Tác động của công bố thông tin tiêu thụ nước đến giá trị doanh nghiệp: tình huống nghiên cứu trong ngành thực phẩm Việt Nam

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TÓM TẮT

Nghiên cứu phân tích tác động của công bố thông tin tiêu thụ nước đến giá trị doanh nghiệp từ dữ liệu 23 công ty thực phẩm niêm yết trên Sở Giao dịch Chứng khoán Thành phố Hồ Chí Minh và Sở Giao dịch Chứng khoán Hà Nội trong giai đoạn từ năm 2010 đến năm 2021. Bằng cách sử dụng các phương pháp ước lượng như bình phương nhỏ nhất (OLS), hiệu ứng cố định (FE), hiệu ứng ngẫu nhiên (RE) và hồi quy hai giai đoạn (2SLS), nghiên cứu đã cho thấy rằng các công bố về mức tiêu thụ nước tác động tích cực đến giá trị doanh nghiệp. Thông qua lý thuyết các bên liên quan, lý thuyết tín hiệu, lý thuyết tính hợp pháp và lý thuyết kinh tế chính trị, nghiên cứu cung cấp bằng chứng thực nghiệm về lợi ích của việc tự nguyện công bố thông tin tiêu thụ nước và hàm ý chính sách cho các nhà quản trị doanh nghiệp, nhà đầu tư và cơ quan quản lý.

Từ khóa: *Công bố thông tin, giá trị công ty, mức tiêu thụ nước, ngành thực phẩm, Việt Nam.*

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Effect of water disclosure on firm value: evidence from food sector in Vietnam

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ABSTRACT

This paper explores the association between water disclosure and firm value in Vietnam's food sector, based on the samples of 23 listed food firms on the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) from 2010 to 2021. By employing Ordinary Least Squares (OLS), Fixed Effects (FE), Random Effects (RE) and Two-Stage Least Squares (2SLS) estimation methods, our study indicates that water consumption reporting is positively associated with firm value. Through the lenses of stakeholder theory, signalling theory; legitimacy theory and political economy theory, the study is expected to provide empirical evidence of voluntary water disclosure's benefits and policy implications for managers, investors, and regulatory authorities.

Keywords: *Firm value, food industry, information disclosure, Vietnam, water consumption.*

1. INTRODUCTION

The fast-changing movement confronts many barriers relevant to the scarcity of natural resources, especially water. Since the rapid economic growth and industrialization have generated heightened demand. The available water resources are diminishing, and this scarcity presents an increasing corporate risk to physical assets, reputation, and financial stability.[1] Therefore, the company increasingly recognizes the need to align its goals with pursuing sustainable growth through responsible operations in using water.[2] Consequently, promoting efficient water resource usage fosters sustainability, resilience, competitiveness, and stakeholder trust.[3]

Ministry of Finance enacted Circular No.155/2015/TT-BTC on October 6th, 2015,

which outlined information disclosure guidelines for listed firms. It introduces a compulsory disclosure mandate for sustainable development, requiring companies to report on seven sustainable development dimensions, including water consumption, in their annual reports. Circular No. 96/2020/TT-BTC has replaced Circular No. 155/2015/TT-BTC since January 1st, 2021 and retained the sustainable development requirements, including water disclosure information.

Many theorem studies prove a favourable association between voluntary disclosure and company's value. From a signalling theory perspective, sustainability information gives favorable notice to the potential stakeholders;[4] thus increasing the value of firm performance.[5] The stakeholder theory posits that a firm with more

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transparent information regarding sustainable activities is motivated by stakeholders' benefits.[6] Furthermore, legitimacy theory[3] also anticipates that environmental, social, and governance information have a beneficial effect on both corporate performance and value.

Nevertheless, the empirical studies' outcomes are controversial in the water and corporate value relationship. Numerous studies have demonstrated the beneficial effects.[7-9] Other researchers demonstrate the unfavorable effect.[7] Finally, many studies show a non-effect association,[10,11] which reveals that the nexus among water disclosure and enterprise value still needs to be explored.

To address the existing literature gaps, the study examines how water disclosure effects enterprise value in an emerging country like Vietnam. In this study, we selected the food industry as a case study for several compelling reasons. Firstly, the food industry in Vietnam plays a vital role in the country's economy and academic landscape.[12] It serves crucial functions such as providing food security, meeting nutritional requirements, and generating employment possibilities. Secondly, the food sector is closely attached to health and consumer safety.[13,14] Since then, the food industry has attracted significant attention from the public, surpassing other industries.[15] Thirdly, the food processing sector heavily relies on essential resources such as water, raw materials, and electricity. Water consumption by the food industry is significant due to resource extraction demands, intricate production procedures, and extensive-scale operations. Fourthly, the extensive supply chain of the food industry increases water consumption. Finally, food companies' production operations have a detrimental influence on the environment. This is mainly due to their insufficient knowledge about waste management, failure to enforce regulations, and lack of civil society engagement in environmental conservation.[12] All of these

factors lead to substantial water consumption in the food industry.[16]

The study provides contributions to the academic literature in two distinct ways. Firstly, it offers empirical evidence support water disclosure's impact on firm value under perspectives of stakeholder, signalling, legitimacy and political economy theory. Secondly, it suggests valuable insights for managers, investors, and regulatory authorities, especially in Vietnam's food industry.

The rest of this paper follows a format: Section 2 summarizes the theoretical frameworks and relevant literature. Section 3 presents an overview of research methodology. Section 4 provides the empirical findings. Finally, Section 5 showcases the conclusion and discussion.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEWS

2.1. Effect of water disclosure on firm value

The stakeholder theory emphasizes the crucial role of a company's cooperation with its stakeholders in achieving success.[17] Companies are not independent entities motivated solely by self-interest; rather, they bear a responsibility to confer benefits upon stakeholders[18] including employees, customers, suppliers, authorities, stockholders, governments, environmentalists, and other groups or individuals affected by the company.[19] Gaining stakeholder support and endorsements is vital for the enterprise's ongoing viability.[20] The corporate social responsibility revelation has proven to be efficacious in securing stakeholder approval.[18] Therefore, according to stakeholder theory, it is evident that organizations ought to improve transparency regarding their water usage policies through increased information disclosure. This approach will enable firms to effectively address the concerns and expectations of stakeholders,[21] ensuring their continuous investment and expediting the firm's sustainable development.

Signalling theory suggests that corporations employ signals as a means of communicating

their capacity to generate profits in the current or future market.[22] These signals extend beyond financial information and encompass non-financial data, such as the company's social and environmental performance and risk management, thus affecting stock prices and firm value.[23,24]

Legitimacy theory centers on the interplay between companies and society, emphasizing the fundamental argument that all activities undertaken by the corporation should be appropriate and adhere to the prevailing values, norms, and societal expectations.[25] Firms voluntarily reveal their social and environmental information to strengthen their social legitimacy and social responsibility.[26] All effort outcomes lead to enhanced firm value.[18]

Political economy theory asserts the intertwined and interdependent relationship between society, politics, and the economy,[27] forming one coherent entity. Consequently, businesses must consider societal and political factors when assessing firm performance. Voluntarily releasing financial, social, and environmental information is a way for companies to alleviate pressure from various, including governments, customers, and environmental organizations, while enabling firms to align their interests with stakeholders.[27] In other words, disclosing information regarding water consumption contributes to the company's sustainable development.

Several empirical studies have examined water disclosure's impact on firm value in nations; however, the findings need more consensus due to varying evidence. The first research stream showed that water consumption reporting has a beneficial association with enterprise value. Khuong et al.[8] conducted an empirical study with 170 publicity firms on HOSE between 2015 and 2019. The outcome asserts that water disclosure is positively associated with firm value using the Ordinary Least Squares (OLS) estimate method. Ali et al.[28] support that water consumption favorably affects earnings per share (EPS). According to their market capitalization, the study concentrated on the top 50 companies in Malaysia's electrical sector.

However, Simionescu et al.[7] discovered two outcomes within their study context. This study examined how water, waste, and energy consumption effects 71 Information Technology firms listed in the S&P 500 from 2009 through 2020. The results indicate that water consumption positively impacts Return on Assets (ROA), indicating increased profitability. In contrast, water consumption negatively affects the Price-to-Book (PB) ratio, signaling a possible market value decline.

On the other hand, Burritt et al.[11] discovered a nonlinear relationship between disclosing water consumption and company value with data from 100 listed Japanese firms. Particularly, profitability was unaffected by water disclosures.

Table 1. Summary of previous studies.

Author	Dataset	Research period	Methodology	Sign
Khuong, et al.[8]	170 public companies on the Ho Chi Minh Stock Exchange	2015 - 2019	OLS	Positive
Ali, et al.[28]	The top 50 market-capitalization companies in the power and electric generation sector	2014 - 2018	OLS	Positive on EPS
Simionescu, et al.[7]	71 technological companies (S&P 500)	2009 - 2020	OLS	Negative on PB Positive on ROA
Burritt, et al.[11]	100 listed companies in Nikkei 225	2013 - 2014	OLS	No effect

2.2. Hypothesis development

Both stakeholder theory[6,20] and signal theory[4,22] propose that the enhancement of transparency in the disclosure of information has a beneficial impact on the value of a company. Furthermore, the inclusion of political economy theory,[24] and legitimacy theory[1] support that the water disclosure positively affects firm value. To shed light on conflicting empirical evidence, some recent studies centered on emerging economies[2,25,29] indicate a beneficial association between water usage and enterprise value. The implementation of Circular No. 96/2020/TT-BTC, which relates to disclosure information, has prompted Vietnamese enterprises, especially those operating in the food industry, to disclose non-financial information. Based on the actual food industry's situation and the argumentation above, we propose the research hypothesis:

Hypothesis: Water disclosure has a favorable impact on corporate value.

3. RESEARCH METHODS

3.1. Data

This study analyzed a dataset from 23 food publicity firms on the Ho Chi Minh Stock Exchange (HOSE) and Ha Noi Stock Exchange (HNX) from 2010 through 2021. According to www.cophieu68.com, which is a collective count of 32 food companies that are currently listed and actively traded on both the HOSE and the HNX. The dataset was collected from 23 food companies, which is 72% of all listed food firms on both the HOSE and HNX. The study's sample was chosen from companies that possessed comprehensive financial data during the examination period. The correctness assurance and financial data reliability can be achieved by sourcing authoritative financial statements. By utilizing historical transaction records, stock prices can be extracted, and data regarding water disclosure is obtained from the firms' annual reports using a scoring technique. All data is winsorized at the 1% and 99% levels to ensure accuracy and remove outliers.

3.2. Variables

3.2.1. Dependent variable

Table 2 presents a complete summary of the definitions and measures of the variables included in the present study. Tobin's q (Q) serves as the dependent variable, which measures the firm's market-to-book value discrepancy. Since 2017, this indicator has gained widespread recognition and evaluates efficiency using market profitability indicators as a proxy firm value.[30] To get (Q), add up the market value of common shares, the book value of preferred shares, and the book value of total liabilities; then divided by the book value of total assets.[31] Additionally, another measurement employed in the calculation Tobin's q is QD.[31-33] QD is obtained by dividing the aggregate value of the firm (including the market value of common stocks, the book value of the preferred stock, long-term debt, short-term debt and subtracting the book value of net current assets) by total assets' book value. An alternative dependent variable is the MB ratio, representing the business's value and the firm's growth opportunities.[34]

3.2.2. Independent variable

Independent variable is Water Disclosure (WCD). Since Vietnam hasn't an official dataset for Vietnam in this domain, we must use the coding method from other research studies.[35-38] Wiseman[36] created a way to evaluate environmental disclosure based on specificity and the presence or absence of monetary information. This method has been used in several studies to measure environmental disclosure.[37] Because of the low disclosure level observed in Vietnam's food sector, we will give WCD a score between 0 and 2. A score of 2 indicates the disclosure of details about monetary and quantity information, a score of 1 represents general information disclosure, and a score of 0 suggests no water consumption information.

3.2.3. Control variables

The control variables consist of GOV, LEV and SIZE, which are employed to control the government ownership, leverage and the size of

listed firms, as in previous studies by Simionescu et al.[7] First, the government ownership value (GOV) measures the government's control over a company, calculated by dividing the owned government share by the total number of shares outstanding.[39] A number of studies have demonstrated a positive impact of GOV on firm value,[40,41] while Musallam[42] reveals an unfavourble effect. Second, the leverage percentage[43] is calculated by dividing total debt by equity. The influence of LEV on firm value continues a topic of contention in scholarly discourse.[44-48] Some scholars provide evidence of a favourable effect of LEV on firm value,[44,46] while others reveal an opposite finding.[47,48] The final control variable is the firm's size (SIZE) which is calculated by the natural logarithm of total assets to measure. A previous study opines a favourable association between company size and firm value.[46]

Table 2. The variables.

Variables	Formula
Dependent variable	
Q	(Market value of equity + Book value of debt) / Book value of total assets.
Independent variable	
WCD	A binary variable that equals 2 if a corporation provides detailed disclosure of monetary and quantity information on water consumption, and 1 if general information disclosure, else 0.
Control variables	
GOV	The percentage of government ownership
LEV	Debt/ equity
SIZE	Ln (total assets)
Others (For robustness test)	
QD	[(Market value of common shares + Book value of preferred shares) + Book value of long term debt + Book value of short term liabilities – (Book value of current asset – Book value of inventory)] / Book value of total asset
MB	Market value of share / Book value of share

3.3. Research model

The research model proposed utilizes panel data, building upon the research conducted by Khuong, et al.,[8] Khunkaew, et al.[9] and Simionescu, et al.:[7]

$$Q_{it} = \beta_0 + \beta_1 WCD_{it} + \beta_2 GOV_{it} + \beta_3 LEV_{it} + \beta_4 SIZE_{it} + \text{Year dummies} + \varepsilon_{it} \ (1)$$

The paper uses four main estimation methods, including Ordinary Least Square (OLS), Fixed Effects (FE), Random Effects (RE), and Two-stage Least Square (2SLS), to examine the relationship between water disclosure and corporate value. In OLS estimation, there might be a correlation between explanatory variables and unobserved and time-constant characteristics, causing bias and inconsistent results.[49] To address this issue, FE and RE are recommended to employ. However, the two methods still consist of potential errors.[50,51] Thus, instrument variables are applied in 2SLS[33] to address endogeneity concerns and enhance the robustness of our analysis.

4. EMPIRICAL RESEARCH

4.1. Descriptive statistics

Table 3. Descriptive statistics.

Variables	Obs	Mean	SD	Min	Max
Q	270	1.396	0.849	0.477	5.889
QD	268	1.016	0.853	-0.173	5.487
MB	265	0.086	0.068	-0.096	0.289
WCD	275	0.567	0.866	0	2
GOV	275	0.219	0.233	0	0.619
LEV	270	1.038	0.817	0.121	4.122
SIZE	262	27.278	1.619	25.248	32.209

Table 3 presents the variables' descriptive analysis in this study. The Q's mean value is 1.396, indicating that, on average, companies operating in the food industry have a market value of roughly 140% of their book value. Notably, the maximum recorded value for Q is 5.889, showing a corporation that possesses a market value above its book value by nearly 6 times. In contrast, the minimum recorded figure

is 0.477, meaning a company with a market value that is only 0.477 times its book value. Moving on to other factors, the mean water disclosure (WCD) value is observed to be 0.567, suggesting that food companies frequently disclose water consumption at an intermediate level. GOV has a mean of 0.219, indicating that, on average, the government controls over 21% of firms in the food industry. The average value of LEV is 1.038, which reveals the firm's debt is typically 1.038 times its equity. Particularly, the lowest value of LEV is 0.121, whilst the max value is 4.122. Lastly, SIZE displays a mean of 27.278, with 32.209 being the highest number and 25.248 being the lowest.

4.2. Correlation analysis

Regarding the correlation analysis, the result in Table 4 displays the findings that reveal important relationships between various variables and firm value (Q). Water disclosure (WCD) significantly correlates with Q at the 1% significance level which means that the firms disclosing more information about their water consumption will likely have higher value. Furthermore, there is a positive association between government ownership (GOV), firm size (SIZE), and Q, suggesting that higher government ownership and bigger size firms tend to obtain better Q. In contrast, leverage (LEV) exhibits a negative correlation with Q at a significance level of 1%.

Table 4. Pearson analysis.

	Q	QD	MB	WCD	GOV	LEV	SIZE
Q	1						
QD	0.981***	1					
MB	0.769***	0.740***	1				
WCD	0.407***	0.398***	0.320	1			
GOV	0.134**	0.130**	-0.098	-0.124**	1		
LEV	-0.162***	-0.115	-0.062	-0.049	-0.028	1	
SIZE	0.192***	0.201***	0.313***	0.312	-0.356	0.044	1

***, **, *: 1%, 5%, 10% significant level

4.3. Regression analysis

In Table 5, we use a t-test to investigate differences in firm value factors such as Q, QD, MB, and other variables between the water disclosed group (WCD > 0) and the non-disclosure group (WCD=0). Firm value of WCD > 0 group is significantly higher than the non-disclosure group. Furthermore, the control variables such as government ownership (GOV) and company size (SIZE) also show differences between the two groups in this analysis. The p-value of 0.202 indicates that the mean of the variable leverage ratio[43] is not notably different between both groups.

Table 5. Subsample analysis.

	WCD=0	WCD > 0	Difference	T	p-value
Q	1.167	1.912	-0.745	-7.271	0.000
QD	0.784	1.514	-0.730	-7.097	0.000
MB	2.789	4.558	-1.769	-5.729	0.000
GOV	0.244	0.165	0.078	2.617	0.005
LEV	1.066	0.977	0.089	0.837	0.202
SIZE	26.962	27.970	-1.007	-4.868	0.000

After the examination of the subsample, we conduct a regression analysis. The coefficients, together with corresponding standard deviations, are enclosed between parentheses and denoted by an asterisk to express the level of significance. In Table 6, the OLS method is employed to estimate the model, which examines how water disclosure effects enterprise value. Both variations of the OLS model were employed with and without year dummies. To assess heteroscedasticity, we employed the Breusch-Pagan test. The presence of a significant p-value suggests the rejection of the null hypothesis, indicating the existence of heteroscedasticity. Consequently, we apply robust standard errors in the OLS estimation to account for this heteroscedasticity. Moreover, VIF values (Variance Inflation Factor) below 10 indicate a low level of correlation among variables or low multicollinearity. The findings from both models indicate a statistically significant impact of the WCD on Q. Therefore, this finding provides approval to the above hypothesis, revealing water disclosure has a favorable effect on corporation value.

Table 6. Impact of water disclosure on firm value.

Dependent variable	Q	
Method	OLS	OLS
WCD	0.354***	0.356***
	(0.055)	(0.064)
GOV	0.928***	0.947***
	(0.207)	(0.210)
LEV	-0.187***	-0.188***
	(0.057)	(0.058)
SIZE	0.098***	0.100***
	(0.031)	(0.032)
Const	-1.523*	-1.504*
	(0.862)	(0.892)
Year dummies	No	Yes
R-square	0.254	0.270

***, **, *: 1%, 5%, 10% significant level

Table 7 indicates FE and RE estimation methods, which reinforce the beneficial impact of WCD on Q at 1% and 5% significant levels. Hausman test results prove that FE method provides a better alignment to the data than the RE. 2SLS estimation method mitigates endogeneity in the research model. The findings obtained in the 2SLS estimation provide evidence that strongly supports our hypothesis. Next, Durbin and Wu-Hausman tests prove that 2SLS method resolves endogeneity effectively.

Table 7. Impact of water disclosure on firm value.

Dependent variable	Q		
Method	FE	RE	2SLS
WCD	0.101**	0.164***	0.365***
	(0.049)	(0.047)	(0.061)
GOV	-0.362	-0.053	2.330***
	(0.279)	(0.258)	(0.815)
LEV	-0.041	-0.053	-0.208***
	(0.071)	(0.065)	(0.063)
SIZE	0.328***	0.161***	0.172***
	(0.103)	(0.058)	(0.054)
Const	-7.498***	-3.030*	-3.834**
	(2.791)	(1.586)	(1.624)
Year dummies	No	No	
R-square	0.124	0.101	0.115
Hausman (Chi²)	20.28	*p-value*	0.0004
Durbin (Chi²)	3.938	*p-value*	*0.047*
Wu-Hausman F	3.905	*p-value*	*0.049*

***, **, *: 1%, 5%, 10% significant level

4.4. Robustness tests

For the purpose of substantiating the research outcomes, we replace the primary dependent variable, Q, with two alternative proxies, namely Tobin's Q detail (QD) and the market-to-book

ratio (MB). Table 8 presents the estimation approach for the QD variable utilizing the OLS, FE, and RE methods. Table 9 displays the OLS estimate as well as the 2SLS estimate for the MB variable, facilitating a full examination of the findings. The results shown in both tables provide more evidence to support our hypothesis that WCD has an advantageous impact on firm value. In relation to the alternative proxy QD, we notice that the WCD has a positive impact on the QD in all three estimating methods. Nevertheless, the variables GOV and LEV lack a statistically significant influence on corporate value. Moreover, government ownership has a non-effect for MB in the OLS estimation. The 2SLS estimated a favorable impact of WCD on MB, with a significance level of 10%. The Durbin and Wu-Hausman test reveals that 2SLS outcome is sustainable.

Table 8. Robustness test 1.

Dependent variable	QD		
Method	OLS	FE	RE
WCD	0.360***	0.085*	0.146***
	(0.065)	(0.050)	(0.048)
GOV	0.965***	-0.280	0.052
	(0.213)	(0.287)	(0.262)
LEV	-0.139**	-0.007	-0.028
	(0.059)	(0.071)	(0.065)
SIZE	0.106***	0.282***	0.161***
	(0.032)	(0.104)	(0.057)
Const	-2.114**	-6.687**	-3.470**
	(0.907)	(2.837)	(1.576)
Year dummies	Yes	No	No
R-square	0.2556	0.093	0.075
Hausman (Chi²)	9.51	p-value	0.0496

*** , ** , *: 1%, 5%, 10% significant level

Table 9. Robustness test 2.

Dependent variable	MB	
Method	OLS	2SLS
WCD	0.595***	0.433*
	(0.194)	(0.249)
GOV	0.975	2.738**
	(0.640)	(1.165)
LEV	-0.462***	-0.621***
	(0.173)	(0.201)
SIZE	0.421***	1.158***
	(0.098)	(0.391)
Const	-7.959***	-28.531***
	(2.731)	(10.716)
R-square	0.224	0.013
Year dummies	Yes	No
Durbin (score) chi2	4.769	*p-value: 0.029*
Wu-Hausman F	4.744	*p-value: 0.030*

*** , ** , *: 1%, 5%, 10% significant level

5. CONCLUSIONS

By employing Ordinary Least Squares (OLS), Fixed Effects (FE), Random Effects (RE), and Two-Stage Least Squares (2SLS), this study presents robust and compelling empirical evidence that the voluntary information disclosure on water consumption exerts a positive influence on the firm value of enterprises operating within Vietnam's food industry. The outcomes are highly supported by stakeholder, signalling, legitimacy and political economy theory. Additionally, the study provides evidence about water consumption information has a positive effect on firm value in the food industry. Finally, this study fills the research gap and offers valuable insights into the nation's industrial environment's context-specific intricacies.

The study's findings are significant for sustainable finance scholars and enterprises, particularly in emerging economies like Vietnam. Firstly, it recommends that managers prioritize

disclosing water consumption information. This approach enables managers to effectively address transparency and sustainability needs, satisfying stakeholders' expectations. Secondly, it offers notable benefits to investors, who can leverage the disclosed information to make decisions when choosing stocks, given its positive effect on firm value. Thirdly, the regulatory authorities can take advantage of research outcomes to develop robust and effective policies referring to information disclosure practices. Finally, policymakers may promote accountability, environmental responsibility, and long term value creation within the food industries.

However, this study is subject to limitations, such as omitting control variables (ownership structure and growth proxies), which may have caused biases and absent variables' concerns. In addition, acquiring data was challenging due to the official sources on sustainable reporting in Vietnam. Thus, the findings might not capture the entire landscape of water disclosure in Vietnam's food industries. Therefore, by addressing these constraints in the future, scholars can enhance comprehensive and robust outcomes, contribute to a full understanding of the relationship between disclosure practice and corporation's value in Vietnam.

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