

# THE IMPLICATIONS OF FUEL PRICES EVOLUTION ON MILITARY CAPABILITIES

Maria CONSTANTINESCU

Regional Department of Defense Resources Management, Brasov, Romania

***Abstract:** The military is a fuel intensive sector and the high volatility of fuel prices and the upward trend of this prices impact on various aspects of the defense planning and operations, in both direct and indirect ways. The negative effects of the fuel price volatility on the development of military capabilities is enhanced by the economic downturn and the degree of fuel dependency of each country, creating challenges in estimating accurately the budget needs.*

***Keywords:** oil, evolution, implications.*

## 1. INTRODUCTION

The price of fuel has been one of the main factors of influence after the Second World War on the world political, military and economic situation. The price of fuel, as any other price, is subject to the evolution of supply and demand; in this case though, these economic concepts are heavily influenced by political, military, social and even psychological factors, leading to a very high volatility and unpredictability of the fuel quotations on the international markets. Fuel prices have been linked in modern history to economic recessions, political and social unrests and even military interventions, making them a very important factor of influence at any level of a modern society, as the prices of many other goods are linked to the price of fuel.

The military sector is also subject to the negative effects of fuel price volatility and increases, more than other government areas, as the military sector, by reason of its specific activities, consumes more fuel than less fuel-intensive areas, such as education. The generation and sustainability of modern and effective military capabilities is directly linked both to the need to increase the fuel efficiency of the military equipment and to embrace in a higher degree alternative, renewable energy

sources, but also to the need to find methods to manage effectively the financial and economic risk of fuel price fluctuations.

## 2. THE EVOLUTION OF FUEL PRICES AND ITS IMPLICATIONS ON THE MILITARY CAPABILITIES

**2.1 The evolution of oil prices and its political, economic and social implications.** The evolution of the oil prices after the Second World War has been intricately linked to the world's political, military and economic events. As shown in figure 1, according to the data provided by the Center for the Analysis of Financial and Economics Dynamics – CAFED, the evolution of the oil prices has been fairly constant, until the 1970 oil crisis, which marked the beginning of the upward trend which has continued since then. After the peak in the '70s and '80s, the oil prices decreased until 1991, when the invasion of Kuwait by Iraq and the subsequent operation Desert Storm lead to a new peak.

The year 1999 marked a low point in the evolution of the oil prices, as the increased supply from Iraq was accompanied by the financial and economic crisis in Asia, leading to a decrease in demand. After this point, the oil prices experienced a rapid increase in the year 2000, followed by a decrease in 2001 and

a new steady increase after the events of 9 September 2001 and the subsequent “war on terror” waged by the US.

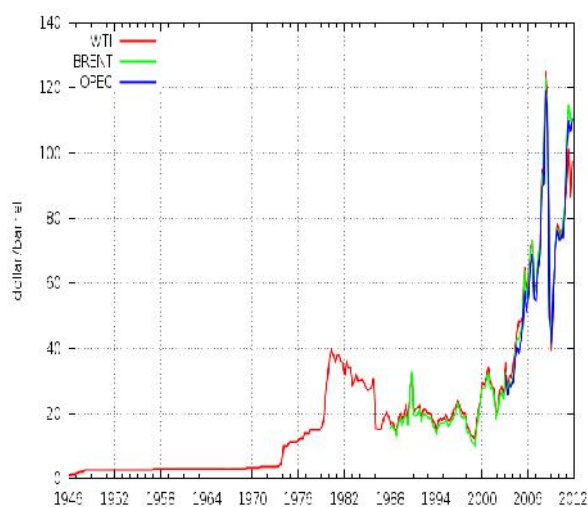


Fig. 1. The historical evolution of oil prices 1946-2012

Base on the data supplied by the Center for the Analysis of Financial and Economics Dynamics – CAFED shown in figure 2, the indirect effects of political, military and natural events on the evolution of oil prices is also visible. The increase of oil prices in 2003 marked the beginning of a steady rise in their evolution, influenced by such events as:

- the war in Iraq and the strike of Nigerian oil workers in 2003, coupled with an increased demand for oil;
- the effects of the hurricane Katrina, the continuing decline of the Iraq oil production, the deterioration of the security environment in 2004 and 2005; the tensions related to the North Korean missile tests, the ongoing Iraq war, the conflict between Israel and Lebanon and tensions related to Iran in 2006;
- tensions in eastern Turkey and the reducing strength of the U.S. dollar in 2007;
- the debut of the financial and economic crises in the United States, which subsequently spread at global level, was one of the most important factors behind the fall in oil prices in 2008, as the global demand for oil fell dramatically due to the recession
- between 2009 and 2010, tensions in Gaza strip and the hope for a timid recovery of the US economy drove up the prices, to be followed by another decline due to concerns

about the European economies going into recession due to budget deficit problems.

- In 2011, tensions in the Middle East (the civil unrests in various Arab countries), culminating with the war in Libya, drove the oil prices to high levels again.

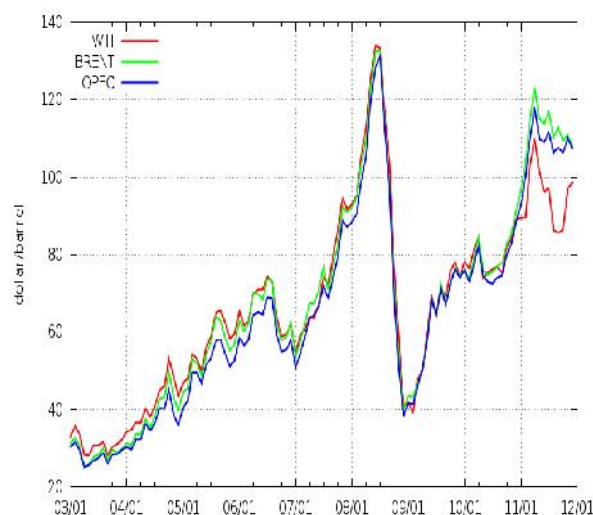


Fig. 2. The historical evolution of oil prices 2003-2012

## 2.2 The implications of the fuel prices evolution on the military capabilities.

The military uses fuel in a variety of ways, from fuel needed to operate the main military systems and equipment (jet fuel, ship fuel, tank fuel, missile fuel etc) to fuel needed for various other purposes, such as heating, functioning of generators etc. The high volatility of fuel prices and the upward trend of this prices impact on various aspects of the defense planning and operations, in both direct and indirect ways.

The *direct implications of the fuel prices* on the military capabilities refer to the difficulty to accurately estimate the fuel costs in order to develop correct budget proposals and also to the increased budget expenditures for fuel should the fuel prices increase.

The specific nature of the activities in the military sector leads to an increased difficulty in quantifying the total additional costs generated by the fuel price increases, as it is a challenging task to accurately provide a clear allocation of the fuel costs to the outcome of military missions and activities. In case the output measure of a military mission is expressed in quantitative terms (such as flying

hours or kilometers patrolled), allocating the fuel related costs to this type of output is possible with a higher degree of accuracy, as norms and regulations provide a framework for calculating the fuel consumption and associated financial requirements (based on average consumption / kilometer / mile / flying hour and the average price of a particular type of fuel used). In this instance, the link between the fuel costs and the mission output is straightforward.

A more challenging situation arises when the result of the military activity is expressed in terms of military capabilities, defined by the US military as “the ability to achieve a specified wartime objective including four major components:

- *force structure* (numbers, size, and composition of the units that comprise the defense forces);
- *modernization* (the technical sophistication of forces, units, weapon systems, and equipments);
- *readiness* (derived from the ability of each unit to deliver the outputs for which it was);
- *sustainability* (the ability to maintain the necessary level and duration of operational activity to achieve military objectives)”.

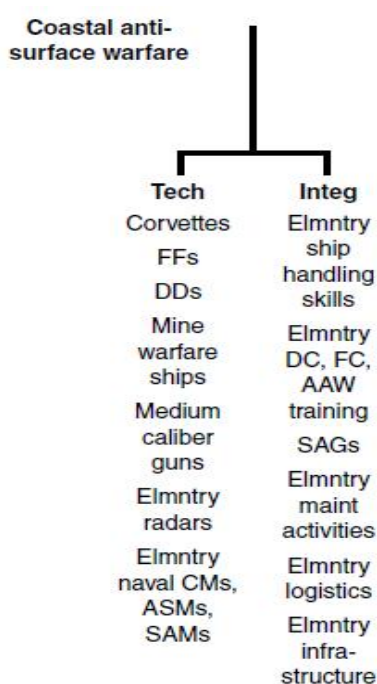


Fig. 3. Coastal anti-surface warfare capability example

The issue of estimating fuel costs and linking them to the outcome of the military capabilities is a very complex one, as it involves a whole array of factors and variables to be taken into consideration, in an increasingly volatile and uncertain economic, political, social and military environment. Measuring military capabilities is an ongoing concern for the modern military analysts, fraught with numerous challenges, related to the complexity of the issue and the fact that many attempts so far at measuring capabilities have focused on the “input measures” approach, rather than the “output measures”. The example of a military capability provided in figure 3, according to the RAND Corporation study MR 1110/A, illustrates the complexity and challenges of such endeavor.

If the fuel costs related to the operation of corvettes, for instance, can be more easily be calculated and allocated, other fuel related costs are not so easy to estimate. For instance, what should be the fuel costs associated to elementary logistics activities which comprise the specified capability? Should the fuel costs associated to the transport of spare parts needed for ensuring the functioning and necessary level of readiness for elementary radars should be allocated to this capability or should it belong in the total costs of the logistic support capability?

Another area where fuel costs may prove to have an important influence over time related to the sustainability component of a capability. In this context, sustainability refers to the need to ensure and maintain the necessary levels of resources (personnel, materials, consumables, equipment etc) required for the sustainment of a military operation. In this respect, a correct and accurate evaluation of the fuel costs is very important in ensuring that the necessary financial allocations have been featured in the budget. If in short term operations this issue is not a problem, as the fuel requirements may be met from a centralized supply system of military depots, the situation is not the same in medium and long term operations, especially in situations when the fuel prices experience a sudden and significant increase.

Fuel costs evolution has also important implications in connection with the concept of

life cycle cost of military equipment – the total cost incurred during the life cycle of a system/equipment, from the development / acquisition costs to operation and maintenance costs and finally salvage costs, when the product is taken out of operation. Fuel costs form an important part of the operating and maintenance total cost and they are especially difficult to estimate accurately considering that for many types of military equipments the life cycle stretches over a medium period of time.

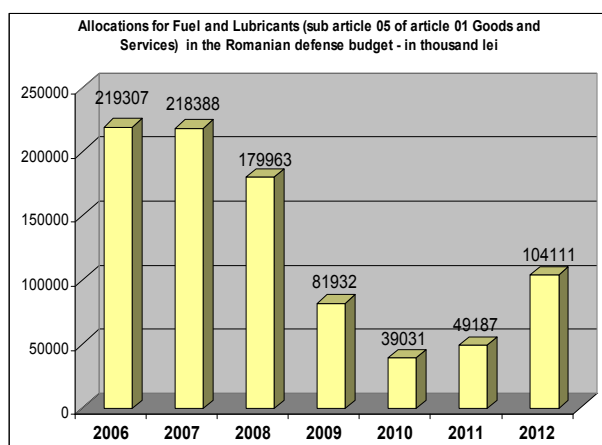


Fig. 4 Evolution of Fuel and Lubricants

There are also indirect implications of the evolution of the fuel prices on the military capabilities, deriving from the negative economic effects such as increased price volatility, increased inflation and increased uncertainty reflected in volatile stock markets or even decreased economic activity. These negative economic effects are also reflected in the decrease budgetary allocations for the defense. The effects of the economic crisis which started in 2008 on Romania's defense budget, with focus on the Fuel and Lubricants budgetary article, is clearly illustrated in the following chart. The dramatic decrease in this type of expenditures was not due directly to a

decrease of the fuel oil prices, but from the indirect effect of the economic downturn on the defense budget as a whole.

### 3. CONCLUSIONS & ACKNOWLEDGMENT

The impact of the fuel price evolution on the development of military capabilities is significant, enhanced by the evolution of the economic crisis. This impact is felt with even more severity in relation to the defense systems in countries relying on fuel imports (as is the case with many NATO and EU members).

Considering that Romania belongs to this category, the decision makers need to carefully analyze this phenomenon and take timely and effective measures for reducing, as much as possible, the impact of the evolution of fuel prices on the national defense capabilities.

### BIBLIOGRAPHY

1. Cook, J. Tellis, A., Bially, J., Layne, C., McPherson, M., Sollinger, J. (2000). *Measuring the National Power in the Postindustrial Age. Analyst's Handbook. Source.* [online]. Available: [http://www.rand.org/content/dam/rand/pubs/monograph\\_reports/2005/MR1110.1.pdf](http://www.rand.org/content/dam/rand/pubs/monograph_reports/2005/MR1110.1.pdf).
2. [http://cafim.sssup.it/~giulio/other/oil\\_price/report.html#price-movements-since-01-01-2003](http://cafim.sssup.it/~giulio/other/oil_price/report.html#price-movements-since-01-01-2003) [13 February 2012, 14.25]
3. [http://cafim.sssup.it/~giulio/other/oil\\_price/report.html#price-movements-since-01-01-2003](http://cafim.sssup.it/~giulio/other/oil_price/report.html#price-movements-since-01-01-2003) [13 February 2012, 15.12]
4. <http://usmilitary.about.com/od/glossary/term/msm/g/m3958.htm> [14 February 2012, 11.48]