

Effects of Civilian and Military Consumption on South and East Asian Countries: A Panel Data Analysis

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Abstract

This study is an attempt to estimate the opportunity costs of military expenditure in terms of consumption in developing economies of South and East Asian countries. Military of developing countries are highly paid comparing to their civilian counterpart. This study examines empirically comparative consumption effect between military and civilian consumption considering ten South and East Asian countries over the period 1988-2008. Empirical analysis of the study finds that the amount of marginal benefit in utility terms accrued by the extra unit expenditure on military is less than the marginal benefit accrued by the extra unit expenditure on civilian in the society as a whole. It is clear that the part of military expenditure which is used for consumption purposes has a positive multiplier effect on the economy though controversy remains about the effect of overall military expenditure on the economy. Therefore, the consumption effect of military expenditure should be accounted with compare to civilian consumption in developing society.

Keywords: Consumption effect; Civilian consumption; Military consumption; Panel data analysis

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1. INTRODUCTION

The very first research regarding the effect of military expenditure (mlex) on economic growth begins with the study of **Benoit (1973)** who finds a positive correlation between mlex and economic growth. After his work, number of researchers analyze in this context using time series, cross-section and panel data of individual country, group of countries applying various econometric techniques. Some find positive growth effect of mlex on the economy, some other find negative effect of mlex on the economy. So, their findings in fact, give rise to an interesting, but fierce debate. A number of researchers have claimed that military expenditure has a positive spin-off effect on the economy. They claimed that military as an organized force help in the process of modernization, provide technical skills, educational training, and create infrastructure necessary for economic development. They argue that this spin-off effect may occur by creating effective demand and increasing productivity through technological advancement. Empirical evidence for this argument is provided by, among others **Benoit (1973, 1978)**, **Ward et al. (1991)**, **Sezgin (1997, 2000)**, **Alexander (1995)**, **Kennedy (1974)**, **Dixon and Moon (1986)**, **Chletsos and Kollias (1995)**, **Dunne and Nikolaidou (2001)**, **Yildirim et al. (2005)**.

On the other hand, a number of researchers also claim that military expenditure may retard economic growth by crowding out civilian consumption, more productive civilian investment, health, and education expenditure and infrastructure development and creates a balance of payments problem. Empirical evidences supporting this argument among others are- **Cappelen et al. (1984)**, **Nabe (1983)**, **Heo (1999)**, **Klein (2004)**, **Lebovic and Ishaq (1987)**, **Mintz and Huang (1990)**, **Linden (1992)**, **Ward and Davis (1992)**, **Dunne and Vougas (1999)**, **Galvin (2003)**, **Lim (1983)**, **Faini et al. (1984)**, **Deger (1986)**, **Antonakis (1997, 1999)**, **Kelly and Rishi (2003)**. The previous studies regarding this issue investigate the effect of overall military expenditure on the economy. In order to identify the effect of mlex on the economy, it is important to know the sectoral allocation of mlex and to calculate its separate effect on the economy. Expenditure on mlex can be broadly divided into four components: (I) Expenditure on military personnel (II) Expenditure on maintenance and operations (III) Expenditure on military hardware import (IV) Expenditure for creating human and physical capital. These sectoral allocations are very important for identifying growth effect of mlex. Expenditure on military personnel creates income of the personnel that have only consumption effect on the economy. Again, such expenditures on building schools, colleges, universities, medical colleges, training institutions, or administer these institutions create human and physical capital for the society. These two types of expenditures might have positive effect on the economy. On the other hand, expenditure on maintenance and operations may not have any positive influence on the economy. But expenditure on military hardware imports put pressure on developing countries' stock of foreign exchange reserves; as a result they may not be able to import other more desired productive capital goods due to shortage of foreign exchange. Therefore, these two kinds of expenditures might have negative effect on the economy. In the developing countries, most parts of mlex remain engaged for salary of military personnel and maintenance and operations purposes. Almost 70% to 80% of their allocation remains for these two sectors. Therefore, very few of the allocation remains engaged for the purpose of creating human and physical capital and per capita cost of creating such capital is very high in this sector. At the one hand, government of

developing countries spend large amount of money for defense sector but they can not play an important role to create human and physical capital. On the other hand, they face a trade-off among budgetary allocations. They compel to allocate large amount of money in defense ignoring various important sectoral allocation such as education, health which could create more economic opportunities, including human capital for the society. As a result, both military and civilian sectors do not remain engaged for creating human capital and can not improve the absorptive capacity of the nations. Savings, investment, human capital, foreign resources are all important for growth and development. Economic growth can be viewed as an interaction of factors that operate from the demand as well as the supply side of aggregate output and its sectoral composition. If the growth of demand is sufficient, then labor-abundant developing countries need human and physical capital to increase growth from the supply side. The effects of milex on the economy mainly depend on the allocation of military budget and how it interacts with the rest of the economy at the one hand and on the other hand, the existence of any trade-off between milex and other government expenditures. Expenditure on armaments and military expenditure in total is not the same thing. The largest proportion of defense expenditure goes not on armaments but on personnel costs and on operations and maintenance. **Harris (1986)** shows that in common with developed countries, personnel costs made up almost half in Indonesia's military expenditure, and 'operation and maintenance' accounted for a further 28% in 1978/79. Again, **Ball (1983)** estimates total security expenditure for 48 LDCs and finds that personnel and operations/maintenance costs made up over 90% of total costs in the Philippines, Singapore and Thailand, and 75% for Malaysia in the late 1970's. **Chletsos and Kollias (1995)** analyze the Greek military data during the period 1974-1990, finds that more than half of military expenditure is allocated for military personnel. Therefore, largest part of military expenditure has a consumption effect on the economy. This consumption effect of milex should be accounted with compare to civilian consumption. This study is an attempt to estimate the opportunity costs of milex in terms of consumption in developing society especially in the economies of South and East Asian countries of the world.

2. OBJECTIVES OF THE STUDY

The main objectives of the study are to identify and analyze the effects of civilian and military consumption on the economies of South and East Asian countries.

3. METHODS OF ESTIMATION

Consumption has a multiplier effect on the economy. **Haris (1986)** and **Ball (1983)** find that most of the military costs go for personnel and maintenance/operations purposes. This cost is made up above 75% for some East Asian countries. And only military personnel cost is no less than 50%. Military personnel income is made up for consumption purposes. This might have consumption effect on the economy. The study aims to examine empirically whether civilian consumption effect is more effective than military consumption effect. Marginal utility is assumed to be a function of consumption expenditure. Therefore, it can be expressed $MU = f(C)$,

Here MU = Marginal Utility, C = Total Consumption Expenditure.

To examine the effect, consumption expenditure is divided into two broad categories of spending.

$C = CC + MC$, here, CC = Civilian consumption, MC = Military consumption

For examining the effect of consumption, the following two very simplistic deterministic models are constructed.

$$MU = b_0 + b_1CC + b_2MC \quad \dots (1)$$

A panel data econometric technique is used to estimate the consumption effect for a sample of 10 South and East Asian countries over the period 1988-2008. Among them Bangladesh, India, Nepal, Pakistan, and Sri Lanka are 5 South Asian countries, and Indonesia, Korea Republic, Malaysia, Philippines, and Thailand are 5 East Asian countries. It is assumed here; per unit consumption creates one unit of utility. Therefore, consumption expenditure of these countries equals total utility in terms of social consumption. First difference of total utility means marginal utility of any country. Consumption expenditures of military are not available. Since, large portion of military are allocated for salary. Further, 50% of military are considered for military consumption. Consumption and military data are collected from World Development Indicator of World Bank. All data are converted into purchasing power parity form. Differencing military consumption from total consumption, civilian consumption is calculated. After converting total consumption into total utility equivalent, total utility, military and civilian consumption expenditure data are transformed into natural logarithmic form. Finally, the following equation is considered for estimation:

$$MU_{it} = b_0 + b_1CC_{it} + b_2MC_{it} + U_{it} \quad \dots (2)$$

Where, MU = Natural logarithms of marginal utility

MC = Natural logarithms of military consumption

CC = Natural logarithms of civilian consumption

U = Disturbances

4. EMPIRICAL RESULTS

To find out the consumption effect for the ten South and East Asian countries, balanced micro panel data over the period 1988-2008 are considered in this regard. The study first investigates whether all the variables of the countries of the model are possible to pool the data or not naturally arise with panel data. The study performs Roy-Zellner test for poolability across countries, allowing for one-way error component disturbances, yields an observed F-value of 0.7880 which is distributed as $F(27,170)$ under $H_0 : \delta_i = \delta$ for $i = 1, \dots, N$. This does not reject poolability across countries even after allowing for one-way error component disturbances. The Roy-Zellner test for poolability over time, allowing for a one-way error component model, yields an F-value of 0.3074 which is distributed as $F(57,140)$ under $H_0 : \delta_t = \delta$ for $t = 1, \dots, T$. This does not reject poolability over time even after allowing for one-way error component disturbances. Summary results of Roy-Zellner test for poolability are shown in table.

Table-1: Summary Results of Roy-Zellner Test for Poolability

Test	Null hypothesis	F values	Findings
Roy-Zellner Test	$H_0 : \delta_i = \delta$ for $i = 1, \dots, N$ (Poolability across countries, allowing for one-way error component model)	F=0.7880 (27 and 170d.f.)	Do not reject at 5% level of significance
Roy-Zellner Test	$H_0 : \delta_t = \delta$ for $t = 1, \dots, T$ (Poolability over time, allowing for one-way error component model)	F=0.3074 (57 and 140 d.f.)	Do not reject at 5% level of significance

Before estimation of the proposed model, the study performs first whether country specific effect contains in this model. This is done using Breusch-Pagan (BP) test, which is distributed as χ_1^2 . Next, the study also examines whether time effect contains in this model. This is also done using BP test. Finally, the study uses Hausman’s test to specify whether a fixed or a random effects model is more appropriate. The Hausman test is distributed as χ_2^2 , where the degrees of freedom are equal to the number of regressors.

Table-2: Summary Results of BP and Hausman Tests

Null hypothesis	Tests	Results
H_0 : no individual effect	BP=3.34 (3.8414)	Null hypothesis do not reject
H_0 : no time effect	BP=0.39 (3.8414)	Null hypothesis do not reject
H_0 : no correlation between the individual effects and other variables	Hausman=5.18 (5.9914)	Null hypothesis do not reject

Values in brackets are χ^2 statistic at 5% level.

BP tests suggests that there are individual and time effects, and the Hausman test, which does not reject any correlation between the individual effects and other variables in the model, the study would conclude that of the two alternatives that have been considered, the random effects model is the better choice. Two-way random effect model is appropriate for the model. Summary results of BP and Hausman tests are shown in Table-2.

After estimating the model, the study performs Wooldridge test for autocorrelation in panel data and identifies the presence of autocorrelation. Therefore, the study applies Feasible Generalized Least Square (FGLS) method that considers heteroskedasticity of the panel data and corrects autocorrelation simultaneously. Estimation output is shown below in equation form:

$$\begin{array}{rcc} \text{MU}_{it} = -0.9805 + 0.68905\text{CC} + 0.2682\text{MC} & & \dots (3) \\ (-1.65) & (7.36) & (3.53) \\ \{0.100\} & \{0.000\} & \{0.000\} \end{array}$$

Values in brackets are standard error and values in parentheses are p-values.

From the estimations, the study finds that the amount of marginal benefit in utility terms accrued by the extra unit expenditure on military is less than the marginal benefit accrued by the extra unit expenditure on civilian in the society as a whole. It can be argued that military expenditure is more costly than the civilian expenditure of ten South and East Asian countries in terms of consumption.

5. CONCLUSION

Like other, consumption expenditure of military has a multiplier effect on the economy. But this impact is less effective than coming from the civilian consumption expenditure. Therefore, the government of developing countries should be more cautious in the military allocation. Given the competing claims on the scarce resources, every developing country ought to prioritize their budgetary allocation based on the opportunity cost as measured by the marginal benefit sacrificed in terms of highly valued civilian benefits.

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