

# Impact of Foreign Direct Investment (FDI) on Unemployment in Somalia

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**Abstracts:** This study evaluates the impact of foreign direct investment (FDI) on unemployment in Somalia. To achieve this goal, a co-integration analysis of the Johansen and VAR models was conducted using annual data from 1991 to 2021. The results indicate that there is no significant long-term relationship between foreign direct investment net inflows and unemployment. Furthermore, the long-term and short-term effects of FDI on unemployment are not significant. Based on the findings, it can be concluded that FDI does not contribute to a reduction in the unemployment rate in Somalia. Therefore, governments in the region should aim to attract labor-absorbing FDI and channel foreign investment inflows towards labor-intensive sectors with high labor-absorptive capacity, such as horticulture and floriculture.

**Keywords:** Foreign Direct Investment, VAR, Variance Decomposition.

## 1. INTRODUCTION

Many scientists and politicians are discussing the phenomenon of unemployment since it is closely related to the whole society and economy because unemployment is a vast and significant concern problematic topic for both developed and developing countries, leading to a wide range of socioeconomic problems whose relevance is highly dependent on economic activity. There has always been a trend that some countries have a higher level of unemployment like Somalia, and some have a lower level. Policymakers especially for developing countries concern this acute problem as it affects the economic welfare and social instability. A high unemployment rate reflects a chronic labor shortage (Rustamugli & Baxodirovna, 2021) and can increase a person's vulnerability to crime and criminality in society, potentially disrupting economic stability (Jawadi et al., 2019). (Muhammad Irfan et al., 2016) reported that high unemployment contributed to high crime rate in Malaysia. So policy holders introduce different measures in order to solve this problem, with the aim to reduce the rate of unemployment. Thus one of the most important solutions that can decrease the spike of unemployment rate is economic growth. Studies conducted by (Hjazeen et al., 2021; Islam et al., 2021; Soyulu et al., 2018) show economic growth decreases the rate of unemployment. In other words, 1% of decrease in the GDP brings 0.276 increase of unemployment rate (Amor & Hassine, 2017).

Since the economic growth is the most important solution of unemployment of developed and developing country economies, governments, policymakers and politicians make efforts increase economic to reduce the unemployment and create social stability. Since Somalia is in African, it is important to know what factors affect the economic growth of Africa. Domestic investment, net ODA inflows, education, government effectiveness, urban population, metal prices positively and significantly affect Africa's economic growth (Anyanwu, 2014) and trade-exports (Sakyi & Egyir, 2017). The result of a study by (Akisik et al., 2020) indicate that foreign direct investments FDI has a positive impact on economic growth and nowadays the issue of foreign direct investments (FDI) is being paid more attention, both at national and international level. It has been experienced that FDI have solved many major problems and can play crucial role on stabilizing and developing the economy of the host countries, especially in developing countries (Karimov et al., 2020).

Therefore, it is crucial to analyze various scenarios in the case of solving issues of unemployment through foreign direct investment (FDI) of the host country. FDI increase the unemployment of the guest country if the host country bring their own staffs, management or advanced technologies etc because they do not hire additional employees. However, on the other hand they can bring labor-intensive technologies and utilize domestic labor so in

this scenario FDI will create additional employment.

Research on FDI and unemployment is deemed crucial in developing countries where unemployment is high and on the rise to guide policy formulation on achieving sustainable youth employment. Somalia, in particular, is behind on such research. To the best of our knowledge, there is no study that has addressed the effect of FDI on unemployment in Somalia. This study, therefore, bridges the knowledge gap in the literature on the causal relationship between FDI and unemployment in Somalia. The rest of the paper is structured as follows. Section 2 presents an overview of the literature on FDI and unemployment in Somalia as general. Section 3 presents the theoretical framework and empirical procedure; Section 4 describes the data used in the study. Section 5 presents and discusses the results, and section 6 draws conclusions.

## 2. LITERATURE REVIEW

The relationship between Foreign Direct Investment (FDI) flows and the unemployment rate have been intensely analyzed by academicians, researchers and theorists during the last decades but the results are different and contradictory. Therefore, FDIs can be classified in two types, one of them is as if they can establish new companies in which they supposed to hire new employees, in this case it will have positive effect on labor market of the host country, and thus they will create employment. Another type is merging with an existing domestic company or if the domestic company is fully purchased, it will not be possible to create additional employment because it already exists. In the following sections, we will look at the previous studies to the first scenario.

(Atilaw Woldetensaye et al., 2022) investigated the effect of foreign direct investments on unemployment in East African IGAD member countries from 1996–2021 utilizing Okun's law. The study revealed that: foreign direct investment negatively, significantly impact the annual rates of unemployment and population growth and economic expansion in the host countries as well. Likewise (Alalawneh & Nessa, 2020) studied the effects of FDI on unemployment for male and female unemployment but in the long-term using the Fixed Effect Model (FEM) and Random Effect Model (REM), as well as they established the causal link in the short-term using Panel VAR (Granger causality tests). Their findings demonstrated that FDI lowers the long-term unemployment rate for all groups, men and women. However, the result shows there is no causal relationship between FDI and unemployment in the short-run.

(Felicien & Elias, 2020) analyzed the impact of foreign direct investment, population growth, and inflation on unemployment in Rwanda using Johansen con-integration test and Error Correction Model (ECM), annually, periodic data from 1985 to 2018. The results indicated that there is a significant long-run relationship between foreign direct investment net inflows (% of GDP), population growth (annual %), inflation, GDP deflator (annual %), and unemployment (% of the total labor force) as well as in the short-run. the two independent variables (population growth and inflation) have a positive impact on unemployment, but Foreign Direct Investment has a negative impact on unemployment in the period of study. About inflation and unemployment there is no presence of causal relationship. Fully Modified Ordinary Least Squares (FMOLS) and the Johansen co-integration methods used by (Osabohien et al., 2020) obtained from a time frame of thirty two years that foreign direct investment is statistically significant and positively related to the employment level in Nigeria in the long-run as well as in the short-run.

However, (Anyanwu, 2013) analyzed characteristics and macroeconomic determinants including domestic investment rate, government consumption expenditure relative to GDP, the inflation rate (percentage change in CPI), real per capita GDP, and real GDP growth on youth employment in Africa and found out that FDI has an insignificant effect on youth employment in the continent as a whole and in North Africa. (Caporale & Gil-Alana, 2014) also found that the impact of FDI on youth unemployment was insignificant in Europe.

(Mkombe et al., 2021) examined the effect of foreign direct investment (FDI) on youth unemployment in the Southern African Development Community (SADC) region using panel data from the World Bank World Development Indicators from 1994–2017. Results from the Feasible Generalized Least Squares (FGLS-Parks) technique revealed that FDI has an insignificant effect on reducing youth unemployment in the SADC region. This could be because the type of FDI in the region is partly mergers and acquisitions, which has fewer jobs creating

capacity compared to Greenfield investment. The study suggests that there is a need for governments in the region to pursue labor-absorbing FDI policies and also ensure that foreign investment inflows are channeled towards labor-intensive sectors that have high labor-absorptive capacity, such as horticulture and floriculture.

### 3. METHOD

We employed annually data series for the Foreign Direct Investment (FDI) and Unemployment (UNEMP). Percentage is measured the unemployment (UNEMP) and Foreign Direct Investment (FDI) is measured Inward Flows of Current Prices (Millions). We analyze a monthly data span from 1991 to 2021.

The descriptive statistics presented in Table 1 the variations of coefficients show that the highest varied among the variables is (FDI) i.e 164.200 and 0.292, respectively. The average unemployment rate of Somalia for last three decades is 19.318 which indicate Somalia has a very high unemployment rate where the average of foreign investment is 131.389. On the other hand, the result of Table 2 display there is a negative correlation between FDI and unemployment rate in Somalia. If we consider the statistical data analyzed, we can see in Figure 1, the unemployment in Somalia is the very high throughput of the analyzed period although in 2015 it was very low. But we can notice the rising trend of FDI in Somalia starting from 2005 apart from 2008 due to world economic recession and the 2011 U.S. Debt Ceiling Crisis, the FDI was a little bit low.

Methodologically, we utilize Granger-causality test proposed by (Granger, 1969) which is the most influential work on causality and led to the invention of the term Granger-causality. Next, the Impulse Response, Forecast Error Variance Decomposition (VDC) then is employed to investigate the changes between the variables. Variance decomposition is employed to show how much of the variable of a variable can explained by the innovation to another variable in the same system of simultaneous equation known as Vector Autoregressive (VAR) model when the VAR is assumed that there is no deterministic components. The representation series in levels of a VAR, one can write

$$y_t = \beta_1 y_{t-1} + \beta_2 y_{t-2} + \dots + \beta_l y_{t-l} + \varepsilon_t \quad (1)$$

where  $y_t$  represents a  $(n \times 1)$  vector of a commodity,  $\beta$  is  $(n \times n)$  matrix of coefficients. In a general format this relationship can be represented as Vector Error Correction (VECM) and it is formulated as:

$$\Delta y_t = \delta_1 \Delta y_{t-1} + \delta_2 \Delta y_{t-2} + \dots + \delta_{l-1} \Delta y_{t-l+1} + \Pi \Delta y_{t-l} + \varepsilon_t \quad (2)$$

$$\delta_i = \sum_{i=1}^{l-1} -\beta_i; \quad \Pi = I_n + \delta_{l-i}$$

#### 3.1. The Co-Integration Test

The co-integration testing developed by (Engle & Granger, 1987) is used to check long term relationship between FDI and unemployment rate. First this study we employ the method developed by (Johansen, 1991, 1995) and (Johansen & Juselius, 1990) abbreviated (JJ). The important advantage of JJ approach is that it can be applied I(2) or higher order series as long as the series are having same order of integration. Since our variables are stationary for the first difference, we can apply JJ to test for con-integration of the variables.

#### 3.2. Granger-Causality Test

The progress of Granger-causality is primarily due to the data-driven methodology's ability to allow analysts to find directional effects of variables without previous knowledge of the subject matter because if two or more variables are co-integrated, then there must be Granger-causality (either in the short-term or long-term or both) between them-either one-way or in both directions although the contrast is not true, when the series are not co-

integrated. As a result, the vector error correction model (VECM) plays a significant role in identifying the endogeneity or exogeneity of the variables in the model. Therefore, the VECM is employed to ascertain the direction of the causal effects in the system given that the co-integration tests do not imply the direction of Granger causality. The regression model of Granger-causality was formulated as:

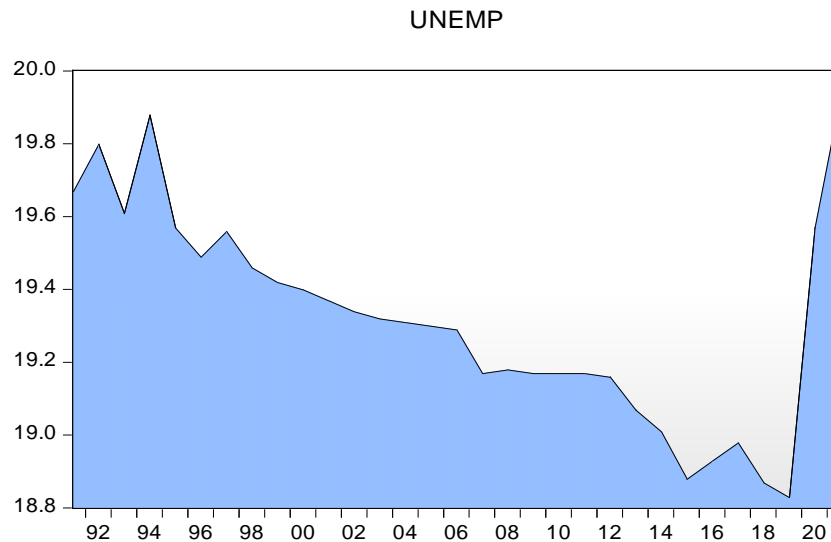
$$x_t = \alpha_0 + \sum_{i=1}^p \omega_i x_{t-i} + \sum_{j=1}^q \varphi_j y_{t-j} + e_t \tag{3}$$

$$y_t = \beta_0 + \sum_{i=1}^p \delta_i x_{t-i} + \sum_{j=1}^q \eta_j y_{t-j} + v_t \tag{4}$$

Variable x lead variable y if the results showed that only the null hypothesis was rejected. However, a causal relationship between x and y exists if both null hypotheses  $H_0$  and  $H_1$  were rejected.

**Table:1 Descriptive statistics**

	FDI	UNEMP
Mean	131.389	19.318
Median	87.000	19.310
Std. Dev.	164.200	0.292
Skewness	0.924	0.251
Kurtosis	2.346	2.409
Jarque-Bera	4.966	0.777
Probability	0.083	0.677
Observations	31	31



**Figure 1.** UNEMP evolution in Somalia, during 1991-2021

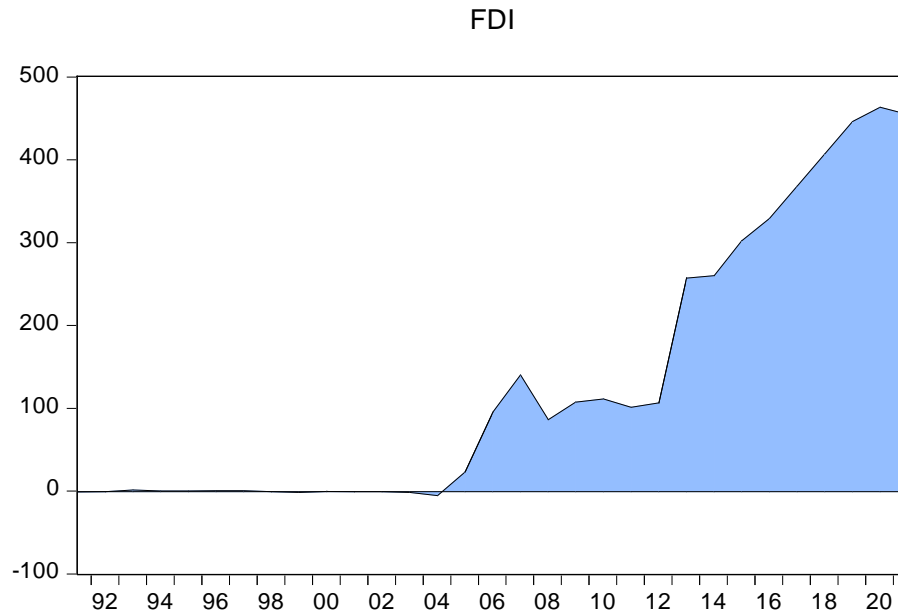


Figure 2. FDI evolution in Somalia, during 1991-2021

#### 4. RESULTS

As per the prerequisite of the Johansen co-integration test, the selected time series must be non-stationary at level 0 and stationary at the first difference. Table 2 presents the ADF and P.P tests conducted on the variables. The results of the unit root tests indicate that the variables Unemployment and Foreign Direct Investment (FDI) are non-stationary at level 0, meaning the series has a unit root. Since the series has a unit root at level 0, we must take the first difference. After taking the first difference, the series becomes stationary, as per the outputs. T-statistics greater than the critical values at the 5% level of significance and P-values less than 0.05 confirm that the null hypothesis that the series has a unit root at the first difference should be rejected. Therefore, ADF and PP results indicate that the observed series is integrated of order I (1), and the Johansen co-integration test can be performed on integrated series of the same order, I(1). Based on the ADF and PP unit root tests, our series are integrated in the same order, I(1).

Table 2 Unit root test

Variable	Type	ADF		PP	
		Level	1 <sup>st</sup> difference	Level	1 <sup>st</sup> difference
UNEMP	Intercept	-1.351	-4.310***	-1.351	-4.331***
FDI	Intercept	0.963	-4.953***	1.161	-4.953***

\*\*\* \*\* Symbols show the two tests ADF and PP are significant at 1% and 5% level and first difference of the variables.

The results of the co-integration test in Table 3 indicate that both the trace and max-eigenvalue tests were conducted at a 5% significance level. This suggests that the study's variables do not have a long-run association with each other since the trace test's p-values (0.092<0.05) and the null hypothesis that there is no co-integration between UEMP and FDI cannot be rejected. Additionally, the null hypothesis that there is no co-integration between the analyzed series cannot be rejected based on the maximum eigenvalue test's p-value (0.163<0.05). These findings, along with the Johansen co-integration test results, lead us to conclude that there is no long-run relationship between the independent variable (FDI) and the dependent variable (UNEMP).

**Table 3 Johansen Co-integration test for UNEMP and FDI**

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.311	13.683	15.494	0.092
At most 1	0.094	2.872	3.841	0.090
Unrestricted Co-integration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.311195	10.81112	14.26460	0.1639
At most 1	0.094311	2.872732	3.841466	0.0901

Trace test indicates 1 co-integrating eqn(s) at the 0.05 level.

Max-eigenvalue test indicates no co-integrating eqn(s) at the 0.05 level.

\* denotes rejection of the hypothesis at the 0.05 level.

Note: \*\*MacKinnon-Haug-Michelis (1999) p-values.

Since we have established the long run relationship among the relevant time series and found absence of co-integration, we can estimate the differenced VAR for variance decomposition and consequence the impulse responses. The optimum lags will be chosen based on Akaike information criterion. Variance decomposition enables us to distinguish the relative importance of the economic variables in the models. Estimated results are shown in Table 3.

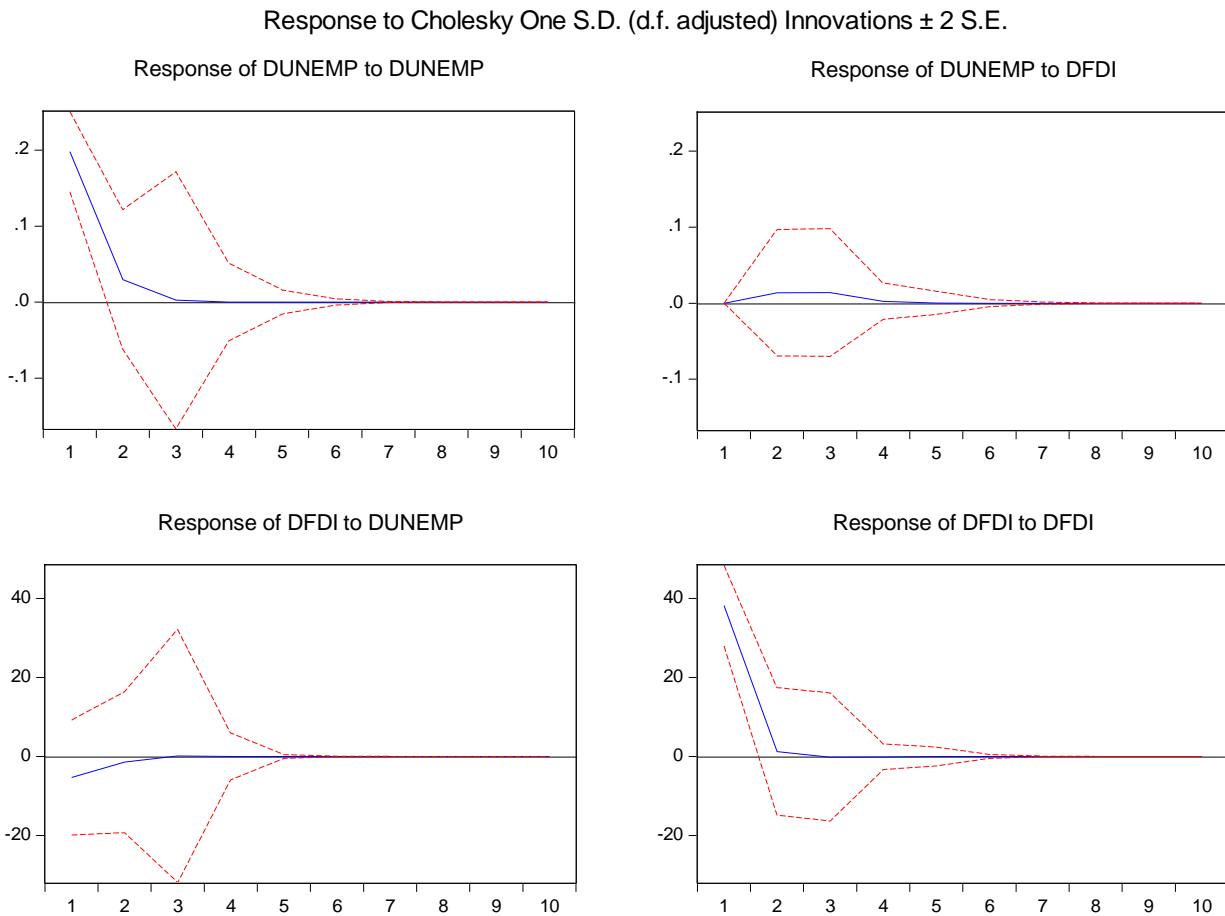
Table 3 indicates that the reported numbers indicate the percentage of forecast error in each variable that can be attributed to innovations in other variables in five different years. First part of Table 4 indicates that the innovation of unemployment rate is due to its own innovation. In the short-run simply indicates unemployment has strong impact on itself. So FDI does not have influence on unemployment in the short-run. This indicates that the innovation in unemployment is mainly explained by its own variation but FDI does not impact it in both long-run and short-run.

The second part of Table 3 shows that FDI growth variability is attributed to shocks by itself (98 %) in the first period, while 1.9% is due to changes in unemployment. However, as time goes by, the explanatory innovation increased to 2% until fifth year. This means that the innovation in the FDI growth rate is mainly explained by its own past values. The conclusion of variance decomposition analysis is that unemployment rate (UNEMP) is weakly sensitive to change in FDI but not conversely. Thus, foreign direct investment (FDI) in Somalia might not create new jobs in the concerned period of time.

**Table 4 Variance Decomposition of DUNEMP and DFDI**

Variance Decomposition of DUNEMP			
Period	S.E.	DUNEMP	DFDI
1	0.197	100.000	0.000
2	0.200	99.533	0.466
3	0.201	99.054	0.945
4	0.201	99.038	0.961
5	0.201	99.038	0.961
Variance Decomposition of DFDI:			
Period	S.E.	DUNEMP	DFDI
1	38.594	1.893	98.106
2	38.641	2.025	97.974
3	38.642	2.026	97.973
4	38.642	2.026	97.973
5	38.642	2.026	97.973

Figure 1 shows that among these self-responses, all variables have permanent effects by their own innovations. The first line in Figure 1 shows the responses of UNEMP to itself and other variables. The shocks of FDI is positive but is not significant. On the other hand, the shocks of UNEMP is negative but also not significant.



As mentioned previously, causal relationship will be checked between UEMP and FDI through the Granger Causality test. According to the obtained results, from Granger causality test, the null hypothesis of no causal relationship from FDI to UEMP should not be rejected ( $P\text{-value} = 0.134 > 0.05$ ) and FDI to UEMP ( $P\text{-value} = 0.242 > 0.05$ ) can also not be rejected. Thus, the results of the causality test demonstrated there is not directional causal relationship from FDI to UEMP.

**Table 5 Granger Causality test for UEMP and FDI**

Pairwise Granger Causality Tests Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause UNEMP	29	2.180	0.134
UNEMP does not Granger Cause FDI	29	1.506	0.242

## CONCLUSION

The purpose of this study was to investigate the effects of foreign direct investment on unemployment in Somalia using SESRIC data for 1991–2021 and the VAR model. First, we checked the stationarity of the variables using the ADF and P. P. tests and found that there are unit roots in the variables. As a result, we had to take the first differences to make them stationary. We then applied the Johansen and Jeseluis co-integration test to determine the long-run relationship, and found that there were no co-integrating vectors in the system. Subsequently, we used the differenced VAR to determine the variance decomposition, and plotted impulse response functions. The findings indicate that FDI might not create new jobs in Somalia, which supports the findings of (Caporale & Gil-Alana, 2014) and (Anyanwu, 2013). Additionally, based on the information in the introduction section and the fact that foreign

investors establish new companies in Somalia, FDI does not have a significant impact on reducing the unemployment rate and stabilizing the economy. Thus, this study proves that FDI does not decrease the unemployment rate of the host country and suggests that governments in the region should pursue labor-absorbing FDI policies and channel foreign investment inflows towards labor-intensive sectors with high labor-absorptive capacity, such as horticulture and floriculture.

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