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**The principal characteristics of the activity of
military technical research and development
(R&D) of NATO countries with special respect
to the 1980 decade**

**the author's review
of entitled doctoral (PhD) thesis**

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1. The formulation and actuality of the scientific problem.

In consequence of change of era in the global economy we may have faced a not experienced till new phenomena in the interaction of the scientific technical revolution and the armament from the 1960 years

The standard and quality of newly adopted military-technical devices, the state of development of the researches and experiments continued on the area of the science, and employment of the scientific and technical results for a direct military purpose increased the cooperation readiness of the military-industrial potential of the NATO countries

All this largely employed the economy, the natural resources, the research and development and the human factors of the production.

All these effect in the 1990 years the disintegration of the geopolitical blocks, the cessation of the bipolar world system and its relative stability into his place an with insecurities full, new, till then with unknown problems, to face up to challenges in today's wording being forced yielded a world order, what was effect onto the change of the budgetary spent on the armament. Beside USA's traditional status, the widening, strengthening its independent identity European Union weaved superpower plans. Appeared as a new power pole states like an economic sense strengthening, military potential building out, aiming to local power, than China, India. In these countries the rate of the development, even in a technological sense, in an economic sense surpassed the traditional leader countries, with creating an economic potential with identical strength with them. These countries represent leading strength in the forming of the market-orientated research and technological cooperation, single pulling industries such as information technology, biotechnology. The provisional loser of the transformation, Russia came forward with the new military doctrine, with repeated power claim, which could not occur without military and economic strengthening. The use of the energy treasures gained new sense at Russia's example demonstrating political influence founded on economic dependence.

The principles of the warfare got to a reinterpretation. Instead of the art of war being based on the traditional armaments got into a forefront the organization of the flexible, quickly modifiable units which trained for action in the mission, provided with efficient weapons By this together increase of the efficiency of. the leadership and management won special significance These necessities (the forming of the order of battle being based on the ability) spotlighted significance of the defence research and development (in the additional R&D) For NATO from the 1990 years, necessary to accomplish its function in a transforming environment fully with challenges. The new technologies increased the efficiency of applied R&D on a not experienced till now. The technologies like that, than the nanotechnology, the biotechnology, the communication and informatics, the usage of the lasers and sensors, the robots, and the space and the cybernetics found new solutions. .

All this the process from the middle of the 2000 years recoiled, and some devolution characterize it in nowadays. The enforcement of the economic interest is needed a tendency in the multiple system too. As this results for the Hungarian researchers - beyond the formal representative activity - it is necessary to be switched on NATO actual cooperation projects, the scientific and technological programs.

Therefore I made a choice the overview of military technical R&D researching because the approach of topic from military or military technical sides does not cover that

effect appearing in the interaction caused for the similar researches of civil life, resp. in the national political, security political effect.

Definition of military technical R&D.

The military technical R&D is research and development of the armed forces' devices that destined for fighting and supporting of the armed combat and for the maintenance of the personal staff and the technical devices. Includes all those the products, methods, procedures, technologies that production, development and exploration for the technical questions of their application effect on the general national security situation of the individual or the society.

Inside the framework of the thesis I demonstrate that historically determining period was the 1980 years considering, that the Warsaw Pact - we know it already now - in its last decade, in the final phase of the fight of the bipolar world system so considerable developments happened, which decided the life not only of Hungary, but Eastern Europe too.

The Strategic Defence Initiative inflicted a deciding blow upon the military potential of the eastern block, and all this NATO member states, (primarily United States) for the activity of R&D can be attributed.

I wish to illustrate with the examination of the NATO countries' military technical research and development, that while the single nations approached each other in the acceptance of the basic concept of the general security, there is a tendency of mitigation being founded on a new defensive concept in development, unfortunately cannot be experienced with this change with an identical direction in the establishment of the military research and development. I do not make an effort on the detailed analysis of the actual defence economy, military technical questions, but -embedding into a wider theoretical world economy context- I wish to reach a presentation of some perspective conclusion.

The time horizon of the paper is 1970-2000 period, the 80s years constitute especially..

The base of my examination is member states of North Atlantic Treaty Organization, NATO, at which it is necessary to take three factors into consideration first of all.

1. One, that as opposed to United States the others NATO countries have an independent nation for, which have their independent legal system, their specific form of state.
2. The other one, that at the same time the North Atlantic alliance's member states belonged to the block beside the conservation of their act freedom, their military R&D activity was coordinated inside NATO.
3. The third important viewpoint, that the countries' majority was the member of a specific Western European economic and political grouping, European Economic Community. While US's leading role was acknowledged in the North Atlantic alliance, the empirical examination of R&D expresses the separate interests till then, indeed the conflicting interests. R&D just that area where the technological closing up is not merely national prestige, with much rather in the sharpening world market competition for the market acquisition, the only opportunity of the market's keeping was concerned. The symbiosis of the science and technology culminates in the R&D. It follows from the above that that economy was left over viable, that in the technical development and in its economic structure was struggling along to increase the weight of the intensive sections of R&D

It is necessary to complete all these with the fact that they were countries with different technical standard, with different economic development and greatness, amidst changed of economic and military conditions by the scientific and technical revolution they were not

capable to develop their technology building upon their resources. Just because of this in Western Europe came into existence the military industrial cooperation's EEC countries with a most different level and character, while their interests were separated.

In the analysis of the military research and development is not enough to examine merely the activity of the national defence ministries and the research institutes belonging to them, what - differently from the Eastern European countries, among others Hungary - in the Atlantic countries several civil organizations, research institute, university, college, and the military industrial company continues and continued military aiming research and development partly independently, partly on basis of the authority of the national defence ministries. I ignored the examination of some countries inside the block because of the deficient sources since this in a case I could have relied on the hypotheses only.

Following the change of regime, with the changing of the military doctrine, the Eastern European changes which can be written down with the dispersion of the Warsaw Pact, signified challenges for NATO that directly affected on the reason for the existence of NATO. Onto any amount the events were promising, the newest achievements of the technology may have been found continuously only in the empire of the military security sphere or raised there in the future too.

The superpowers have arms systems which sufficient for destroying the civilized human life many times.

The opportunities of the solution gleamed then, but the social and political control of the military research and development could have been the key issue of checking of the armament and for the efforts being aimed at the demobilisation.

The excessive encryption of the military statistics significantly made harder writing the paper

From this reason primarily I may have used the substances with unclassified and confidential classification published in the domestic and the foreigner technical press only.

2. The objectives of the scientific research and its hypotheses:

I summarize my objectives according to the under mentioned based on summary of scientific problems:

- I wished to find an answer with presenting of NATO's historical roots and research and development (R&D) happened in the 1980 decade it in that direction, that legal was on it processes, and what they were based on, that considerable economic, military and world politics changes were yielded in the 1990 years.
- I wished to provide analysis the of 1980 years the institution background of research and development, human resources, financing and legal background with presentation according to NATO's member states
- I wished to get an answer for it, that with the analysis of the experiences NATO scientific and technological cooperation can be responded, why was left the Hungarian participation in the R&D programs despite a cooperation opportunity provided for us following our accession.
- I wish to direct the attention to it, that while the results of military R&D controversially though, but they contributed to it significantly for developing of United States and other NATO countries , for civil economies with the assuring of the fast adaptation opportunities, all this did not ensue in Hungary. One of the reasons of the backwardness may be the deficiencies appearing in the difficult receipt of the technological transfers.

- I present the changing of the direction of the contact appearing in the interaction of civil the military R&D, taking effect a reverse „spin-off”.

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I stood the under mentioned hypotheses in the sense of my objectives formulated based on the scientific problems:

- The second section of the scientific-technical revolution started an intensive change in the national defence.
- In the NATO countries the research and development is a strategic question and it has a determining role in the forming of the economic-political philosophies.
- Most of NATO countries have a coordinated and centrally supported R&D policy, that has being effective both in the civil the military sectors..
- The expenses devoted to the research-developmental aim rise from a year to a year essentially.
- Where the military research has a stimulating effect to civil R&D, there the considerable part of the scientists, engineers, technicians makes developing research with a military aim too.
- The main directions of the research and development coincide with the requirements of the technological development, with armed forces' claims, and expand on all areas the armament, equipment of the military force
- The military R&D generate the newer generation's of the high technologies development too, whose certain areas regarded as the long-term propulsive sector of the civil developments and the industry.
- R&Ds with a military aim are close systematic ventures with a scientific base and with a task orientation, that it is spanned all areas of the basic and applied research, the natural, the physical, the social and behaviour science and on their scope of operation areas (laboratories, research institutions, industrial enterprises) it characteristic is the team work, the cooperation and competition..
- In NATO member states many civil organizations, universities, educational institutions take a part in the military research and development, , that the national defence ministries finance it financially.

3. Research methods

To the realisation of the aims I applied the under mentioned methods:.

- I made use of those personal experiences that I gathered in connection with the topic as a student of the Economic University Budapest, as a head of department of Zrínyi Miklós National Defence University.
- In a period before, NATO extension I regularly consulted with different military leaders and experts, I attended in the domestic and international economist meetings related with the topic, I made inquiries. On these I met with foreign researchers, specialists and decision makers too. I contributed my personal lecture to the efficiency of The German-Hungarian economist meetings organized by the defence economy department.
- I studied the available public documents in the course of my researches, vocational substances, and various analyses. .
- I processed the studies of the foreigner and Hungarian strategic research institutes dealing with the research and development, particularly SIPRI analyses and strategic studies of the Strategic Defensive Research Institute, London, and the Hungarian Strategic Defensive Research Institute (SVKI).

4. The brief description of the done examination by chapters

I divided the thesis in a volume into five chapters..

In the introductory thoughts my aim was the presentation the activity of R&D of NATO countries in the mirror of the challenges.

I. chapter

Culmination of world tendencies- overview

II. chapter

The interaction of the scientific technical revolution and the arming

The new relation system of the arming and an economy in the 1980 years

III. chapter

Unity and contrary of NATO countries in the activity of military R&D

The directions of R&D with a military aim of main NATO countries and their profiles

IV. chapter

The trend of military R&D, the interaction of the military and the civil R&D

V. chapter

Judgement of Hungary on the area of military R&D. Hungarian results in NATO's programs.

5. Summarised conclusions

Second section of STR started an intensive change in the national defence.

The research development is a strategic question, its role was and is determining in the forming of economic philosophy.

The NATO countries had a coordinated and centrally supported policy of R&D, which is a feature in our days too.

In the interaction of the military and the civil industry prevailed the spin-off effect and in this period presented itself the reverse spin-off effect..

The R&D competition intensified internationally, the actual picture of this can be caught a hook with rivalization of the USA, Europe and China.

In the 80s years Russia had a specific developmental way, in our days Russia achieves considerable results on the area of R&D..

In 2010 it is not possible to deduct the conclusion that the result of the demobilisation agreements would reduced earmarked amounts of R&D with a military aim in NATO countries' national economies.

In the examined period more and more civil organization, universities, educational institutions took a part in the military R&D

6. My new scientific achievements

1. I systematized, summarised, on this basis I firstly formulated the macroeconomic characteristics of arming and the value reduction questions of the economy, which yield a new growth path in the economy, and from time to time they yield different quality of development in the balance of the sectorial contacts
2. I proved factually that R&Ds with a military aim are close systematic ventures with a scientific base and with a task orientation that it is spanned all areas of the basic and applied research. Their results controversially though, but significantly contribute to the development of the civil economy with the forming of the fast adaptation opportunities of technological overflow.
3. I made statements about anomalies between the activity of research and development civil and the military sphere, direction in connection with reverse spin-off an effect, the civil universities' workshops created the acknowledging worthy scientific results in the 80 years.
4. I proved with analysis of background of the domestic military R&D, that experienced domestic recession that after elimination of the bipolar system was not necessary, the Hungarian army's modernisation only with the wide-ranging use of the resources of the national economy can be realized.

7. Recommendations, practical usability.

The present thesis prepared on the basis the encouragement of Dr. Tibor Palánkai and Dr. Péter Deák who were the opponents of the university doctoral dissertation of the author successfully protected in 1991 in the world economy department of Economic University, Budapest. The thesis prepared with using of the improvement of my former dissertation, the lesson of the special literatures, different workshops, conferences. The statements of the treatise proved to be a reliable on basis of the formulations of the history of science of the empirical researches.

The thesis together with the tables may offer help for defence economy researchers clashing of the known research results by them, opinions are. It serves as information to the lectures in the topic and for the non-professionals expressing an interest in the topic. I wish to contribute to the acquaintance of the theoretical theses of the defence economy with processing of the lessons of this period. I think my thesis is suitable to use as source-material for the students of Zrínyi Miklós National Defence University, and serves as help for the decision makers with the occasion of a workshop debate. Similarly it may serve as help to theoretical preparation of personal planned for foreign service in NATO member states.

- a. *As source-material* in the course of creating of the experience processing and utilising strategy of the Hungarian Home Defence Forces.
- b. *As an exemplary conceptual guiding, for the structural modernisation and the purchase of the devices* of the high and middle level leadership structure, military organisations of Hungarian Home Defence Forces.
- c. *As reference material* coming next “Defensive Review” and. Strategic Review of the Hungarian Home Defence Forces in the course of the military reform, in the concern of the transformation aims and its methodology.
- d. *Educational aid*, in the relevant measure, in the course of the professional development,. education preparing of the officers and NCOs.

8. Publication register

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2. Újratermelés, gazdasági növekedés és konjunktúra ciklus (Reproduction, economic increase and prosperity cycle) ZMKA tankönyv 1987. VII fejezet
3. Értéknagyság, értékredukció a modern gazdaságban (Extent of value, value reduction in the modern economy) MKKE, Politikai Gazdaságtan Füzetek, 1988.
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7. Magyar-német katonai közgazdász konferencia társelőadás (Hungarian-German military economist conference lecture) BKE 1992. (Önálló kiadásként magyar-német nyelven) 105-110 oldal 1/ Мировой кризис, венгерская экономика в кризисе
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11. La Hongrie et l'OTAN – Előadás – „L'Association des Anciens et Amis des Ecoles Supérieures de Guerre et du Collège Interarmées des Défense” szervezésében – CID 2001
12. Zrínyi Miklós Nemzetvédelmi Egyetem gazdálkodási tevékenysége a 1997-2002 közötti időszakban (The economical activity of the Zrínyi Miklós National University in the 1997-2002) Hadtudományi Hírlevél 2003. 2. szám
13. Tanulmány a katonai felsőoktatás normatív finanszírozásának lehetőségére (Study to the opportunity of the normative financing of the military higher education) Nemzetvédelmi Egyetemi Közlemények 2003. 7. évf. 4. szám.
14. A modern biológiai hadviselés és a biovédelem legfontosabb katonai (katonaorvosi) elemei (The most important military (medical officer) elements of the modern biological warfare and the bioprotection) Nemzetvédelmi Egyetemi Közlemények 2004. 3. szám
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Professional scientific curriculum vitae

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Professional experience

1973-80	Tapolca rocket brigade technical-assistant
arrangement:	Company Commander then technical-assistant
1980-83	Zrínyi Miklós Military Academy
arrangement:	student (academic specialisation)
1983-85	ZMNE Political Economy Department
Arrangement:	lecturer
1986-88	ZMNE Political Economy Department
arrangement:	Team leader, senior lecturer
1988-97	ZMNE Economical Department
arrangement:	head of department
1997-2000	ZMNE rector direct
arrangement:	independent inner controller
2000-2010	ZMNE Economical Directorate
arrangement:	Deputy of economical director

Qualification

1965-69	Metallurgy polytechnic Miskolc (metallurgy technician diploma)
1969-73	Zalka Máté Military Technical College (air defence device specialisation technician officer's diploma)
1980-83	Zrínyi Miklós Military Academy (higher qualification army officer's degree)
1985-90	Marx Károly Economical University (analysing economist teacher degree)
1991	Doctor Grade acquisition on Budapest Közgazdaságtudományi Egyetem P-521990-91
2003-2007	ZMNE Military Technical Doctoral School (correspondent PhD education)

Language knowledge

Russian language knowledge with a negotiation level (intermediate, C type vocational language exam 1989)

Slovak Köznapi (intermediate C type language exam 1998)

Publications: didactics, theoretical economics topic, money theory, real economy cycles, the economic aspects of scientific technical revolution (technological overflow), the examination of value reduction problems.

Computerised knowledge: On an application level: Windows NT 95 98 XP, Word, internet

Hobby: Sports (cycling, swimming, volleyball), chess, reading, excursion, travel, hobby gardening

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