819
Sales	5.25996	.136672
Source: Author		

Table 2. Pearson correlating coefficients matrix and P-value

Independent variables	Pearson Correlation Coefficient	Sig.(p-value<0.05)
GDP Per Capital	-.548	.040
Inflation Rate	.402	.110
Total Liability	-.435	.091
Total Equity	-.295	.189
Total Debt	-.598	.026
Interest Expense	-.471	.072
Total operating cost	.941	.000
Income Tax Expense	.711	.007
Total Asset	-.339	.154
Net income	.948	.000
Total expenditure	.397	.113
Total revenue	.963	.000
Sales	.882	.000
Dependent Variable: EBIT		
Source: Author		

Furthermore, Table 2 above shows the test of mutual dependence between the individual independent variables and the dependent variable on the significance level of 0.05, which is compared to the p-value of the test of significance of Pearson correlation coefficient. Even as there exist a mutual dependency between the independent variables and the dependent variable the p-value statistics still shows that some of the independent variables are not statistically significant to explain the dependent variable i.e., there is no significant relationship between them hence they were not included in the model. We decided to include these variables in the model of corporate prosperity estimation considering the independent variables: Income tax expense, Net income, Sales, Total debt, Total operating cost, Total revenue and GDP Per capital having their p-value lower than the level of significance (0.05) hence the null hypothesis was rejected, and we conclude that there is a dependence between the individual independent variables and the dependent variable.

Table 3.   Estimated Model Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
(Constant)		-2.312	2.395		-.966	.366
Total revenue		.749	.535	.196	1.400	.020
Net income		.542	.088	.654	6.190	.000
Income	Tax	.124	.037	.253	3.388	.012
Expense						

Dependent Variable: EBIT

Source: Author

The significance should be below the significance level P-value <0.05 to consider all predictors significant for the model. Table 3 above shows the result of the fitted regression model, all independent variables are below the determined significance level hence we concluded that Total revenue, Net income and Income Tax expense are all statistically significance to predict the dependent variable (EBIT). The model diagnostic check for multi-collinearity was display in Table 4 below.

Table 4.   Collinearity measured by VIF

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Total revenue	.182	7.262
Net income	.143	6.984
Income Tax Expense	.286	3.497

Dependent Variable: EBIT

Source: Author

The variance inflation factor (VIF), calculated in Table 2 above, measures the impact of collinearity among the variables in a regression model. It is always greater than or equal to one. There is of formal VIF value for determining presence of multi-collinearity; however, values that exceed 10 are often regarded as

indicating multi-collinearity. Based on the result in the model it can be concluded that there is no multi-collinearity symptom, as all values are between 1 and 10.

Furthermore, the model significance was using the F-Test (Anova) presented in the Table 3 below

Table 5.   ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.869	3	.623	206.061	0.000
Residual	.021	7	.003		
Total	1.890	10			

Dependent Variable: EBIT

Source: Author

The result value of the calculated F statistics is again compared to the significance level 0.05, and as it is below the determined level, we can conclude that the mode is statistically significant

The final notation of the model of the prosperity quantification, based on the corporate profitability, in condition of the chevron financial data is:

$$Corporate\ prosperity\ (EBIT) = -2.312 + 0.749_{total\ revenue} + 0.542_{Net\ income} + 0.124_{Income\ tax\ expense}$$
(2)

Discussion of finding

Findings from the study show that there is linear relationship between the two macro-economic indicators and the corporate prosperity & profitability of Chevron Corp. The GDP Per capital exhibit a medium and negative linearity with the prosperity & profitability of the Chevron Corp with a correlation coefficient of -0.548 and thus implies that an increase in the corporate prosperity & profitability of Chevron will results to a decrease in the GDP Per capital of United State of America and vice versa. A medium but positive relationship exists between the profitability ratio and inflation rate of United State of America with a correlation coefficient of 0.402 causing an increase in the inflation rate of the United State of America will also increase the prosperity & profitability measure of Chevron Corp and vice versa.

The multi-national industry model of the corporate prosperity and profitability shows that the value of the intercept (Constant) Is the limit value, which means that if all financial ratios are zero and the company has the value of the corporate prosperity equal or less than the constant value (-2.312), the future prosperity of the company is bad, it is considered to be non-prosperous. In that case, the company has to consider their efficiency and profitability in the future or take measures to eliminate or prevent the financial risks. If the value of the corporate prosperity is higher than the constant value, the company is considered profitable in the future. The value $0.749_{total\ revenue}$ implies that a unit measured increase/decrease in Total revenue the corporate prosperity will increase/decrease by 0.749\$. The value $0.542_{net\ income}$ means if the value of Net income increase/decrease by one measured unit, the corporate prosperity increase/decrease of 0.542\$ and lastly the value $0.124_{Income\ tax\ expense}$ means if the value of Income tax expense increase/decrease by one measured unit, the corporate prosperity increase/decrease of 0.124\$.

Conclusion

The main aim of the paper was to strategize the management of financial and tax risks related to the unhealthy financial situation of a multi-national company. The results gained in the model are not just extra important for companies themselves but also for their business partners, suppliers and creditors to eliminate financial and other corporate risks related to the unfavorable financial scenario. Based on the results of the multiple linear regression analysis we can identify the financial predictors, which play a crucial role in the process of the prosperity quantification measured by EBIT and financial risks identification.

The financial prediction modeling helps to predict the financial distress of companies. The importance of the area is underline by the fact that the information about the future profitability eliminates potential financial and tax risks and enables to evaluate the financial health of the company base on some selected external and internal factors. Realizing the multiple regression analysis, we identify the statistically significant determinants that affect the future financial development of the company and thus we form a regression model to estimate the financial risk, the corporate prosperity and profitability. As the statistically significant predictors were determined which includes Total revenue, Total debt, Net income, Sales and Total operating cost and in other to examine some external factors that might affect the model adequacy, two micro-economic indicators which includes GDP per capital and Inflation rate of the United State of American were also gotten from their database online.

The identified factors are significant enough to manage the financial risks and to affect the profitability and prosperity of the company and can be later used in the model to predict the default of Chevron Corporation. The multi-national model of the financial and tax risk management perceived the value of the intercept as the limit value, which means that if the company has the value of the corporate prosperity equal or less than intercept value, there is thread of financial problems in the future. Moreover, the multi-national company considers their cooperation with their strategic plan in the future or take measures to eliminate or prevent the financial risks involved. The limitation of this study can be seen in the use of only one company case study, so while the conclusions reached can be perfectly applied to Chevron Corporation or similar companies in the oil industry, it may not apply to all multinational companies. Future studies can explore a number of case studies that cut across different multinational companies

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