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SECURITY AND DEFENCE ECONOMICS-AN UNKNOWN DISCIPLINE

Abstract

Conflicts and wars are like laws of nature an integral part of humankind. Since time immemorial there have been conflicts and wars in the world and thus military forces, their personnel and the demand for armament goods are an important object of national politics. As a decisive part of Security and Defence Policy, armed forces have an outstanding position. Nearly in every independent state which maintains military forces, these forces can be seen as a large enterprise - in most cases even the largest enterprise.

A konfliktusok és a háborúk, csakúgy, mint a természet törvényei szerves részei az emberiségnek. Időtlen idők óta voltak konfliktusok és háborúk a világon, és így a katonai erő, maguk a katonák, valamint a fegyverzet és felszerelés biztosítása fontos céljai a nemzeti politikának. Ennek megfelelően a biztonság és védelempolitika egyik kiemelt területe a fegyveres erők szerepe. Szinte minden független állam, amely katonai erőt tart fenn, úgy tekint a fegyveres erőkre, mint egy nagyvállalatra - a legtöbb esetben a legnagyobb vállalkozásra.

Keywords: *conflict, war, national politics, military forces ~ nemzeti politika, katonai erő*

INTRODUCTION

Like civilian enterprises armed forces produce goods and services, but these goods and services differ from products and services of their civilian counterparts. The range of all goods and services produced by armed forces are wide and manifold, i.e. the output reaches from deterrence and dissuasion, military training and exercises, medical treatment, maintenance in a naval wharf, operations abroad, scientific research work and teaching at military universities to the paperwork of the Ministry of Defence. To produce all final and intermediate products armed forces use land, labour and capital as factors for production. In peace and in wartime the factors of production are scarce and therefore their supply and use in production is always a critical bottleneck for satisfying all the needs of military planners and leaders.

In order to be economically successful, private enterprises need to observe the law of rational and efficient use of factors of production. Armed forces as typical state enterprises in the narrow sense without the need to yield profit, especially in wartime, seem to neglect the law of rational and efficient use of factors of production. This special situation of armed forces in a society stimulated economists to study armed forces as “a special case of an enterprise (*sui generis*)” and they also wanted to know more about the production process with armed forces. Therefore a small group of economists created the discipline “Defence Economics” as a part of economic science.

Defence Economics seems to be a rather new discipline without a family tree, which goes back to economic thinkers of the early days of humankind, but this new discipline may have its starting point in the 18th Century when the so-called classics made also some research work in the field of military affairs.

In the following essay we firstly will make a journey into the past by studying the literature of the so-called “classical economics” to find out what the founding fathers of economic science thought about the economic value of military forces. In the second chapter the author analyses the importance of the science-discipline Defence Economics in selected countries. The scientific basis of Defence Economics is presented in the third chapter and finally in the fourth chapter we give an overview what the special disciplines of economics can contribute to solve concrete questions in connection with, for example, defence, armed forces, recruitment and armament industry. Concluding remarks round off the discussion and give a forward look at possible fields of further research work for Defence Economics.

“DEFENCE ECONOMICS” AS PART OF THE SCIENTIFIC WORKS OF EARLY ECONOMISTS

Economics is the science discipline which analyses the production, distribution, and consumption of goods and services. The term “economics” itself comes from the ancient Greek and means in a wider sense “management of a household (*oikos* = house, *nomos* = law)”. Economists with a special focus on historical facts always remark that in their eyes the founders of economics are the philosophical thinkers in the ancient Greece and Rome, but they also mention that modern economic theory has more its roots in the theoretical works of the classical thinkers of economic theory who lived and wrote their important works in the last decades of the 18th and first decade of the 19th Century, rather than in the famous and well-known works of the philosophers of the ancient times, like Plato.

It's not clear until now who was the first scientist to introduce the term “Defence Economics” into academic discussion. In Germany researchers found that in the 17th Century a few scientist made some economic research work about armed forces. In 1680 the German mathematician and philosopher *Gottfried Wilhelm Leibnitz* (1646-1716) wrote his

“*Oeconomia militaria*” (Military Economy) in which he discussed the connection between military affairs and the economy. After that, archbishop and one of prime advocates for the defence of Vienna in 1683 against the Ottomans, **Leopold Karl Graf von Kollonitsch** (1631-1707) wrote his “*Ökonomie in Militärsachen*” (Economy in Military Affairs) in which he analysed the connection between military affairs and the economy.

In Western Europe, especially England and France, the main military powers of the 18th Century, some scientists also focused their research work on armed forces. In the second half of the 18th Century the so-called “Classical Economists” wrote their thoughts about armed forces, wars and armament production in their famous works.

Adam Smith (1723-1790) the founder of modern economics devotes one chapter of his famous and well-known book “*An Inquiry into the Nature and Causes of the Wealth Nations*”, published in 1776, to the worth of defence, armed forces, recruitment of soldiers and financing the forces.

One of his most famous successors, **David Ricardo** (1772-1823), the founder of the modern theory of trade, published the results of his research in his book “*Principles of Political Economy and Taxation*” (1817). In his analysis, Ricardo became an opponent of wars because wars create turbulence in the economic activity, which results in great loss of welfare for nearly all groups in a society and participants in the economy. As a determined opponent of wars he was against the activity of any kind of armament industry. In sum he saw the work of soldiers extremely negative.

Ricardo’s contemporary in France as one of the great economists of his time was **John Baptiste Say** (1767-1823). Say was the first economist to study the sense of the business cycle in detail. In his work “*Traité d’économie politique ou simple exposition de la manière dont se forment, se distribuent, et se consomment les richesses*” (1803) he concluded among other things that wars create loss of welfare because on the battlefields many young men died. Most of these young men were skilled workers in their civil occupation. Mostly, their education costs a lot of money. After they died in action their capacity for work was lost for production and therefore they are not able to pay back all the money which was spent for their education. Furthermore, he expressed the opinion that with all the dead men lost in the war an economy also lost many future consumers.

The founder of Marxism and opponent of capitalism, **Karl Marx** (1818-1883), pays no tribute to the military sector of a society. In his eyes soldiers are only an instrument of the leading class, the capitalists. Therefore expenditure in the defence sector is non-productive.

Two of the most influential economists of the 20th Century made also some research work about the military sector. The British economist **John Maynard Keynes** (1883-1946) and founder of “Keynesianism” wrote in 1940 during the Second World War “*How to pay for the war*” in which he made a proposal about the best possible way of financing the contribution of Great Britain to the great war. The political leaders in Great Britain trusted him and followed his advice. Following his ideas was one of the reasons why Great Britain organised an effective and efficient system of financing all activities during wartime.

In the USA the Noble Prize Laureate **Milton Friedman** (1912-2006) and founder of “Monetarism” studied in the 1970ies the system of recruitment of the Armed Forces of the USA. He found out that it was very ineffective and therefore very inefficient. In his opinion the problem was the quality and effort of the so-called recruitment officers, especially in the Army branch.

In summary, it may be said that defence as an important part of every society was not discussed in sufficient detail by the economists of the past. One reason for this failure caused in the outstanding model which included an explicitly military sector. A great step forward to solve this failure was made by **Charles J. Hitch and Roland N. McKean** in their work “*Economics of Defense in the Nuclear Age* (1960)” and **Keith Hartley and Todd Sandler**

"Handbook of Defense Economics (2007)", nowadays important reference literature for further academic discussion.

The current academic discussion is influenced by the books of Hartley and Sandler and focuses on the question "What is the nature and scope of defence economics?"

In Hartley and Sandler's "The Economics of Defence - Volume I" we can find a helpful definition what "Defence Economics" is. Intriligator wroteⁱⁱ *"Defence economics is concerned with that part of the overall economy involving defence-related issues, including the level of defence spending, both in total and as a fraction of the overall economy; the impacts of defence expenditure both domestically for output and employment and internationally for impacts on other nations; the reason for the existence and size of the defence sector; the relation of defence spending to technical change; and the implications of defence spending and the defence sector for international stability and instability."*

At first, we will leave the definition and discuss the scientific basis of "Defence Economics" in Chapter III in more detail.

THE DEVELOPMENT OF DEFENCE ECONOMICS IN SELECTED EUROPEAN COUNTRIES

In this chapter we have presented a short historical overview about the development of Defence Economics in Austria, West-Germany, former East-Germany and, United Germany since the end of the Second World War.

Defence Economics in Austria

After the Second World War, Austria was divided and occupied by the victorious nations United States of America, Soviet Union, Great Britain and France. In 1955 Austria regained its sovereignty, declared itself neutral and has stayed so until now and organised small Austrian Armed Forces (Österreichisches Bundesheer). It was also decided that Austria should spend only a small amount of its federal budget (GNP) on the Armed Forces. The small army and the small amount of military spending provide little incentive to make scientific research work about the impacts of Austrian Armed Forces on the economy on a larger scale. Therefore defence did not play a great role in the academic discussion and we can find only a small number of publications which can be assigned to the research field Defence Economics. Worth mentioning are Professor Alexander van der Bellen's study about "Rüstungskonversion/Conversion of armament", Professor Gudrun Biffel's study on "Wehrsysteme/Systems of Recruitment and their impacts on the labour market", Professor Herbert Strunz's study on "Management in Armed Forces", Professor Klaus Arnold's study on the "Garrisons and their economic impact on the regional economy", Strunz/Pöcher/Breunig's book about "Wehrökonomik/Defence Economics" and Harald Pöcher's book about "Geld, Geld...und nochmals Geld - Das Österreichische Bundesheer als Wirtschaftsfaktor von 1955 bis heute/Money, Money...and more Money - The Austrian Armed Forces as an economic factor from 1955 until present". Furthermore Strunz and Pöcher published some articles in the state-owned Austrian Military Journals "Truppendienst" and "Österreichische Militärische Zeitschrift" as well as in the independent Austrian Military Newspaper "Der Soldat".

This blatant apathy towards research work on military affairs in Austria becomes evident in the lack of academic educational establishments and research institutions.

Defence Economics in Western Germany and the reunited Germanyⁱⁱⁱ

The "Deutsche Bundeswehr/German Federal Armed Forces" was founded in 1955. Shortly after the foundation of the Bundeswehr Dr. Johannes Gerber, tried to introduce economic

thinking into the Armed Forces by writing essays and articles in newspapers and journals, i.e. “Modern Cost Accounting in Armed Forces” in the “Frankfurter Allgemeine Zeitung” as well as “Economy and Armed Forces” in the German military journal “Soldat und Technik”. Many publications in Western-German newspapers and military journal followed.

A great step forward was the foundation of two universities of the Federal Armed Forces in the early 1970ies in Munich and Hamburg. At these universities economists made research work about defence economics, i.e. Helmut Maneval, Lothar Grössl and Günter Neubauer in Munich as well as Straubhaar in Hamburg later. Other scientists who are worth mentioning, were Oswald Hahn at University of Nürnberg-Erlangen, Lutz Köllner, Carola Bielfeldt and Günter Kirchhoff. The most important publications of the heydays of the “German Defence Economics” were Kirchhoff (ed.) *Handbuch zur Ökonomie der Verteidigungspolitik/Handbook on the Economy of Defence-Policy* and Hahn *Militärbetriebslehre/Microeconomics of military sector*. Not later than the early 1970ies the Federal German Forces set a system of cost accounting in force.

After the reunification it was necessary to disarm the former National People’s Army (NVA) and to start a process of economic modernisation of the Federal Armed Forces. During this period, economists were welcomed as advisers how to disarm the NVA efficient and to solve the problem of integration of personnel of former NVA into the Bundeswehr. Not later than the 2000ies economic thinking became a cornerstone of the process of the so-called “Transformation of the Bundeswehr”, which is still on-going. Economists developed a series of measurements to compare the current situation of Bundeswehr with the status of the past.

After the death as well as retirement of the leading figures of the German Defence Economics the research work declined and has never been recovered until now. Defence Economics and its results of research therefore stayed widely unknown in the German Federal Armed Forces and the acceptance of Defence Economics is not widespread.

Defence Economics in the former German Democratic Republic^{iv}

The “Nationale Volksarmee (NVA)/National People’s Army” was founded in 1956 as an answer of the foundation of the Federal Armed Forces (Deutsche Bundeswehr) of the Federal Republic of Germany and NVA was disbanded in 1990 after the reunification of both German states into a unified Germany.

The Defence Economics in the former German Democratic Republic is also known as “Economic Theory of Armed Forces”. The science discipline has got its scientific basis from the theoretical Marxism-Leninism. As a central question, the scientists had to justify the work of soldiers as a necessity for the further development of socialism. The importance of the “Economic Theory of Armed Forces” was a part of the constitution of the former German Democratic Republic. In the 1960ies the most important economists published their “Probleme der Militärökonomie/Problems of Economic Theory of Armed Forces” (1967). During the 1980ies economists of the Military College “Friedrich Engels” in Dresden and of the University of Economics in Berlin consolidated their research and planned to publish a textbook, titled “Economic Theory of Armed Forces”. The work on the textbook lasted too long and the unforeseen reunification prevented the publication.

The research work of Economic Theory of Armed Forces in Socialism had to fulfil three main tasks. Firstly, Economic Theory of Armed Forces was a science discipline, which had to find out the best possible economic preparations against an aggression of western capitalist countries, especially the members of North Atlantic Treaty Organization (NATO). Furthermore, the scientists had to study the preparations of NATO-Members against the Warsaw Pact carefully. Secondly, Economic Theory of Armed Forces had to find out the most effective and efficient way to organise and arm the forces in peacetime and to prepare it for

operation in wartime. Thirdly, Economic Theory of Forces had to organise the co-operation between the civilian sector of national economy and the military forces in peace and wartime.

The author studied carefully the results of the research work of Economic Theory of Armed Forces in Socialism in the former GDR and after the Iron Curtain had vanished, he also discussed the results with former professors of the Military Academy “Friedrich Engels” in Dresden. In his opinion, the theoretical model was very carefully developed and led to results, which commanders of the former NVA could use for an efficient conduct of operations.

SOME REMARKS ON THE SCIENTIFIC BASIS OF DEFENCE ECONOMICSv

Beforehand, it is beyond debate that theoretical knowledge of economic science is the basis of research work on Defence Economics.

Most of the countries of the world have mixed economies in that they feature a mixture of public and private sectors, of markets and command decision-making systems, and of incentive mechanism used. The private sector refers to all production that is in private hands and the public sectors refer to all production that is in public hands. Many of the production activities of the government are similar to corresponding activities carried out by private firms. The market mechanism, the operation of the forces of supply and demand is the very heart of the market system. The market mechanism can only operate fully when people follow certain „market“ behavioural norms. The seller of goods and services must be motivated by profit. The buyer must be motivated by wanting to get the most for their money, i.e. the biggest bang for the buck. Whenever market performance is judged to be faulty, it is the practice to speak of market failure. Market failure does not mean that nothing good has happened, but that the best attainable outcome has not been achieved. There are certain kinds of goods and services that would not be produced at all if the choice were left up to the market mechanism, even though it might be acknowledged by everybody that such goods provide benefits for all. *Such goods are public goods. An example on a large scale is national defence, on a small scale, navigational aids (such as a light buoy).* These are called pure public goods. They have two critical properties:

First, it does not cost anything for an additional individual to enjoy the benefits of the public goods. It costs no more to defend a country of one million and one individual than to defend a country of one million. This non-rival nature of public-goods has important effects on what we call efficient resource allocation, i.e. allocation of resources to produce at minimum cost what consumers want most.

Secondly, it is difficult or impossible to exclude individuals from the enjoyment of the public good. If our national defence policy is successful in diverting an attack from abroad, we all benefit; there is no way we could exclude any single individual from these benefits. The fact that private markets will not supply, or will supply too little of public goods, provides a rationale for many government activities.

Using these two characteristics, Figure 1 divides goods into four main categories:

- *Private Goods* are both excludable and rival. Consider clothing, for example. Clothing is excludable because it is possible to prevent someone from using clothing - you just don't give it to him.
- *Public Goods* are neither excludable nor rival. That is people cannot be prevented from using a public good, and one person's enjoyment of a public good does not reduce another person's enjoyment of it.
- *Common resources* are rival, but not excludable. For example, fish in the ocean are a rival good: When one person catches fish, there are fewer fish for the next person to

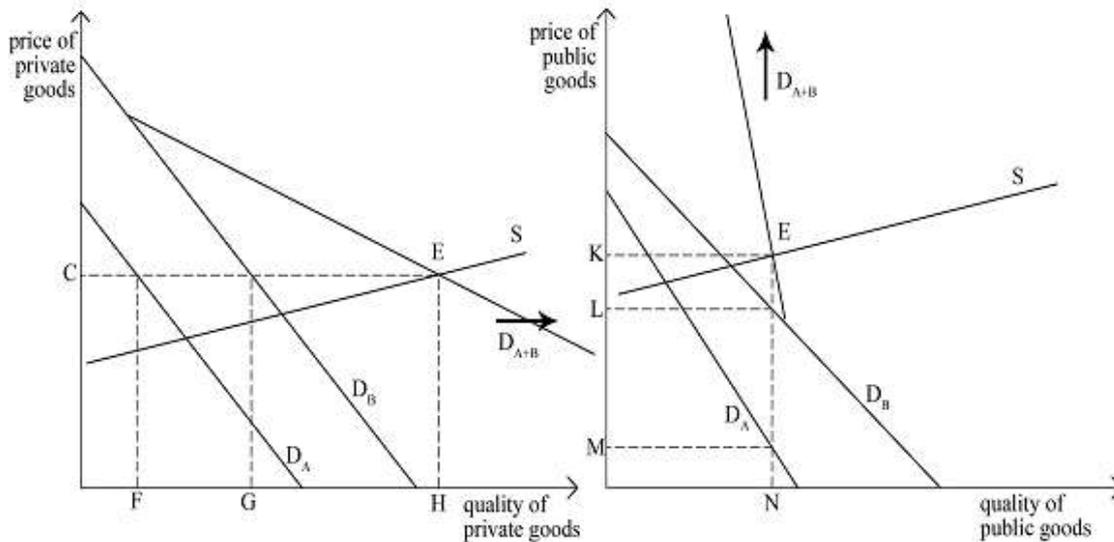
catch. Yet these fish are not excludable good because it is difficult to charge fishermen for the fish that they catch.

- When a good is excludable, but not rival, it is an example for a *Natural Monopoly*, i.e. fire protection in a small village or cable TV.

		Rival	
		yes	no
Excludable	yes	Private Goods - Clothings - Meals	Natural Goods - Fireprotection - Cable Tv
	no	Common Persons - The enviroment - Fish in the ocean	Public Goods - Efficent Government - Defence

1. Figure. Four types of goods

To explain the non-rival nature of public goods, it is helpful to compare the demand-and-supply diagram for private goods with the corresponding diagram for public goods.



2. Figure. Demand for private and public goods

(Source: Musgrave/Musgrave, page 52)

The left side of figure 2 shows the construction of market for a private good. D_A and D_B are the demand curve of individual A and individual B, based on a given distribution of income and prices for other goods. The aggregate demand curve D_{A+B} is obtained by horizontal addition of D_A and D_B , adding the quantities which A and B purchase at a given price. SS is the supply schedule, and equilibrium is determined at E, the intersection of market demand and supply. Price equals OC and output OH , with OF purchased by A and OG by B where $OF + OG = OH$.

The right side of figure 2 shows a corresponding diagram for a public good. We assume for this purpose that the consumers are willing to reveal their marginal evaluation of the public good. D_A and D_B are A's and B's respective demand curves, subject to the same conditions of given incomes and prices of other goods. Since it is unrealistic to assume that consumers volunteer their preferences, such curves have been referred to as "pseudo-demand curves". But suppose for argument's sake that consumer preferences are revealed. The crucial difference from the private-good case then arises in that the market demand curve D_{A+B} is obtained by vertical addition of D_A and D_B , with D_{A+B} showing the sum of the prices which A and B are willing to pay for any given amount. This follows because both consume the same amount and each is assumed to offer a price equal to his or her true evaluation of the marginal unit. The price available to cover the cost of the public good equals the sum of prices paid by each. SS is again the supply schedule, showing the marginal cost (chargeable to A and B combined) for various outputs of the public good. The level of output corresponding to equilibrium output OH in the private good case now equals ON . Which is the quantity consumed by both A and B? The combined price equals OK , but price paid by A is OM while that by B is OL , where $OM + OL = OK$.

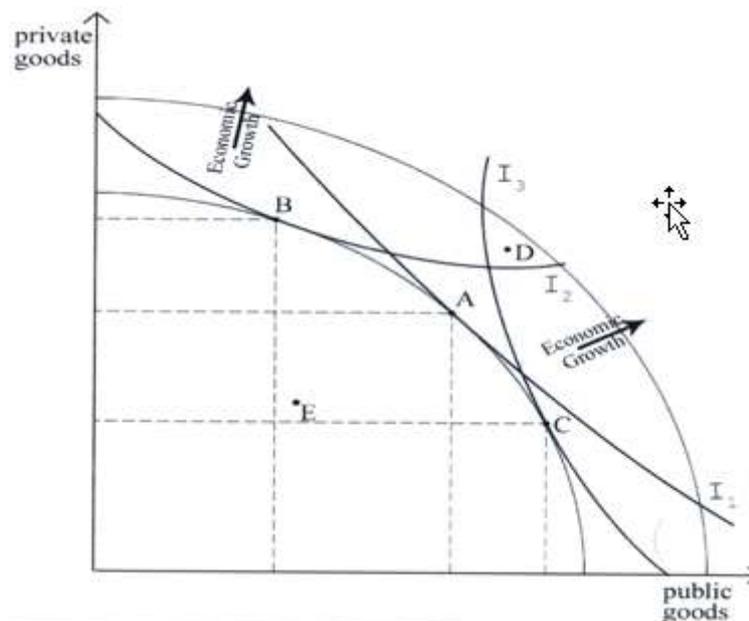
While the presentation of Figure 2 is helpful in bringing out the difference in efficiency conditions, it is misleading if taken to suggest that the provision of public goods might be implemented by the market mechanism of demand and supply, with equilibrium at E in the case of the private good. This interpretation implies that the consumers will bid as they would for private goods and thus overlooks the crucial fact that public goods are provided without exclusion. Because of this, consumer preferences for such goods will not reveal voluntarily. Since the number of participants is usually large, any one contribution will make little difference in total provision. Knowing this, consumers will find it in their interest to act as free-riders. The pseudo-demand curves of Figure 2 do not come into play and the market mechanism cannot function. To bypass this difficulty, economists have defined efficiency allocation for public goods in terms of a model which simply assumes that preferences are known, but it is not an operational approach. In practice, a political process must be used to obtain revelation of preferences and to furnish it with the fiscal resources needed to pay for them. This is done through voting on tax and expenditure decisions. Individuals, knowing that they must comply with the majority decision, will find it in their best interest to vote for that solution which will move the outcome closer to their own desires, and in this way they will be induced to reveal their preferences.

Public Goods (=guns) versus Private Goods (=butter)

In the defence economic discussion, economists often use the terms "guns" and "butter" instead of public and private goods. The use of these terms should symbolize the trade-off between social welfare and military strength. Economics, as I mentioned above, is the study of scarcity. Given that resources are limited and people's wants are unlimited, the problem any economy has is how much of our resources should be devoted to the production of public and how much to private goods. The allocation of scarce resources among alternative uses, called resource allocation, determines the quantities of various goods that are produced. Choosing to produce a particular combination of goods means choosing a particular allocation of resources among the society. Further, because resources are scarce, it is desirable that they be used efficiently. In summary, because economic resources are scarce, a full- employed economy cannot have more of both bundles of goods. Let's consider an economy, which is fully employed and is producing its maximum possible outcome level. When an economy's available resources are fully employed, we say that the economy is producing its maximum possible output of goods. Given that resources are limited, the maximum possible output level is limited too. To have more of one, it must give up some of the other. The cost of having

more of one is the opportunity cost, or the amount of the other, that must be given up. Let us illustrate this concept by using the concept of a production possibilities frontier¹. A production possibilities frontier is a curve representing the maximum possible output combinations of goods that can be produced with a fixed quantity of resources.

Figure 3 gives the various possible combinations of public and private goods that the society may produce.

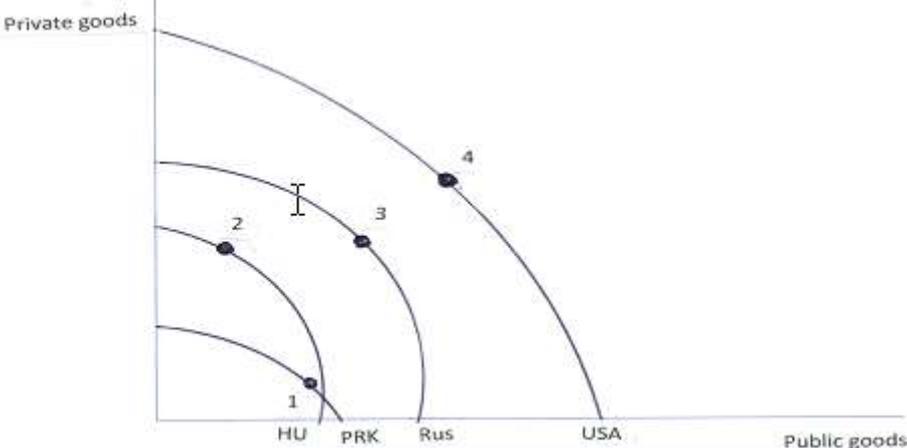


3. Figure. Production Possibility Frontier

Figure 3 uses the concept of the production possibility frontier (ppf) and the concept of indifference curves (I). The downward-sloping boundary shows the combination that is just attainable when all of the society's resources are efficiently employed. Indifference curves show us combination of goods among which an individual is indifferent. The highest level of welfare is attainable at a point where the indifference curve tangent to the production possibility frontier. The indifference curves (I₁-I₃) in our figure represents combinations of private goods and public goods. The quantity of public goods produced is measured along the horizontal axis, the quantity of private goods along the vertical axis. Thus any point on the diagram indicates some amount of each kind of good produced. The production possibilities frontier separates the attainable combinations of goods such as A, B and C from the unattainable combinations of goods such as D. It slopes downward because resources are scarce. That means, more of one good can be produced only if resources are freed by producing less of the other goods. Points A, B and C represent an efficient use of society's resources. Points A, B and C are the graphical expression what combinations of private and public goods are basically available for a society. The concrete decision what combination will be realized is a main task of the government and it is normally influenced by the election process in which political parties present their preferences about the provision of the public goods "National Defence". Point E represents either inefficient use of resources or failure to use the available resources. Point D on the other hand, represents a combination that cannot be produced given available resources and technology. The point can only be achieved if the production possibilities frontier shifts outward as a result of economic growth.

Let us consider that the ppf in figure 3 characterises for example the economy of the USA. The different location of point A, B and C needs a further explanation. The different location of point A, B and C on the ppf depends on the different indifference curves which tangent the ppf on different boundary points. Indifference curves are influenced by the special

circumstances in a country. In the USA, for example, on the one hand side most of the people are absolutely convinced that USA need strong armed forces to hold its position in the world as Number One but on the other hand side the people want an adequate supply with private goods. The situation of the USA is therefore most likely characterized by point A. In point C the production of public goods are higher but the level of supply with private goods may be too low to fulfil all the needs of the USA society. And finally in point B the production of public goods seems too low to guarantee the leadership of the USA in the world.



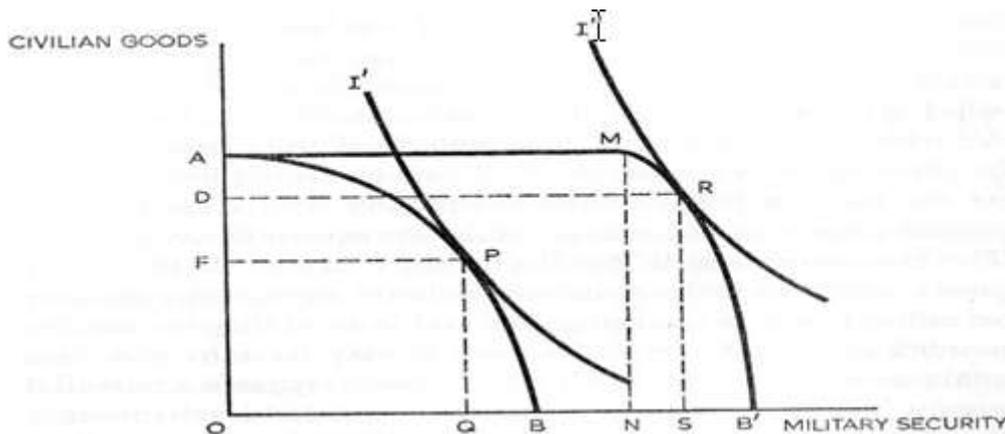
4. Figure. Production possibility frontiers of selected countries

Figure 4 needs some explanation. The production possibility frontiers (ppf) in figure 4 show the maximum amounts of production that can be obtained by economies, given its technological knowledge and quantity of inputs available. The four ppf represent the economic situation in four selected countries. Countries with a higher population normally have more capacities to produce goods and services than countries with a smaller population. A measure to compare the effort of countries producing goods and services is the Gross Domestic Product (GDP). In our special case the GDP of the USA is higher than the GDP of Russia (Rus), Hungary (HU) and the People’s Republic of Korea (PRK). The points 1, 2, 3 and 4 represent the efficient use of society’s resources in the selected countries. Point 1 shows us that the PRK produces a lot of more public goods than private goods. Point 2 shows us that HU produces a lot of more private goods than public goods, and so on.

The location of points 1, 2, 3 and 4 has consequences on the amount of defence budget. It is clear that a country which demands only a small amount of public goods needs less money for the production of public goods than countries which demand a higher amount of public goods. Therefore the decision-making process of a society concerning guns versus butter has a great influence on the strength of military power.

The economic advantage of a membership in a military alliance

Using the concept of production possibility frontier and indifference curve we can discuss the special case of the advantages to be a member state of a military alliance.



5. Figure. Economic advantages as a member state of a military alliance

(Source: Kennedy G.: *The Economics of Defence*, Rowman and Littlefield 1975, Page 54)

In figure 5 we measured the amount of military security purchased along the horizontal axis and the cost of civilian goods on the vertical axis. The model is based on the concept of the production possibility frontier and the community indifference curves. The realism of the concept will not be argued. The production possibility function AB shows all the combinations of output at the most effective levels of a country. The indifference curve is based on the assumption that if an individual prefers more of something to less of it, he must be indifferent to equal amounts. The indifference curve connects all points to which the individual is indifferent. In our model the society's indifference curve I' touches the production possibility frontier at P. This is an optimum combination of civilian goods and military goods in the case of the country. At point P the country will produce OF of civilian goods and OQ of military goods. If the country joins a military alliance what happens? The country benefits from the additional military security of the alliance. In the model this is shown by AM. The additional security moves the production possibility frontier outwards from the origin to a new tangential position with a higher indifference curve I'' at R. The new combination of civilian goods and military security available to the country are OD of civilian goods and OS of military security. Total security is OS but the alliance contributes AM (ON) of this, and the country contribution only NS (instead of OQ outside the alliance). As the military effort required is less, this releases resources for civilian goods available for consumption. On most scales of welfare it would be considered to be better off.

CONTRIBUTION OF SPECIAL DISCIPLINES OF ECONOMICS TO DEFENCE ECONOMICSvi

Economics as a science discipline has a wide field of research opportunities. For the purpose of this essay we want to divide economics into Macro-and Microeconomics, Business Economics, Economics of the Public Sector, Economic History, Economic Geography, Business Informatics and Operations Research. For the better understanding of the following chapter we will give a definition of macro- and microeconomics. Economists often use the terms macroeconomics and microeconomics to distinguish between different levels of economic analysis. In macroeconomics we are concerned with the workings of the whole economy or large sectors of it. These sectors include government, business, and households. For the purpose of analysis, the smaller groups that make up these large sectors are often lumped up together and treated as one unit. For example, the consumer sector may be treated as though it were one large household. The business sector might be considered to be one large business. Macroeconomics deals with such issues as economic growth, unemployment, recession, inflation, stagnation, and monetary and fiscal policy.

Microeconomics, on the other side, focuses on the individual units that make up the whole of the economy. Here we are interested in how households and businesses behave as individual units, not as part of a larger whole. Microeconomics studies how a household spends its money. It also studies the way in which to produce, how to make best use of factors of production, what pricing strategy to use, and so on. Microeconomics also studies how individual markets and industries are organized, what patterns of competition they follow, and how these patterns affect economic efficiency and welfare.

Though the special science discipline "Economics of Defence" is not widely known, researchers with a background in economics are well-advised to take the opportunity making research work in one or two special fields as mentioned above in this chapter.

Contribution of Macro-and Microeconomics

Security and Defence Policy is an important field of governmental policy. For politicians and economists it is clear that only in a secure environment economic activity can prosper. Most of the national economies nowadays as a result of globalisation are closely-linked and therefore any kind of turbulence may have tremendous effects on almost every national economy. Defence Economy has to analyse the consequences of a failure of national Security and defence policy on the national economy. (See for more detail the essay of the author "Security policy and economy", published in *Hadtudományi szemle* Volume 1, Issue 1)

More and more important in times of recession is the question what amount of defence spending is still just acceptable in order not to endanger economic growth. Defence Economists have to give answers to this question.

Another interesting field of research work is "Economic warfare". Defence Economists who studied military science and economics are best qualified to analyse what kind of warfare countries should take. (See for more detail the essay of the author "Economic Warfare", published in *Hadtudományi szemle* Volume 2, Issue 3)

As a part of the industry the armament industry is a matter of discussion in nearly every state. The armament industry withdraws factors of production which therefore cannot be used in other parts of the industry, i.e. industry which produces consumer goods and services. (See for more detail the essay of the author "The armament industry of Japan from the foundation of Yamato-state (660 BC) to the present", published in *Hadtudományi szemle* Volume 4 Issue 4)

Within the last years, a wide field of discussion is the Civil Military Co-operation (CIMIC), which also has an economic part. One of the tasks of CIMIC in missions abroad is the initiation of economic activity between the troop-contributing countries and the area of the mission. (See for more detail the essay of the author "The internal dimension: economic impacts in troop-contributing countries - the example of Austria", published in *Hadtudományi szemle* Volume 3, Issue 1)

In microeconomic understanding the military is a large enterprise, in many countries the largest enterprise. The broad field of microeconomic research work will be discussed in the following paragraph.

Contribution of Business Economics

Business economics as a field in applied economics uses economic theory and quantitative methods to analyse enterprises and the factors contributing to diversity of organizational structures and the relationship of enterprises with labour, capital and product markets.

Armed Forces as an enterprise guarantee security. They don't trade their goods and services on a marketplace and therefore they don't get income for the supply of their goods and services by every citizen, but only by the federal budget. The accounting system of the Ministry of Defence and the Armed Forces is an input-oriented governmental accounting with

a sole comparison of revenues and spending. In most cases costs of the production process of Armed Forces and the cost spiral are not really known. To solve this unsatisfactory situation most of the Ministries of Defence in Europe have introduced a strategic and operational controlling. Since that time within the operational controlling cost accounting has been playing a decisive role to find out the most efficient way to produce goods and services by the Ministry of Defence and the Armed Forces.

Furthermore, during the process of transformation Armed Forces use the methods of the Theory of Organization, Management of Personnel Resources, Logistics, Quality Management and Business Process.

Contribution of Economics of the public sector (Public finance)

Economics of the public sector has its main focus on taxes, subsidies and the budgetary process of a government. Most of the Western countries have a states-budget which is only input-oriented. Therefore the administrative organisations have no interest in knowing their cost structure because it doesn't play any role how efficient an organization really works.

One of the most important questions in every country is "How much should we spend on national defence?" It is a more difficult question to answer than the question of how to allocate a given defence budget.

Within the last years great efforts were made to develop an output-oriented budget system which gives an organisation more responsibility and more incentive to work effectively and efficiently. For example, this new budgetary-system will be set in force in Austria in 2013. The author will write a special essay about this new budget process and its effects on the Austrian Armed Forces in one of the next issues of *hadtudományi szemle*.

Another important field of research work in public finance is the effect of the burden of military spending on the national economy and the international comparison of military spending. The burden of military spending and the ability to pay for military affairs plays an important role for the discussion about burden-sharing in alliances.

Economists of the public sector are concerned with the development of cost-benefit or cost-effectiveness analysis to find out what measurement of government is the most efficient. Therefore these methods have find a way into the planning process of armed forces.

Contribution of Economic History

Economic History is a part of Cultural and Social History. The important works of the classics of economics of the 18th and 19th Centuries contain large parts which analyse economic activity in the past and which can be classified as masterpieces of Economic History.

Nowadays, Economic History plays an important role by analysing National and International Armament Industry, the development of the organization of Armed Forces and to discuss the relationship between society and the military sector of an economy, the so-called military industrial complex.

Contribution of Economic Geography

Economic Geography is a part of Geography with a close link to economy. An important field of research work of Economic Geography is to analyse the effectiveness and efficiency of national and regional economic structure to get usable data for the national and regional development plan.

Economic Geography plays an important role in research work about the impacts of military spending on the national and regional economy. The results of such an analysis could be used in the decision-making process if a garrison should be closed or not.

Contribution of Business Informatics

Business Informatics has its focus on the research work on an efficient use of information technology in the whole economy and in public and private enterprises. A special field of interest widely discussed in Armed Forces is Information Management Systems and their efficient and secure use by military leaders in peace and wartime.

Contribution of Operations Research

Operations Research is a discipline that deals with the application of advanced analytical methods to help make better decisions. Modern operational research originated at Bawdsey Research Station in Great Britain in 1937 and was the result of an initiative of the station's superintendent, A. P. Rowe. Rowe conceived the idea as a means to analyse and improve the working of UK's early-warning radar system, Chain Home. As a formal discipline, operational research originated in the efforts of military planners during World War II. The research work in Operations Research is focused on the solution of complex problems. To solve these problems scientists use econometric methods, mathematical optimisation, linear and non-linear programming, game-theory, simulation and network diagrams.

THE IMPORTANCE OF DEFENCE ECONOMICS FOR MILITARY LEADERSHIP

Leadership plays for states and for every public and private institutions and enterprises an important role to fulfil tasks efficiently. An efficient leadership in this context is characterised by an efficient use of all available resources. To be efficient leaders, military leaders have to study the methods of economics very carefully and should use them wisely. Only if the fundamentals and principles of economics are put into practice, will armed forces be able to make an efficient job in peace and wartime.

Every military academic institution for the training of higher military leaders is well-advised to offer widely varied lectures in economics and defence economics to prepare future military leaders for their tasks in the best possible way.

CONCLUDING REMARKS

After the Second World War the special economics discipline Economics of Defence focused on the research topic "efficient operations of Armed Forces under the conditions of the use of atomic weapons". In the past Defence Economists got their tasks for research work mostly from the government and governmental organisations. The experiences with research work of all these Defence Economists have clearly shown that Defence Economics as a science discipline provided many useful results for a *better design of Security and Defence Policy* and for a *better management within the Armed Forces*.

The environment for Armed Forces in Europe has been significantly changed since the end of the Cold War, but the new scenarios of threats are not less dangerous. These new threats shouldn't be neglected by the leading politicians in Europe and beyond. In Europe the leading politicians are working on the "Peace Project Europe" and within the last decades they have slowly, but steadily brought it to fruition. For roughly 20 years the period of Cold War has been over and the demands on Armed Forces have also significantly changed. In the new project the leading politicians assigned therefore new tasks to Armed Forces, especially humanitarian missions and various peace-support operations.

As a result of this development, defence economics should help to get the idea of the "Peace project: Europe" widely accepted. Particularly, defence economists should work out the advantage of an international division of labour of Armed Forces in nearly all fields of activity and the advantage of standardisation.

Further Readings

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i See Köllner L.: Militär und Ökonomie-literaturhistorische und literaturkritische Bemerkungen, in: Schulz 1976, page 52 ff

ii See Hartley and Sandler, 2001, Volume I, page 3 ff

iii See Kirchhoff (Hrsg.): Handbuch zur Ökonomie der Verteidigungspolitik 1986, Seite 534

iv See Schönherr S.: Militärökonomie-Rückblicke für die Gegenwart, Ausblicke für die Zukunft, Gesellschaft für Militärökonomie, Dachau 2002, Seite 49- 61 und 221 ff

v See Musgrave R. & Musgrave P.: Public Finance in Theory and Practice, McGrawHill, New York 1984, Page 51 ff

vi The chapter was written using theoretical and practical experiences of The author's research work during the last 30 years