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Influence of Debt to Equity Ratio on Basic Earning Power Ratio in firms listed on the Vietnamese stock exchange

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Abstract

The study investigates the influence of Debt to Equity Ratio (D/E) (X1) on Basic Earning Power Ratio (BEP) in the telecommunications technology firms listed on Vietnamese Stock Exchange. The study employs a set of aggregated data from 33 telecommunications technology firms listed on the Vietnamese Stock Exchange. The research uses both qualitative and quantitative research methods. For the quantitative research method, the

supporting tool is Stata13 software. The research results show that, the factor D/E (X1) positive influence on BEP of telecommunications technology firms listed on the Vietnamese Stock Exchange. Based on the findings, some recommendations are given for D/E (X1) for improving BEP in the telecommunications technology firms listed on the Vietnamese Stock Exchange.

Keywords: Debt to Equity Ratio (D/E) (X1), Basic Earning Power Ratio (BEP), Accounting, Telecommunications Technology Firms, Financial Ratios

JEL Classification codes: M40, M41, F65

1. Introduction

According to the definition of the 2007 Vietnam Standard Industrial Classification System (VSIC), the telecommunications technology industry provides communication services and related services such as transmission of voice, audio, character, and image, production of computer software, software services and outsourcing, system integration services, information technology services, production, assembly and distribution of computers, etc. Transmission systems for these activities may employ single line of technology or combine different technologies (Vietnam Standard Industrial Classification System - VSIC, 2007) [8]. Business activities of telecommunications enterprises include several components: Service provider, client, service, market price of services, quality of telecommunication services provided to clients, etc. Therefore, investments in telecommunication businesses need to be sustained and developed. However, in the context of global integration, competition within the industry will be increasingly fierce. Every industry has distinct characteristics and capital structures, so enterprises in the industry need to show profitability.

D/E is one of the important financial indicators which helps investors assess financial structure and cash source of business operations.

D/E is the ratio between the capital raised by the firm from lending activities and the equity capital. The Debt to Equity ratio can be used to assess a company's financial leverage. It is also an important measurement for enterprises to self-reflect and assess their own financial situation and discover potential risks to have timely responses.

With D/E ratio, investors could tell the amount of debt that the company owes in comparison to the total value of liabilities. Debt is an amount that must be repaid or refinanced; being subjected to interest pressure, or in the worst case of default, D/E may worsen (be higher) which comes with a higher investment risk because the enterprise bases largely on the funding of debt. D/E could be used as a measurement of how much a company spends for its business activities with the funding of debts instead of internal resources.

2. Literature review

Basic Earning Power Ratio (BEP)

BEP = EBIT / Total assets; this ratio reflects the firm's ability to seek a net profit before tax, its financial leverage. This indicator is effective when comparing multiple firms but different in tax and financial leverage.

This index is very meaningful in comparing the performance of enterprises with the general ground of the industry. Enterprises have higher basic profit margins than the industry and good profit margins. The higher the BEP, the better, the business performance of the business.

Luu and Vu (2011) ^[4] affirmed that one of the indicators to evaluate the profitability of enterprises was Basic Earning Power Ratio (BEP) is also known as the rate earnings before interest and taxes EBIT. This entry reflects the profitability of assets or business capital regardless of the impact of corporate income tax and business origin.

Debt to Equity Ratio (D/E) (X1)

Enterprises could use loans to gain advantage of tax shield. With lower debt expense and tax shield, enterprises can benefit from raising their debts. However, at a high debt-to-equity ratio, debt expenses also increase, and if an enterprise cannot repay their debts, their profitability can be decreased. According to research results by Zeitun and Tian (2007) ^[10], Onaolapo and Kajola (2010) ^[6], Marian *et al.* (2012) ^[5] capital structure (debt-to-equity ratio) has negative impacts on enterprises' profitability. According to the trade-off theory of capital structure, the equilibrium balances the benefits of debt against the cost of debt, and using debt for a certain outcome will yield higher returns. However, benefits of debts will not be stable after a certain level of capital structure is achieved. In other words, if an enterprise depends more on debts, its income tax may decrease, but its financial risks can also be greater.

After reviewing previous research and interviewing experts, in the scope of this study, we use the criteria of debt-to-ratio to represent the independent variable of capital structure. The scale for these indicators is determined as such:

$$\text{Debt to Equity Ratio} = \frac{\text{Debt}}{\text{Equity}}$$

3. Data collection and research methodology

3.1 Research sample

The research sample is an important factor that determines the success of a quantitative study. Generally, there are two methods to choose: Random sampling and haphazard sampling. The random sampling is more widely used and brings more objective results. In this article, we randomly selects telecommunications technology firms listed on Vietnam stock market. This sample source is reliable.

We collected financial indicators of 33 telecommunications technology firms listed on Vietnam stock market ^[9] in the period 2015-2021 and within 2 months and collected 231 observed variables.

3.2 Research model and research hypothesis

Inheriting the above studies and experts' opinions, we built the research model as shown below (see Fig 1):



Fig 1: Research model

Hypothesis H1: Debt to Equity Ratio (D/E) positive influence on BEP in telecommunications technology

firms listed on the Vietnamese Stock Exchange.

3.3 Analysis approach

To test the research hypotheses, we used Stata software to perform the following analysis: Descriptive statistics; Correlation analysis; Regression; autocorrelation by VIF coefficient and heteroskedascity (estat hettest).

4. Research Results

4.1 Descriptive statistic

Table 1 show that the dependent variable includes 1 observed variables; the independent variable includes 1 observed variables. Each observed variable is described by 231 observations. Basic indicators such as mean, max, min, standard deviation (std), variance, skewness coefficient of variation, sum of variables, range, coefficient of variation (p50), coefficient of variation of each observed variable (cv) has been identified and these basic indices accurately reflect the current state of BEP and the influence of X1 on the BEP of listed telecommunications technology firms.

Table 1: General descriptive statistics and detail descriptive statistics

General descriptive statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variable					
BEP	231	.0643923	.1043255	-.6291168	.8308792
Independent variable					
X1	231	1.325621	1.484841	-.7689997	6.400521
Detail descriptive statistics					
Stats	BEP	X1			
N	231	231			
sum	309.7714	306.2183			
range	80.195	14.09052			
variance	22.85648	2.204753			
cv	3.56513	1.12011			
skewness	3.079757	.2743393			
kurtosis	65.55703	10.68445			
p50	.995	1.089836			

4.2 Correlation analysis results

Table 2: Correlation analysis results of independent variable

	BEP	X1
BEP	1.0000	
X1	0.1345	1.0000

Table 2 shows the results of correlation analysis, also known as multicollinearity analysis. The results show that the absolute value of each correlation coefficient between 2 variables is less than 0.8; therefore, no multicollinearity occurs (Bryman & Cramer, 2001; Kohler & Kreuter, 2005; Torres-Reyna, 2007; Ditzen, 2018). The remaining regression model has 1 independent variable with 1 observed variables, 1 dependent variable with 1 observed variables.

4.3 Regression Results

Regression results without control variables

Table 3: OLS regression results

OLS regression results for observed variable BEP of the dependent variable (regress BEP X1)					
Source	SS	df	MS	Number of obs = 231	
Model	.045258168	1	.045258168	F (1, 229) = 4.22	
Residual	2.45802031	229	.010733713	Prob > F = 0.0412	
Total	2.50327847	230	.010883819	R-squared = 0.0181	
BEP	Coef.	Std. Err.	t	P> t	Adj R-squared = 0.0138
X1	.0094472	.0046008	2.05	0.041	Root MSE = .1036
_cons	.0518689	.0091467	5.67	0.000	[95% Conf. Interval]
					.000382 .0185125
					.0338464 .0698914

With 95% confidence degree, Table 5 shows:

Value of F is equal to 4.22 > 1.96 and value of Prob is larger than value of F (Prob > F) by 0.0412 (< 0.05). Thus, the model is consistent and statistically significant (Bryman & Cramer, 2001). R-Squared = 0.0181 means that the independent variable in the research model explained 1.81% of the influence of the independent variable on the dependent variable (BEP). Therefore, the research results are accepted. However, it is necessary to test the goodness of fit of the model (Bryman & Cramer, 2001; Kohler & Kreuter, 2005; Torres-Reyna, 2007; Ditzen, 2018) [1, 3, 7, 2].

Table 4: Result of the autocorrelation by VIF coefficient (estat vif) of X1

Variable	VIF	1/VIF
X1	1.00	1.000000
Mean VIF	1.00	

Table 6 shows that all the observed variables of the independent variables have VIF coefficients < 2, so it can be confirmed that 100% of all independent variables do not have autocorrelation (Bryman & Cramer, 2001; Kohler & Kreuter, 2005; Torres-Reyna, 2007; Ditzen, 2018) [1, 3, 7, 2].

Table 5: Results of heteroskedascity (estat hettest)

BEP
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of BEP
chi2(1) = 205.04
Prob > chi2 = 0.0000

Table 5 shows that Prob > chi2 < 0.05; Thus, there is phenomenon of variable variance, ie the research model is not consistent with the input data. Therefore, there is need to use the model at a higher level (Bryman & Cramer, 2001; Kohler & Kreuter, 2005; Torres-Reyna, 2007; Ditzen, 2018) [1, 3, 7, 2]. The higher-level models are the fixed-effects regression model (FEM) and the random-effects model (REM). However, the results of the FEM and REM models are not significant (P = 0.000 < 0.05) (table 6), so GLS regression model have to used (table 7).

Table 6: Estat hottest: Results of the estat hottest test of the observed variable

Breusch and Pagan Lagrangian multiplier test for random effects
BEP [ID, t] = Xb + u[ID] + e [ID, t]

Estimated results:

	Var	sd = sqrt (Var)
BEP	.0108838	.1043255
E	.007155	.0845874
U	.0030506	.0552325
Test: Var(u) = 0		
chibar2(01) = 53.91		
Prob > chibar2 = 0.0000		

Table 7: GLS regression

. xtglm BEP X1, panels(iid) corr(independent)					
Cross-sectional time-series FGLS regression					
Coefficients: generalized least squares					
Panels: homoskedastic					
Correlation: no autocorrelation					
Estimated covariances	=	1	Number of obs	=	231
Estimated autocorrelations	=	0	Number of groups	=	33
Estimated coefficients	=	2	Time periods	=	7
			Wald chi2(1)	=	4.25
Log likelihood	=	196.9488	Prob > chi2	=	0.0392
BEP	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
X1	.0094472	.0045808	2.06	0.039	.000469 .0184255
_cons	.0518689	.009107	5.70	0.000	.0340194 .0697184

Based on Table 7, p>|z| and Coef column, with the significance level of 5% (95% confidence level), the regression equation for the influence of factor D/E (X1) on BEP is as follows:

$$\text{BEP} = .0094472 \text{ D/E}$$

The observed variable D/E has a positive influence on BEP. Therefore, hypothesis H1 was partially accepted (Bryman & Cramer, 2001; Kohler & Kreuter, 2005; Torres-Reyna, 2007; Ditzen, 2018) [1, 3, 7, 2].

BEP

Table 8: Average BEP over the years of telecommunications technology firms listed on the Vietnam stock market

Description	2015	2016	2017	2018	2019	2020	2021	Average 2015-2021
BEP (%)	7.9	5.8	8.0	9.0	5.8	4.5	4.0	6.4

Sources: <https://finance.vietstock.vn/>; <http://cafef.vn>, Global Data Services Company and authors synthesized ^[9]

Table 9: Average BEP over the years (2017-2021) of each telecommunications technology firms listed on the Vietnam stock market

S. No	BEP<0%		0%<BEP<10%		10%<BEP<20%		BEP>20%	
	Stock code	BEP (%)	Stock code	BEP (%)	Stock code	BEP (%)	Stock code	BEP (%)
1	SRB	-6.1	ABC	0.02	ITD	10.4	SRA	24.2
2	IFC	-4.7	TTZ	0.4	ST8	10.7		
3	LTC	-0.3	VIE	1.6	TTN	11.0		
4			UNI	1.8	ADC	11.5		
5			VEC	1.8	VLA	12.5		
6			TST	2.6	FPT	15.5		
7			CKV	3.3	FOX	16.0		
8			CNN	3.4	CNC	17.7		
9			POT	3.7				
10			VAT	4.4				
11			ONE	4.5				
12			SAM	5.1				
13			KST	5.6				
14			SGT	5.6				
15			ELC	5.7				
16			HPT	5.8				
17			SMT	6.8				
18			VTC	7.0				
19			CMG	8.0				
20			SVT	8.2				
21			CMT	8.7				

Sources: <https://finance.vietstock.vn/>; <http://cafef.vn>, Global Data Services Company and authors synthesized ^[9]

Experts say that, when evaluating BEP, it is necessary to compare with bank loan interest rates. Currently, banks lend firms with interest rates from 7% to 12% / year, so the BEP of 28 telecommunications technology firms listed on the the Vietnam stock market is lower than the interest rate for bank

loans, 5 telecommunications technology firms have BEP which is larger interest rate for bank loans.

D/E

Table 10: Average D/E over the years of telecommunications technology firms listed on the Vietnam stock market

Description	2015	2016	2017	2018	2019	2020	2021	Average 2015-2021
D/E (X1) (%)	134.7	95.8	146.3	131.8	144.8	145.5	129.1	132.6

Sources: <https://finance.vietstock.vn/>; <http://cafef.vn>, Global Data Services Company and authors synthesized ^[9]

Table 11: Average D/E over the years (2017-2021) of each telecommunications technology firms listed on the Vietnam stock market

S. No	D/E (X1) <50%		50%< D/E (X1) <100%		100%< D/E(X1) <200%		D/E(X1) >200%	
	Mã CK	D/E (X1) (%)	Mã CK	D/E (X1) (%)	Mã CK	D/E (X1) (%)	Mã CK	D/E (X1) (%)
1	ABC	-18.66	ELC	50.1	VIE	100.2	SGT	241.9
2	IFC	-6.5	CNC	54.1	ADC	121.2	VTC	273.8
3	SVT	6.9	SRA	54.1	CMG	122.1	HPT	280.3
4	VLA	9.6	SAM	63.3	FPT	125.8	LTC	311.4
5	UNI	15.4	ITD	69.9	CKV	126.0	ONE	333.8
6	SRB	19.7	TTN	74.4	CMT	139.4	CNN	386.6
7	TTZ	21.8	VEC	76.5	KST	142.2	POT	493.8
8	ST8	37.0			TST	148.2		
9					VAT	149.6		
10					SMT	164.3		
11					FOX	186.4		

<https://finance.vietstock.vn/>; <http://cafef.vn>, Global Data Services Company and authors synthesized ^[9]

Tables 10 and table 11 show that the D/E (X1) of telecommunications technology firms listed on the Vietnamese Stock Exchange fluctuated strongly. Many firms have reduced Equity capital. D/E of telecommunications technology enterprises listed on the Vietnamese Stock Exchange in the period 2015-2021 still reveals many limitations, which are: unstable debt, many enterprises with business efficiency are decreasing day by day.

During the period 2015-2021; there are 2 enterprises with negative D/E (ABC, IFC); two enterprises with the highest D/E (CNN, POT).

Generally, D/E is advised to be lower than 1. However, D/E may fluctuate depending on each section that enterprises are operating on. Production usually has a D/E at around 2, but tech is often approximately 0.5 (7 firms). In addition, D/E

also depends on each period of the economy, as enterprises are always affected by the general trend of the market.

5. Discussion and implications

If D/E is lower than 1

(i) For enterprises: Debt is lower than equity, which means that the enterprise are managing risks of debts well. In case the enterprise must pay off their debt urgently, its financial capacity is still capable of handling these debts. (ii) For investors: $D/E < 1$ means that the company's debt management is good, and the lower D/E means better financial capacity.

If D/E is higher than 1

(i) For enterprises: This means the enterprise's debt is greater than its equity, and the enterprise needs to take measures to lower D/E to under 1, assess risks and have appropriate handling. (ii) For investors: If $D/E > 1$, the company is at risk of bankruptcy as debt is greater than equity, which means there is a high level of risk, so investors need to be careful before investing in these enterprises.

Growths that are made from debts could produce higher income and profits than expenses arising from the debts, which could benefit shareholders. In the contrary, if the expenses arising from debts are greater, price of share and profit also decreases.

D/E depends on debts and equity of enterprises. In reality, these indexes have characteristics that may make it difficult for investors to determine D/E.

Using D/E to compare 2 firms, it is important to pay attention to the maturity of debt: Companies that have less short-term debt to pay should usually be preferred, except when banks increase their lending rates.

When 2 firms with the same level of D/E and similar equity, but their debt maturity may be able to reflect the risks and management capacity that the companies possess.

Investment decisions should not be reliant solely on D/E. Investors should make careful analysis and assessment based on other factors such as revenue, invested projects, P/E, P/B, etc.

6. References

1. Bryman A, Cramer D. Quantitative data analysis with SPSS release 10 for windows: A guide for social scientists, 2001.
2. Ditzgen. Estimating dynamic common-correlated effects in Stata. The Stata Journal. 2018; 18(3):585-617. Doi: <https://doi.org/10.1177/1536867X1801800306>
3. Kohler U, Kreuter F. Data Analysis Using Stata. College Station, TX: Stata Press, 2005.
4. Luu TH, Vu DH. Enterprise finance textbook. National Economics University Publishing House [Vietnamese], 2011.
5. Marian A, Circumaru D, Dalia S. The correlation between the return on assets and the measures of financial balance for Romanian companies. International journal of mathematical models and methods in applied sciences. 2012; 2(6):249-256.
6. Onaolapo, Kajola. Capital Structure and Firm Performance: evidence from Nigeria. European Journal of Economics, Finance and Administrative Sciences. 2010; 7(4):23-30. Doi: 10.9790/5933-0704032330.
7. Torres-Reyna O. Panel Data Analysis Fixed and Random Effects Using Stata (v. 4.2). Data & Statistical Services, Princeton University, 2007.
8. Vietnam Standard Industrial Classification System - VSIC. It is issued with the Prime Minister's Decision No. 10/2007/QĐ-TTg, on January 23, 2007.
9. Website: cophieu68.vn; cafef.vn; [https://vietstock.vn](http://vietstock.vn); [https://financevietstock.vn](http://financevietstock.vn) [Vietnamese].
10. Zeitun R, Tian GG. Capital structure and corporate performance: Evidan from Jordan. Australian Accounting Business and Finance Journal. 2007; 1(4):1-24.