JOURNAL OF ECONOMIC DEVELOPMENT 51
Volume 42, Number 2, June 2017

EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN MILITARY ENDEAVOR, ECONOMIC GROWTH AND HAPPINESS

NEILA BEN AFIA AND SANA HARBI

Faculté des sciences économiques et de Gestion de Sousse, Tunisia
Institut Supérieur de Fiscalité et de Finance de Sousse, Tunisia

We study the relationship between happiness, economic growth and military endeavor. A distinction is drawn between the direct and the indirect impact of military endeavor on happiness which operates through the impact of military endeavor on income and the impact of income on happiness. Using panel data analysis for 45 countries covering the period from 2000 to 2013, direct and indirect impacts of military endeavor on happiness are estimated. Our results show that the military endeavor has a positive direct impact on happiness. Indirect effects are found to be positive, the total effect of military endeavor on happiness is positive.

Keywords: Happiness, Military Endeavor, Income and Panel Data
JEL Classification: A13, C26, I31

1. INTRODUCTION

Economic literature is replete with references to the relationship between growth and happiness (Clark and Oswald, 1996;Frey and Stutzer, 2002; Blanchflower and Oswald, 2004). Likewise, there is an extent research about the relationship between military effort and economic growth (Birdi and Dunne, 2001;Dunne, 2010). However, there is almost no study that addresses the possible interactions between happiness, military effort and growth. Although the merits of the contributions proposed within these separate lines of studies are remarkable, we argue that they don't get grip on all the aspects of military endeavor. This lack of connection in research leaves many empty spaces between these different aspects, yet closely interacted. This article intends to contribute to fill this gap.

The purpose of this paper is to provide a rigorous examination of the links between military endeavor, growth and happiness. From this perspective, we argue that there are two mechanisms through which military endeavor may impact happiness.

The first is a direct mechanism through which the military effort directly impacts the happiness. The second is the "indirect" mechanism by which it affects per capita income

which in turn impacts happiness. We assert that the total effect of military effort on happiness is the result of these two effects. As far as we know, prior contributions have neglected this indirect effect, which might significantly affect happiness. To empirically investigate these direct and indirect effects of military efforts on happiness, we use a sample of 45 countries covering the period 2000 to 2013.

We assert that military endeavour is likely to influence average happiness in countries in several ways. It is generally presented as a mean to achieve readiness of the country against any attack. In that sense, it is the way to provide national security which is conventionally considered as a typical public good in that it is non-rivalrous and non-excludable in consumption. Frank (1997) argues that consuming public good increases happiness to a certain point. Public good and happiness are so closely related that happiness approach has recently been used to assess the value of public goods (Di Tella et al., 2001; Welsch, 2007).

Protecting the security of citizens implies not only protecting their lives but also their general living conditions. It consists in protecting facilities and insuring a continued supply of materials, i.e food, equipment, steel, water ect. From this perspective, military endeavour seems to be a mean at the service of human wellbeing. It grants to individuals a sense of protection and feelings of security. As such, individuals living in countries with well-equipped armies are expected to be happier. Moreover, countries approach national security as the national first priority considering it as an embodiment of their national sovereignty. It is natural to assume that nationals belonging to countries with high military readiness have deep feelings of national pride which make them happy. From this perspective, it seems reasonable to assume that the more important is the military effort in a Nation, the higher will be the average happiness in that Nation.

In contrast with this positive view, several scholars stress some negative aspects of military effort (Welsch, 2008; Collier and Hoeffler, 2003). Indeed the impressive waste of resources that military endeavour causes and the potential distortion of the occupational structure that entails may prompt anger and fear from the population.

Moreover, if military effort aims to protect the population against any counter attack, the demarcation point between defence and invasion is very fuzzy and not immovable.

Besides, the increase of the military effort may refer to an imminent war which is the worst fate that put individuals in the farthest point from happiness (Welsch, 2008; Frey et al., 2007; Collier, 1999; Collier and Hoeffler, 2003; Murdoch and Sandler, 2002).[1] In that regard, military endeavour represents a degraded form of security and may be the prelude to a human tragedy rather than happiness.

By considering the total result of military effort on happiness in nation, our contribution is three-fold. First, given that it refers to war which negatively influences happiness whereas provides national security which is a source of positive feelings; it seems reasonable to question the effect of military effort on the overall happiness in

[1] Continuing to admit the harmful effect of war, Frey (2011) notice that even war can bring happiness in that it trigger feeling of solidarity, trust and friendship which tend to raise wellbeing

countries. The findings should interest policymakers by questioning the reason of their engagement in arms race. Second, the use of a panel data analysis allows us to handle time and cross sectional effects. Third, our analysis adds empirical evidence to the literature related to happiness in that it focuses on military readiness rather than in war and conflict.

The remainder of the paper is organized as follows; Section 2 presents the literature review, whilst Section 3 outlines the methodology used within this paper. Section 4 provides the empirical results and Section 5 provides the conclusion.

2. THE LITERATURE REVIEW

2.1. The Relationship between Military Effort and Economic Growth

While the empirical studies on the relationship between military effort and the happiness are very limited, studies on the relationship between armed conflict and economic growth abound.

Benoit (1978) was the first who empirically tested the relationship between economic growth and defense spending. He found strong evidence suggesting that defense spending encourage economic growth especially in less developed country.

More than thirty years on from the Benoit pioneering study, yet the literature on the relationship between growth and military spending hasn't reached a consensus. These ambiguous empirical results reflect the diversity of approaches that dealt with this question. Indeed, different structure of data (panel, cross sectional) as well as different techniques and variable natures were used. Authors used adhoc econometric regressions Dunne (2010), as well as estimation of growth models (Dunne et al., 2005).

Without pretending to be exhaustive, Table 1 provides the main contributions related to the relationship between economic growth and military spending.

2.2. The Effects of Growth on Happiness.

The unrestricted use of GDP as a measure of central variable welfare does not understand the reasons that lead people to not perceive the progress of well-being associated with increased consumption. But all empirical work on the sense of well-being shows the low sensitivity of individuals to grow their income and thus consumption. Specifically, it appears that the well-being felt by individuals depends much on their marital status (married couples have a level of well-being higher than singles), gender (women are less "happy" that the men), ethnicity (in the US, blacks have a level of well-being lower than that of whites) and age (young and old feel a welfare higher) than their income, even if this variable plays well as expected (Banchflower and Oswald, 2004).

Table 1. Effects of Military Spending on Economic Growth

Authors	Research question	Methodology	Results
Dunne and Mehmet (2003)	The link between arms spending and economic growth for developing countries	A Multivariate cointegration ad variance decomposition techniques	They suggest that there is little or no evidence for a positive effect of arms spending to economic growth and that it is more likely to have a negative effect, or at best no significant impact at all.
Galvin (2003)	The impact of military expenditure on economic growth	A cross section study of 64 developing countries using Simultaneous equation methodologies (2SLS and 3SLS)	The empirical results, suggest that defense spending has a negative impact on both the rate of economic growth and the savings-income ratio. Yet it also indicates that the effect is greater for middle-income nations which may have less to gain from defense sector spill-overs. The results also indicate that strategic factors, as much as economic constraints, determine defense spending in developing countries.
Birdi and Dunne (2001)	The relationship between military spending and economic growth in Africa	A cointegrating vector autoregressive (VAR)	The existence of a positive long run relationship between military spending and manufacturing output, and a negative short run effect of the growth of military spending on the growth of manufacturing output.
Pieroni (2007)	The relationship between military expenditure and economic growth?	The growth regression method, derived by the endogenous growth model and estimation is tested by regression method and using a nonparametric approach. The estimation is applied to two subsamples: a group with high military spending level and a second group with low military spending	For the first group (high military spending level) the authors find a weak negative relationship between the share of military expenditure and economic growth. By contrast, countries with lower military burden show an insignificant relationship between growth and military burden.

The debate on the link between life satisfaction and income or GDP is still open: Easterlin (1974) finds no significant relationship between happiness and income in time-series analysis.

He shows that US income per capita in the period 1974–2004 almost doubled, but the average level of happiness showed no appreciable upward trend. This result, called the Easterlin Paradox, has been confirmed by Inglehart (1990) and has been confirmed also for European countries by Easterlin (1995).

Easterlin et al. (2010) provides also some evidence that there is no long-run effect of income on happiness even for developing countries.

Life satisfaction appears to be strictly monotonically increasing with income when one studies this relation at a point in time across nations (Deaton, 2008; Inglehart, 1990; Stevenson and Wolfers, 2008).

To reconcile the cross-sectional evidence with the Easterlin Paradox, some have suggested that the positive relation in happiness vanishes beyond some value of income (Inglehart et al., 2008; Layard, 2005; Inglehart, 1990; Di Tella et al., 2010). This last interpretation has been contested by Stevenson and Wolfers (2008) and Deaton (2008), who claim that there is a positive relation between GDP and life satisfaction in developed countries.

3. DATA AND METHODOLOGY

3.1. The Data

Before outlining our empirical strategy, we present in the following the structure of our sample and discuss the main variables in our study. These variables represent the military endeavour, the happiness and the economic growth.

The data sample describes 45 different countries over 14 years (from 2000 to 2013). In this paper we used the variable military expenditure per capita (MILexp) to express the military effort. This indicator is collected from the World Bank. The military expenditure variable is used by several authors (Biswas and Ram, 1986; Deger and Sen, 1983; Leontief and Duchin, 1983; Pieroni, 2007; Dunne, 2010) namely to study the link between economic growth and military expenditure.

The happiness measures used in this paper are provided by the world database of happiness.[2] This database provides different variants of measures drawn from questionnaires on representative sample of the population as well as the distributional findings on happiness in Nation. In our article we have the mean value obtained from the distribution of the four step verbal life satisfaction.

Economists have used happiness variable for more than two decades (Easterlin, 2013;

[2] Veenhoven, R., World Database of Happiness, Erasmus University Rotter-dam. Available from http://worlddatabaseofhappiness.eur.nl/hap nat/nat fp.php.

Deaton, 2008; Di Tella et al., 2010; Bjornskov et al., 2008).

3.2. The Empirical Strategy

3.2.1. Presentation of the Model

In order to capture both the direct and indirect effects of military effort on happiness, we use the joint estimation of two equations: an equation expressing happiness ($Happ$) as a function of income, military effort and other factors and the second equation expressing income (Y) as a function of military effort and other factors. Equations (1) and (2) are defined below:

$$Happ_{it} = \gamma_i + k_t + \beta_1 y_{it} + \beta_2 MILexp + \beta_3 W_{it} + \varepsilon_{it}, \quad (1)$$

$$Y_{it} = \lambda_i + \tau_t + \alpha_1 X_{it} + \alpha_2 MILexp + \mu_{it}, \quad (2)$$

where subscripts t and i denote year and country, respectively. Eq. (1) expresses happiness as a function of military expenditure (*MILexp*) and per capita income (Y). Eq. (1) also includes W, a vector of additional explanatory variables. These include the inflation rate, in order to capture the effect of purchasing power, the government spending ($GovSp$) to capture the effect of government consumption on the happiness and the share of exportation in GDP to investigate whether openness to trade influences happiness. Finally, κ_t and γ_i represent year and country and specific effects, and ε_{it} and μ_{it} denote error terms.

Eq. (2) expresses per capita income as a function of year and country specific effects (τ_t and λ_i), military expenditure ($MILexp$) and X, a vector of other explanatory variables that have commonly been used in the literature (Levine and Zervos, 1993;Mankiw et al., 1992). These variables include the population growth ($POPgr$), gross capital formation (GCF), Inflation rate and the share of exportation in GDP are added incrementally to assess the sensitivity of the coefficient on ($MILexp$) to the inclusion of additional explanatory variables.

Table A1 in the appendix gives background information about all the variables used in the empirical analysis.

3.2.2. Instrumental Variables

In equation (2) income is a function of military endeavor,[3] yet military endeavor is itself likely to be a function of income; consequently this equation may suffer from an endogeneity problem. To deal with this potential endogeneity, $MILexp$ is instrumented in this equation. The instrumental variable solution is to find another variable that is highly correlated with $MILexp$, but not correlated with the error term (μ_{it}). We use the Human Development Index (HDI) and the life expectancy at birth (in years) (LE) as

[3] Military endeavor is composed by military expenditure per capita.

instrumental variables. We selected these variables because they have a high correlation with $MILexp$ and not correlated with the error term. Table 2 presents the descriptive statistics of these instrumental variables.

Table 2. Definition of the Variables and Descriptive Statistics

Variable (abbreviation)	Mean	Std.Dev	Min	Max
Happiness (Happ)	2.925	0.374	1.700	3.68
Military expenditure per capita (MILexp)	5.154	1.274	1.741	7.581
Gross Domestic Product per capita (GDP)	9.296	1.105	6.869	11.381
Gross capital formation (GCF)	23.999	1.801	20.594	28.604
exports of goods and services (EXP)	44.154	26.866	9.390	183.75
Inflation rate (INF)	5.272	7.506	-4.480	96.090
Annual population growth (POPgr)	0.716	0.846	-3.600	2.642
Government spending(GovSp)	3.834	0.705	0.000	4.568
Human Development Index(HDI)	0.785	0.112	0.511	1.000
Life expectancy(LE)	75.976	3.909	62.950	85.160

3.2.3. Identifying the impact of military expenditure (MILexp) on happiness

The total effect of the military endeavor on happiness ($dHapp/dMILexp$) decomposes into a direct and an indirect effect. The direct effect is defined as the impact of the military expenditure on happiness. The indirect effect is expressed as the product of the impact of military endeavor on income ($\delta Y/\delta MILexp$) and the impact of income on happiness ($\delta Happ/\delta Y$). Formally, these effects can be expressed as:

$$\frac{dHapp}{dMILexp} = \frac{dHapp}{dMILexp} + \frac{dHapp}{dY}\frac{dY}{dHapp}, \tag{3}$$

where $Happ$, $MILexp$ and Y denote happiness, military expenditure and income, respectively.

4. EMPIRICAL RESULTS

4.1. Estimation Results

The Table 3 provides estimates of per capita income equation. In the first column of the Table 3, MILexp is treated as being exogenous with regard to income, but in all subsequent columns, MILexp is instrumented by the Human Development Index (HDI) and the life expectancy at birth (LE).

Model (Y4) begins by expressing per capita income simply as a function of the gross capital formation (GCF) and military expenditure. Models (Y1) to (Y3) include additional explanatory variables used by previous studies (Levine and Zervos, 1993;Mankiw et al., 1992;Levine and Renelt, 1992). These variables are the rate of

inflation (INFL), the population growth rate (POPgr), the gross capital formation (GCF) and the share of exports in GDP (EXP).

In Table 3, Military expenditure is found to have a statistically negative impact on income in all models. This result is in line with (Deger and Sen, 1983;Faini, et al., 1984;Leontief and Dutchin, 1983; but contradicts by Benoit, 1973).

Table 3. The Impact of Military Expenditure Per Capita on Per Capita Income

	Exogenous conflict	(Y1)	(Y2)	(Y3)	(Y4)
MILexp	0.208***	-0.640**	-0.672**	-0.895*	-1.228**
	(0.017)	(0.321)	(0.326)	(0.475)	(0.530)
GCF	0.211***	0.313***	0.314***	0.355***	0.400***
	(0.007)	(0.040)	(0.041)	(0.062)	(0.069)
EXP	0.126***	0.088*	0.090*	0.082*	
	(0.019)	(0.049)	(0.050)	(0.062)	
INF	-0.0005	-0.011	-0.001		
	(0.0005)	(0.021)	(0. 001)		
POP gr	-0.013*	-0.001			
	(0.009)	(0.001)			
R^2	within=0.743	within=0.277	within=0.266	within=0.177	within =0.096
	between=0.7530	between=0.403	between=0.427	between=0.534	between=0.626
n	624	624	624	624	624
Sargan- test		11.451	0.121	0.245	0.097
P-value		(0.743)	(0.727)	(0.621)	(0.755)
F-test on IVs		281.12	269.73	196.40	124.05
Prob >χ^2		(0.000)	(0.000)	(0.000)	(0.000)

Note: Standard errors in parentheses (probabilities for Sargan and *F*-tests). In the first column military expenditure is treated as being exogenous with regard to income and is therefore not instrumented. In models Y1 to Y4 Military expenditure is instrumented using 2SLS. All models use a random effect. *, ** and ***denotes significance at 10%, 5% and 1% respectively.

The signs of the other explanatory variables are positive and statistically significant, except the inflation rate (INFL) and the population growth which are found negative and not significant.

Moreover, the correlation between MILexp and the instruments is high whereas the correlation between the residuals of the model (Y1) and the instruments is very low. The first stage regression results (reported in Table A3 in the appendix) validate the use of the variables Human Development Index, life expectancy as instruments.

Indeed, the obtained *F* value is high and the first stage estimates are significant (see Table A3). Eventually, a Sargan test of over-identifying restrictions fails to reject the null hypothesis that the instruments are uncorrelated with the error term (μ_{it}) and that the specification is correct. This gives extra support to the validity of the instruments used.

Table 4. Estimates of Happiness based on Model (Y1)

	(Y1a)FE	(Y1b)FE
MILexp	0.465 ***	0.549***
	(0.108)	(0.104)
GDP	-0.450***	-0.521***
	(0.120)	(0.117)
INF	-0.004***	
	(0.001)	
EXP	0.294 ***	
	(0.062)	
GovSp	0.054*	
	(0.031)	
R^2	within=0.108	within=0.049
	between= 0.221	between=0.123
Hausman FE.v.RE	28.28	25.93
	(0.000)	(0.000)
N	624	624

Note: Standard errors in parentheses. *, ** and *** denote significance at 10%, 5% and 1% respectively. Estimated jointly with model Y1in Table 1. Model Y1a and model Y1b use a fixed effect.

Table 4 provides estimates of happiness, utilizing the results of the 'full' income models (Y1) (see Table 3). A 'basic' equation for happiness is estimated (models Y1a and Y1b) where happiness is expressed simply as a function of per capita income and military expenditure. In all models $MILexp$ has a positive and statistically significant effect on happiness. In addition, the variables governments spending (GovSp) and export of goods and services (EXP) positively influence the happiness. This result is in line with Bjornskov et al. (2008), who show that there is a positive relationship between economic openness and subjective well-being in a large database of 90,000 observations across 70 countries. In contrast, Di Tella and Culloch (2008) found that there is a negative relationship between economic openness and subjective well-being in OECD countries between 1975 and 1997.

The coefficient related to the economic growth is found to be negative and significant. This result is confirmed by Easterlin (2016), and contrasts with Deaton (2008) and Stevenson and Wolfers (2008).

In the same table 4, inflation rate has a negative and statistically significant effect on happiness. This result is in line with others studies that found a negative effect of inflation on subjective well-being in Latin America (Graham and Pettinato, 2001), Europe (Wolfers, 2003; Di Tella et al., 2001)and in the US (Di Tella et al., 2003).

It is now possible to quantify the impact of military expenditure on happiness. Firstly, Table 5 provides the direct, indirect and total effect of military expenditure on happiness for each of the two models presented in Table 4.

Table 5. The Impact of Military Expenditure on Happiness (Elasticities)

Happiness model $\delta Happ/\delta MIL \delta Happ/\delta Y \delta Y/\delta MIL Happ/dMIL$			
	Direct effect	Indirect effect	Total effect
(Y1a)	0.465	0.288	0.753
(Y1b)	0.549	0.338	0.887

As stated before, the ultimate object of this paper is to identify the impact of military expenditure on the happiness. Table 5 provides the direct, indirect and total effect of military expenditure on happiness for each model presented in Table 4. The first part ($\delta Happ/\delta Y$) of the indirect effect is consistent upon the level of income. For all models, this table indicates a positive direct impact of military expenditure on happiness. This result reflects the estimated coefficients on $MILexp$ reported in Table 4. For happiness, the indirect effect is positive, providing a positive total effect.

This positive sign of indirect effect reflects the same sign of the relationship between happiness and income ($\delta Happ/\delta Y$) and the relationship between military expenditure and income ($\delta Y/\delta MIL$). Consequently, a military expenditure-decrease induces a reduction in income which leads to a reduction in happiness and vice versa.

However, as has already been indicated, the indirect effect of military expenditure on happiness is consistent with the level of per capita income. Fig. 1 plots the direct, indirect and total effect of military expenditure on happiness against per capita income using the results from model Y1a.

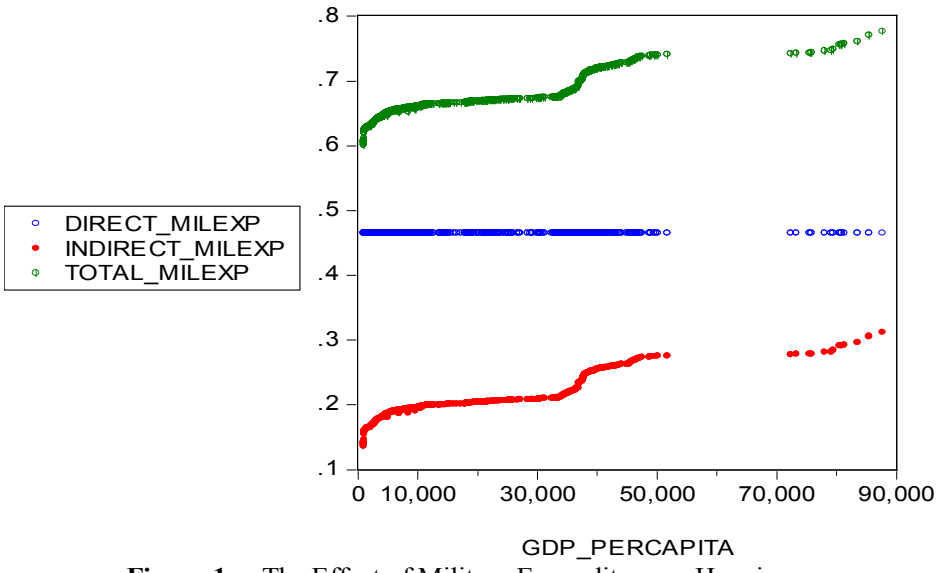

Figure 1. The Effect of Military Expenditure on Happiness

In figure 1, the indirect effect of military expenditure on happiness increases as per capita income increases. As, has already been established, the direct effect is positive and does not vary with income. The resulting total effect of military expenditure on happiness is generally positive, and increasing with income.

The shape of the indirect effects is positive and increasing from a positive sign (i.e. the fact that it increases with income) that determines the shape of the total effect. The indirect effect results from the product of $\delta Happ/\delta Y$ and $\delta Y/\delta MIL$.

From the model on which Fig 1 is based (income model Y1 and happiness models Y1a), the indirect and total effects increase with income as a result of the same sign of $\delta Happ/\delta Y$ and $\delta Y/\delta MILexp$.

5. CONCLUSION

Does military expenditure increase happiness? Our study suggests a positive response. Surprisingly, the obtained results seem to be a further justification of militarization rather than a condemnation of this activity. Why individuals feel happy when they are more armed? In the introduction, we have evoked as a possible explanation of feeling happy when being more armed, the fact that arms refer to the consumption of the ultimate public good i.e security. This leads to the following question: Why do individuals suffer from a lack of security so that they perceive the world as a threatening danger requiring military equipment? These questions are fundamentally important but go well beyond the scope of our article.

In the light of our results, policies that seek disarmament per se seem to be a delirium. The necessary prerequisite for the demilitarization appear to rely on the promotion of a harmonious word where the different ethnicities are not hostile to each other. Our word today seems to be far from this situation which suggests even more militarization.

Although we have offered new empirical evidence regarding the relationship between happiness and military expenditure, we have not identified precisely the contribution of each mechanism to the overall impact. Indeed, the final result identified through regressions is likely to be the effect from different combinations of driving forces across countries. Moreover, we have not investigated whether these results hands equally for developed as well as for developing countries.

APPENDIX

Table A1. Data Information

Variable	Definition	Source
GCF	Gross capital formation (% of GDP) (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	World Bank
GDP	Gross Domestic Product per capita ($US constant 2000) is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	World Bank
Happ	The mean value obtained from the distribution of the four step verbal life satisfaction	World data base on happiness
MILexp	Military expenditures per capita include expenditure of the armed forces. Military expenditures are presented as a percentage of Gross Domestic Product (GDP)	World Bank
GovSp	They include payments for operating activities of the government in providing goods and services. It includes compensation of employees (such as wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends.	World bank
INFL	Inflation rate (annual%),Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals.	World Bank
EXP	The share of exports of goods and services in GDP .Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services	World Bank
POPgr	Annual growth ofpopulation (%oftotal population)	World Bank
LE	The Life expectancyat birth (years) indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.	World Bank
HDI	Human Development Index is an index that measures the quality of life of the average population of a country $\boldsymbol{t}$, theoretically the index is between 0 and 1.	Human Development Reports

Table A2. Correlation Matrix

	MILexp	Happ	GDP	EXP	Govsp	GCF	POPgr	INFL	HDI	LE
MClLexp	1.00									
Happ	0.25	1.00								
GDP	0.90	0.35	1.00							
EXP	0.15	0.14	0.34	1.00						
Govsp	-0.58	-0.24	-0.59	-0.17	1.00					
GCF	0.64	0.19	0.63	-0.25	-0.33	1.00				
POPgr	-0.20	0.43	-0.18	-0.10	0.23	-0.07	1.00			
INFL	-0.34	-0.07	-0.37	-0.13	0.29	-0.19	0.16	1.00		
HDI	0.74	0.13	0.78	0.31	-0.50	0.50	-0.37	-0.38	1.00	
LE	0.80	0.32	0.87	0.16	-0.54	0.62	-0.09	-0.38	0.72	1.00

Table A3. First Stage Estimations of Military Expenditure

	(Y1)	(Y2)	(Y3)	(Y4)
HDI	-0.270*	-0.260*	-0.183*	-0.183*
	(0.278)	(0.278)	(0.278)	(0.278)
LE	-1.873***	-1.857***	-1.556**	-1.779**
	(0.724)	(0.713)	(0.699)	(0.278)
GCF	0.166***	0.164***	0.165***	0.165***
	(0.022)	(0.021)	(0.021)	(0.020)
EXP	0.027	0.028	0.004	
	(0.053)	(0.053)	(0.051)	
INF	-0.001	-0.001		
	(0.001)	(0.001)		
POPgr	-0.009			
	(0.021)			
F	75	75	79	80
	(0.000)	(0.000)	(0.000)	(0.000)
N	624	624	624	624

Note: Standard errors in parentheses. *, **and*** denote significance at 10%, 5% and 1%.

REFERENCES

Benoit, E. (1973), *Defense Spending and Economic Growth in Developing Countries*, Lexington: Lexington Books.

_____(1978),"Growth and Defense Spending in Developing Countries," *Economic Development and Cultural Change*, 26 (2), 271-280.

Birdi, A., and P. Dunne (2001), "An Econometric Analysis of Military Spending and Economic Growth in South Africa," Middlesex University Business School.

Biswas, B., and R. Ram (1986), "Military Expenditures and Economic Growth in Less Developed Countries: An Augmented Model and Further Evidence", *Economic Development and Cultural Change*, 34 (2), 361-372.

Bjornskov, C.H., D. Axel, and J.A.V. Fischer (2008), "Cross-country Determinants of Life Satisfaction: Exploring Different Determinants Across Groups in Society," *Social Choice and Welfare*, 30(1) ,119-73.

Blanchflower, D.G., and A. Oswald (2004), "Well-being over Time in Britain and the USA," *Journal of Public Economics*, 88(7-8), 1359-1386.

Clark, A., and A. Oswald (1996), "Satisfaction and Comparison Income," *Journal of Public Economics*, 61(3), 359-381.

Collier, P. (1999), "On the Economic Consequences of Civil War", *Oxford Economic Papers*, 51(1), 168-183.

Collier, P., and A. Hoeffler (2003), Military Spending in Post-Conflict Societies, Mimeo, Centre for the Study of African Economies, Oxford, mimeo.

Deaton, A. (2008), "Income, Health, and Well-being around the World: Evidence from the Gallup World Poll," *Journal of Economic Perspectives*, 22(2), 53-72.

Deger, S., and S. Sen (1983), "Military Expenditure, Spin-off and Economic Development," *Development Economics*, 13(1-2), 67-83.

Di Tella, R., R.J. MacCulloch, and A. Oswald (2003), "The Macroeconomics of Happiness," *Review of Economics and Statistics*, 85(4), 809-827.

Di Tella, R., and R. MacCulloch (2008), "Gross National Happiness as an Answer to the Easterlin Paradox?" *Journal of Development Economics*, 86(1), 22-42.

_____ (2010), "Happiness Adaptation to Income Beyond Basic Needs," *International Differences in Well-Being*, Oxford University Press.

Di Tella, R., J. Robert, R.M. Culloch, and J.O. Andrew (2001), "Preferences over Inflation and Unemployment: Evidence from Surveys of Happiness," *American Economic Review*, 91(1), 335-341.

Dunne, J.P. (2010), "Military Spending and Economic Growth in Sub Saharan Africa," Preliminary draft, School of Economics, University of the West of England,.

Dunne, J.P., and U. Mehmet (2003), "Defence Spending and Development," Department of Economics, British University in Egypt and University of the West of England.

Dunne, J.P., R. Smith, and D. Willenbockel (2005), "Models of Military Expenditure and Growth: A Critical Review," *Defence and Peace Economics*, 16(6), 449-461.

Easterlin, R.A. (1974), "Does Economic Growth Improve the Human Lot? Some Empirical Evidenc," *Nations and Households in Economic Growth*, 89, 89-125.

_____ (1995), "Will Raising the Incomes of All Increase the Happiness of All?" *Journal of Economic Behavior and Organization,* 27(1), 35-47.

_____ (2013), "Happiness and Economic Growth: The Evidence," IZA Discussion Paper. 7187.

_____ (2016), "Paradox Lost?" IZA Discussion Paper. 9676.

Easterlin, R.A., L.A. McVey, M. Switek, O. Sawangfa, and J.S. Zweig (2010), "The Happiness-Income Paradox Revisited," *Proceedings of the National Academy of Science,* 107(52), 22463-22468.

Faini, R., P. Annez, and L. Taylor (1984), "Defense Spending, Economic Structure and Growth: Evidence among Countries and Over Time," *Economic Development and Cultural Change*, 32(3), 487-498.

Frank, R.H. (1997), "The Frame of Reference as a Public Good", *Economic Journal*, 107(445), 1832-1847.

Frey, B. (2011), "Peace, War and Happiness. Bruder Klaus as Well-being Facilitator," *International Journal of Well-being*, 1(2), 226-234.

Frey, B.S., S. Lüchinger, and A. Stutzer (2007), "Calculating Tragedy: Assessing the Costs of Terrorism," *Journal of Economic Surveys*, 21(1), 1-24.

Frey, B., and A. Stutzer (2002), *Happiness and Economics: How the Economy and Insti-tutions Affect Well-Being*, Princeton: Princeton University Press.

Galvin, H. (2003), "The Impact of Defence Spending on the Economic Growth of Developing Countries: A Cross Section Study," *Defence and Peace Economics*, 14(1), 51-59.

Graham, C., and S. Pettinato (2001), "Happiness, Markets and Democracy: Latin America in Comparative Perspective," *Journal of Happiness Studies*, 2(3), 237-268.

Inglehart, R. (1990), *Cultural Shift in Advanced Industrial Society*, NJ: Princeton University Press.

Inglehart, R., R. Foa, C. Peterson, and C. Welzel (2008), "Development, Freedom, and Rising Happiness: A Global Perspective (1981-2007)," *Perspectives on Psychological Science*, 3(4), 264-285.

Layard, R. (2005), *Happiness: Lessons from a New Science*, London: Penguin.

Leontief, W., and F. Duchin (1983), *Military Spending: Facts and Figures, Worldwide Implications and Future Outlook*, New York: Oxford University Press.

Levine, R., and D. Renelt (1992), "A Sensitivity Analysis of Cross-country Growth Regressions," *American Economic Review*, 82(4), 942-963.

Levine, R., and S.J. Zervos (1993), "What We have Learned about Policy and Growth from Cross-country Regressions?" *American Economic Review*,83(2), 426-430.

Mankiw, N.G., D. Romer, and D.N. Weil (1992), "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics*, 107(2), 407-437.

Murdoch, J.C., and T. Sandler (2002) "Economic Growth, Civil Wars, and Spatial Spillovers," *Journal of Conflict Resolution*, 46(1), 91-110.

Pieroni, L. (2007), Military Spending and Economic Growth, Working Papers Series No.0708, Bristol Business School, University of the West of England.

Stevenson, B., and J. Wolfers (2008), "Economic Growth and Subjective Well-being: Reassessing the Easterlin paradox," *Brookings Papers on Economic Activity*, 1-102.

Welsch, H.(2007), "Environmental Welfare Analysis: A Life Satisfaction Approach," *Ecological Economics*, 62(3-4), 544-551.

_____ (2008), "The Social Cost of Civil Conflict: Essays from Surveys of Happiness", *Kyklos*, 61(2), 320-340.

Wolfers, J. (2003), "Is Business Cycle Volatility Costly? Evidence from Surveys of Subjective Well-being," *International Finance*, 6(1), 1-26.

Mailing Address:Faculté des sciences économiques et de Gestion de Sousse, Cité Riadh – 4023 - Sousse, Sousse 4023, Tunisia.Email:neilabenafia@yahoo.fr.

Received January13, 2017, Accepted April 26, 2017.