

# Political Economy of Defense Budgeting in Korea\*

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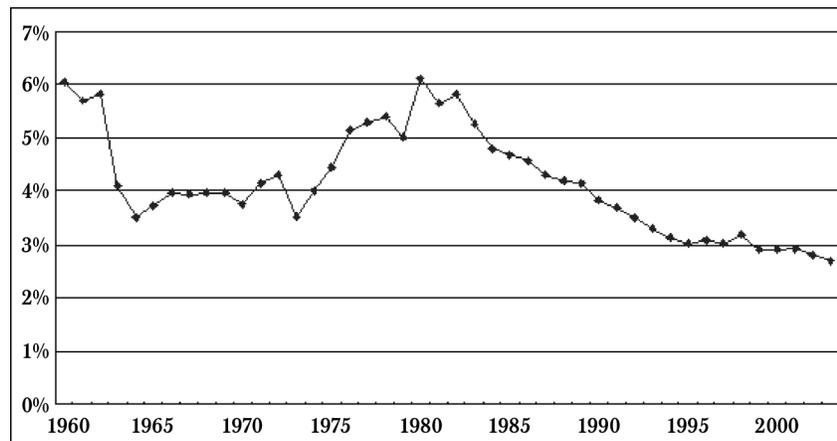
## I. Introduction

Every government should deal with the problem of resource allocation. A defense allocation is determined on the basis of the availability of revenue, political constraints, public opinion, the priorities and beliefs of the political leaders, and security needs. In Korea a large amount of the government budget is devoted to defense, and this fact signifies the high priority the Korean government places on security. Strengthening military capability has been one of the top policy priorities of the Korean governments for the last four decades.

The ratio of defense spending to Gross National Product or Gross Domestic Product (GNP/GDP) is the most widely used measure of a society's military burden. It is a major index of the resource cost of defense as well as a nation's security requirements. During the 1970s and 1980s, Korea has devoted about more than 5 percent of its GDP and about 30 percent of the central government budget to the defense sector. Since the beginning of the 1990s, these ratios have fallen, gradually reaching 2.7 percent and 15.6 percent respectively in 2003.

The aim of this paper is to investigate the internal and external determinants of the demand for security in Korea for the last forty years. A country's military expenditure is directly connected to its demand for security. Military expenditure is accepted as a symbol of a nation's commitment to security. Taking into account factors that affect the levels of military preparation, this study is set to find out what should be managed in order to achieve optimal defense management in the post-Cold War era, especially after the dismantling of Cold-War structure in Korean peninsula. For this purpose determinant variables suggested by previous theoretical models and empirical studies are used to explain the determinants of defense expenditures in Korea.

<Figure 1> Ratio of Military Expenditure to GDP (%)



## II. Research Hypothesis

Based on the previous studies, several potential explanations of the determinants of military expenditure in Korea are examined by asking the following research questions:

1. Does budgetary incrementalism affect military budget formulation in Korea?
2. What economic factors are likely to influence the defense budget allocation process?
3. Can military confrontation between the two Koreas be one important explanation of the defense spending level?
4. Can U.S. military aid be another factor for defense budgeting?
5. Can Presidents' policy priorities affect the nation's defense spending level?

One of the key insights suggested by recent research on defense spending is that its factors are not homogeneous. This means that one needs to disaggregate defense spending and analyze the different factors that influence different aspects of defense spending. The relative importance of determinant factors for military procurement expenditure might be different from those for total military expenditure. For example, it is possible that expenditure on military procurement is more sensitive than total military expenditure to the military threat posed by the potential security threats.

Total military expenditure can be partitioned into two main sub-categories. (1) operation and maintenance costs for daily operation (O&M) and (2) procurement and R&D costs for force improvement (FI). In this study, the determinants of the force improvement expenditure are also examined, assuming that this expenditure, which comprised 32.9 percent of total military expenditure in 2003, might be relatively controllable. <Table 1> shows the changes in the composition of the defense budget during the last decade.

<Table 1> Composition Ratio of Defense Expenditure : 1991-2003 (%)

Year	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03
FI	34.8	33.0	31.6	30.2	29.1	28.0	28.9	29.6	30.1	36.9	33.9	33.5	32.9
O&M	65.2	67.0	68.4	69.8	70.9	72.0	71.1	70.4	69.9	63.1	66.1	66.5	67.1

Source: Defense White Paper, [www.mnd.go.kr](http://www.mnd.go.kr)

The following section details those variables that are regarded as potential explanations of military expenditure levels in Korea. The explanations consist of internal factors and external factors.

### 1. Internal Factors

**Budgetary Incrementalism:** Incrementalism has a special importance in budgetary decision-making. The decision makers will normally only make slight increases or decreases in base-year spending. Most studies of budget formulation emphasize the importance of the incremental aspect of government decision-making due to the bureaucratic nature of politics. Budgetary incrementalism can be expressed by the following statement: An organization's budget for  $FY_t$  is formulated by making marginal adjustments to the budget for  $FY_{t-1}$ . The previous level may be the principal determinant of current spending. That is,

$FY_{i,t} = a + b FY_{i,t-1} + e$ , where  $FY_{i,t}$  = an organization's budget at fiscal year  $t$ .

The size of the previous fiscal-year budget could be the best predictor of the current budget because of the incremental nature of budgeting. It implies that each organization focuses on changes in behavior from one time period to the next. In other words, previous behavior is viewed as a base from which decision makers deviate only slightly.<sup>1)</sup>

Bureaucratic politics, the bureaucratic pressures and inertia within the government, result in incremental budgets. The leaders and members of any government agency are concerned with the interests of their own organization. Maintaining and increasing their budget are primary concerns for leaders whose influence within an organization partly depends on the amount of their own available resources. Niskanen assumed that bureaucrats act to maximize the budget of their bureau, especially their bureau's discretionary budget.<sup>2)</sup> This implies that the base year's spending suggests what is plausible and what is needed for determining the next year's spending level. In addition to bureaucratic pressure, the complexity of real-world problems induces decision-makers to formulate simple and acceptable solutions.

Military budgeting is no exception. A glance at the level of military expenditure showed that they have been increasing every year, with few exceptions (in 2000 constant price). Budgetary incrementalism is a prime determinant of defense expenditure according to some scholars.<sup>3)</sup> One plausible reason for the trend in the military spending of some contemporary nations is the tendency for past expenditure levels to fuel future increments in spending.<sup>4)</sup> Therefore, a first potential explanation of the determinants of the defense budget is the bureaucratic politics of the budgeting process, represented by incrementalism. The hypothesis is that "incrementalism has been positively affecting military budgeting in South Korea."

**Economic Constraints:** The level of national income would seem to be a relevant variable for defense spending, since in a general way, national income reflects the overall ability of a country to maintain a particular volume of military expenditures.<sup>5)</sup> All budgets are sensitive to changes in economic conditions.<sup>6)</sup> As its economy grows, a nation has more resources with which to provide security. In a broad sense, the production possibility curve of a country moves as the economy grows, enabling the society to enjoy more military security as well as greater civilian output. Therefore, military expenditures and GDP are hypothesized to be positively related, so that defense is a normal good whose demand rises with income.<sup>7)</sup> In other words, a higher GDP represents more resources available for financing military expenditures and a lower opportunity cost, and this implies a positive relation between the two variables.<sup>8)</sup>

On the other hand, military preparations are an economic burden. Whatever resources are devoted to national security are not available to other sectors. A notion of opportunity cost often is mentioned as the basic criticism of defense expenditure. If a government spends more on one item of its budget, it has to decide which items to sacrifice unless additional finances are available. The more resources that are allocated to defense, the fewer that are available for social and economic development through investment in education, health and social welfare. In this sense, many studies<sup>9)</sup> are devoted to the budgetary trade-off between military and welfare expenditures. Since

the modern defense establishment is a heavy consumer of technical and managerial personnel and foreign exchange, especially in non-arms producing countries, one would expect the negative effect to be especially strong in those developing countries where these resources are particularly scarce.<sup>10)</sup> In this regard, welfare expenditure, which may be vulnerable due to policy priorities on defense, should be treated as an explanatory variable with a potential negative relationship to military expenditure.

**Presidential Priority:** All budgets are affected by political pressure. Previous studies expected to find political influence on the military budget correlated with regime characteristics.<sup>11)</sup> Regime characteristics are expected to have a particular strong influence on military expenditure in developing countries, where the allocation procedure has not been fully institutionalized. The regime in power has control over government expenditures and therefore differences in the patterns of budgetary allocations may be explained by particular regime characteristics. One hypothetical inference is that the military will enjoy more resources when its influence on the allocation process is greater. This inference assumes that the military will pursue its self-interest. This political factor was one of the key variables for Hill,<sup>12)</sup> who shows that the level of influence of the military on politics is positively related to the level of military spending through interest group-like influences. Ball<sup>13)</sup> also points out the direct association between the political power of the military and its influence in deciding the amounts allocated to national defense. Hewitt<sup>14)</sup> shows that military governments spent more on defense than all other forms of government except monarchies, other conditions being equal. The control of the government by the military is associated with an on-average 2 percent higher level of defense allocation in Maizel and Nissanke's study.<sup>15)</sup> The military has a stronger influence (much like an interest group) on defense allocation when its involvement in politics is increased.

There is no doubt that the influence of the military on politics, as it relates to the resource allocation process, had been substantial in Korea until the early 1990s. During the 1970s, due to various internal and external environmental changes, President Park Chung-Hee declared national security to be the number one national priority, and made an enormous investment in military build-up after launching an authoritarian political regime, the Yushin (維新). As shown in graph, military expenditure as a percentage of GDP sharply increased during the Yushin period (1972–1979). With the beginning of Chun Doo-Hwan administration, those ratios have been gradually decreasing. Since 1989, the ratio of military expenditure to GNP has fallen below 5 percent, at a continually decreasing rate, and went down to 2.7 percent in 2003. In this paper, the Yushin variable is included in the basic specification and represented as a dummy variable.

## 2. External factors

**Potential Threat:** One of the most widely tested approaches to explain patterns of military expenditures has been the arms race model developed from Richardson's seminal work.<sup>16)</sup> It is assumed that the behavior of a nation interacts with other countries' behaviors. According to the model, military expenditures are influenced by political, psychological, and international parameters that emphasize each government's perception of its adversaries and the behavior of its allies and neighbors. Richardson's

arms race model, known as the “action-reaction model,” focuses on the interactive nature of military spending among nations in conflict. Change in one nation’s level of armaments results in a parallel change in the level of the rival nation’s armaments, for each nation seeks to maintain a desired ratio of spending with respect to its perceived adversary. In this sense, buying arms to counter what an adversary has acquired is a widely accepted explanation of armament.<sup>17)</sup>

Ostrom emphasizes external environmental factors that affect the decisions of policy-makers on defense spending.<sup>18)</sup> In his reactive linkage model, used to estimate the determinants of U.S. military expenditures from 1955 to 1973, ‘international conflict’ and ‘defense expenditure of the Soviet Union’ are treated as major factors affecting decisions. Deger and Sen also emphasize that threat perception should be taken into account when deriving the demand function for the defense expenditure of a country.<sup>19)</sup> They show that an increasing threat would decrease the marginal utility of civilian expenditure and increase the marginal utility of security. McKinley also conducted a cross-sectional study of developing countries with the arms race model.<sup>20)</sup> McKinley’s hypothesis is that military expenditure will be sensitive to the different levels of intensity of interstate conflicts. He determines that military expenditures rise in response to interstate conflicts. Higher levels of conflict intensity and duration predict higher levels of military expenditures.

In this context, the military threat posed by North Korea should be reviewed for analysis. The policy maker’s perception of the threat posed by North Korea is important in shaping South Korea’s defense spending level. The hypothesis is that the greater the flow of deeds by North Korea that are perceived as threats, the greater will be the military expenditure in South Korea.

**Military Alliance:** Having a military alliance or being a member of a collective security treaty may influence a government’s resource allocation.<sup>21)</sup> If countries A and B form a military alliance, the military capability of A would enhance that of B and vice versa. In terms of resource allocation, country A would have to spend more for the same amount of security if it were not a member of the alliance.

Olson and Zeckhauser pointed out that because alliances provide the public good of collective defense, and because the marginal contribution of an economically smaller state to public goods is minimal, smaller states are likely to be “free-riders” on the defense spending of larger states.<sup>22)</sup> In other words, the public good characteristic of defense in the domestic realm expands when a nation is in a relationship with a group of countries who share a public good in the form of a security alliance. As with any public good, alliances can give rise to a free-rider problem between countries A and B if country A attempts to distort its preference for security in anticipation of reducing its share of the burden. Olson and Zeckhauser empirically found that defense burdens are positively correlated with the economic size of the allies as measured by GNP. When the U.S. asked its European allies to spend more on defense, the findings of Olson and Zeckhauser were used as the theoretical underpinnings of the discussion of burden sharing among the NATO countries. The U.S.-Korea military alliance may affect the allocation process during the period, especially when military aid plays an important role in military expenditure in Korea.<sup>23)</sup>

### III. Model Specification

The equation used to estimate military expenditure should include political and economic considerations and internal as well as external factors. To estimate the military expenditure demand function in Korea, this paper examines several variables, according to the following general form, from 1962 to 2002. The year 1962 is chosen as the starting point for the data series because it is the starting point of economic growth and modernization.

$$\text{MILITARY EXPENDITURE} = f(\text{Budgetary Incrementalism, Economic Constraints, Presidential Priority, Potential Threat, Military Alliance})$$

describes the situation in which military expenditure depends on the prior-year's expenditure on defense, economic constraints, the threat of potential adversaries, and the nation's security alliance structure. Also affecting this basic function are specific presidential priorities.

To estimate the military expenditure demand function, this study examines the following variables in a time series analysis. This study uses a generalized least square (GLS) regression. The variables used in the regression analysis are listed below.

#### *Dependent and Independent Variables:*

Two dependent variables of Korea's allocation of resources to the defense sector are examined in the regression analysis. The first is total military expenditure. It can be measured in several different ways. The dependent variable could be expressed as (1) the ratio of military expenditure to gross domestic product, which shows the level of commitment to defense relative to the economic capacity of the nation, and/or (2) the ratio of military spending to government expenditure, and/or (3) the total amount of defense spending itself. The ratio of government military expenditure to GDP (ME/GDP) is used as the dependent variable in this study in order to reduce heteroskedasticity problems. In addition to total military expenditure, a second dependent variable is somewhat controllable military spending, which is the difference between total military spending and the sum of operation and maintenance costs. The majority of controllable spending consists of military procurement, which comprises about 30% of total military expenditure as shown in the table 1. This amount may be more vulnerable to environmental change than personnel and maintenance costs. This variable is also measured as a share of GDP.

As independent variables, this study employs several operationalizations of potential explanatory variables. To measure incrementalism, the lagged endogenous variable (ME<sub>t-1</sub>) is treated as an explanatory variable.

For the economic constraints of the country, this study uses the unemployment rate as an independent variable. GDP per capita and GDP growth rate are inseparable from the problem of multicollinearity with the lagged endogenous variable of ME/GDP. Due to the trade-off relationship between the unemployment rate and economic growth, it is expected that the unemployment rate has a negative relationship with military expenditure, whereas the GDP growth rate has a positive relationship. The unemployment rate data come from various issues of Social Indicator of Korea (Office of Statistics).

To measure welfare expenditures, several categories of social spending in the central

government expenditure are added together. These include the categories of ‘education,’ ‘health,’ ‘social security and welfare,’ and ‘housing and community amenities.’ This variable is also measured as a share of GDP.

To measure the threat from North Korea, the military spending of the country, if its record is reliable, may be the best indicator. The starting point of every discussion about defense spending is usually the perceived security threat. It is largely assumed that the military expenditures of the two confronting nations are interactive, with each country reacting to increases in defense expenditure by the other in order to keep at least a minimum level of defense. In this case threat can be measured by the estimated North Korean military expenditure.

Although many institutes publish their estimations of military spending in North Korea, these estimations are questionable for many reasons, as were those of the Soviet Union in the Cold War era. In this study, the number of violations by North Korea of the Armistice Agreement, which is announced by the commander of the United Nations Forces in Korea, is used as a proxy to measure the threat level. It is likely that the greater the number of violations by North Korea, the higher the threat level, which results in a larger allocation for the military in South Korea. To enable an optimal reaction time to the threat variables, the threat measure is lagged by one year, which is commonly used to test the arms race model.

Until 1977, there were fair amounts of capital inflow from the United States for a military buildup in Korea. The U.S. capital nearly equaled the South Korean government’s spending on the military during the 1960s. The amount, which is not treated as part of the military expenditure of a government although it is used for military buildup, should be controlled for the analysis. On the basis of the public good attributes of military consumption, a negative relationship between U.S. military aid and the Korean government’s military expenditure is expected.

To consider internal political factors, the basic specification has the Yushin (1972-1979) dummy variable with a value of 1 from 1973-1980 and 0 for rest of the period to test its significance.

Thus, the model can be specified as follows:

$$(1) ME_t = \beta_0 + \beta_1 ME_{t-1} + \beta_2 UNEMPLOY_t + \beta_3 WELFARE_t + \beta_4 THREAT_{t-1} + \beta_5 MA_t + \beta_6 D_t + \mu_t$$

The variables used in the specification are listed below.

ME	the share of the GDP spent on government military expenditure
ME t-1	the lagged share of the GDP spent on government military expenditure
UNEMPLOY	the unemployment rate
WELFARE	the share of the GDP spent on government welfare expenditure
THREAT	the number of violations of the Armistice Agreement by North Korea
MA	the amount of U.S. military aid given to Korea (which is not included as government military expenditure in Korea)
D	a dummy variable for Yushin, 1 from 1973 to 1980, otherwise 0

In this study, the sum of force improvement expenditure is treated as another

dependent variable, which consists of 32.9 percent of the total military expenditure in 2003.

$$(2) FI_t = \beta_0 + \beta_1 ME_{t-1} + \beta_2 UNEMPLOY_t + \beta_3 WELFARE_t + \beta_4 THREAT_{t-1} + \beta_5 MA_t + \beta_6 D_t + \mu_t$$

where FI is the share of force improvement expenditure to the gross domestic product.

#### IV. Empirical Results and Policy Implications

The results of the regression analysis reveal several interesting and unexpected outcomes in terms of the hypotheses suggested. Table 2 and Table 3 show the results of the specifications for (1) total military expenditure, and (2) force improvement expenditure. Empirical analysis on the determinants of military expenditure shows the significance of budgetary incrementalism, perceived threats and regime characteristics to the defense planning process. Incrementalism also shapes force improvement expenditures. Most importantly, the results indicate the significance of the previous year's spending levels both in military expenditure as a share of GDP and force improvement expenditure as a share of GDP. The results imply that budgetary incrementalism is the dominant determinant of military expenditure level in Korea, as expected. Although incrementalism is a common phenomenon in budgeting, due to bureaucratic politics and the complexity of real world problems, budgeting techniques have been developed to minimize its role as much as possible. The introduction of program budgeting in the defense planning process could hypothetically eradicate incremental budgeting. However, as the statistical evidence demonstrates, defense budgeting has been formulated by making marginal adjustments to the previous year's budget. Due to the high degree of the correlation between coefficient of dependent variable and endogenous variable, the final model specification omitted endogenous variable for analysis. In other words, the final specification of this study tries to analyze the change of the military expenditure with budgetary incrementalism as a given condition for budgeting.

<Table 2> Coefficient Estimates of the Model for Military Expenditure in Korea

#### Correlation

	ME/GDP	ME/GDP-1	Unemploy	Welfare/GDP	Threat	MA
ME/GDP	1.000					
ME/GDP-1	.890**	1.000				
UNEMPLOY	.088	.006	1.000			
WELFARE/GDP	-.030	.152	-.043	1.000		
THREAT	.267	.378*	-.350*	0.92	1.000	
MA	-.047	.059	.520**	-.257	-.191	1.000

\*p< .05 \*\*p<.01

Regression Analysis

	unstandardized coefficient		standardized coefficient	t	p-value
	B	S.D.	B	t	p-value
constant	.147	1.580		.093	.926
UNEMPLOY	.270	.109	.427	2.479	.019
WELFARE/GDP	.265	.316	.173	.839	.408
THREAT	.521	.142	.556	3.666	.001
MA	-5.571E-07	.000	-.153	-.819	.419
Dummy	.913	.384	.429	2.379	.024
$R^2 = .307$ $F = 4.193$ $p = .005$					

Table 3: Coefficient Estimates of the Model for Force Improvement Expenditure (FI) in Korea

Correlation

	FI/GDP	FI/GDP-1	THRE	UNE	WEL/GDP	MA
FI/GDP	1.000					
FI/GDP-1	.919(**)	1.000				
THREAT	.471(**)	.501(**)	1.000			
UNEMPLOY	-.326 (*)	-.430(**)	-.350(*)	1.000		
WEL/GDP	.425(**)	.324 (*)	.092	-.043	1.000	
MA	-.703(**)	-.764(**)	-.191	.520(**)	-.257	1.000

\*p < 0.05   \*\*p < 0.01

Regression Analysis

	standardized coefficient		unstandardized coefficient	t	p-value
	B	S.E.	B	t	p-value
constant	-.855	.452		-1.892	.068
UNEMPLOY	.065	.055	.140	1.182	.246
WELFARE/GDP	.277	.081	.360	3.439	.002
THREAT	.250	.070	.366	3.590	.001
MA	-1.606E-06	.000	-.601	-5.194	.000
Dummy	.438	.15	.279	2.759	.010
$R^2 = .666$ $F = 15.774$ $p = .000$					

The Coefficient for the variables other than the lagged endogenous variable in model (1) are also statistically significant. Economic constraint variable, the unemployment rate, contrary to the hypothetical inferences, has statistically significant positive values in relation to military expenditure. One possible explanation for the unexpected positive sign of the unemployment variable is that the government has spent more on the defense to achieve a macroeconomic objective while boosting the economy to reduce the unemployment rate when a high unemployment rate exists. Another

implication of the result is that as the economic capability of Korea increases, the relative importance of allocation on defense decreases. The elasticity of the military on economic growth is less than one, so the military has the attribute of a necessity good in Korea.

There is no statistical evidence that a trade-off exists between welfare and military expenditure in general. The unexpected result could be explained that the both expenditures increase autonomously when budget constraint is not tight. As Hewitt found in his cross-country study, increases in military expenditure could lead to higher spending on every sector of the government when the budget constraint is not tight.

The threat variable assumes the expected sign in equation (1). This implies that decision-making on security issues has been sensitive to the behavior of the potential military adversary, as suggested by the arms race model. Although the needs of national security also had been used to justify the authoritarian rule of the regime during the 1970s and early 1980s, the empirical results imply that defense allocation decisions have been based on the security threat posed by North Korea. The results of the equation imply that, without clear security threat after the dismantling of the Cold-War structure in the Korean Peninsula, pressure for reducing military expenditure would grow substantially. The lack of clear security threat makes it more difficult to persuade the public of the need for defense planning for uncertain security environment or the maintaining the spending level for defense.

The negative military aid coefficient on the force improvement model shows evidence of security free-riding on the military spending. The military aid from the allied force had worked as an incentive mechanism for lowering the defense expenditure at least in terms of military procurement spending.

Finally, the empirical evidence shows that presidential priorities have been influencing over the level of military expenditure in Korea. The dummy variable for Yushin (維新) period provides a strong explanation for the pattern of defense expenditure in Korea. It shows a strong leadership preference for high spending on defense during that period. To cope with a changing security environment, President Park Chung-Hee put forth a rigorous security policy to maximize Korea's own endogenous military capability. In order to finance force modernization, the defense surtax was introduced to develop military-industrial capabilities sufficient to keep up in the arms race with the North. The military has enjoyed more resources when its influence on the allocation process is greater. However, the dummy variable for the period of civilian Presidents — for Kim Young-Sam and Kim Dae-Jung period — does not provide meaningful explanation on the defense spending level in Korea. In other words, the empirical evidences show that the civilian governments had low policy priority on defense. The nature of the defense good could be one possible explanation why the security issues were less attractive for five-years one-term Presidents. They have little incentive to pay attention more on defense allocation because defense investment requires relatively longer period of lead-time to get the fruits of the investment.

After the inauguration of President Roh Moo-Hyun, widespread debates on the military expenditure have made defense planning an important policy issue for the general public. Security issues have been rapidly changing. Even though the two Koreas still confront each other, the tension between the two has been easing greatly.

The alliance structure between the U.S. and Korea is now facing in transition. As the empirical result implies that the administration's policy priority is the major factor on the resource allocation for future defense.

**Notes:**

- \* This work was supported by Korea Research Foundation Grant (KRF-2000-CA-0029).
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