



Putting numbers on capabilities: Defence inflation vs. cost escalation

by Katharina Wolf

Imagine a world without weapons: no battle tanks, no combat helicopters, no nuclear submarines – a world at peace, presumably. This world might soon come true if we believe what US aerospace businessman Norman R. Augustine famously predicted in 1983, namely that “in the year 2054, the entire [US] defence budget will purchase just one aircraft”. Very little has changed since then: costs for defence equipment are still skyrocketing while, in parallel, defence budgets have largely slid into a downward spiral. The world, however, has hardly become more peaceful – especially in Europe’s neighbourhood. As a result, a better understanding by policymakers of the relation between (cripplingly) expensive capabilities and complex security challenges appears to be much in need.

Spiralling costs

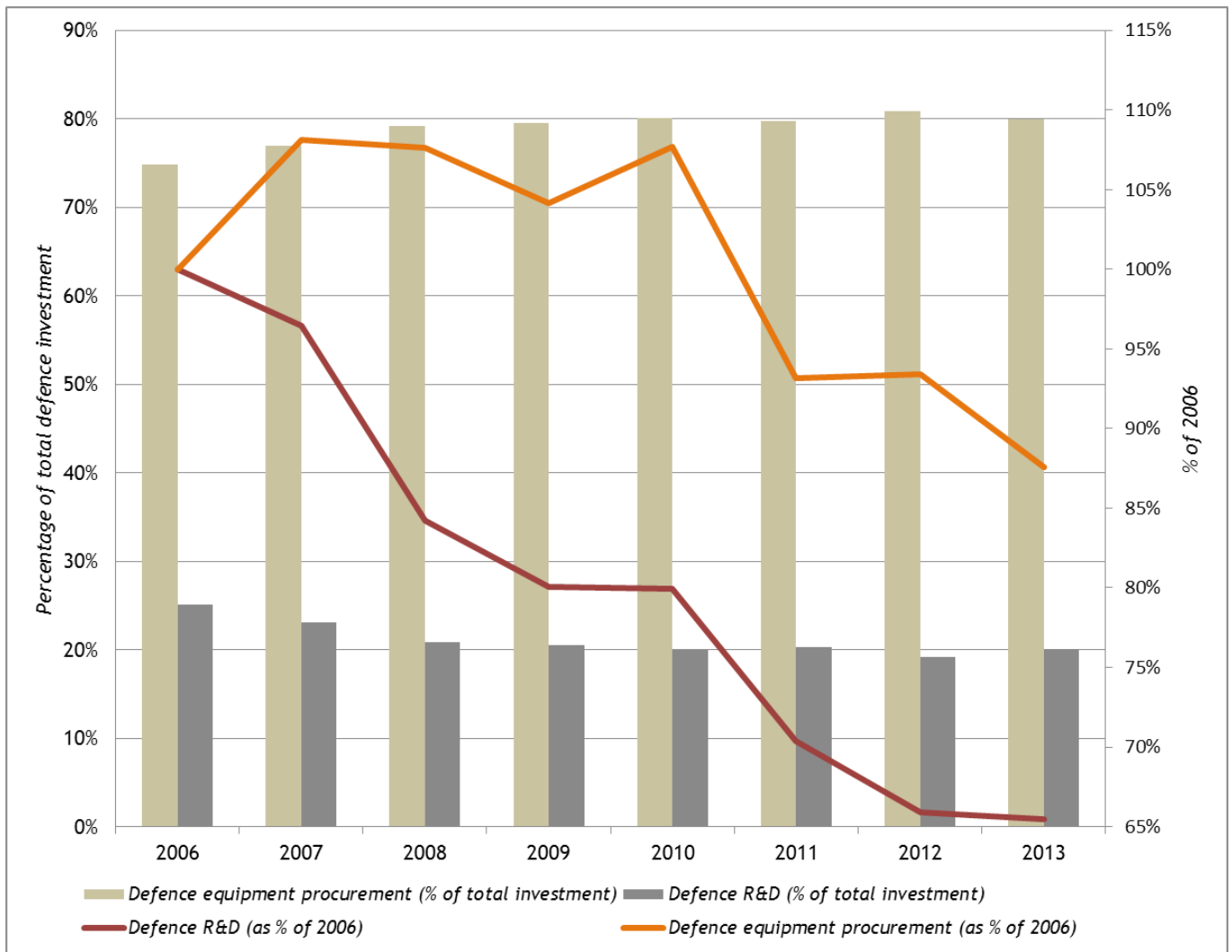
The assumption that the defence sector suffers from comparatively higher inflation rates and cost escalation than the general economy is hardly new. In 1983, academics Kirkpatrick and Pugh found that the unit costs of UK combat aircraft had increased by more than 8% per year since the end of the Second World War. Pugh later updated this estimate to be 10% for the period between 1952 and 1976, and 11% between 1955 and 2005. Following these early findings, much research has

been conducted on defence costs – with differing results.

While more recent studies find that cost escalation figures are lower than early empirical work suggested, all of them provide evidence that above-average cost growth is a persisting and universal phenomenon that affects a large variety of military equipment. Cost increase is generally believed to be lowest (1%-4%) for main battle tanks, small arms and frigates, and highest (6%-11%) for transport and fighter aircraft, infantry fighting vehicles, and submarines.

The consequences are already visible: expenditure for both equipment procurement and research and development (R&D) has fallen in real terms since 2006, but spending on R&D has seen the more dramatic decrease – by 12% more than equipment procurement and by 35% in total. Likewise, spending for R&D as a share of total investments has declined proportionally to defence equipment procurement expenditure. This has practical implications, too: procurement programmes are smaller, and order books – as seen with Europe’s A400M transport aircraft and the F-35 Joint Strike Fighter – are shrinking. As a result, keeping military equipment cutting-edge is increasingly tough and burdens already tight budgets.

EU 27 defence investment (2006-2013)



Source: EDA Defence Data 2013 *Data does not include Denmark *2006-2012 data does not include Croatia *2012 and 2013 data is partial, as several member states were unable to provide data

Differing concepts – and results

Despite the obvious importance of spiralling equipment costs for European defence planning, the phenomenon is little understood. Defence inflation, cost escalation and cost growth are the terms which are mainly used to describe price variations in the defence sector. They do not measure the same factors, however, and the conclusions which follow from them tend to differ.

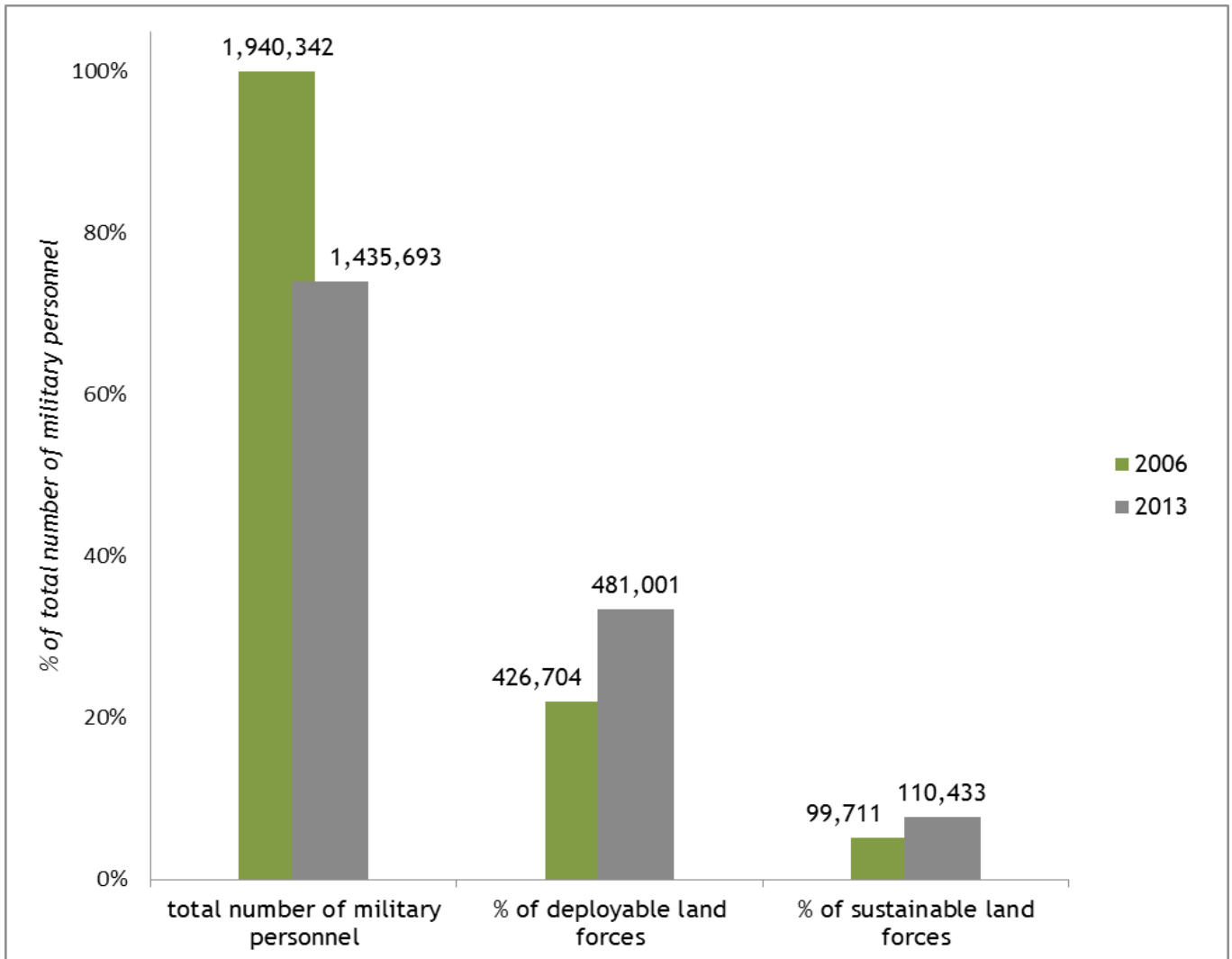
Defence inflation as it is currently measured (by the UK Ministry of Defence, for instance), gives the increase in prices for all goods and services covered by the defence budget. In contrast to output inflation indicators, such as the GDP deflator, defence inflation is an input measure, which holds constant the quantity and quality of the goods and services included. Because it does not account for productivity and efficiency gains, it generally displays higher growth rates than general inflation indicators. *Cost growth*, on the

other hand, arises through overoptimistic forecasting and planning, as well as changing requirements during the development and production phases of a specific defence project. Last but not least, *cost escalation* occurs if new generations of weapon systems are purchased in reaction to a changing security environment.

Cost escalation and cost growth

Most research to date has centred on cost escalation and cost growth of military equipment – and the driving forces behind them. There are a number of factors which contribute to cost increases in the defence sector. One is the imperfectly competitive structure of the defence market, which features only a few numbers of suppliers and typically only one main customer, the defence department. Others include the relative value of defence equipment, which has to be superior to those of potential rivals, and the continuous struggle to acquire (costly) cutting-edge military

Number of deployable and sustainable (land) forces (% change and absolute figures)



Source: EDA Defence Data 2013 *Data does not include Denmark *2006-2012 data does not include Croatia *2012 and 2013 data is partial, as several member states were unable to provide data

equipment. Lastly, preferential arrangements favouring national industries also tend to distort prices.

Recent defence projects show evidence of these negative forces. Initially set to cost €20 billion, quarrels over extra requirements for Europe's A400M Atlas programme (as well as the quest for preferential investment decision which led to the establishment of a European engine consortium) meant that the project is now running years behind schedule and €10 billion over budget. To keep costs within specified limits, European governments cut the size of the project from a total of 196 ordered transport aircrafts to 174, thus further driving up unit costs.

Cost escalation of weapon systems is not an exclusively European problem: military planners on the other side of the Atlantic are racking their brains over how to control the same inefficiencies and cost increases of acquisition programmes, too. A 2014 report by

the US Government Accountability Office showed that almost half (42%) of the major weapon acquisition programmes of the US Department of Defence in 2013 experienced an increase of unit costs by 25% or more – and a schedule overrun of 28 months on average.

Do figures hide more than they reveal?

Countermeasures have already been taken to face up to these challenges. The 2009 EU defence procurement directive and the European Commission's 2014 roadmap 'A New Deal for European Defence' aim to increase cooperation between member states, promote competitiveness, and reduce national protectionism and the fragmentation of defence markets in Europe. Some positive effects can already be seen. The introduction of a common licensing system, for instance, now facilitates the transfer of defence-related goods between member states.

More collaborative projects in development, production and maintenance of weapon systems, so the logic goes, are key to ensuring that European defence remains credible. Cooperation promises savings through economies of scale, shared development, production and maintenance costs, as well as through the common use of training and logistical facilities. And yet, duplication of weapon systems and the fragmentation of the defence market still persist. Overall, European states have almost four times the number of platforms and systems in use than the US and some remain reluctant to forge closer and deeper cooperation.

If Augustine's prediction is in any way accurate, however, inefficient weapon programmes will become unaffordable from a financial perspective and risky from a security point of view in the long run. After all, a world in which security threats have become more diverse and diffused does not offer a choice between quantity and quality. Matching numbers with capabilities is a necessity: sending a naval ship to fight pirates in the Horn of Africa is of little use without the helicopters needed for the operation – and a single aircraft obviously cannot be present in two theatres at a time.

That said, cost escalation hype can easily lead to false conclusions and uncoordinated efforts in the pursuit of savings. The problem runs deeper and requires more complex responses than cost escalation figures may indicate. Cost escalation estimates are essential for European military planners to determine the programming and budgeting of defence equipment. They provide information on the likely cost growth of weapon systems and are crucial in attempts to anticipate how many new capabilities can be acquired with the resources available. Yet, because cost escalation estimates do not take quality changes into account, they do not provide any information on how effective the purchased capabilities are, whether they make a nation more secure and whether they are able to thwart the threats which they are intended to tackle. In short, such figures show absolute price changes of weapon systems but do not disclose their relative value and effectiveness. In fact, research conducted for the UK Ministry of Defence and the latest figures of a study by Hove and Lillekvelland reveal that once changes in characteristics and quality are adjusted for, cost escalation estimates tend to fall.

For example, a 2009 report by RUSI shows that although the size of the UK fleet of combat aircraft has shrunk by 40% in absolute terms since the end of the Cold War, those of Russia and China have fallen by more than 70%. Hence, UK air capabilities increased in relation to those of the other two powers. The variation in the number of deployable and

sustainable forces is another indicator which provides some insight into military efficiency: absolute numbers of military personnel of the 27 European Defence Agency (EDA) states decreased by 26% between 2006 and 2013, but the share of deployable land forces increased by almost 12%, and that of sustainable land forces by almost 3%.

Measuring defence output

Getting a better sense of the relative effect of capabilities, the security which military equipment provides and, more broadly, the benefits of spending on defence would obviously be valuable for defence analysis, planning, programming and budgeting – but it is also of interest to the general public. Yet there are several difficulties with the construction of an output measure for defence, something which has hindered the development of such an indicator so far.

Clearly, measuring peace, national interests, the projection of power and the protection from terrorist attacks with numbers is a tricky undertaking. Equally problematic is how to measure the added value of defence expenditure, a process which would require determining the costs and consequences of not spending on defence – i.e. measuring the counterfactual. Another problem is that the performance of defence services is always relative: capabilities not only need to be assessed against the *changing* capabilities of and threats posed by potential rivals, but their efficiency also depends on the capabilities of allies when they are used in common operations. Due to these difficulties, the only publicly available defence inflation measure in Europe – used by the UK – follows the input=output convention which measures defence output according to the volume of input and does not take quality changes or relative effectiveness of capabilities into account.

Despite these obstacles, recent advancements through the calculation of quality-adjusted cost escalation figures demonstrate that progress in this direction might be cumbersome but is not impossible. From a practical viewpoint, the Capability Development Plan produced by the EDA – which addresses capability challenges based on future scenarios – is just as valuable. Ultimately, while measuring defence performance is a remote goal, a rational assessment of defence capabilities in their respective security environments, backed up by thorough defence planning and efficient procurement, is essential. That is, as long as it remains uncertain that tomorrow's world will be peaceful.

Katharina Wolf is a PhD candidate at the EUI and a former Junior Analyst at the EUISS.

