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NHÂN TỐ TÁC ĐỘNG TỚI RỦI RO TÀI CHÍNH CỦA CÁC CÔNG TY NIÊM YẾT TRONG NHÓM NGÀNH DƯỢC PHẨM, Y TẾ VÀ HÓA CHẤT Ở VIỆT NAM

Đào Quỳnh Mai [1]
Sinh viên K57 Ngân hàng và Tài chính quốc tế - Khoa Tài chính ngân hàng
Trường Đại học Ngoại Thương, Hà Nội, Việt Nam

Phan Trần Trung Dũng
Giảng viên bộ môn Tiền tệ Ngân hàng- Khoa Tài chính ngân hàng
Trường Đại học Ngoại thương, Hà Nội, Việt Nam

Tóm tắt

Bài nghiên cứu xem xét các yếu tố tác động tới rủi ro tài chính của các doanh nghiệp niêm yết thuộc nhóm ngành dược phẩm, y tế và hóa chất ở Việt Nam. Bài nghiên cứu sử dụng dữ liệu thứ cấp gồm 352 công ty từ năm 2010 đến năm 2020, và phương pháp bình phương nhỏ nhất tổng quát (Generalized Least Square) nhằm khắc phục những vấn đề của các phương pháp khác và đảm bảo tính chính xác của kết quả hồi quy. Kết quả nghiên cứu cho thấy, cơ cấu nguồn vốn, tính thanh khoản, khả năng hoạt động, trách nhiệm xã hội, quy mô doanh nghiệp có tác động ngược chiều tới rủi ro tài chính; ngược lại, tồn tại mối quan hệ cùng chiều giữa cơ cấu nợ và rủi ro tài chính. Bên cạnh đó, biến độ tuổi của công ty có mối quan hệ cùng chiều với rủi ro tài chính, điều này trái với mong đợi của tác giả. Kết quả bài nghiên cứu mang lại đóng góp về mặt thực tiễn, giúp nhà quản trị tài chính quản trị rủi ro doanh nghiệp hiệu quả hơn.

Từ khóa: Rủi ro tài chính, sức khỏe, dược phẩm, hóa chất, trách nhiệm xã hội

FACTORS AFFECTING FINANCIAL RISK OF LISTED COMPANIES IN HEALTH, PHARMACEUTICAL AND CHEMICAL INDUSTRIES IN VIET NAM

Abstract

This study examines elements that influence financial risk of companies in health, pharmaceutical and chemical industries in Vietnam. The study sample is comprised of panel data for 352 listed firms on the Vietnam stock exchange from 2010 to 2020. To address econometric problems and enhance the quality of regression results, Generalized Least Square (GLS) method is used. The study's independent variables include debt structure, liquidity, profitability, operation ability, capital structure, CSR (Corporate social responsibility) adoption, institutional ownership, interest rate, economic growth, inflation, sale growth, firm size and firm age. The model's findings suggest that, in order to minimize financial risk for companies listed in health, pharmaceutical and chemical industries, special attention should be paid to debt structure, liquidity, profitability,

[1] Tác giả liên hệ, Email: k56.1713340033@ftu.edu.vn

operation ability, capital structure and CSR. Among these factors, profitability, capital structure, liquidity, operation ability, CSR, firm size shows a negative relationship with financial risk. Findings also show a strong positive relationship between debt structure and financial risk. Regarding firm age, the result is unexpected with a positive relationship with firm age and financial risk. Also, the other factors have no correlation with financial risks including institutional ownership, interest rate, GDP, inflation, and sales growth. The outcome of this article is beneficial to business administrators, as they will assist company managers in making the best financial decisions possible in order to enhance the efficiency of financial risk management in businesses.

Keywords: Financial Risk, health, pharmaceutical, chemical, CSR

1. Introduction

In nearly every firm, risk is a key factor. Risk is seen as an unexpected event that should be reduced or mitigated to the greatest extent feasible. To achieve corporate success and sustainability in a globalized environment, it is becoming increasingly necessary to identify, manage, and investigate risk across companies (Rahmi, Azma, Muttaqin, Jazil, & Rahman, 2016). Changes in financial markets, such as interest rates, market rates, and commodity prices, affect financial risk owing to objective causes. It can also be caused by subjective variables, such as a person's financial status.

Currently, Vietnam is getting more integrated into the global economy. Up to now, Vietnam has officially joined, signed and implemented 14 in-force FTAs and 01 FTA has officially been signed, coming into effect, and is currently negotiating 02 FTAs. Health, Pharmaceutical and Chemical industries have become increasingly important and play a crucial role in Vietnam's economy. However, FTA brings opportunities and challenges for domestic pharmaceutical and chemical companies because these firms have been experiencing an increasingly competitive environment. As in today's modernization context, health is the top priority issue of mankind, these industries draw much attention of foreign suppliers and foreign investors, which pose a high threat and stress to local pharmaceutical firms. For example, it is evident that 2020 is a year with many notable M&A deals in the pharmaceutical industry. According to SSI research, the total value of M&A in 2020 is estimated at VND 1,680 billion, with the participation of many foreign investors, with expertise in the list of high-quality drugs. In addition, another problem which may do harm to financial health of these firms is the relatively high input price. Local supply for these firms is heavily dependent on imports, which makes the situation become worse especially with the occurrence of Covid 19. API sources manufactured in China & India account for 55% of global APIs and nearly 70% of total APIs used in drug manufacturing in Vietnam. 2020 is also the year when there is a shortage of key pharmaceutical raw materials (APIs) from China/India, causing high drug production costs. All the above factors enlarge the financial risk of companies in the industries. The volatility of the corporate environment, as well as the inherent contradictions that arise throughout the growth process, forces Vietnamese firms to place a greater emphasis on risk management. This study examines the factors that influence financial risk in Vietnam's health, pharmaceutical and chemical industries. The purpose of this study is to help provide crucial input for risk-based decision-making process. Corporate leaders and policymakers will benefit from the study's findings in terms of financial risk management.

2. Literature review

For both managers and academics, financial risk is a critical concern. Throughout the last few decades, several researchers have dedicated themselves to studying company financial risks from various perspectives.

2.1 Measurement of financial risk

The asset-liability ratio, probabilistic analysis, financial leverage coefficient, and other ways of quantifying financial risks were mentioned in prior studies. In 1984, researcher Alexander Bathory presented a methodology to quantify a company's financial risk using scales based on five sets of financial indicators such as capital structure, profitability, and capital allocation, investment in assets... and identify financial risks using five financial indicators. According to Bathory's approach, the greater the value of FR, the better the financial situation. This study utilizes Bathory's approach to calculate financial risk.

2.2. Effect of financial firm-specific factors

2.2.1 Effect of debt structure

As predictors of financial risk, Cao and Zen (2005) used debt structure as one of his independent variables, along with liabilities magnitude, interest rate, profitability, operation capacity, and solvency. Financial risk is favorably connected with debt amount and structure, according to this research. However, Gang and Dan (2012), Bhunia and Mukhuti (2012) indicated there's also no link between financial risk and debt structure. In Viet Nam, Hau (2017) shared the same result when conducting the research on financial risk of real estate listed businesses on the Ho Chi Minh Stock Exchange.

In fact, in comparison to long-term debt financing, current liabilities financing is short-term, low-cost, and has a higher debt risk. The results of previous research varied, and this prompts the hypothesis:

H1: Debt structure has a significant positive impact on financial risk.

2.2.2 Effect of liquidity

Liquidity reflects the company's capacity to stay solvent in the short term. According to Cao and Zen (2005), liquidity shows no correlation with financial risk. In contrast, financial risk is highly connected with the current solvency ratio according to Gang and Dan (2012), Bhunia and Mukhuti (2012). Hau (2017) indicates that liquidity has a significant negative impact on financial risk. This study aims to test the relationship of liquidity and financial with the hypothesis:

H2: Liquidity has a significant negative impact on financial risk.

2.2.3 Effect of profitability

Profitability is the capacity to create profit from a unit of cost, input or output that represents business outcomes. Charalambakis (2008) conducts a research on the factors affecting financial leverage level with profitability, tax rate, company size, fixed asset ratio, and industry leverage are among the independent factors. The results show that profitability is the only factor that financial risk has an inverse relationship with. In addition, Cao and Zen (2005) showed the same result in terms of the relationship between financial risk and profitability. Oliveira et al. (2017) also look at the characteristics that influenced the financial risks of companies in the United States that went bankrupt between 1980 and 2013 and profitability was employed as one of the independent factors. Although the results of the study differ depending on the model, they demonstrate that numerous

variables have a major impact on the company's risk. Therefore, in this study, the authors established the hypothesis:

H3: Profitability has a significant negative impact on financial risk.

2.2.4 Effect of operation ability

Operational capabilities are firm-specific sets of skills, procedures, and routines established within the operations management system and utilized on a regular basis in configuring operational resources to solve challenges. Several previous studies utilized operation ability as one of its independent variables while examining relationships with financial risk. Cao and Zen (2005) conducted an empirical study on the financial risk of large-scale businesses which claimed that a firm's financial risks have a negative relationship with operation ability. In contrast, Gang & Dan (2012); Bhunia & Mukhuti (2012); Hau (2017) do not support a link between performance and financial risk. Strong operational capability may lead to increased profitability, which in turn ensures company solvency and reduces financial risk. In this study, the authors established the hypothesis:

H4: Operation ability has a significant negative impact on financial risk.

2.2.5 Effect of capital structure

Capital structure is the particular combination of debt and equity used by a company to finance its overall operations and growth. There have also been researches that looked at the link between financial risk and capital structure decisions in the literature (Charalambakis et al., 2008; Oliveira et al., 2017; Turaboglu et al., 2017). Turaboglu et al. (2017), for example, employed the Altman Z-Score and the Springate S-Score values as dependent variables in their research. The debt/equity ratio, short term/total debt ratio, and total assets/fixed asset ratio were all employed as predictive factors in this study, whose findings indicated that all factors, except for the short-term debt ratio, had an impact on the financial failure score. In addition, financial risk is highly connected with fixed capital according to Gang and Dan (2012), Bhunia and Mukhuti (2012). Georges Dionne (2013) argued that risk management improves a company's capital structure, implying that enterprises in good financial standing should utilize their knowledge advantage to devise ways for hedging future price fluctuations. The authors established a hypothesis to test the relationship between capital structure and financial risk:

H5: Capital structure has a significant negative impact on financial risk.

2.2.6 Effect of sales growth

Sales growth is the percent growth in the net sales of a business from one fiscal period to another. It shows the earnings improvement through 2 consecutive periods. Sales growth trends could mirror the business cycle of that industry to some extent. There are few studies conducted to investigate the relationship between sales and financial risks. However, sales have a direct relationship with earnings per share, which shows an inverse relationship with financial risk according to Mehri (2015). Hence, in this research, the authors propose the hypothesis:

H6: Sales growth has a significant negative impact on financial risk.

2.3 Effect of non-financial firm-specific factors

2.3.1 Corporate social responsibility

Corporate social responsibility (CSR) is a self-regulatory business model that enables a firm to be socially responsible to itself, its stakeholders, and the general public. Spicer (1978) was one of

the first researchers to look into the relationship between CSR and financial risk. There is no substantial relationship between financial success and characteristics like social forecasting or having a social responsibility committee, although all of the latter are considerably and negatively connected to overall financial risk and insignificantly negatively correlated with long-term beta. Aupperle and Pham (1989) employ return on asset, return on equity, and return on stock and market metrics of corporate financial performance (CFP) to aggregate the noneconomic components of corporate social performance (CSP). They discover no link between CSP and any measure of financial success, even financial risk. Therefore, in this study the authors aim to test whether:

H7: CSR adoption has a significant negative impact on financial risk

2.3.2 Institutional ownership

Regarding institutional ownership, external stakeholders are increasingly demanding information on the type and quantity of risk that a company takes if most of the external stakeholders are other firms and organizations. Liebenberg (2003) and Pagach (2003) explored the impact of this aspect on ERM adoption in their studies (2011). The importance of this idea has only been shown by the latter. As a result, the following research topic will be investigated in this study to evaluate this hypothesis:

H8: Institutional ownership has a significant negative impact on financial risk

2.3.3 Firm size and Firm age

Next, regarding firm size, there is a common belief that larger banks are riskier owing to a moral hazard issue (De Jonghe, 2010; Uhde & Heimeshoff, 2009). Surprisingly, there is also an argument that larger banks are less vulnerable to risk due to their management competence and efficiency. In addition, firm age is the difference between the current year and the year of establishment. It is argued that the firm which stays longer in the industry will have more experience in management and therefore has better ability to mitigate the risk exposure.

The hypotheses are*:*

H9: Firm size has a significant negative impact on financial risk

H10: Firm age has a significant negative impact on financial risk

2.4. Effect of macroeconomic factors

2.4.1 Interest rate

There is a lot of evidence to back up the idea that interest rates have a big impact on bank risk. The dynamics of inflation and interest rates, according to Hoggarth, Sorensen, and Zicchino (2005), are key variables indirectly impacting financial stability and loan portfolio quality. However, Cao and Zen (2005) prove that there is no link between financial risk and interest rate. The authors aim to examine the relationship of interest rate on firms other than banks with the hypothesis:

H11: Interest rate has a significant positive impact on financial risk.

2.4.2 GDP growth

Banking industry has displayed cyclical tendencies with few exceptions. According to most of the literature, greater rates of growth are related with a more stable economy and a lower risk of banking crises (e.g., Borio & Lowe, 2002b; Festic, Kavkler, & Repina, 2011; Marcucci &

Quagliariello, 2008; Poghosyan & Cihak, 2011; and others). In this study, to examine the impact of GDP growth on financial risk of firms in studied industries, the authors built the hypothesis:

H12: Real GDP growth has a significant negative impact on financial risk

2.4.3 Inflation

According to Arpa, Giulini, Ittner & Pauer (2001), the percentage of risk provisions in total loans in the banking industry varies directly with inflation (both CPI and real estate price inflation). Similarly, Baboucek and Jancar (2005) demonstrate that rising inflation worsen the NPLr. According to Uhde and Heimeshoff (2009), the impact of changes in inflation rates is dependent on whether banks expect inflation and if it corresponds with overall economic instability. In this study, the authors' purpose is the test the impact of inflation on financial risk of sample firms with the hypothesis:

H13: Inflation has a significant positive impact on financial risk.

2.5. Research model and research hypotheses

Research model:

Table 1. Variable summary

Variable name		Measurement	Coding
Dependent variable	Financial Risk	Bathory's approach Which can be expressed as below FR= SZL+SY+GL+YF+YZ The higher the value of FR, the smaller the financial risk. Where: SZL= (profit before tax + depreciation + deferred tax) / current asset SY= Pre-tax profit/operating capital, GL=Shareholders' interests / current liabilities, YF=Net tangible assets / total liabilities, YZ=Working capital / total assets.	FR
Independent variables	Debt Structure	Current liabilities / Total liabilities	DEBT
	Liquidity	(Current assets-inventory)/ current liabilities	LIQ
	Profitability	Net Income Before Taxes/ Average total assets	PRO
	Operation ability	Cost of goods sold/average inventory	OPE
	Capital structure	Equity/total asset	CAP
	Sales Growth	(Current period net sales – previous period net sales)/ previous period	SALE

Variable name	Measurement	Coding
CSR adoption	Dummy Variables: Year with annual report contains sustainable development report =1, Otherwise = 0	CSR
Institutional Ownership	Number of shares owned by institutions/ total number if firm's shares *100	INS
Firm size	Total asset	SIZE
Firm age	Year of research – year of establishment	AGE
Interest rate	Obtained from World Bank	INT
Economic growth	Obtained from World Bank	GDP
Inflation	Obtained from World Bank	INF

Research Hypotheses

H1: Debt structure has a significant positive impact on financial risk.

H2: The liquidity has a significant negative impact on financial risk.

H3: Profitability has a significant negative impact on financial risk.

H4: Operation ability has a significant negative impact on financial risk.

H5: Capital structure has a significant negative impact on financial risk.

H6: Sales growth has a significant negative impact on financial risk.

H7: CSR adoption has a significant negative impact on financial risk.

H8: Institutional ownership has a significant negative impact on financial risk.

H9: Firm size has a significant negative impact on financial risk.

H10: Firm age has a significant negative impact on financial risk.

H11: Interest rate has a significant positive impact on financial risk.

H12: Real GDP growth has a significant negative impact on financial risk

H13: Inflation has a significant positive impact on financial risk.

3. Data and Methodology

The data used in this research is secondary data. The initial purpose of this data is not about supporting research at hand (Ozer *et al*., 2006). Secondary data already exists in records such as financial statements, sales data, expenditure records. Vietnam's health, pharmaceutical and chemical industries consist of 40 listed companies. The 32 chosen companies are 32 largest contributors to market capitalization. Data is collected from financial statements of 32 companies in health, pharmaceutical and chemical industries in Vietnam, which are available on website cafef.vn. The data of 32 companies in the health, pharmaceutical and chemical industries in Viet Nam was collected over an 11-year period from 2010 to 2020, totaling 352 observations.

3.1 Research methodology

Before doing regression analysis, this fundamental analytical stage helps to ensure that the sample is suitable. To verify the trustworthiness of quantitative research outcomes, the authors used POLS (Pooled ordinary least square model), FEM (Fixed effect model), and REM (Random effect model). To remove multi-collinear issue between independent variables, the authors conduct statistical description analysis and correlation analysis. Multicollinearity test results show that the magnification coefficient of VIF variances is smaller than 10, the model does not have multicollinearity phenomenon. The F-test result indicates that FEM is more appropriate than POLS, and the Hausman test result reveals the most appropriate model is REM. After deciding on the best model approach, the authors look at the model's heteroskedasticity, multicollinearity and autocorrelation. There is a flaw in the model, the authors found the detects in the REM model after the hypothesis testing of heteroskedasticity. Finally, the authors utilize the GLS (Generalized least squares) approach to fix it.

3.2 Descriptive analysis

Table 2. Variable correlation matrix

	FR	**DEBT**	**LIQ**	**PRO**	**OPE**	**CSR**	**INS**	**INT**	**GDP**	**INF**	**SALE**
FR	1.000										
DEBT	(0.283)	1.000									
LIQ	0.709	(0.317)	1.000								
PRO	0.424	0.255	0.237	1.000							
OPE	(0.076)	0.001	(0.007)	(0.003)	1.000						
CSR	0.224	(0.068)	0.204	0.100	0.076	1.000					
INS	(0.004)	0.124	0.024	0.024	(0.201)	0.047	1.000				
INT	(0.133)	(0.016)	(0.175)	0.055	0.031	(0.151)	(0.047)	1.000			
GDP	0.137	0.003	0.173	(0.060)	(0.036)	0.178	0.057	(0.779)	1.000		
INF	(0.090)	(0.018)	(0.140)	0.055	0.017	(0.144)	(0.064)	0.679	(0.692)	1.000	
SALE	0.134	(0.044)	0.228	0.244	0.197	(0.063)	(0.163)	0.023	(0.040)	0.050	1.000
SIZE	(0.042)	0.131	0.031	(0.019)	(0.075)	(0.026)	0.112	(0.182)	0.229	(0.149)	0.064
AGE	(0.046)	0.167	(0.060)	0.217	0.047	0.085	0.167	(0.213)	0.264	(0.181)	0.002
				SIZE				**AGE**			
SIZE				1							
AGE				0.228				1			

Source: Results from Stata

The correlations between variables are lower than 50%. Based on the correlation table analysis, it is clear that debt structure, operation ability, institution ownership, interest rate, inflation rate, firm size and firm age have a negative correlation with FR. Meanwhile, the correlation results of Liquidity, Profitability, capital structure, CSR, interest rate, GDP,

Inflation, Sales growth are consistent with most previous studies in the world and in line with expectations.

4. Research Findings

4.1 Results

Table 3. Regression result

	OLS	**FEM**	**REM**	**GLS**
	FR	**FR**	**FR**	**FR**
DEBT	-4.195***	-3.026***	-3.376***	-3.178***
	(-7.58)	(-4.90)	(-5.99)	(-10.23)
LIQ	0.623***	0.475***	0.504***	0.744***
	(6.5400)	(5.5300)	(5.9400)	(10.4300)
PRO	5.400***	5.991***	5.872***	3.767***
	(5.7100)	(6.4500)	(6.6000)	(5.8200)
OPE	0.141***	0.263***	0.226***	0.0526***
	(5.5900)	(7.3600)	(7.6300)	(3.7400)
CAP	9.774***	11.58***	11.07***	8.216***
	(17.3000)	(14.4100)	(17.5300)	(20.2900)
CSR	0.1030	0.2020	0.0914	0.469***
	(0.6400)	(0.7100)	(0.4200)	(4.9500)
INS	(0.2570)	0.2770	0.0131	0.0391
	(-0.88)	(0.5300)	(0.0300)	(0.2700)
INT	(1.1390)	(0.6470)	(1.1310)	0.7000
	(-0.36)	(-0.26)	(-0.45)	(0.4300)
GDP	0.0002	(0.0002)	0.0002	0.0002
	(0.7000)	(-0.43)	(0.9100)	(1.1400)
INF	3.2830	4.021**	3.828**	0.8580
	(1.4100)	(2.2300)	(2.0600)	(0.7000)
SALE	(0.1710)	-0.426***	-0.378***	0.0164
	(-1.37)	(-4.01)	(-3.57)	(0.1700)
SIZE	0.000000253***	0.000000221*	0.000000286***	0.000000167***

	OLS	FEM	REM	GLS
	FR	FR	FR	FR
	(4.1500)	(1.8800)	(3.5000)	(3.4400)
AGE	-0.0285***	0.0347	-0.0345***	-0.0229***
	(-4.05)	(0.5000)	(-2.72)	(-5.23)
_cons	0.2720	-3.326**	(1.4470)	0.0903
	(0.2500)	(-2.43)	(-1.49)	(0.1600)
N	352.0000	352.0000	352.0000	352.0000
R-sq	0.8010	0.6980		

Source: Results from Stata

Note: *, **, ***: Statistically significant at 10%, 5%, and 1%

Multicollinearity test

Table 4. Multicollinearity test

Variable	VIF	1/VIF
GDP	3.08	0.324556
INT	2.84	0.352296
CAP	2.4	0.416969
INF	2.13	0.469376
LIQ	2.04	0.489584
PRO	1.64	0.610864
OPE	1.38	0.72359
DEBT	1.36	0.73654
AGE	1.27	0.784509
SIZE	1.25	0.798239
SALE	1.22	0.816957
INS	1.13	0.888212
CSR	1.12	0.892959
Mean VIF	1.76	

Source: Results from Stata

Overall, all the VIF values for all variables are smaller than 10. Therefore, multicollinearity does not occur in our model.

Heteroskedasticity check for Pooled OLS

White's test for Ho:	Homoskedasticity
against Ha:	Unrestricted heteroskedasticity
chi2(103)	= 321.22
Prob > chi2	= 0.0000

Cameron & Trivedi's decomposition of IM-test

The result for white test shows that Prob > chi2 = 0.0000, which is lower than 5 percent. Therefore, heteroskedasticity occurs in our model.

Autocorrelation check for pooled OLS

Wooldridge test for autocorrelation in panel data

H0:	no first-order autocorrelation
F (1, 31)	= 0.607
Prob > F	= 0.4417

The result of Prob>F = 0.4417, which indicates that this model does not have autocorrelation phenomenon.

Hausman test for selection between FEM and REM

Result of hausman test

Test:	Ho:	difference in coefficients not systematic
	chi2(11)	= (b-B)'[(V_b-V_B)^(-1)](b-B)
		6.56
	Prob>chi2	= 0.8338
		(V_b-V_B is not positive definite)

The Prob>chi2 equals 83%, which is higher than 5%, therefore it does not have enough evidence to reject the null hypothesis. The result shows that the REM model is more suitable than the FEM model. Our selection is the REM model. The next step is hypothesis testing for the REM model.

Autocorrelation testing for REM

Wooldridge test for autocorrelation in panel data

H0:	no first-order autocorrelation
F (1, 31)	= 0.607
Prob > F	= 0.4417

The test for autocorrelation shows that with Prob>P = 0.4417, which is higher than 5%, our model does not have an autocorrelation phenomenon.

Heteroskedasticity testing for REM

Var	sd	= sqrt(Var)
Test:	Var(u)	= 0
chibar2(01)		= 199.97
Prob > chibar2		= 0.0000

The P-value is smaller than 5%, which indicates the heteroskedasticity occurring in this model.

Generalized Least Square model (GLS)

To fix the heteroskedasticity for REM, the Generalized Least Square (GLS) model is used. The result of GLS can be shown in table 4.

The final equation is:

FR = 0.09 - 3.178 DEBT + 0.7444 LIQ + 3.767 PRO + 0.053 OPE + 8.216 CAP + 0.469 CSR + 0.000000167 SIZE - 0.229 AGE

4.2 Key findings

Firstly, regarding debt structure, the coefficient is equal to -4.195 showing the strongest relationship with FR in a negative way, and with financial risk in a positive way. This result supports H1, however, it is different from the research results of Gang and Dan (2012), Bhunia and Mukhuti (2012), and Hau (2017). Those researchers pointed out that there is no direct relationship between debt structure and financial risk.

Secondly, the coefficient of liquidity is 0.744 which indicates that liquidity has a positive impact on FR, meaning a reverse relation with financial risk. Though it is not a strong relationship, it is understandable that the higher the current asset over the current liability, the lower the financial risk the company has to face. The finding supports H2 and is also consistent with the research results of Gang and Dan (2012), Bhunia and Mukhuti (2012).

Thirdly, regarding the impact of profitability on financial risk, the result indicates that profitability has a strong positive impact on FR (with the coefficient of 3.76), which means that it shows a strong reverse relation with financial risk. This result supports H3 and is consistent with the research results of Gang and Dan (2012), Bhunia and Mukhuti (2012).

Fourthly, regarding the impact of operation ability on financial risk, the result indicates that operation ability has a positive impact on FR (with the coefficient of 0.53), which means that it shows a moderate reverse relation with financial risk. This result supports H4 and is consistent with the research results of Cao and Zen (2005).

Fifthly, the result implies that capital structure has a substantially strong positive impact on FR (with the coefficient of 8.21), which means that it shows a strongest negative relation with financial risk among others. This result is consistent with the research results of Gang and Dan (2012), Bhunia and Mukhuti (2012), and Hau (2017).

CSR is the dummy variable in this model. The coefficient of this dummy variable is 0.469. The interpretation of this result is that with other variables being unchanged, the difference of financial risk value between a company who has CSR activity and a company who does not is 0.469 units. This is one of new findings in this research as none of previous research has mentioned

the relationship between financial risk and CSR. The positive relationship supports H7 and is consistent with Spicer (1978).

Regarding the impact of size, the result indicates that firm size has a positive impact on FR (with the coefficient of 0.000000167), meaning a reverse relation with financial risk. Though this coefficient shows a quite weak correlation between financial risk and size of firm, this is to some extent consistent with the expectation and supports H9.

The result of firm age indicates that firm age has a negative impact on FR with the coefficient equaling - 0.229, which means a positive relation with financial risk. This is not consistent with the hypothesis H13, and therefore not consistent with the expectation of the authors. However, the impact of firm age on financial risk is controversial due to some arguments (such as the fast-changing environment makes old experience become less valuable) hence the unexpected outcome in this model is inevitable.

In this research, the result of the regression model shows that INS, INT, GDP, INF and SALE are insignificant to the value of financial risk as the P-value equals 0.79 > 5%, 0.67 > 5%, 0.26 > 5%, 0.48 > 5% and 0.86 > 5% respectively. This research points out that there is no direct relationship between financial risk and institutional ownership, interest rate, GDP, inflation or sales growth of companies in health, pharmaceutical and chemical industries in Viet Nam.

5. Implications and Conclusions

5.1. Discussion and Implications

Overall, among thirteen considered determinants, capital structure has the strongest relationship with FR in a positive way, which means the inverse relationship with financial risk. This result can be easily understood because the capital structure is calculated by the ratios of equity to total assets. The lower the ratio the more of a business is leveraged or owned by the bank through debt. The higher the equity, the lower the debt, and companies also have to pay less interest, therefore, the risk of not meeting requirements for paying debt also decreases. In fact, companies should try to find their optimal capital structure and the equity to asset ratio should not be too low.

In contrast, out of thirteen determinants, debt structure has the strongest relationship with FR in a negative way, which means the positive relationship with financial risk. Debt structure describes the proportion of current liabilities to total liabilities. The summary table indicates that the mean value of debt structure is 0.9, which is substantially high. It explains that sample firms tend to use short-term debt financing as their main source of funds. For this case, they must need a large number of current assets, or they cannot pay their interest and principal. Therefore, the higher this ratio, the higher the financial pressure for the firm, and of course the higher financial risk. Paying attention to the payment capacity is one of the most crucial policies for these firms.

For liquidity ratios, the result shows a significant negative impact on financial risk. As mentioned above, sample companies mainly use short-term debt, this results in the higher need for cash or current assets to pay the interest and the principal of those short-term debts. Therefore, the result of the model can be explained that the more liquid the company is, the less pressure and also less financial risk it has to face. A liquidity management policy should be put in place to better oversee the liquidity condition.

Regarding probability ratio, this ratio has a positive relationship with FR, which means the inverse relationship with financial risk. Probability ratio is calculated by the ratio of profit before tax over average total asset. This is quite understandable in reality as it indicates the performance of the company. It is evident that the company with a strong ROA ratio shows a strong financial health, which helps the company reduce exposure to financial risk. Therefore, the higher the profitability, the lower the financial risk. Companies should develop strategy to boost sales as well as reduce cost to improve profitability.

Next, regarding operation ability, the result shows that operation ability has a positive relationship with FR, which means negative relationship with financial risk. The representative ratio to measure the operation capabilities is inventory ratio. This ratio is calculated by the ratio of cost of goods sold over the average inventory. The ratio calculates the amount of inventory that must be maintained to support a given number of sales. Overall, this ratio indicates the efficiency of the inventory management system. Therefore, it is easy to understand in reality that the higher the operation ability, the lower the financial risk. Firms should pay attention to operational efficiency to better capture the risks emerging from operation.

Regarding CSR which stands for corporate social responsibility, the positive relationship supports H6. This variable is a dummy variable, companies who report their sustainability report and corporate social activity in the financial statement will be marked as 1, if the company does not mention any social activity in its financial report, it will be marked as 0. This is one important variable in this report as none of the previous studies about companies in Viet Nam mentioned the relationship between CSR and financial risk. CSR is increasingly important and becoming a new trend recently. CSR helps companies boost their social image, saving cost and benefit their employees. Therefore, establishing a CSR strategy as well as preparing a report for CSR will help companies' business be more sustainable.

Firm size shows a positive relationship with FR hence a negative relationship with financial risk. Larger firms are less vulnerable to risk due to their management competence and efficiency. This seems to be true in these firms in health, pharmaceutical and chemical industries with the support from model results.

Finally, the firm age shows a negative relationship with FR hence a positive relationship with financial risk. The impact of firm age on financial risk is different from the author's expectation. In fact, the relationship between two variables is quite controversial. The main reason is that the fast change in the health, pharmaceutical and chemical industry makes it more attractive, and the number of competitors is increasingly high. Companies with longer time in the industry must keep up with the change promptly. The cost of changing and transformation for the older firm is higher than for the younger one hence this puts older firms at some levels of financial risk.

5.2. Conclusions

In conclusion, the aim of this study is to evaluate the impact of factors on financial risk of companies in health, pharmaceutical and chemical Industries in Viet Nam. The study was conducted using secondary data in financial statements and annual statements of 32 companies from 2010 to 2020 with 352 observations in total. There are thirteen variables including both firm-specific variables and macroeconomic variables. These variables are debt structure, liquidity, profitability, operation ability, capital structure, corporate social responsibility, institutional ownership, sales growth, firm size, and firm age. The macroeconomic factors include GDP,

inflation, and interest rate. Through analysis, GLS is the optimal model that can be applied. The result from this model indicates that there is a positive relationship between debt structure and financial risk. The findings also indicate that liquidity profitability, operation ability, capital structure, CSR, and firm size have a negative correlation with financial risk. Institutional ownership, interest rate, GDP, inflation, and sales growth are not significant to the change in financial risk. Findings of this research are believed to be useful. These findings will be used as input for the risk management process of any firms in health, pharmaceutical and chemical Industries; therefore, help financial manager in the risk-based decision-making process. In addition, it can also be useful for investors.

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