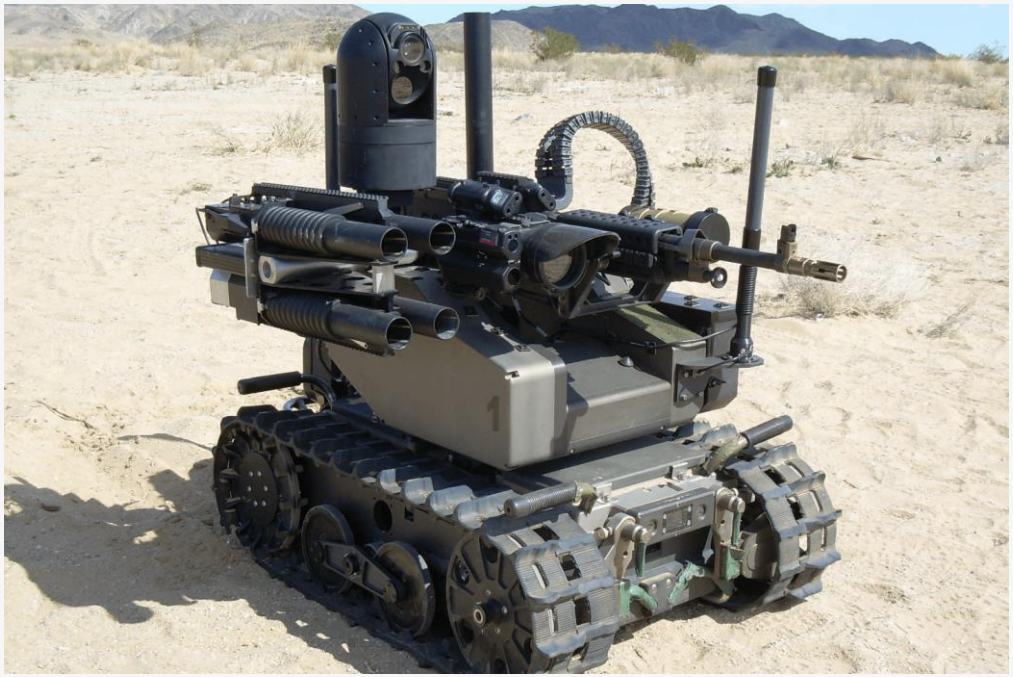
# DEFENCE RESOURCES

# THE ECONOMICS OF MILITARY ROBOTICS



# The Economics of Military Robotics

## Content of Topic

**INTRODUCTION**

- Basic Concepts
  - History of Military Robotics
  - Typology of Military Robotics
- Principles influencing development of military robotics area
- Microeconomic analysis – substitution between labour and capital
- Economic aspect of military robots introduction in practice
- Economic aspects of military robotics development

**CONCLUSION**

# The Economics of Military Robotics

## INTRODUCTION

# The Economics of Military Robotics

## Introduction

- **Main Objective of these lecture is** to point out and to explain economic aspect of military robotics.
- **As partial aims of this lecture,** we can see:
  - demarcation of historical development of military robotics and its typology,
  - description of economic principles usefulness in military robotics area,
  - demarcation of economic aspects military robots introduction in the war theatre, and
  - description of factors and agents influencing future development of military robotics.

# The Economics of Military Robotics

## Introduction

- **Military robotics is revolutionizing warfare** today **through the use of advanced technologies** that help the military on the battlefield and create a better, more flexible and cost efficient military. Military Robotics can be used to help in the diffusing of bombs for example, or unmanned aerial vehicles can provide a "birds-eye-view" of territories for military troops.

- In the future, military robotics will include such things as medical robots to help carry wounded soldiers off the battlefield and will be used as prosthetics for injured troops who have had limbs amputated. Recent research from WinterGreen Research predicts the market for military robotics will hit $9.7 billion by 2016. The robotics units used in public spaces and on the battlefield.

# The Economics of Military Robotics

## BASIC CONCEPTS

# The Economics of Military Robotics

## Basic Concepts

- **Definition of military robots and military robotics**
  - Military robots
  - Military robotics
- **Historical background of military robotics (History of military robotics and military robots**
- **Typology of military robots**

# The Economics of Military Robotics

## PRINCIPLES INFLUENCING DEVELOPMENT OF MILITARY ROBOTICS AREA

# The Economics of Military Robotics

## Principles influencing development of military robotics area

- principle of the marginal opportunity costs,
- principle of expected marginal costs and benefits,
- principle of substitution,
- principle of economies of scale,
- principle of diminishing returns,
- principle of the incentives role and
- principle of the customer and supplier relationship.

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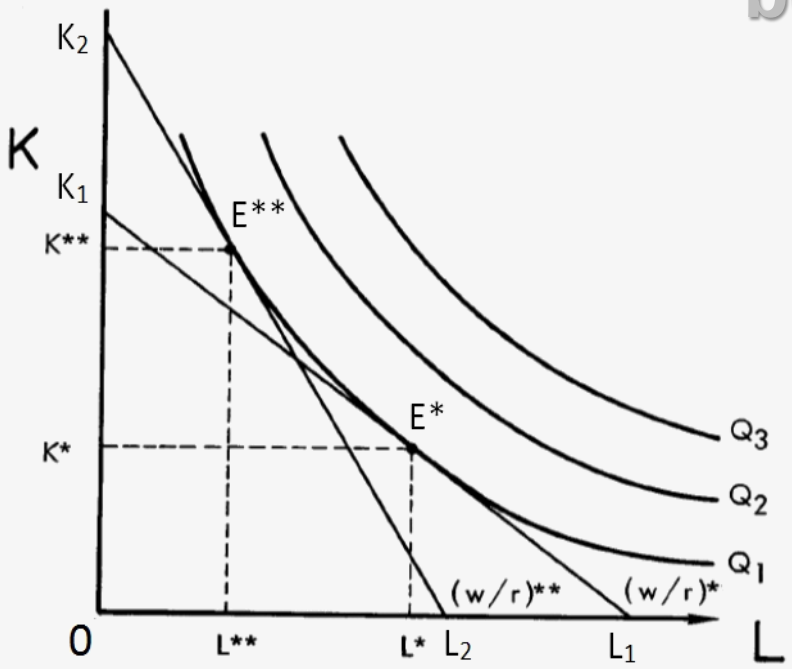
## MICROECONOMIC ANALYSIS – SUBSTITUTION BETWEEN LABOUR AND CAPITAL

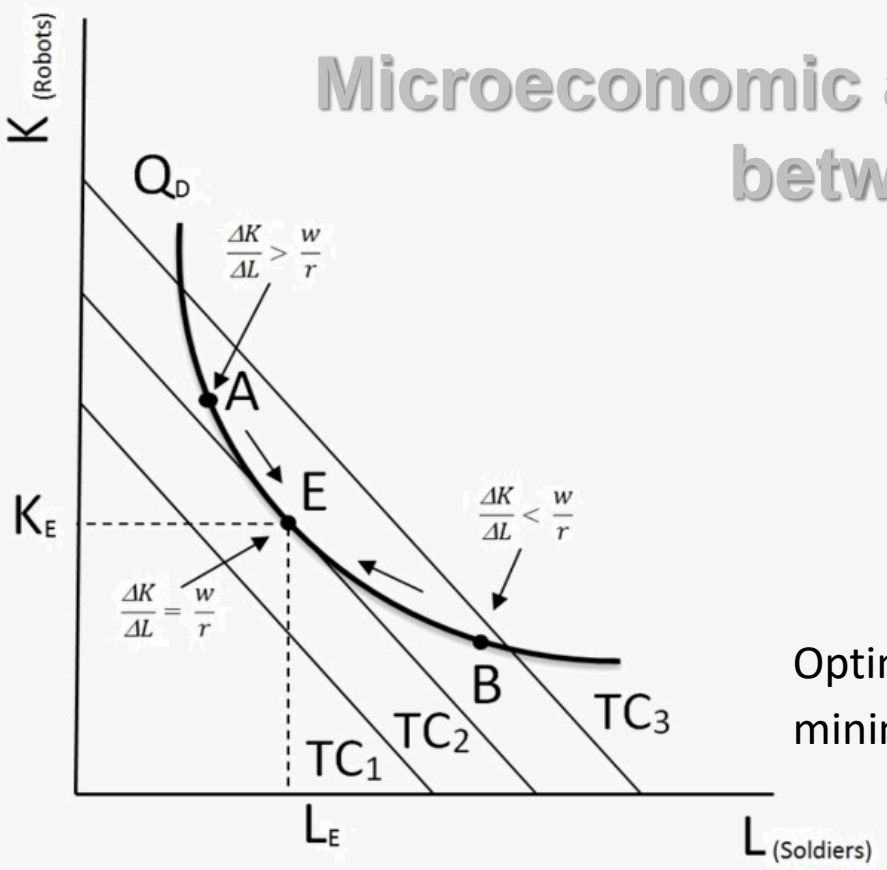
# The Economics of Military Robotics

## Microeconomic analysis – substitution between labour and capital




Production function of defense – two factors model

# The Economics of Military Robotics




## Microeconomic analysis – substitution between labour and capital

Optimal production defense and costs minimalization

# The Economics of Military Robotics

## ECONOMIC ASPECT OF MILITARY ROBOTS INTRODUCTION IN PRACTICE

# The Economics of Terrorism

## Economic aspect of military robots introduction in practice

**Economic aspects of military robotics theatre introduction on the side of the industry**

Future of military robotics market is dependent on next preconditions:

a) successful military tests of developed military robots;
b) requirements to reach a competition advantage or competition threats;
c) ability in short time to reach economies of scale;
d) solvency of future potential customers (mainly national government).

# The Economics of Terrorism

## Economic aspect of military robots introduction in practice

**Economic aspects of military robotics theatre introduction on the side of the armed forces and government**

Main reasons for military robots introduction to the theatre are following:

a) protection of human (soldier) life;
b) higher level of efficiency and effectiveness of robotic systems;
c) armed forces attractiveness increasing with connection on the recruitment goals;
d) modernization of armed forces.

# The Economics of Military Robotics

## ECONOMIC ASPECTS OF MILITARY ROBOTICS DEVELOPMENT

# The Economics of Military Robotics

## Economic aspects of military robotics development

A. The Main Agents Influencing Military Robotics Development
B. The **Main Factors** Influencing Military Robotics Development

# The Economics of Military Robotics

## Economic aspects of military robotics development

A. The **Main Agents** Influencing Military Robotics Development
   1) Governments
   2) Military
   3) Military robotics industry

# The Economics of Military Robotics

## Economic aspects of military robotics development

**B. The Main Factors Influencing Military Robotics Development**

1) Value of human life
2) Costs of military professionals training
3) Future development and achievable size of the military robotics market
4) State and future development of public finance and budgets

# The Economics of Military Robotics

## CONCLUSION

# The Economics of Military Robotics

## Conclusion

- Appeal for military organizations is fact that robotic devices are able to change the essence of armed combat. Decreasing of military budget is worldwide spreaded trend. This direction is from human point of view acceptable; however it is very danger from military point of view. This direction decreases the ability to react on unforeseeable events.

- The attention is devoted to human as living being, as a part society which does not accept the losses including the members of armed forces. These trends are visible and cause qualitative changes in the armed forces, resulting in modernization, professionalization and reorganization. The main result should be required ability of prompt reaction on an invisible risk and danger.

# The Economics of Military Robotics

## Conclusion

- New technologies, unfortunately, are very expensive. For that reason, the usage and introduction new technologies in the armed forces have to be cost-effective.

- In connection to military robotic, it is visible that we will able to take advantage of capital-labour substitution in the foreseeable future. The mass production of military robotic enables military robots producers to take advantage of economies of scale and to decrease unit price of military robotics systems. Higher autonomy of the military robots will develop the substitution of labour by military robots. And consequently, capital deepening will lend support to decreasing technological forwardness of armed forces.

# The Economics of Military Robotics

## STUDY RESOURCES

# The Economics of Military Robotics

## Study Resources


- SINGER Peter., W. Wired for War (Robotic Revolution and Conflict in the Twenty First Century. London: Pengiun, 2009. 483 p. ISBN 978-1-59420-198-1
- Military Ground Robot Market Shares, Strategies, and Forecasts, Worldwide, 2012 to 2018. Accesible on: http://www.chinamarketresearchreports.org/military-ground-robot-market-shares-strategies-and-forecasts-worldwide-2012-to-2018/
- STRUIJK, Bob. Influence of the new trends in the economics on the robot system design philosophy. Budapest: National University Of Public Service, 2012. (Disertation). 114 p. (p.25-26)
- OLEJNÍČEK, Aleš. Economic Aspects of the Military Robotics Introduction and Development in the War Theatre. In Recent Advances in Energy, Environment and Economic Development. Dostupné na: http://www.wseas.us/e-library/conferences/2012/Paris/DEEE/DEEE-59.pdf

# THANK YOU FOR YOUR ATTENTION !!!

## IN CASE OF QUESTIONS, CONTACT ME ON

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