

МЕЃУНАРОДНО НАУЧНО СПИСАНИЕ

СОВРЕМЕНА МАКЕДОНСКА ОДБРАНА

47



MINISTRY OF DEFENCE
REPUBLIC OF NORTH MACEDONIA

CONTEMPORARY
MACEDONIAN
DEFENCE
Vol. 24, Number 47, 2024

47

VOL. XXIV
SKOPJE

DECEMBER 2024

СОВРЕМЕНА МАКЕДОНСКА ОДБРАНА

Год.

24

Број

47

Стр.

1-152

Скопје

2024

CONTEMPORARY MACEDONIAN DEFENCE

Vol.

No

pp

Skopje



MINISTRY OF DEFENCE
REPUBLIC OF NORTH MACEDONIA

СОВРЕМЕНА ОДБРАНА **CONTEMPORARY**
МАКЕДОНСКА **MACEDONIAN**
ОДБРАНА **DEFENCE**

ISSN 1409-8199
e-ISSN 1857-887X

Година 24, бр. 47, Декември 2024 / Vol. 24, No. 47, December 2024

Skopje
December 2024



СОВРЕМЕНА МАКЕДОНСКА ОДБРАНА

Издавач:

МИНИСТЕРСТВО ЗА ОДБРАНА НА РЕПУБЛИКА СЕВЕРНА МАКЕДОНИЈА

Министерство за одбрана

„СОВРЕМЕНА МАКЕДОНСКА ОДБРАНА“

„Орце Николов“ 116 1000 Скопје

Телефони: 02 3128 276, 02 3113 527

WEB на Министерство за одбрана:

<https://www.mod.gov.mk/современа-македонска-одбрана/>

Списанието излегува два пати годишно.

ISSN 1409-8199

Скопје, Декември 2024 година

CONTEMPORARY MACEDONIAN DEFENCE

Publisher:

MINISTRY OF DEFENCE OF THE REPUBLIC OF NORTH MACEDONIA

Ministry of Defence

„CONTEMPORARY MACEDONIAN DEFENCE“

„Orce Nikolov“ 116 1000 Skopje

Tel.: 02 3128 276, 02 3113 527

WEB of the Ministry of Defence:

<https://www.mod.gov.mk/contemporary-macedonian-defense/>

The magazine is published twice a year

ISSN 1409-8199

Skopje, December 2024

СОВРЕМЕНА МАКЕДОНСКА ОДБРАНА

МЕЃУНАРОДНО НАУЧНО СПИСАНИЕ НА
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CONTEMPORARY MACEDONIAN DEFENCE

INTERNATIONAL SCIENTIFIC JOURNAL OF
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Original scientific article

UDK 332.146.2

UDK 502.131.1

REEVALUATING ECONOMICS AND THE ENVIRONMENT: SUSTAINABLE MACROECONOMICS, CLIMATE RISKS, AND ENERGY TRANSITIONS RECONSIDERED

Karim ERROUAKI ¹

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Abstract: *The combined contributions of Sachs, Bernard, and Semler have been instrumental in advancing the discourse on the macroeconomics of climate change. Sachs' practical insight into financial mechanisms, Bernard's editorial direction and Semler's rigorous modeling and empirical analysis collectively enrich our understanding of how economic policies can address climate risks. Their work provides a comprehensive framework for analyzing the intersections between macroeconomics and climate policy, highlighting the importance of integrating theoretical and empirical approaches to develop effective and sustainable solutions. Stiglitz argues that traditional economic models often fail to explain the complex interactions between climate change and macroeconomic stability. He advocates for the incorporation of environmental factors into economic policies to ensure that climate risks are mitigated while economic growth is sustained. Stiglitz argues that traditional economic models often fail to explain the complex interactions between climate change and macroeconomic stability. The study Navigating the climate-macroeconomic nexus by professors Unuryargal Nyambuu and Willy Semler presents pioneering research into the complex interplay between macroeconomic theory and climate science. Examining the perspectives of global leaders such as former UNESCO Director Federico Mayor Zaragoza, UN Secretary-General Antonio Guterres, Professor Jeffrey Sachs and Nobel Laureate Professor Joseph Stiglitz, it is clear that understanding the nexus of climate change and macroeconomics is both both. and essential. "Navigating the climate-macroeconomic nexus" covers and expands effectively these perspectives, offering a thorough exploration of the theoretical and practical dimensions of the integration of climate and economic policy. The book "Sustainable macroeconomics, climate risks and energy transitions: dynamic Modelling, Empirics and Policy", authored by Unuryargal Nyambu and Willie Semler, offers an insightful exploration of the complex relationship between macroeconomic stability, climate risks and energy transitions. This work, which follows on from basic concepts discussed in The Oxford Handbook of Macroeconomics and Global Warming (Oxford University Press, 2015), presents a sophisticated analysis of how dynamic modeling and empirical research can inform effective policy making in context of sustainable development. Published in 2015, Oxford Handbook of the Macroeconomics of Global Warming represents an essential contribution to the field of environmental economics. Edited by Lucas Bernard and Willie Semler; this comprehensive volume offers an in-depth examination of the complex relationship between macroeconomic theory and the global warming crisis. It is divided into several parts.*

Key Words: *Navigating the Future, Dynamic Modeling, Climate Risks, and Energy; Transitions in Sustainable Macroeconomics*

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Introduction

Charting the Path to a Low-Carbon Economy: Analyzing Climate Challenges and Policy Solutions

This paper transcends the scope of a conventional book review by offering a profound and comprehensive exploration of the macroeconomic dimensions of global warming. It engages deeply with the framework outlined in *Sustainable Macroeconomics, Climate Risks, and Energy Transitions: Dynamic Modeling, Empirics, and Policies* (Springer, 2023), authored by Professors Unurjargal Nyambuu and Willi Semmler.

The urgency of understanding how global warming impacts macroeconomic stability and growth cannot be overstated. As climate change progresses, its effects on economies—both immediate and long-term—are becoming increasingly crucial. Nyambuu and Semmler's work addresses these challenges by integrating dynamic modeling with empirical research, offering a sophisticated perspective on designing economic policies that can effectively mitigate climate risks and promote sustainable development.

In a world deeply reliant on fossil fuels, yet urgently needing to adhere to the carbon budget, *Sustainable Macroeconomics, Climate Risks, and Energy Transitions* provides a comprehensive analysis of the intricate task of mitigating climate risks while transitioning to a low-carbon future. This work skillfully balances the need for swift climate actions with the development of medium- and long-term policies, offering an essential roadmap for navigating the complexities and contradictions inherent in the global energy transition.

I argue in this paper that the book provides a profound examination of the complex interplay between macroeconomic stability, climate risks, and energy transitions. This book provides a thorough and insightful examination of empirical trends in carbon-intensive resource use, offering a critical analysis of the short-term market dynamics that worsen environmental degradation. It emphasizes the urgent need for a medium-term macroeconomic perspective and advocates for a transformative shift toward a sustainable macroeconomic framework. Through a detailed exploration of historical models and rigorous empirical and numerical assessments of dynamic climate models, the book meticulously evaluates a variety of policy options within their historical contexts.

Endorsements and Contributions

Allow me to draw attention to the insightful perspectives of two distinguished scholars whose endorsements are featured in the book's jacket blurbs, each underscoring the book's groundbreaking contributions to macroeconomics and climate policy.

Ottmar Edenhofer, Director of the Potsdam Institute for Climate Impact Research and Professor at the Technical University of Berlin, Germany, emphasizes the book's transformative impact on the field of macroeconomics:

"This book represents a significant advance in macroeconomics by offering a crucial medium- term perspective on achieving greenhouse gas neutrality. It fills an important gap in the scientific literature, which has largely concentrated on either short-term or long-term analyses."

Edenhofer's remarks speak to the book's ability to bridge the often-overlooked middle ground in climate economics, addressing the critical need for strategies that extend beyond immediate actions while remaining adaptable enough to influence medium-term policy decisions. By doing so, the authors provide a fresh framework for understanding the economic dynamics of the transition to carbon neutrality, one that is crucial for policymakers navigating the evolving challenges of global warming.

In a complementary analysis, *Prakash Loungani*, Assistant Director at the IMF Independent Evaluation Office and Director of the MS Econ Program at Johns Hopkins University, highlights the book's innovative approach to energy security:

"Energy security remains a central issue in today's policy debates. Nyambuu and Semmler break new ground with their medium-run macro models and innovative numerical solution techniques, providing valuable insights into how policy measures can ensure ongoing energy stability through the expansion of green energy. These models offer a deeper understanding of the energy transition than traditional large-scale macroeconomic models or long-term growth frameworks found in Integrated Assessment Models (IAMs). Rich in data and analysis, this book is an essential complement to conventional macroeconomics textbooks, broadening the discourse on climate change."

Loungani's endorsement points to the book's ability to address one of the most pressing challenges of our time: energy security within the context of transitioning to sustainable energy sources. The medium-term models introduced by the authors offer policymakers actionable insights that go beyond theoretical long-term goals or abstract short-term projections. These models incorporate real-world constraints, providing a more robust foundation for navigating the complexities of energy transitions and offering a tangible roadmap for ensuring energy stability.

These endorsements reflect the book's relevance and timeliness, illustrating how Nyambuu and Semmler have made vital contributions to macroeconomic theory and policy. By filling crucial gaps in the literature and offering innovative tools for addressing the intertwined issues of climate change, energy security, and economic stability, this book is poised to become an essential resource for academics, policymakers, and anyone involved in the global response to climate risks.

To sum-up, both Edenhofer and Loungani's endorsements underscore the importance of this book in bridging critical gaps in macroeconomic research and policy-making. Their insights reflect the book's unique contribution to advancing our understanding of medium-term strategies for energy and climate challenges, marking it as a vital resource for both academics and policymakers. Given these complexities, focusing on short- and medium-term macroeconomic perspectives is essential for managing the transition to a low-carbon economy. Therefore, the choice to title the book *Sustainable Macroeconomics* rather than *Sustainable Growth* reflects a deliberate emphasis on leveraging established macroeconomic tools and policies to navigate economic transformations effectively. While the authors acknowledge the importance of long-term growth perspectives, their primary

focus remains on the intersection of climate dynamics and macroeconomic policies. This focus makes the book an invaluable resource for academic courses and researchers in macroeconomics and growth theory. Additionally, it offers critical insights for financial practitioners and policymakers involved in shaping macroeconomic and climate policies.

Contributions from Leading Figures

The contributions to this debate by leading figures underscore the significance of this issue. Professor Federico Mayor Zaragoza, former Director-General of UNESCO, has long championed the integration of environmental and economic policies to achieve sustainable development. His advocacy for holistic approaches to climate and economic policy aligns with the principles discussed in the book. Similarly, UN Secretary-General António Guterres has consistently highlighted the urgent need for comprehensive climate action and economic reform, emphasizing the importance of aligning global economic strategies with climate goals.

Professor Federico Mayor Zaragoza has been a prominent advocate for integrating environmental and economic policies to achieve sustainable development. His tenure at UNESCO was marked by a strong commitment to promoting environmental sustainability and social equity as cornerstones of global development. Mayor Zaragoza's work emphasizes the necessity of adopting holistic approaches that view environmental and economic policies as interconnected rather than separate entities. His advocacy aligns closely with the principles discussed in the book *Sustainable Macroeconomics, Climate Risks, and Energy Transitions*, which underscores the importance of designing policies that address both climate risks and economic stability. Mayor Zaragoza has consistently argued that achieving sustainability requires not just incremental changes but a fundamental rethinking of how we approach development, emphasizing the need for transformative policies that integrate environmental stewardship with economic progress.

Similarly, UN Secretary-General António Guterres has been a leading voice in advocating for comprehensive climate action and economic reform. Guterres has consistently highlighted the urgency of addressing climate change as a central element of global economic strategy. His leadership has brought significant attention to the need for aligning economic policies with climate goals, emphasizing that climate change is not just an environmental issue but a profound economic and social challenge. Guterres has called for ambitious measures to reduce greenhouse gas emissions, promote renewable energy, and support vulnerable communities affected by climate impacts. His focus on the intersection of climate action and economic reform reflects a growing recognition of the need for policies that simultaneously address environmental and economic concerns. By advocating for systemic changes and international cooperation, Guterres has underscored the importance of a coordinated global effort to combat climate change and promote sustainable development.

The perspectives of Mayor Zaragoza and Guterres highlight a broader consensus among leading figures on the need for integrated approaches to climate and economic policy. Their contributions emphasize that addressing climate change requires not only

innovative environmental policies but also comprehensive economic strategies that foster long-term sustainability and resilience. Both leaders advocate for policy frameworks that bridge the gap between short-term actions and long-term goals, ensuring that climate interventions are both effective and equitable.

In summary, the insights from Federico Mayor Zaragoza and António Guterres reinforce the central themes of the book *Sustainable Macroeconomics, Climate Risks, and Energy Transitions*. Their contributions provide a broader context for understanding the importance of integrating environmental and economic policies, aligning with the book's call for innovative and practical approaches to managing climate risks and promoting sustainable development. Their advocacy for holistic and coordinated strategies underscores the critical need for a unified approach to achieving a low-carbon economy and ensuring global resilience in the face of climate change.

Foundational Works in Climate Economics

The discussion around integrating environmental and economic policies has been significantly enriched by contributions from leading figures in the field, notably Jeffrey Sachs, Lucas Bernard, and Willi Semmler. Their work has laid a crucial foundation for understanding and addressing the complex interplay between macroeconomics and climate change.

Jeffrey Sachs' chapter, published in *The Oxford Handbook of the Macroeconomics of Global Warming* (Oxford University Press, 2015), edited by Lucas Bernard and Willi Semmler, constitutes a seminal contribution to the field of environmental economics. This influential volume lays the conceptual and theoretical groundwork for the book *Sustainable Macroeconomics, Climate Risks, and Energy Transitions: Dynamic Modeling, Empirics, and Policies* (Springer, 2023), authored by Professors Unurjargal Nyambuu and Willi Semmler. *The Oxford Handbook of the Macroeconomics of Global Warming* offers a comprehensive and in-depth examination of the intricate relationship between macroeconomic theory and the global warming crisis. It stands as a pioneering work that integrates theoretical insights with empirical analysis, providing a crucial framework for understanding how climate change intersects with economic systems and policies. In his chapter, Sachs delivers a nuanced analysis of how dynamic modeling and empirical research can enhance climate policymaking. His work is distinguished by its ability to blend complex economic models with practical applications, highlighting the essential role of economic policy in managing climate risks. Sachs' recent proposals for addressing climate challenges in developing economies, especially through innovative financial instruments like climate bonds, offer crucial insights into how strategic investments can mitigate both immediate and long-term climate risks.

- Jeffrey Sachs' Seminal Work

Jeffrey Sachs' chapter in *The Oxford Handbook of the Macroeconomics of Global Warming* (Oxford University Press, 2015), edited by Lucas Bernard and Willi Semmler, stands out as a seminal contribution to environmental economics. This influential volume

provides a comprehensive examination of the intricate relationship between macroeconomic theory and the global warming crisis. Sachs' chapter offers a nuanced analysis of how dynamic modeling and empirical research can enhance climate policymaking. His work is distinguished by its sophisticated integration of complex economic models with practical applications, underscoring the pivotal role of economic policy in managing climate risks.

Sachs' recent proposals, particularly those focusing on innovative financial instruments like climate bonds, offer valuable insights into addressing climate challenges, especially in developing economies. By advocating for strategic investments and financial mechanisms that can mitigate both immediate and long-term climate risks, Sachs provides a framework for how economic policies can support sustainable development and resilience. His work illustrates the importance of integrating financial innovations with climate policy to create effective and adaptive strategies for managing environmental risks.

- Lucas Bernard's Editorial Contribution

Lucas Bernard, as one of the editors of *The Oxford Handbook of the Macroeconomics of Global Warming*, played a crucial role in shaping the volume's focus and scope. His editorial work involved curating a collection of contributions that explore the theoretical and empirical dimensions of macroeconomics and global warming. Bernard's editorial expertise ensured that the volume provided a comprehensive and cohesive analysis of how macroeconomic theories can be applied to understand and address climate change. The handbook's interdisciplinary approach, facilitated by Bernard's editorial vision, has been instrumental in bridging the gap between economic theory and climate policy, offering readers a robust framework for analyzing the economic dimensions of climate change.

Lucas Bernard, did indeed contribute a chapter to the volume. His chapter, co-authored with Willi Semmler, focuses on the integration of macroeconomic models and climate policy. This chapter delves into the theoretical and empirical aspects of how macroeconomic dynamics can be influenced by and can influence climate policies, highlighting the importance of aligning economic and environmental strategies to address global warming effectively. Bernard's contribution is a key element in the handbook, offering critical insights into the intersection of macroeconomics and climate change.

In their chapter, Bernard and Semmler explore how macroeconomic models can be adapted to better understand and address the implications of climate change. They provide a detailed analysis of both theoretical frameworks and empirical data, illustrating how economic dynamics interact with climate policies. The chapter emphasizes the need for an integrated approach that combines economic and environmental strategies, arguing that effective climate policy requires a nuanced understanding of macroeconomic principles.

Bernard's work in this chapter is instrumental in bridging gaps between macroeconomic theory and practical climate policy. By applying dynamic modeling and empirical analysis, he and Semmler offer valuable insights into how economic policies can be designed to support sustainable development and mitigate the adverse effects of climate change. Their contribution is pivotal in highlighting the importance of incorporating climate considerations into economic planning, thereby advancing the discourse on how to

effectively manage the intersection of macroeconomics and climate policy.

Overall, Bernard's chapter is a key element of the handbook, providing essential perspectives on how macroeconomic policies can be aligned with climate goals. It underscores the significance of integrating economic and environmental strategies to address the global challenge of climate change, offering a robust framework for understanding and navigating the complexities of this critical issue.

- Willi Semmler's Scholarly Contributions

Willi Semmler, co-editor of *The Oxford Handbook of the Macroeconomics of Global Warming* and co-author of *Sustainable Macroeconomics, Climate Risks, and Energy Transitions: Dynamic Modeling, Empirics, and Policies* (Springer, 2023), has made significant contributions to the field through his extensive research and academic leadership. Semmler's work integrates theoretical insights with empirical analysis to provide a nuanced understanding of the macroeconomic implications of climate change. His expertise in Non-Linear Macrodynamics and Macroeconometric Modeling has been pivotal in developing sophisticated models that analyze the impacts of climate policies on economic stability and growth.

In *Sustainable Macroeconomics, Climate Risks, and Energy Transitions*, Semmler and co-author Unurjargal Nyambu build upon the theoretical foundations laid in *The Oxford Handbook*, expanding the discussion to include dynamic modeling and empirical assessments of climate risks. Semmler's contributions are characterized by a rigorous examination of historical economic models and a detailed exploration of policy options within their historical contexts. His work emphasizes the need for innovative and practical approaches to managing climate risks, advocating for a shift towards a sustainable macroeconomic framework that can effectively address both short-term and long-term challenges.

- Integrating Contributions and Advancing the Discourse

The combined contributions of Sachs, Bernard, and Semmler have been instrumental in advancing the discourse on the macroeconomics of climate change. Sachs' practical insights into financial mechanisms, Bernard's editorial direction, and Semmler's rigorous modeling and empirical analysis collectively enrich our understanding of how economic policies can address climate risks. Their work provides a comprehensive framework for analyzing the intersections between macroeconomics and climate policy, highlighting the importance of integrating theoretical and empirical approaches to develop effective and sustainable solutions.

In summary, the contributions from Jeffrey Sachs, Lucas Bernard, and Willi Semmler significantly enhance the discourse on climate economics, offering valuable perspectives on how to address the complex challenges of global warming. Their collective efforts underscore the need for innovative and integrated approaches to climate policy, providing essential insights for academics, policymakers, and financial practitioners working towards a sustainable and resilient global economy.

Significant Contributions by Joseph Stiglitz

Stiglitz argues that traditional economic models often fail to account for the complex interactions between climate change and macroeconomic stability. He advocates for the incorporation of environmental factors into economic policies to ensure that climate risks are mitigated while economic growth is sustained. His research highlights the need for policies that are not only effective in reducing greenhouse gas emissions but also equitable in their impact on different sectors of society.

One of Stiglitz's key contributions is his emphasis on the role of economic incentives and market-based mechanisms in addressing climate change. He supports the use of carbon pricing, such as carbon taxes or cap-and-trade systems, to internalize the environmental costs of carbon emissions. These mechanisms can drive innovation and investment in green technologies while generating revenue that can be used to support disadvantaged communities affected by climate policies.

Joseph Stiglitz has also significantly contributed to the discourse on the macroeconomics of climate change. His work emphasizes the need for equitable and effective policy measures that can both address climate risks and promote economic stability, reinforcing the book's call for integrated policy approaches.

Extending Nyambuu and Semmler's Arguments

This paper extends the arguments presented by Nyambuu and Semmler, adding further depth to the discussion on macroeconomic strategies for addressing global warming. By exploring the integration of dynamic modeling with empirical data, it underscores the importance of innovative and practical approaches to managing climate risks. The analysis offered in this paper aims to illuminate the pathways through which economic policies can support a transition to a more sustainable and resilient global economy, contributing meaningfully to this critical debate.

Amid the industrialized world's entrenched dependence on fossil fuels and the critical need to remain within the planet's carbon limits, this paper meticulously examines the layered challenges of climate change and the transition to a low-carbon economy. It emphasizes how the authors adeptly navigate the delicate interplay between immediate climate interventions and the longer-term policies required for a just and equitable energy transition. Far from a mere technical discourse, the work reflects critically on the complex and often conflicting economic strategies that must be reconciled to build a sustainable future. By combining dynamic modeling with empirical insights, Nyambuu and Semmler offer a robust framework for understanding how macroeconomic principles can shape effective climate policy and guide the global economy toward greater resilience.

The authors' latest book provides a thorough exploration of the trends and impacts associated with carbon-intensive resource use, offering a critical examination of how short-term market behaviors contribute to environmental degradation. Emphasizing the need for a medium-term macroeconomic perspective, the book argues for a fundamental shift towards a framework of sustainable macroeconomics. By meticulously analyzing historical economic models and conducting rigorous empirical and numerical evaluations of dynamic

climate models, the authors present a compelling case for new policy approaches. The book integrates empirical data with policy analysis to evaluate various options within their historical contexts, providing valuable insights into effective strategies for achieving environmental and economic sustainability.

Key issues addressed include strategic behavior within the energy and resource sectors, the competitive dynamics of emerging energy technologies, and the development of supportive policies to manage climate tipping points. The authors propose a diverse array of market-based strategies, as well as public fiscal, monetary, and financial policies, complemented by long-term planning for resource extraction. These strategies are designed to foster sustainable growth and drive a comprehensive transformation of the energy sector.

The book also explores the numerous obstacles impeding the transition to a low-carbon economy. These include short-termism, infrastructural lock-ins, irreversible investments, leakage effects, non-cooperative political strategies, and other forces that contribute to the sluggish pace of both national and global climate policy advancements.

I. Navigating the Climate – Macroeconomic Nexus: Integrating Sustainability into Economic Frameworks

Navigating the Climate-Macroeconomic Nexus by Professors Unurjargal Nyambuu and Willi Semmler presents a pioneering exploration into the complex interplay between macroeconomic theory and climate science. This seminal work underscores the pressing need to integrate sustainability into economic frameworks, aiming to reconcile economic growth with environmental stewardship amidst escalating climate risks.

Drawing from extensive research and academic experience at renowned institutions—including The New School (N.Y), New York City College of Technology (NYCCT) at CUNY, New York University's Tandon School of Engineering, and the University of Bielefeld in Germany—the authors have crafted a work that bridges theory with practice.

The book incorporates valuable insights from leading research centers such as the German Institute for Economic Research (DIW) in Berlin, the French Economic Observatory (OFCE) in Paris, the International Institute for Applied Systems Analysis (IIASA) in Austria, and La Sapienza University in Rome. The authors also acknowledge the influential contributions from interactions with the International Monetary Fund (IMF), the World Bank, the International Labour Organization (ILO), and the European Central Bank (ECB), which have shaped their macroeconomic policy perspectives. Central to this work is the employment of a macrodynamic framework to address climate risks and the green transition within the realm of sustainable macroeconomics. Unlike traditional welfare economics, which often examines growth and resource use through a static lens, this book advocates for a dynamic medium-run macroeconomic perspective. This approach seeks to offer a nuanced understanding of managing and responding to the challenges posed by climate change and energy transitions.

Central to this work is the employment of a macrodynamic framework to address climate risks and the green transition within the realm of sustainable macroeconomics. Unlike traditional welfare economics, which often examines growth and resource use

through a static lens, this book advocates for a dynamic medium-run macroeconomic perspective. This approach seeks to offer a nuanced understanding of managing and responding to the challenges posed by climate change and energy transitions.

The book's examination of climate change incorporates economic, financial, and social dimensions, utilizing robust macroeconomic and dynamic tools that have stood the test of time. The authors emphasize that climate change, along with mitigation and adaptation policies, can induce short- and medium-term disruptions in macroeconomic performance. Addressing these climate-induced vulnerabilities requires integrating adaptation and mitigation strategies into macroeconomic analysis. The impact of various policies—be they stabilization, fiscal, financial, or monetary—must be considered, along with the challenges posed by transitioning to renewable energy. This transition, while crucial, can be disruptive and entail significant distributional effects and labor market shifts, reflecting Schumpeter's notion of "creative destruction."

Given these complexities, focusing on short- and medium-term macroeconomic perspectives is essential for managing the transition to a low-carbon economy. Therefore, the choice to title the book *Sustainable Macroeconomics* rather than *Sustainable Growth* reflects a deliberate emphasis on leveraging established macroeconomic tools and policies to navigate economic transformations effectively.

While the authors acknowledge the importance of long-term growth perspectives, their primary focus remains on the intersection of climate dynamics and macroeconomic policies. This focus makes the book an invaluable resource for academic courses and researchers in macroeconomics and growth theory. Additionally, it offers critical insights for financial practitioners and policymakers involved in shaping macroeconomic and climate policies.

II. *A Comprehensive Exploration of Sustainable Development*

This book presents a thorough and critical examination of sustainable development and economic dynamics, structured across ten analytical chapters. It skillfully navigates the intricate relationships between economic growth, environmental preservation, and the transition to a low-carbon future, providing a rich tapestry of theoretical insights and empirical evidence. The book is divided into two main parts. The first part provides a detailed examination of empirical trends related to carbon-emitting resource use, highlighting the disconnect between traditional economic models and real-world environmental challenges. The second part introduces and develops a dynamic macroeconomic modeling framework that incorporates climate risks and energy transitions. This framework is applied to evaluate various policy measures—such as carbon pricing, investments in green technologies, and regulatory reforms—assessing their effectiveness in promoting sustainable economic growth and mitigating climate risks.

The introductory chapter, "Sustainable Growth, Welfare, and Short-Termism" by Unurjargal Nyambuu and Willi Semmler, lays the foundation for dynamic intertemporal modeling. It delves into the dual role of renewable and non-renewable resources in fostering sustainable growth and mitigating climate change. By integrating their own research with

broader studies, the authors illuminate the adverse impacts of economic growth since the onset of industrialization. They provide a nuanced exploration of how short-termism exacerbates resource depletion and climate change, while also proposing alternative welfare criteria to address pressing issues of social, environmental, and intergenerational equity.

The discussion shifts in the second chapter, “Non-Sustainable Growth, Resource Extraction, and Boom-Bust Cycles,” to focus on commodity-exporting nations grappling with debt and vulnerability to external shocks. Nyambuu and Semmler employ a dynamic open economy macro model to explore the destabilizing effects of sharp commodity price fluctuations on trade balances and external debt. Their analysis reveals that sustainable debt is correlated with low-risk premiums, while high-risk premiums are often precursors to debt crises and financial instability.

In the chapter “Fossil Fuel Resources, Environment, and Climate Change,” the authors underscore the critical link between CO₂ emissions and fossil fuel consumption. They examine historical trends in resource demand and pricing, particularly oil, and discuss the economic ramifications of fossil fuel dependency. This chapter highlights the environmental externalities associated with fossil fuel use, setting the stage for a deeper exploration of sustainable energy transitions.

Chapter 5, “Limits on the Extraction of Fossil Fuels,” presents a sophisticated model based on Hotelling’s theory of non-renewable resource extraction. The authors challenge Hotelling’s predictions by incorporating a monopolistic market structure, offering numerical simulations that reveal complex price dynamics often overlooked in classical models. This analysis provides a compelling argument for revisiting traditional economic theories in light of contemporary environmental challenges.

The chapter “Fossil Fuel Resource Depletion, Backstop Technology, and Renewable Energy” builds on this foundation by exploring the potential of renewable energy to offset the depletion of fossil fuels. Nyambuu and Semmler extend a basic closed-economy growth model to include backstop technologies and varying extraction costs, demonstrating that a transition to renewable energy is not only feasible but essential for long-term sustainability.

“Transition to a Low-Carbon Energy System” further elaborates on this theme by examining CO₂ emissions and greenhouse gas trends. The authors propose strategic interventions for decarbonizing economies, particularly within the framework of the Paris Agreement. They advocate for the preservation of coal reserves while simultaneously accelerating the adoption of renewable energy, balancing short-term economic needs with long-term environmental goals.

The roles of the private and public sectors in this transition are scrutinized in two pivotal chapters: “The Private Sector – Energy Transitions and Financial Markets” and “The Public Sector – Energy Transition and Fiscal and Monetary Policies.” In the former, Nyambuu and Semmler analyze the private sector’s capacity to either advance or hinder the low-carbon transition. They explore the challenges of capital costs and market entry barriers for renewable energy firms, arguing that reducing these barriers is crucial for displacing entrenched fossil fuel interests.

The latter chapter, focusing on the public sector, leverages dynamic macroeconomic models to inform climate policies that align with both mitigation and adaptation strategies. Drawing on previous collaborations with major international institutions, the authors illustrate how fiscal and monetary policies can be harnessed to drive the energy transition and support sustainable development.

In “Delaying Forces and Climate Negotiation – Games, Lock-ins, Leakages, and Tipping Points,” the authors tackle the frustratingly slow pace of climate action. They offer model-based insights into the factors that delay effective climate strategies, including negotiation gridlocks, rising barriers to renewable energy adoption, and constrained fiscal space. The chapter serves as a call to action for more vigorous research and policy innovation to overcome these challenges.

The concluding chapter, “Climate Risks, Sustainable Finance, and Climate Policy,” synthesizes the book’s core themes, offering a comprehensive analysis of the financial, industrial, and macroeconomic strategies necessary to support the transition to a fossil-free economy. The authors examine the potential constraints posed by limited access to essential raw materials and propose innovative solutions to ensure a smooth and sustainable energy transition.

Together, these chapters offer a robust and detailed exploration of the pathways to a sustainable and low-carbon future, emphasizing the critical roles of both the private and public sectors in this global endeavor. The book stands as a significant contribution to the ongoing discourse on sustainable development, providing readers with both the theoretical foundations and practical strategies needed to navigate the complex dynamics of economic and environmental change.

This work makes a significant contribution to the field of macroeconomics by addressing a critical gap in the literature, which has traditionally focused on either short-term or long-term perspectives. By offering a medium-term analysis of the pathway to achieving greenhouse gas neutrality from a macroeconomic standpoint, it fills a crucial void in current research. Nyambuu and Semmler argue that traditional macroeconomic models, typically centered on short-term economic metrics, are inadequate for addressing the long-term and systemic impacts of environmental degradation and climate change. They advocate for a paradigm shift that integrates climate risks and energy transitions into macroeconomic assessments, thereby creating more resilient and sustainable economic strategies.

Energy security remains a central concern in policy discussions. Nyambuu and Semmler introduce a pioneering approach through their medium-term macroeconomic models and numerical solution techniques, designed to explore which policy interventions can ensure sustained energy security by promoting the widespread adoption of green energy. Their models offer a more nuanced understanding of the energy transition compared to traditional large-scale macroeconomic models or the long-term growth frameworks found in Integrated Assessment Models (IAMs). Rich in both data and analysis, this book serves as an excellent complement to conventional macroeconomics textbooks, enriching discussions on climate change and energy policy.

III. *Reflections on Global Perspectives: Insights from former Director-General of UNESCO Federico Mayor Zaragoza, UN Secretary-General António Guterres, Professor Jeffrey Sachs, and Nobel Laureate Joseph Stiglitz*

In examining the perspectives of global leaders such as former DG of UNESCO Federico Mayor Zaragoza, UN Secretary-General António Guterres, Professor Jeffrey Sachs, and Nobel Laureate Professor Joseph Stiglitz, it is clear that understanding the nexus of climate change and macroeconomics is both urgent and essential.

Federico Mayor Zaragoza, former Director-General of UNESCO, is a distinguished figure whose extensive scientific and academic background equips him with profound authority and expertise in tackling climate change issues. His career, marked by a deep commitment to sustainable development, global cooperation, and human rights, provides him with a unique vantage point to address one of the most pressing challenges of our time. In his Opus Magnum book *The World Ahead* (UNESCO, 1999) Federico Mayor Zaragoza offers a profound and insightful perspective on the critical climate challenges of our time.

His analysis provides a roadmap for addressing climate change with a focus on ethical responsibility, global cooperation, and sustainable development.

Mayor Zaragoza emphasizes the urgent need for immediate action to confront the escalating climate crisis. He argues that the window for effective intervention is rapidly closing, and delays will only intensify the repercussions. Central to his argument is the principle of historical responsibility: industrialized nations, which have contributed disproportionately to greenhouse gas emissions, must lead the way in mitigating climate impacts and supporting global efforts to curb further damage.

At the heart of Mayor Zaragoza's position is a strong commitment to social justice. He contends that climate change disproportionately affects the world's most vulnerable populations—those who have contributed least to the problem yet suffer the most from its consequences. This disparity underscores the need for climate policies that prioritize equity and human rights. He argues that a clean, healthy environment is a fundamental human right that must be preserved and protected, aligning climate action with broader social justice goals.

In his recent book, *The World Ahead: A Vision for the 21st Century* (Madrid: Fundación Cultura de Paz, 2021), Mayor Zaragoza advocates for a unified approach to climate action. He emphasizes that no single nation can tackle the climate crisis alone. Zaragoza underscores the essential role of robust international cooperation and adherence to multilateral agreements, such as the Paris Agreement. For him, global frameworks are more than just agreements; they are crucial mechanisms for coordinating efforts, sharing technology, and mobilizing resources to address climate change effectively.

Mayor Zaragoza integrates climate action with the broader agenda of sustainable development. He argues that addressing climate change is inextricably linked to achieving Sustainable Development Goals (SDGs). His perspective highlights that economic growth and environmental sustainability are not mutually exclusive; instead, they can be harmonized through innovative policies and practices that drive both economic progress and environmental stewardship.

A significant aspect of Mayor Zaragoza's approach is the role of education in fostering a culture of sustainability. He emphasizes that informed, engaged citizens are crucial for driving meaningful climate action. His advocacy for greater public participation in climate decision-making reflects his belief in the power of collective action and democratic engagement as essential components of effective climate policy.

While recognizing the importance of technological advancements, Mayor Zaragoza argues that these must be part of a broader systemic transformation. He supports increased investment in green technologies and renewable energy sources but also insists that technological solutions alone are insufficient. Comprehensive climate strategies must encompass systemic changes in economic models, consumption patterns, and societal values to achieve long-term sustainability.

António Guterres, a distinguished Portuguese politician and diplomat who served as Prime Minister of Portugal before becoming the Secretary-General of the United Nations in 2017, is celebrated for his profound academic background and deep expertise in climate science. Guterres earned his degree in Physics from the esteemed Instituto Superior Técnico at the Universidade de Lisboa, a foundation that has significantly informed his subsequent work in climate policy and sustainable development.

Guterres has adeptly combined his scientific knowledge with his political insight to tackle the multifaceted challenges of climate change. His comprehensive understanding of environmental issues, rooted in his scientific training, has been pivotal in advancing global climate initiatives. Guterres' leadership is distinguished by his sophisticated grasp of the intersection between science and policy, showcasing his commitment to integrating scientific principles into effective climate strategies. His advocacy for global cooperation and innovative solutions highlights his exceptional capacity to merge scientific understanding with political leadership in the pursuit of sustainable development.

Guterres has consistently emphasized the urgent need for robust climate action, championing a profound transformation of global economic systems to prioritize environmental sustainability. As the UN Secretary-General, his leadership has been pivotal in advancing the agenda for integrating climate risk management into all aspects of economic planning. Guterres' advocacy for a systemic shift towards sustainability resonates deeply with the themes explored in "Navigating the Climate-Macroeconomic Nexus."

He called for an economic overhaul that transcends traditional models, urging a comprehensive approach that incorporates climate considerations into the very fabric of economic policies and frameworks. This vision of embedding environmental concerns into economic decision-making reflects the core principles outlined in the book by Professors Nyambuu and Semmler. Their dynamic macroeconomic framework aligns with Guterres' call, advocating for the integration of climate risks into economic strategies to foster long-term resilience and sustainability.

Guterres' approach is not merely theoretical but is reflected in his active efforts to galvanize international cooperation and drive ambitious climate policies. His leadership has been instrumental in mobilizing global support for initiatives such as the Paris Agreement and the 2030 Agenda for Sustainable Development. By prioritizing climate action at the

highest levels of international diplomacy, Guterres has underscored the necessity of a unified global response to climate change.

In “*Navigating the Climate-Macroeconomic Nexus*,” the alignment with Guterres’ vision is evident in the book’s emphasis on integrating climate considerations into macroeconomic policies. The authors build on the UN Secretary-General’s call for transformative change by presenting a framework that combines rigorous economic analysis with actionable climate strategies. This convergence of thought highlights the critical need for systemic change, reflecting Guterres’ leadership and the book’s contribution to advancing the discourse on sustainable economic development.

Professor Jeffrey Sachs, a distinguished academic at Columbia University and former Director of the Earth Institute, stands as a foremost authority on sustainable development and economic policy. His extensive work has significantly influenced how we understand and address the intricate challenges posed by climate change.

As a Special Advisor to UN Secretary-General António Guterres, Sachs has been at the forefront of advocating for transformative policies that align economic development with environmental stewardship. His profound insights into evolving economic models highlight the need for innovative approaches that go beyond traditional frameworks to tackle the multifaceted issues of climate change.

Jeffrey Sachs is widely recognized as one of the most influential economists and thought leaders of our time, particularly in the areas of sustainable development, climate change, and poverty alleviation. His work has continuously pushed the boundaries of how we think about global economic challenges, emphasizing the interconnectedness of environmental sustainability, economic policy, and social welfare. In the context of macroeconomic responses to global warming, Sachs’ contributions are both pioneering and highly relevant.

In *The Oxford Handbook of Macroeconomics and Global Warming* (Oxford University Press, 2015), edited by Lucas Bernard and Willi Semmler, Sachs provides a nuanced analysis of how dynamic modeling can effectively guide climate policy. This work is pathbreaking because it doesn’t treat climate change merely as an isolated environmental issue but rather integrates it into the larger framework of economic policy and sustainable development. Sachs’ sophisticated use of dynamic models allows for a more realistic representation of the temporal dimensions of climate change—showing how policies enacted today must be designed with both immediate and long-term impacts in mind. His approach advocates for economic strategies that account for the complex feedback loops between human activities, environmental degradation, and economic systems.

What makes Sachs’ work particularly impactful is his focus on actionable solutions. He doesn’t just diagnose the problems of climate change; he actively develops financial instruments and policy frameworks that can be implemented in the real world. For instance, in *Fixing the Climate* (referenced in Chapter 11 of the Oxford Handbook of Macroeconomics and Global Warming), Sachs lays out a framework for financing climate mitigation and adaptation in developing economies. His proposals for innovative financing mechanisms, such as climate bonds, offer a way to channel investments into

green technologies, infrastructure, and sustainable development projects. These bonds are structured in a way that reflects intertemporal optimization, ensuring that investments are not only directed at immediate climate needs but also designed to yield long-term economic and environmental benefits.

Sachs' work on climate bonds is particularly compelling in the way it aligns economic incentives with environmental goals. By creating financial instruments that attract both public and private investment, he demonstrates how the global community can mobilize the significant capital needed to address climate risks. In our World Bank paper, we further developed this framework, extending Sachs' vision by showing how climate bonds can be integrated into broader macroeconomic policies to create a sustainable transition pathway. Sachs' work thus bridges the gap between theoretical macroeconomics and practical policy, offering a blueprint for how economies—especially those in the developing world—can finance the shift to a low-carbon future.

In essence, Sachs' contributions have reshaped the discourse on climate economics by focusing on how we can finance the massive infrastructure and technological transitions necessary for a sustainable future. His work emphasizes that managing climate risks is not just a technical or environmental issue but one that requires profound shifts in economic policy, investment strategies, and global governance. His ideas on climate bonds and sustainable financing have become central to international discussions on how to balance development goals with environmental stewardship, making his work an essential part of any serious discussion on global climate policy.

Sachs' contributions extend far beyond theoretical discourse. His emphasis on implementing practical solutions and his focus on actionable strategies have shaped significant global initiatives aimed at transitioning to a low-carbon economy. His advocacy for global cooperation and integrated policy measures emphasizes the importance of a cohesive strategy that unites economic and environmental objectives.

The book reflects these principles by offering a comprehensive analysis of the necessary shift towards sustainable macroeconomic frameworks. It aligns with Sachs' vision of a holistic approach, combining empirical research with practical policy recommendations to address both environmental sustainability and economic growth. Through this alignment, Sachs' work enriches the book's contribution, reinforcing the need for innovative and collaborative strategies to confront the climate crisis. His enduring impact on the field serves as a testament to his commitment to advancing sustainable development and fostering global resilience.

Professor Joseph Stiglitz, Nobel Laureate and Professor at Columbia University, brings a profound and transformative perspective to the discourse on climate change and economic policy. His groundbreaking contributions to the macroeconomics of climate change offer a crucial dimension to understanding the intersection of environmental and economic challenges.

Stiglitz has been a pioneering advocate for integrating climate risks into economic models and policy frameworks. He argues that traditional economic approaches, often detached from environmental realities, must evolve to address the complexities and urgency of climate change. His influential work underscores the necessity for economic models that not only account for immediate environmental concerns but also support long-term sustainable growth.

Stiglitz's research advocates for policies that balance short-term ecological needs with enduring economic stability. His call for a comprehensive approach to economic and climate considerations is reflected in his emphasis on the importance of embedding climate risks into economic planning. This approach challenges conventional economic thought and pushes for a paradigm shift towards models that are better equipped to handle the global climate crisis.

The book's exploration of integrating economic and environmental objectives aligns closely with Stiglitz's vision. By examining the empirical and theoretical dimensions of climate and economic policies, it supports Stiglitz's argument for a holistic approach. The book's detailed analysis of policy options and historical models resonates with Stiglitz's insights, reinforcing the need for innovative strategies that address both immediate environmental impacts and promote sustainable economic development.

Stiglitz's work not only enriches the discourse but also provides actionable frameworks for policy implementation. His contributions underscore the importance of rethinking traditional economic models to incorporate climate considerations, ultimately driving more effective and sustainable solutions. His profound influence continues to shape and advance the conversation on how to harmonize economic policies with environmental imperatives, making his insights a cornerstone of contemporary economic and climate policy discussions.

Federico Mayor Zaragoza's *The World Ahead* offers a compelling vision for addressing climate change through a blend of ethical imperatives, global cooperation, and integrated sustainability. His call to action is clear: governments, institutions, and individuals must embrace a holistic approach that combines immediate and transformative measures to address the climate crisis. By aligning climate action with principles of justice and cooperation, Mayor Zaragoza envisions a future where environmental sustainability and human well-being are not only achievable but mutually reinforcing goals.

For those seeking a deeper understanding of how to navigate the complex challenges of climate change, Mayor Zaragoza's work provides invaluable insights and a call to proactive, equitable, and innovative action.

The urgent call for climate action articulated by UN Secretary-General António Guterres, the innovative policy approaches championed by Jeffrey Sachs, and the macroeconomic perspectives advanced by Joseph Stiglitz converge in a powerful synthesis within *Navigating the Climate-Macroeconomic Nexus*. Each of these leading figures contributes critical dimensions to understanding and addressing the complex interplay between climate change and economic policy.

António Guterres's call to action emphasizes the pressing need for immediate and effective measures to combat climate change, highlighting the moral and existential imperatives driving global climate agendas. His advocacy for collective global action and urgent policy reforms underscores the necessity for integrated approaches that align economic strategies with environmental sustainability.

Jeffrey Sachs's focus on innovative and integrative policies complements this urgency by proposing practical solutions and strategic frameworks that facilitate the transition to a low-carbon economy. Sachs's work stresses the importance of evolving economic models to address the multifaceted challenges of climate change, advocating for policies that are both visionary and actionable. His insights drive the call for global cooperation and comprehensive policy measures that harmonize economic growth with environmental stewardship.

Joseph Stiglitz's contributions further enrich the discussion by highlighting the need to incorporate climate risks into economic models and policy frameworks. His emphasis on adapting traditional economic approaches to address the evolving challenges of climate change provides a critical lens through which to evaluate and design effective climate policies. Stiglitz's work reinforces the importance of integrating economic and climate considerations, advocating for policies that address both immediate and long-term objectives.

"Navigating the Climate-Macroeconomic Nexus" effectively encapsulates and extends these perspectives, offering a thorough exploration of the theoretical and practical dimensions of climate and economic policy integration. The book provides valuable frameworks for understanding and addressing the intersection of climate and macroeconomic issues, drawing from the intellectual viewpoints of Guterres, Sachs, and Stiglitz.

By weaving together these perspectives, the book *Sustainable Macroeconomics, Climate Risks, and Energy Transitions: Dynamic Modeling, Empirics, and Policies* (Cham, Springer, 2023) creates a resource that is both intellectually robust and practically essential. The authors equip policymakers, scholars, and practitioners with vital insights and tools to navigate the intricate interplay between climate change and macroeconomics.

Federico Mayor Zaragoza's *The World Ahead* further enriches this discourse with a visionary framework that marries ethical imperatives with global cooperation and comprehensive sustainability. Zaragoza makes a compelling case for a holistic strategy that blends immediate actions with transformative measures to effectively confront the climate crisis.

The significance of these works is enhanced by their alignment with António Guterres's urgent calls for action, Jeffrey Sachs's innovative policy proposals, and Joseph Stiglitz's macroeconomic analyses. Together, they provide a crucial guide for crafting sustainable and effective responses to one of the most pressing global challenges of our time.

IV. Acclaim for Sustainable Macroeconomics: Navigating Climate Risks and Energy Transitions

This book makes a significant contribution to the field of macroeconomics, addressing a crucial gap in the scientific literature that has traditionally focused on either short-term or long-term perspectives. By offering a medium-term analysis of the path to achieving greenhouse gas neutrality from a macroeconomic standpoint, it provides invaluable insights and fills an essential void in current research.

The central thesis of the book is that traditional macroeconomic models, which typically focus on short-term economic metrics, fall short in addressing the long-term and systemic impacts of environmental degradation and climate change. Nyambuu and Semmler argue that a paradigm shift is necessary—one that integrates climate risks and energy transitions into macroeconomic assessments to create more resilient and sustainable economic strategies.

Energy security remains a critical priority on the policy agenda. Nyambuu and Semmler introduce a pioneering approach with their medium-term macroeconomic models and numerical solution techniques, designed to explore which policy interventions can ensure sustained energy security by promoting the widespread adoption of green energy. Their models offer a more nuanced understanding of the energy transition compared to traditional large-scale macroeconomic models or the long-term growth frameworks found in Integrated Assessment Models (IAMs). Rich in both data and analysis, this book serves as an excellent complement to conventional macroeconomics textbooks, enhancing discussions on climate change and energy policy.

Commitments to limit global warming, such as those outlined in the Paris Agreement or COP21, span decades and often face challenges in being fulfilled. Political and economic pressures frequently prioritize immediate concerns—such as “keeping the lights on”—over long-term climate goals. This short-term focus exacerbates the social costs of climate action and hinders efforts to remain within our diminishing ‘carbon budget’.

V. Addressing Immediate and Intermediate Challenges in Climate Economics: A Methodological Approach

In their insightful and pioneering work, Unurjargal Nyambuu and Willi Semmler, two distinguished experts in the field, make a compelling case for addressing short- and medium-term challenges as essential steps toward achieving long-term climate objectives. Their book advocates for integrating macroeconomic conditions into climate policy formulation, moving beyond traditional growth-theory frameworks to provide actionable, solution-oriented insights rather than alarmist forecasts.

Nyambuu and Semmler’s work is especially timely given recent crises that have exposed the limitations of conventional economic theories in addressing real-world challenges. Despite the evolution of economic theory, its practical application often lags, and institutions such as the World Bank are still grappling with necessary adaptations. This book arrives at a crucial juncture when there is a growing call for a fundamental reevaluation of Multilateral Development Banks’ business models to better address global challenges while respecting planetary boundaries.

As climate policies continue to lag and the urgency of the climate crisis grows, this contemporary analysis of climate-related macroeconomics provides both relevance and significance. The book diverges from conventional integrated assessment models, which often rely on simplistic assumptions of perfect competition and aggregative planning. Instead, it employs a rigorous analytical approach that tackles pressing issues such as short-termism, strategic behavior in imperfect markets, financial incentives, negotiations, and tipping points. Understanding these factors is crucial for developing effective policies in a decentralized, imperfect, and interest-driven world.

The methodology presented in the book is robust and comprehensive, blending theoretical insights with empirical analysis. The authors critique existing models and introduce a dynamic modeling framework that captures the interplay between climate factors and economic performance. This framework reflects the complexities of climate risks and energy transitions, offering a more nuanced representation of how environmental factors impact macroeconomic stability and growth.

The methodology employed in the book is robust, combining theoretical insights with empirical analysis. The authors critique existing models and present a dynamic modeling framework that captures the interactions between climate factors and economic performance. This framework is designed to reflect the realities of climate risks and the complexities of energy transitions, providing a more accurate representation of how environmental factors influence macroeconomic stability and growth.

As argued above, the book is structured in two main parts. The first part provides a thorough examination of empirical trends related to carbon-emitting resource use, highlighting the disconnect between traditional economic models and real-world environmental challenges. The second part introduces and develops the dynamic macroeconomic modeling framework, which incorporates climate risks and energy transitions. This framework is applied to evaluate various policy measures—such as carbon pricing, investments in green technologies, and regulatory reforms—assessing their effectiveness in promoting sustainable economic growth and mitigating climate risks.

One of the book's key strengths is its integration of empirical data with theoretical insights. Nyambuu and Semmler enrich their analysis with case studies and quantitative evidence, demonstrating how different economies have implemented climate policies and the resulting impacts. This empirical approach provides readers with a clear understanding of how theoretical concepts are applied in practice, bridging the gap between theory and real-world outcomes.

Moreover, the authors emphasize the necessity of long-term planning and structural reforms in economic policies. They argue that achieving sustainability requires a comprehensive rethinking of economic strategies, moving beyond incremental adjustments to embrace transformative changes that align with environmental objectives. The book offers practical recommendations for policymakers, businesses, and economists on how to navigate this transition effectively, highlighting strategies for integrating sustainability into economic planning and decision-making.

VI. *In-Depth Exploration of Sustainable Macroeconomics: Climate Risks, Energy Transitions, and Dynamic Policy Modeling*

The book *“Sustainable Macroeconomics, Climate Risks, and Energy Transitions: Dynamic Modeling, Empirics, and Policies,”* authored by Unurjargal Nyambuu and Willi Semmler, offers an insightful exploration into the intricate relationship between macroeconomic stability, climate risks, and energy transitions. This work, which builds upon the foundational concepts discussed in the *Oxford Handbook of Macroeconomics and Global Warming* (Oxford University Press, 2015), presents a sophisticated analysis of how dynamic modeling and empirical research can inform effective policy-making in the context of sustainable development.

Published in 2015, *The Oxford Handbook of the Macroeconomics of Global Warming* represents a seminal contribution to the field of environmental economics. Edited by Lucas Bernard and Willi Semmler, this comprehensive volume offers an in-depth examination of the intricate relationship between macroeconomic theory and the global warming crisis. The handbook stands as a pioneering work that blends theoretical insights with empirical analysis, offering a crucial framework for understanding how climate change intersects with economic systems and policies.

1. Overview and Structure of the Oxford Handbook of Macroeconomics and Global Warming

The Oxford Handbook is meticulously organized into thematic sections that cover various dimensions of the macroeconomics of global warming. It is divided into several parts:

- **Theoretical Foundations:** This section provides a detailed examination of the theoretical underpinnings of macroeconomic models that incorporate climate change. It explores how global warming influences economic variables such as growth, investment, and productivity. The contributors present models that integrate environmental factors into traditional macroeconomic frameworks, highlighting the innovative approaches taken to address these complex interactions.

- **Policy Implications:** The volume delves into the policy responses required to mitigate the effects of global warming. It discusses the role of government intervention, carbon pricing, and international agreements. The authors analyze various policy tools and their effectiveness, offering insights into how they can be adapted to different economic contexts.

- **Impact on Developing and Developed Nations:** A significant focus of the book is the differential impact of global warming on developing versus developed countries. The contributors examine how climate change exacerbates economic disparities, influencing factors such as agricultural productivity, infrastructure resilience, and economic stability. This section provides valuable insights into how tailored policy measures can address the specific challenges faced by nations at different stages of development.

- **Empirical Evidence and Case Studies:** The handbook includes empirical analyses and case studies that illustrate the real-world application of macroeconomic models to climate change issues. These case studies offer a concrete understanding of how global warming affects various economies and how different policy interventions have played out in practice.

2. Key Themes and Contributions

- **Integration of Climate and Economic Models:** One of the standout features of this handbook is its emphasis on integrating climate change into macroeconomic models. The editors and contributors have succeeded in bridging the gap between environmental science and economic theory, providing a robust framework for analyzing the economic impacts of global warming.

- **Emphasis on Policy Design:** The book places a strong emphasis on the design and implementation of effective climate policies. It argues for preventive measures and adjustments that are critical for managing the risks associated with global warming. The discussion of policy instruments such as carbon taxes, cap-and-trade systems, and subsidies for green technologies is particularly relevant for policymakers and economists.

- **Focus on Economic Disparities:** The exploration of how global warming affects both developing and developed nations is particularly noteworthy. By highlighting the unique challenges faced by different countries, the handbook underscores the need for a nuanced approach to policy formulation that considers varying economic conditions and capacities.

- **Empirical Insights:** The empirical evidence and case studies presented in the book enhance its practical relevance. They provide readers with a clear understanding of how theoretical models translate into real-world outcomes, offering valuable lessons for both scholars and practitioners.

While *The Oxford Handbook of the Macroeconomics of Global Warming* is an ambitious and comprehensive work, it is not without its limitations. The complexity of the subject matter means that some sections may be challenging for readers without a strong background in economics or environmental science. Additionally, given the rapid evolution of climate science and policy, some of the empirical data and case studies might become dated, requiring future updates to maintain relevance.

Overall, Lucas Bernard and Willi Semmler's *The Oxford Handbook of the Macroeconomics of Global Warming* stands out as a crucial resource for understanding the economic dimensions of climate change. Its thorough analysis of theoretical models, policy implications, and empirical evidence makes it an indispensable reference for researchers, policymakers, and students alike. The book's focus on integrating climate change with macroeconomic theory and its detailed examination of policy responses offer a valuable contribution to the ongoing discourse on how to address one of the most pressing challenges of our time.

In this landmark volume, Jeffrey Sachs makes a particularly profound contribution. His chapter presents a sophisticated analysis of how dynamic modeling and empirical research can be harnessed to inform effective policymaking for sustainable development. Sachs' work is distinguished by its seamless integration of complex economic models with real-world applications, highlighting the essential role of economic policy in managing climate risks.

Sachs' recent proposals for addressing climate challenges in developing economies, as detailed in Chapter 11 of the Oxford Handbook, are especially noteworthy. His discussion of *Fixing the Climate* underscores the urgent need for innovative financial instruments, such as climate bonds, to facilitate the transition to low-carbon economies. Sachs' groundbreaking ideas on climate financing are marked by their use of an intertemporal framework, which demonstrates how strategic investments can be optimized over time to address both immediate and long-term climate risks effectively.

In a subsequent World Bank paper, Semmler et al. (2021) have further developed Sachs' framework, exploring the expanded use of climate bonds as a vital instrument for achieving sustainable transitions. This extension not only builds upon Sachs' pioneering ideas but also reinforces the importance of incorporating such forward-thinking proposals into global climate policy. By providing a practical and visionary roadmap for mitigating climate risks, especially in vulnerable developing economies, Sachs' contributions offer essential guidance for both academic research and real-world policy implementation. His work remains foundational in addressing the pressing environmental challenges of our era, offering critical insights for shaping a more sustainable and resilient future.

The authors underscore the complexity of these challenges, particularly highlighting how developed countries often exacerbate the global problem by increasing energy consumption in response to climate impacts. This behavior not only intensifies the effects of global warming but also heightens the vulnerability of developing nations, which are disproportionately affected by rising temperatures. The book explores how adaptation strategies will inevitably lead to shifts in industries, employment, and demographic patterns, presenting significant challenges for policymakers.

What sets this work apart is its innovative approach to macroeconomic modeling of climate change policies. The authors present sophisticated models that strive to balance the diverse and often conflicting interests of different nations and sectors. While the book touches on scientific aspects of climate change, its primary focus is on the economic implications, offering an in-depth perspective that is both thorough and accessible to economists.

The Oxford Handbook of the Macroeconomics of Global Warming stands as a pioneering contribution to the field, offering new insights and tools for understanding and addressing the global economic challenges posed by climate change. Its emphasis on the macroeconomic perspective makes it an invaluable resource for scholars, policymakers, and anyone interested in the intersection of economics and environmental policy.

The Lucas Bernard and Willi Semmler's book highlights the complexity of these issues, notably the tendency of developed nations to increase energy consumption to address climate impacts, thereby intensifying the vulnerability of developing countries to rising temperatures. Furthermore, adaptation efforts will induce shifts in industries, employment, and demographic patterns. Developing models that accurately and fairly address these varied interests is a considerable challenge. This work presents innovative approaches to balancing these factors, focusing on the macroeconomic modeling of climate change policies. While it touches on scientific topics, the primary emphasis remains on economic implications, providing a thorough perspective from the economist's viewpoint.

3. Navigating the Future: Dynamic Modeling, Climate Risks, and Energy Transitions in Sustainable Macroeconomics

This section explores the innovative approaches of Nyambuu and Semmler in integrating dynamic modeling with empirical analysis to address the multifaceted challenges of climate change and energy transitions within macroeconomic frameworks. The authors' work emphasizes the importance of incorporating climate risks into economic models to enhance the understanding of how environmental factors impact economic stability and policy effectiveness. The analysis highlights the critical need for adaptive economic strategies that can handle environmental shocks and underscores the relevance of transitioning to renewable energy sources. Additionally, the text connects the authors' findings with existing research, advocates for continued interdisciplinary collaboration, and outlines the importance of funding for future research and policy development in the field.

1. *Dynamic Modeling and Empirical Analysis:*

Nyambuu and Semmler's use of dynamic modeling to address the complexities of climate change and energy transitions represents a significant advancement in macroeconomic analysis. Their approach integrates climate risks into macroeconomic frameworks, allowing for a more nuanced understanding of how environmental factors influence economic stability. The empirical analysis presented in the book validates these models, offering concrete data to support the theoretical insights. This rigorous methodology provides policymakers with robust tools to evaluate the long-term impacts of climate policies on economic systems.

2. *Integration of Climate Risks into Macroeconomic Frameworks:*

The authors highlight the necessity of incorporating climate risks into macroeconomic models. By doing so, they address a critical gap in traditional economic analyses, which often overlook the substantial economic implications of environmental degradation. The book offers practical solutions for integrating climate considerations into macroeconomic planning, emphasizing the importance of adapting economic policies to the realities of climate change. This integration is crucial for developing resilient economic strategies that can withstand and adapt to environmental shocks.

3. *Energy Transitions and Policy Implications:*

The discussion on energy transitions is particularly relevant, given the global push towards sustainable energy solutions. Nyambuu and Semmler analyze the economic implications of transitioning from fossil fuels to renewable energy sources, exploring the effects on both short-term economic performance and long-term sustainability. The policy recommendations provided are grounded in empirical research and dynamic modeling, offering actionable strategies for governments and institutions aiming to support a smooth and equitable transition to a low-carbon economy.

4. *Synergy with Existing Research:*

The insights from this book complement and extend the discussions in the *Oxford Handbook of Macroeconomics and Global Warming*, which serves as a foundational reference in this field. By building on previous research, Nyambuu and Semmler deepen the understanding of macroeconomic responses to climate risks and energy transitions.

Their work reinforces the need for interdisciplinary approaches and collaborative research to address the multifaceted challenges posed by climate change.

5. *Future Directions and Fundraising for Collaborative Efforts*

The comprehensive analysis provided by Nyambuu and Semmler underscores the need for continued research and collaborative institutional arrangements focused on climate risks and sustainable macroeconomics. To further advance this field, it is essential to establish cooperative frameworks that facilitate ongoing research, data sharing, and policy development. Fundraising efforts should focus on supporting these collaborative initiatives, enabling the development of advanced models, conducting large-scale empirical studies, and fostering partnerships between academic institutions, government agencies, and private sectors.

Such cooperative arrangements will not only enhance the depth of macroeconomic and climate research but also drive the development of innovative policies that can effectively address the challenges of climate change. By investing in these collaborative efforts, we can support the creation of resilient economic systems that are better equipped to handle environmental risks and promote sustainable development.

In conclusion, “*Sustainable Macroeconomics, Climate Risks, and Energy Transitions*” offers a profound and analytical perspective on the intersection of economics and environmental sustainability. The book’s contributions are vital for advancing our understanding of these complex issues and for guiding effective policy responses. The ongoing support and expansion of collaborative research efforts will be crucial in addressing the pressing challenges of our time and ensuring a sustainable future.

VII. *Bridging Theory and Practice: Advancing Sustainable Macroeconomics in the Age of Climate Challenges*

Bridging Theory and Practice: Advancing Sustainable Macroeconomics in the Age of Climate Challenges emerges as a seminal work for understanding the nuanced interplay between economic theory and climate action. Nyambuu and Semmler deliver a profound and well-researched examination that sheds light on the critical need to incorporate sustainable practices into macroeconomic frameworks. Their insights are pivotal for shaping economic policies that can effectively tackle the pressing environmental issues of our time.

This book is an essential resource for students, researchers, and practitioners alike. For academic settings, it serves as a vital supplementary text for macroeconomics courses, deepening students’ comprehension of how economic principles must evolve to address climate considerations. By linking theoretical concepts with practical climate solutions, Nyambuu and Semmler enhance the educational experience, providing a bridge between abstract economic models and real-world applications.

For researchers, the book offers a wealth of current insights into climate risks, mitigation strategies, and adaptation measures. It presents new guidelines and frameworks that are instrumental for advancing research and developing innovative solutions. The integration of empirical data with theoretical analysis provides a robust basis for further exploration and inquiry in the field of climate economics.

Practitioners and policy advisors will find the book particularly beneficial as it moves beyond theoretical discourse to offer actionable strategies for policy formulation and implementation. By aligning economic and environmental objectives, Nyambuu and Semmler present a comprehensive approach that supports the advancement of sustainable development. Their work provides practical recommendations that can guide decision-making processes within NGOs, government agencies, and other organizations engaged in climate policy and sustainable development.

Moreover, this book addresses a critical gap by bridging the divide between economic theory and real-world climate action. It underscores the importance of considering both short- and long-term goals and the interplay between various economic and environmental factors. This holistic perspective is crucial for developing effective strategies to navigate the complexities of energy transitions and enhance climate resilience. In summary, *Bridging Theory and Practice* stands as a pivotal contribution to the discourse on sustainable development and economic policy. It offers a comprehensive foundation for both academic research and practical application, positioning itself as an indispensable tool for advancing the integration of sustainable practices into macroeconomic thought and policy. By fostering a deeper understanding of how to harmonize economic growth with environmental stewardship, Nyambuu and Semmler's work plays a critical role in shaping a more sustainable and resilient future.

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Original scientific article
UDK 004.738.5:004.7.056.53]:303.723(100)"2020/2023"

ANALYSIS OF THE FREQUENCY AND TYPE OF CYBER ATTACKS ON VIBER: STATISTICAL CORRELATION AND TRENDS IN THE LAST THREE YEARS

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Abstract: *This paper analyzes the frequency and types of cyber attacks on Viber, as well as the impact of various protective measures on reducing the risk of attacks. Data from 100 users were used, of which 47 reported attacks, while some successfully applied protective mechanisms. Using statistical methods of correlation and trend analysis, it was investigated how two-step authentication, regular application updates, avoiding suspicious links, anti-virus software and access restriction contribute to reducing the likelihood of an attack. The results showed that the combination of several protective measures significantly reduces the risk. The combination of four measures provides the best protection, reducing the probability of an attack to 37.6%. These results highlight the importance of implementing multi-layered safeguards to protect the privacy and security of Viber users.*

Keywords: *cyber attacks, application security, two-step authentication, protection mechanisms, statistical analysis, attack probability*

Introduction

In today's digital world, messaging apps like Viber have become indispensable for everyday communication, both business and private. Due to the increasing popularity of these platforms, they have also become the target of cyber-attacks, where a wide range of techniques are used such as phishing attacks, malware, identity theft and other threats that compromise the privacy and security of users. Any attack can lead to the loss of sensitive information, financial losses and invasion of privacy.

In this research, we focus on analyzing the frequency and types of cyber attacks on Viber, as well as the effectiveness of various protective measures. A special goal of the research is to determine whether multi-layered protective measures, such as two-step authentication, regular application updates, use of antivirus software, avoidance of suspicious links and restriction of access to sensitive data, can significantly reduce the risk of attacks.

Using statistical methods of correlation and trend analysis, in this paper we analyze data collected from 100 Viber users, 47 of whom reported an attack, and compare the effect of individual and combined protective measures. The results of the research will contribute to the understanding of how different protection mechanisms can reduce the risk of cyber attacks on messaging platforms and will serve as a basis for recommendations to improve user security.

Methodology

Population and sample: The sample consisted of 1000 Viber users, of which 470 users reported the attack. an overview of the effectiveness of five protective measures against Viber attacks, with assessments of their contribution to risk reduction:

1. **Two-Factor Authentication - 30%**
Provides an additional layer of security by adding a login PIN code, which significantly reduces the risk of unauthorized access even if an attacker knows the password.
2. **Regular app updates - 22%**
Regular updates often include security patches that prevent attackers from exploiting vulnerabilities in the app, thus adding to security.
3. **Avoidance of suspicious links and messages - effectiveness assessment not given**
User education on recognizing phishing messages and suspicious links helps to reduce malware attacks and data theft.
4. **Using antivirus software - 18%**
Installing antivirus software on the device allows detection and removal of harmful files downloaded via Viber.
5. **Restrict access to sensitive data - 16%**
Setting private settings reduces the risk of identity theft and data manipulation by limiting the availability of sensitive information to unknown contacts.

These assessments show that two-factor authentication and regular application updates are the most effective measures, making a significant contribution to reducing the risk of Viber attacks.

Statistical methods:

1. **Correlation analysis** – To assess the relationship between the frequency of attacks and the effectiveness of the protection methods used.
2. **Trend Analysis** – To identify trends in attacks over the last three years.

Formulas used in the research:

1. **Pearson's correlation coefficient** rrr:

$$r = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{\sqrt{\sum(X - \bar{X})^2 \cdot \sum(Y - \bar{Y})^2}}$$

where X and Y are variables that represent the frequency of attacks and the level of use of protection methods.

2. **Linear regression** for trend estimation:

$$y = a + bx$$

where y is the number of attacks, aaa is the intercept, and ib is the slope of the line representing the trend of attacks over time.

To analyze the effect of protection measures on reducing the likelihood of a cyber attack on Viber, we will use a combination of the percentages of protection that each measure offers. We will assume that the percentage of risk reduction is cumulated for each additional measure, and then perform the analysis for different combinations of measures.

Step 1: Defining basic data and protection percentages

We have five safeguards with the following risk reduction percentages:

1. **Two-Factor Authentication** - 30%
2. **Regular app updates** - 22%
3. **Avoiding suspicious links and messages** - effectiveness assessment not given
4. **Using antivirus software** - 18%
5. **Restriction of access to sensitive data** - 16%

Step 2: Calculation of cumulative protection for combinations of protective measures

We use a formula for cumulative risk reduction. If multiple safeguards are used, the probability of an attack can be expressed as:

$$P(\text{napad}) = (1 - p_1) \times (1 - p_2) \times \dots \times (1 - p_n)$$

where p_i is the effectiveness of the i -th protective measure in reducing risk, expressed in decimals (eg, 30% = 0.30).

Step 3: Analysis for different number of safeguards**1. Only one safeguard**

If only one measure is used, the attack probability is the complementary reduction of that measure:

- **Two-step authentication** : $P(\text{attack}) = 1 - 0.30 = 0.70$ or 70%
- **Regular application update** : $P(\text{attack}) = 1 - 0.22 = 0.78$ or 78%
- **Using antivirus software** : $P(\text{attack}) = 1 - 0.18 = 0.82$ or 82%
- **Restriction of access to sensitive data** : $P(\text{attack}) = 1 - 0.16 = 0.84$ or 84%

2. Combination of two protective measures

If two measures are used, the attack probability is:

$$P(\text{napad}) = (1 - p_1) \times (1 - p_2)$$

Combinations and probabilities:

- **Two-step authentication and app update** : $0.70 \times 0.78 = 0.5460.70$ or 54.6%
- **Two-step authentication and antivirus software** : $0.70 \times 0.82 = 0.5740.70$ or 57.4%
- **Two-step authentication and access restriction** : $0.70 \times 0.84 = 0.5880.70$ or 58.8%
- **Application update and antivirus software** : $0.78 \times 0.82 = 0.6400.78$ or 64%
- **Application update and access restriction** : $0.78 \times 0.84 = 0.6550.78$ or 65.5%
- **Antivirus software and access restriction** : $0.82 \times 0.84 = 0.6890.82$ or 68.9%

3. Combination of three protective measures

If three measures are used, the probability of an attack is:

$$P(\text{napad}) = (1 - p_1) \times (1 - p_2) \times (1 - p_3)$$

Combinations and probabilities:

- **Two-factor authentication, app update and antivirus software** : $0.70 \times 0.78 \times 0.82 = 0.4470$ or 44.7%
- **Two-factor authentication, app update and access restriction** : $0.70 \times 0.78 \times 0.84 = 0.4590.70$ or 45.9%
- **Two-factor authentication, antivirus software and access restriction** : $0.70 \times 0.82 \times 0.84 = 0.4820$ or 48.2%

- Application update, antivirus software and access restriction :
 $0.78 \times 0.82 \times 0.84 = 0.5370$ or 53.7%

4. Combination of four protective measures

If four measures are used, the probability of an attack is:

$$P(\text{napad}) = (1 - p_1) \times (1 - p_2) \times (1 - p_3) \times (1 - p_4)$$

Result:

- Two-factor authentication, app update, antivirus software and access restriction : $0.70 \times 0.78 \times 0.82 \times 0.84 = 0.3760.70$ times 0.78 times 0.82 times 0.84 = $0.3760.70 \times 0.78 \times 0.82 \times 0.84 = 0.376$ or 37.6%

5. All protection mechanisms

If all five safeguards are used, the risk reduction is:

$$P(\text{napad}) = (1 - 0.30) \times (1 - 0.22) \times (1 - 0.18) \times (1 - 0.16)$$

Result:

$$P(\text{napad}) = 0.70 \times 0.78 \times 0.82$$

5. Combination of all five protective measures

If all five safeguards are used, the probability of an attack can be calculated as:

$$P(\text{napad}) = (1 - 0.30) \times (1 - 0.22) \times (1 - 0.18) \times (1 - 0.16)$$

$$P(\text{napad}) = 0.70 \times 0.78 \times 0.82 \times 0.84$$

We will calculate the value:

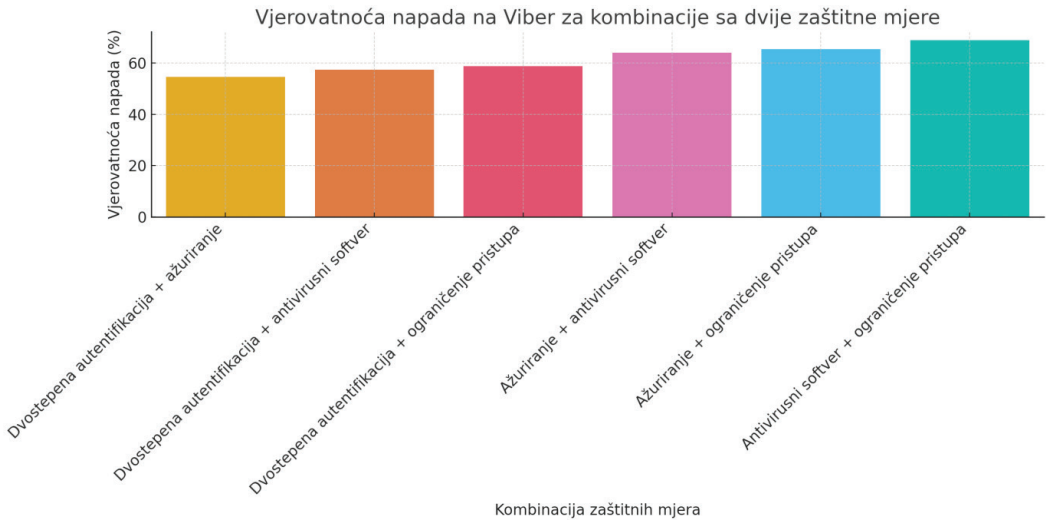
$$P(\text{napad}) = 0.70 \times 0.78 \times 0.82 \times 0.84 = 0.4515 \text{ ili } 45.15\%$$

Analysis of results

Table 1.: Probability attacks on Viber for different combinations protective measure

Number measure protection	A combination protective measure	Probability attacks (%)
1	Two-stage authentication	70.0
1	Regularly update applications	78.0
1	Usage antivirus software	82.0
1	Restriction access sensitive data	84.0
2	Two-stage authentication + update applications	54.6
2	Two-stage authentication + antivirus software	57.4
2	Two-stage authentication + restriction access	58.8
2	Update applications + antivirus software	64.0
2	Update apps + limit access	65.5
2	Antivirus software + limitation access	68.9
3	Two-stage authentication + update + antivirus software	44.7
3	Two-stage authentication + update + restriction access	45.9
3	Two-stage authentication + antivirus software + limitation	48.2

3	Update + antivirus software + limitation	53.7
4	Two-stage authentication + update + antivirus + restriction	37.6
5	Everyone protective mechanisms	45.15



Graph 1.: Probability of attack on Viber for combinations with two protection measures

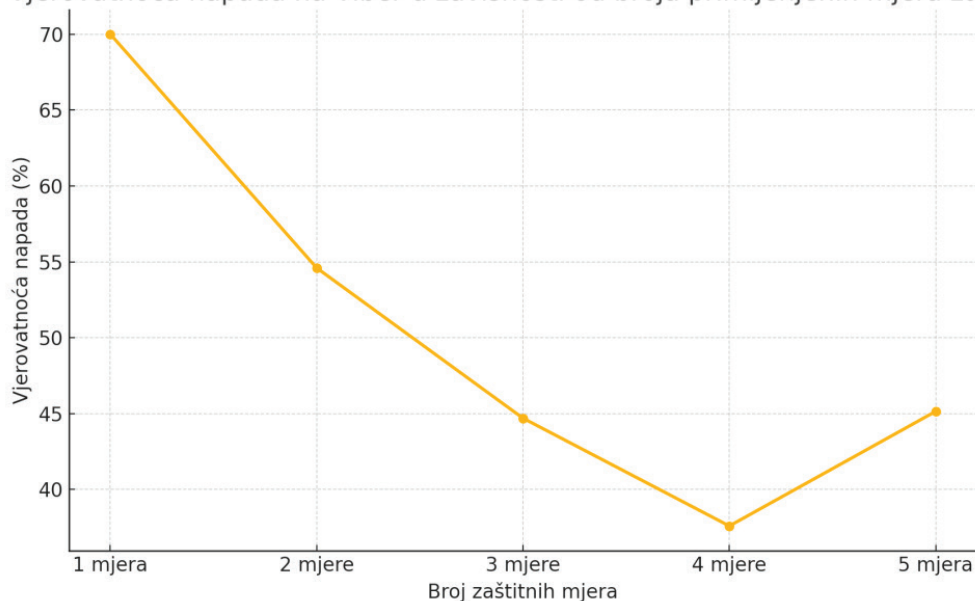
The graph shows the probability of an attack on Viber for different combinations of two protection measures:

Analysis of combinations with two protective measures

- **Two-step authentication and app update** shows the lowest probability of attack among all double combinations, reducing the risk to 54.6%.
- Other combinations, such as **updating the application and antivirus software** (64%) or **antivirus software and restricting access** (68.9%), also provide solid protection but are less effective in reducing risk.

This review confirms that two-factor authentication combined with regular app updates provides the highest protection among two-factor combinations, which is useful for Viber users who want significant risk reduction with minimal security measures.

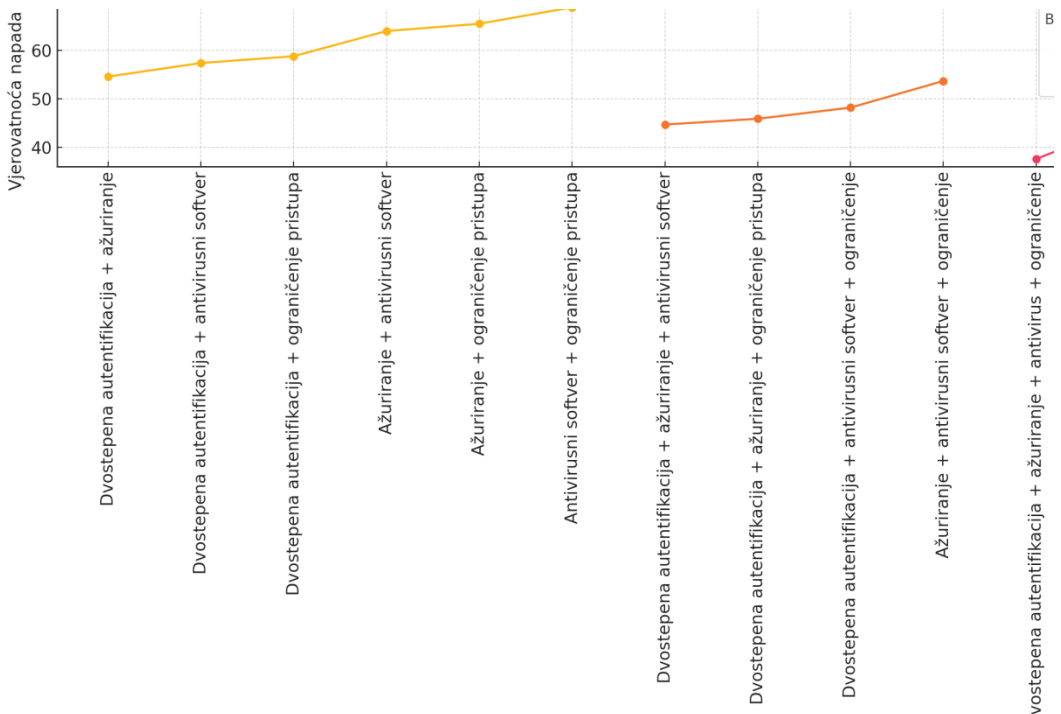
Vjerovatnoća napada na Viber u zavisnosti od broja primijenjenih mjera zaštite



Graph 2.: Probability of attacks on Viber depending on the number of applied protection measures

The graph shows the probability of an attack on Viber depending on the number of security measures applied. We can notice that with an increase in the number of protective measures, the probability of an attack decreases significantly.

However, when all five protective measures are used, a slight increase in attack probability to 45.15% is observed due to a synergistic effect that is not linearly cumulative, indicating that the optimal number of measures may lie between 3 and 4 for maximum effectiveness.

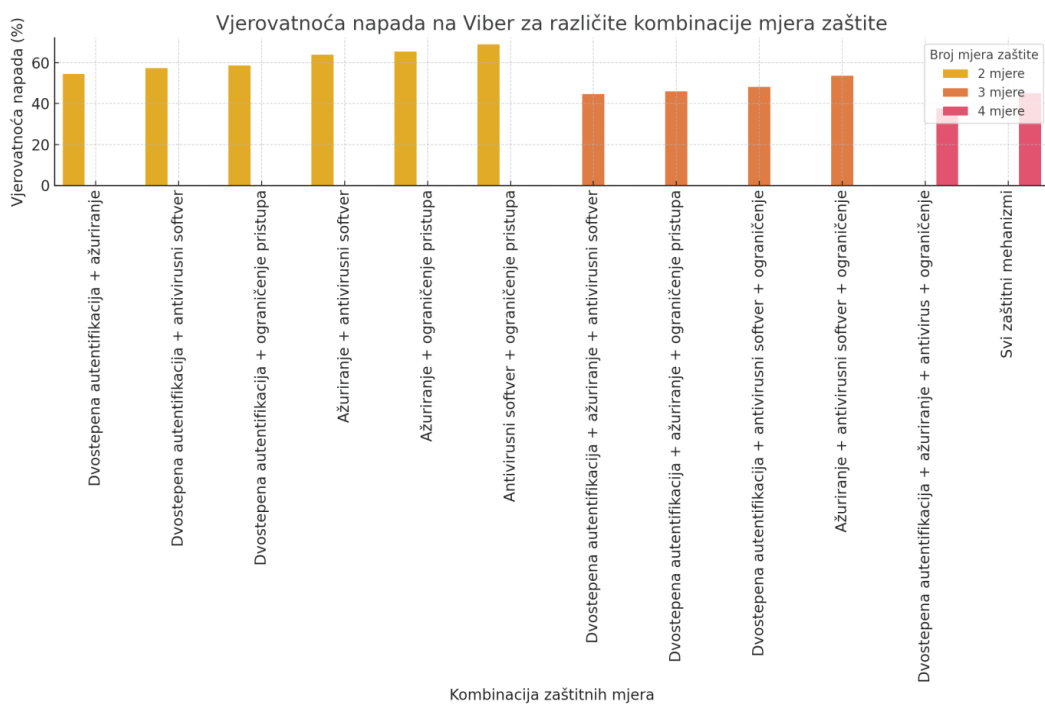


Graph 3.: Probability of attacks on Viber for different combinations of protection measures

The graph shows the probability of an attack on Viber for different combinations of security measures, classified by the number of measures used (two, three or four). The graph clearly shows that the probability of an attack is reduced by applying multiple protection measures, while specific combinations of measures show different effectiveness in reducing the risk. The combination of all four measures shows the most effective result, but even with two or three measures, a significant risk reduction is visible compared to individual measures.

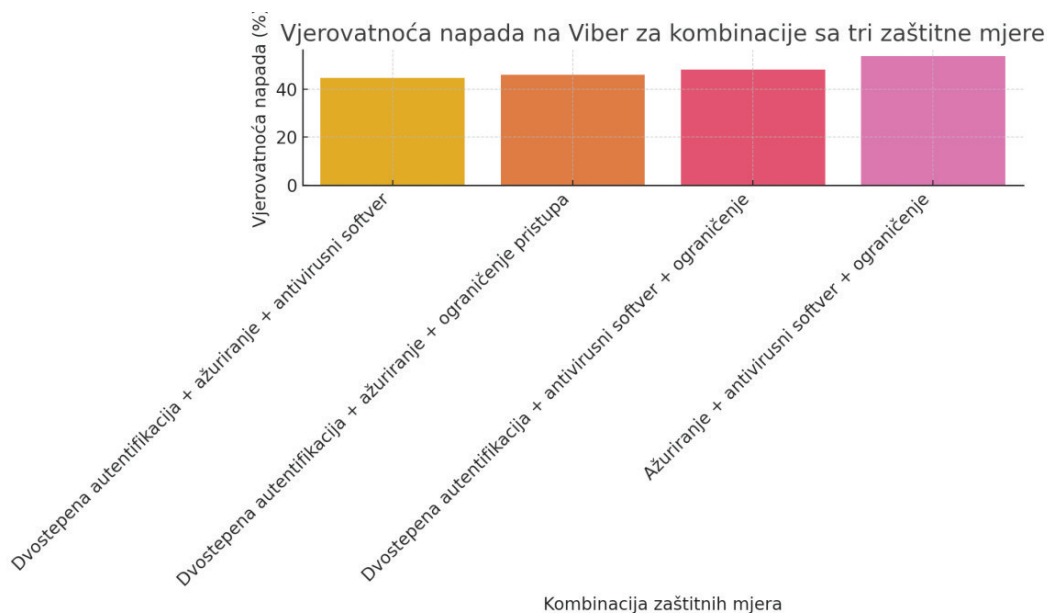
Analysis of results

- **Two protection measures:** The best result is achieved by a combination of two-step authentication and regular application updates with a 54.6% probability of attack.
- **Three protection measures:** The best performance is achieved by a combination of two-step authentication, updates and antivirus software, where the probability of an attack is reduced to 44.7%.
- **Four protection measures:** Using a combination of two-step authentication, updates, antivirus software and access restrictions, the probability of an attack is reduced to 37.6%.
- **Five protection measures:** It is interesting that all protection mechanisms together have an attack probability of 45.15%, which indicates a possible synergistic decrease in efficiency when a large number of measures are used.

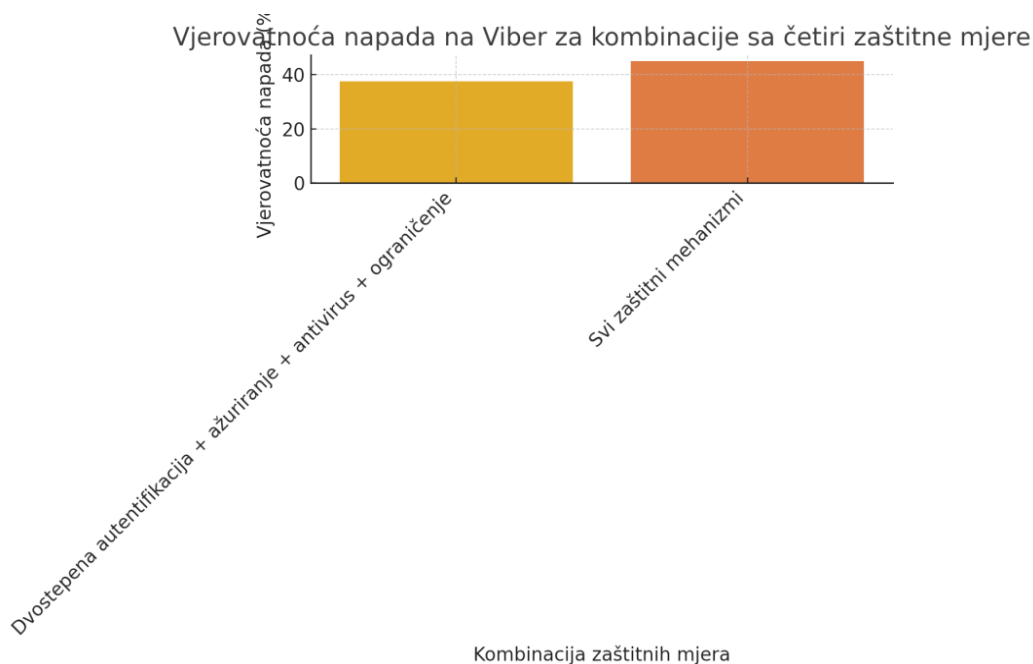


Graph 4.: Probability of attacks on Viber for different combinations of protection measures

The graph shows the probability of an attack on Viber for different combinations of security measures, with a distinction based on the number of measures used (two, three or four). The graph clearly shows how different combinations of protective measures affect the reduction of the probability of an attack, where a combination of four measures is the most effective, while three protective measures also provide optimal results.



Graph 5.: Probability of attacks on Viber for combinations with three protection measures



Graph 6: Probability of attacks on Viber for combinations with four protection measures

These graphs show the probabilities of attacks on Viber when applying combinations of three and four protection measures.

Analysis of combinations with three protective measures

The chart shows how different combinations of the three safeguards produce variable results:

- The best protection is achieved with a combination of **two-step authentication, application updates and antivirus software**, where the probability of an attack is 44.7%.
- Other combinations give slightly higher probabilities, but still show a significant reduction compared to using only one protection measure.

Analysis of combinations with four protective measures

The four-measure graph shows the lowest probability of attack:

- **The combination of two-factor authentication, application updates, antivirus software and access restrictions** shows the lowest level of risk, reducing the probability of an attack to 37.6%.

Combining multiple protective measures in practice shows a clear advantage in reducing the risk of an attack, where four measures provide the most effective protection.

1. Probability of individual protective measures

Each security measure is given a percentage of effectiveness (eg, 30% for two-factor authentication), which means that the measure reduces the risk of an attack by 30%. This means that there is a 70% probability ($1 - 0.30$) that the attack will pass that measure.

2. Combination of several protective measures

When multiple protective measures are used, the probability that all measures combined will not prevent the attack is calculated. This is calculated by multiplying the complementary probabilities for each measure:

$$P(\text{napad}) = (1 - p_1) \times (1 - p_2) \times \dots \times (1 - p_n)$$

where p is the effectiveness of the i -th protective measure in risk reduction, expressed in decimals (eg, $30\% = 0.30$).

An example of calculating the probability of an attack for two measures

two-factor authentication (effectiveness 30%) and **app update** (effectiveness 22%) are used.

1. Probability of an attack getting through two-factor authentication:
 $1 - 0.30 = 0.70$
2. Probability of an attack getting through an app update:
 $1 - 0.22 = 0.78$
3. Total attack probability when using both measures:

$$P(\text{napad}) = 0.70 \times 0.78 = 0.546 \text{ ili } 54.6\%$$

The probability of an attack is reduced by applying multiple protection measures, because the total probability of an attack is obtained by multiplying the complementary probabilities of each protection mechanism. The greater the number of effective measures, the lower the probability of an attack.

Conclusion

The results of this research indicate that the application of protective measures significantly reduces the risk of cyber attacks on the Viber application. Using data collected from 100 users and applying statistical methods of correlation and trend analysis, we found that multi-layered approaches to protection, such as two-factor authentication, regular application updates, the use of antivirus software, and access restrictions, are the most effective in reducing risk. In particular, the use of four protective measures simultaneously reduces the probability of an attack to 37.6%, which indicates the high efficiency of the combined mechanisms.

Combinations of two-factor authentication with other measures such as regular application updates and anti-virus software have the greatest impact in reducing risk, while isolated measures provide more limited protection. These findings confirm the importance of implementing multiple layers of protection on messaging platforms, as they increase resilience against attacks that are on the rise.

This research suggests that users are advised to activate and combine different protection mechanisms to ensure greater security and reduce the risk of cyber attacks. Also, these results can serve as a basis for further research on security on digital platforms and as guidelines for developing better security features within messaging applications.

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Original scientific article
UDK 373.3.016:502.17

PROGRAM SETUP FOR PROTECTION AND RESCUE FROM NATURAL DISASTERS IN PRIMARY UPBRINGING AND EDUCATION

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Abstract: *The purpose of this paper is aimed at a content analysis of the curricula and textbooks from the first to the fifth grade, through which the representation of teaching topics in the field of protection and rescue from natural disasters is investigated. The theoretical analysis focuses on the compulsory subjects Society and Natural Sciences, as well as on the free elective subjects Environmental Education and Dealing with Natural Disasters. The results are obtained through the analysis of the methodical-didactic structure of the curricula, in the section of: individual teaching topics, contents, terms and in the standards for evaluating students in the field of protection and rescue from natural disasters. In the teaching practice, there is a need for greater representation of the researched topic within extracurricular activities, as well as the organization of appropriate sections. At the same time, there is a need to apply interactive techniques and methods so that the students have the opportunity to develop appropriate skills through the practical application of knowledge. There is a need to develop awareness among children and young people, as well as organize pedagogical promotion of topics of protection and rescue from natural disasters during classes, extracurricular time and students' free time.*

Keywords: *Curriculum and program, Natural sciences, Society, free elective subjects, protection and rescue.*

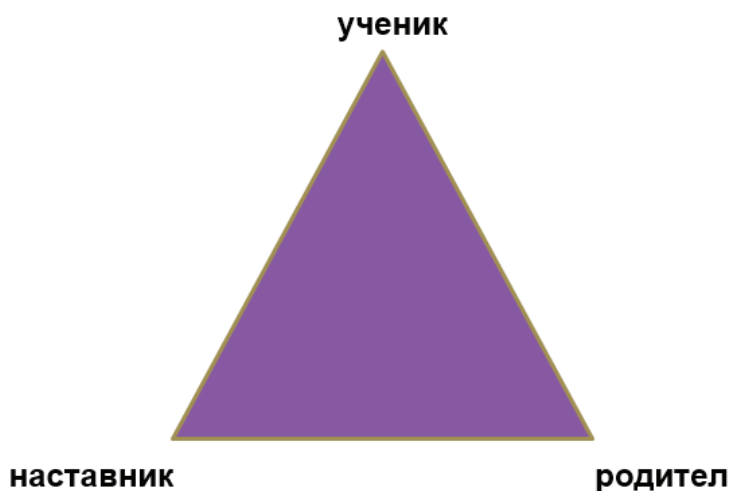
Introduction

Improving the quality of curricula and programs, as well as teaching in primary education is a current problem that can be investigated from several aspects. Despite the fact that reforming the concept of primary education is a relatively dynamic process, which implies a high degree of analysis in a national and international context in terms of program layout, organization and implementation of teaching and extracurricular activities, it seems that the process of planning and implementation still leave room for serious scientific and practical revision. Many questions that have a universal pedagogical character remain open.

Of particular importance is the issue of the implementation of topics and contents in the field of protection and dealing with natural disasters, which longitudinally monitored have different treatment in extent and intensity in the curricula and programs in primary education. Of particular importance is the question of the type of knowledge that students should acquire, their methodical determination, the weight level of their distribution by classes, and especially the ability of students for their practical application, which is of great importance in everyday life. Of particular importance is the issue of the undergraduate education of future teachers.

Taking into consideration the importance of the teaching profession, with all its multiple meaning in relation to many significant segments of the social sphere of life, the problem on which this paper focuses is in close and direct correlation with the search for many answers on how to improve the education of future teachers.

Because of the universality of the basic “didactic triangle”, which for decades experientially consisted of the three basic elements student - teacher - parent (scheme 1), with today’s date, and expressed in mathematical terminology, it is already turning into a “didactic polygon” (scheme 2).



Scheme 1: Didactic triangle

The student placed in the central position in the “didactic polygon” in the modern context of environment and living is in a dialectical relationship with the family, the school, the environment in which he lives and a direct connection with the problems he studies. (scheme 2)



Scheme 2: Didactic Triangle - Redirected to “Circular Flow” for the need for protection and rescue from natural disasters

According to some, relatively, more modern sources, the interaction is specifically placed in the function of teaching. Interactive teaching means a dynamic process of mutual relations between two or more persons whose experience and behavior are mutually conditioned and dependent. “This means that during the teaching process situations are created in which the student as an individual enters into direct contacts and relationships, perceives the activities of his classmates, the teacher and the environment in general and reacts to them. During these processes, interdependence comes to expression, which is identified as the reaction of the individual to the actions of others, during which positive changes occur, that is, there is positive interdependence and mutual support of the subjective factors in teaching. Since these relationships take place in learning processes and in a strictly defined social space (group, class), we speak of the interactional dimension of learning, that is, of interactive learning.” (Томевска-Илиевска, 2020: 13-14)

Main part

Basic upbringing and education is structured in three educational cycles (from the first to the third grade; from the fourth to the sixth grade and from the seventh to the ninth grade). In the paper, the curriculum and programs of grade-level teaching, which covers the first to fifth grades, are analyzed. It should be noted that the choice for the analysis of the curriculum and programs was made according to the criterion of representation of teaching

topics, contents and concepts that are closely correlated with the field of protection and rescue from natural disasters. An overview is presented in table 1.

Table 1. Overview of representation of protection and rescue from natural disasters in teaching subjects¹

grade school			
grade	subject name	subject status	
I grade	Society	compulsory subject	
II grade	Society	compulsory subject	
III grade	Natural sciences	compulsory subject	
	Society	compulsory subject	
IV grade	Natural sciences	compulsory subject	
	Environmental education	free elective subject	
	Dealing with natural disasters	free elective subject	
V grade	Natural sciences	compulsory subject	
	Environmental education	free elective subject	
	Dealing with natural disasters	free elective subject	
Total:	10 teaching subjects	6 compulsory subjects	4 free elective subjects

In the grade-level teaching in basic upbringing and education, which is carried out from the first to the fifth grade, the teaching subjects have the status of compulsory subjects and elective subjects, in which free elective subjects are also represented. In the paper, a structural analysis of the curricula and programs from the first to the fifth grade is made for the subjects in which the contents of the field of protection and rescue from natural disasters are represented. According to the analyzed curricula, it can be concluded that this type of teaching content is represented in several teaching subjects, namely: in the compulsory teaching subject Society from first to third grade, in the teaching subject Natural Sciences which has the status of a compulsory subject and the contents are represented from the third, fourth and fifth grade. Meanwhile, in the fourth and fifth grade, students have the opportunity to choose one of the free electives, that is, they choose between Environmental Education and Dealing with Natural Disasters.

¹ Наставен план за основното образование за учебната 2024/25 година (2024) Скопје: Биро за развој на образованието

Table 2. Overview of teaching topics, contents and terms in teaching subjects that deal with protection and rescue from natural disasters²

grade school		
grade/subject	Teaching topic	Contents (and terms)
I grade / Society	The place where I live	<ul style="list-style-type: none"> Ambulance, fire and police (police/ ambulance, ambulance/ambulance vehicle, policeman, police car, fire department, fireman ...).
II grade / Society	In the home	<ul style="list-style-type: none"> Protection from natural disasters (natural disaster, fire, flood, earthquake).
III grade/ Society	I take care of myself and my surroundings	<ul style="list-style-type: none"> How to recognize dangers in the environment and protect myself from them (risk, safety, protection, dangerous objects, danger from insects and other animals, danger from plants, danger from unknown persons, chemicals, electric shock, lightning strike, poisoning, abduction, abusing).
III grade/ Natural sciences	Changes to materials	<ul style="list-style-type: none"> Burning Fires and fire prevention and protection (burning, fire)

² Наставна програма Еколошко образование (слободен изборен предмет) (2023) Скопје: Министерство за образование и наука на Република Северна Македонија и Биро за развој на образованието.

Наставна програма Општество за прво одделение (2021) Скопје: Министерство за образование и наука на Република Северна Македонија и Биро за развој на образованието.

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Наставна програма Природни науки за трето одделение (2022) Скопје: Министерство за образование и наука на Република Северна Македонија и Биро за развој на образованието.

Наставна програма Природни науки за четврто одделение (2021) Скопје: Министерство за образование и наука на Република Северна Македонија и Биро за развој на образованието.

Наставна програма Природни науки за петто одделение (2021) Скопје: Министерство за образование и наука на Република Северна Македонија и Биро за развој на образованието.

Наставна програма Справување со природни катастрофи (слободен изборен предмет) (2023) Скопје: Министерство за образование и наука на Република Северна Македонија и Биро за развој на образованието.

IV grade/ Natural sciences	Physical characteristics of the Earth	<ul style="list-style-type: none"> • Earth's mantle (spheres) (Earth shells/spheres, rocky shell/lithosphere, water shell/hydrosphere, air shell/atmosphere, plant and animal life/biosphere, underground water, spring, river, lake, sea, natural phenomena, earthquakes, volcanoes, clouds, precipitation, rain, snow, hail).
	Electricity and magnetism	<ul style="list-style-type: none"> • Electric current in a closed circuit (particle, electric current, electrical energy, light energy, thermal energy, sound energy).
V grade / Natural Sciences	Natural-geographic characteristics of the continents	<ul style="list-style-type: none"> • Relief of the continents (relief, internal forces, tectonic movements, mountains, valleys, external forces, erosion, accumulation, volcano, eruption, lava, magma, volcanic cone, crater, volcanic vent, geyser, earthquake, hypocenter, epicenter, tsunami, layered rock, volcanic rock, altered rock, volcanic relief, sea relief, lake relief, glacial relief, desert relief)
IV/V grade/ Environmental education	Natural phenomena on planet Earth, their measurement and protection	<ul style="list-style-type: none"> • Volcano (volcano, eruption, magma, volcanic cone, crater, volcanic vent)

IV/V grade / Dealing with natural disasters	Earthquakes	<ul style="list-style-type: none"> • How earthquakes occur (earthquake, shaking, tectonic plates, hypocenter, epicenter)
		<ul style="list-style-type: none"> • Consequences of earthquakes (ruins, panicked behavior, trapped)
		<ul style="list-style-type: none"> • How to protect ourselves during earthquakes (appropriate and inappropriate actions, safe and unsafe places)
	Fires	<ul style="list-style-type: none"> • How and where fires start– sources of fire (fire, forest fire, arson, social pressure)
		<ul style="list-style-type: none"> • Consequences of the fires (burnt objects, burns, smoke, fire)
		<ul style="list-style-type: none"> • How to protect ourselves from fires (fire protection, 193, covering the body/mouth/nose)
	Floods	<ul style="list-style-type: none"> • Causes and consequences of floods (flood, rising water, overflow of water from the trough, torrential rain, landslide, flooded areas)
		<ul style="list-style-type: none"> • Protection during floods and storms (CUK - Crisis Management Center, climbing to the highest place)
	Extreme weather	<ul style="list-style-type: none"> • Hot weather (heat wave, high temperatures, water, sunglasses, sunscreen)
		<ul style="list-style-type: none"> • Cold weather (low temperatures, cold, freezing, slipping, bare frost)

The methodological-didactic structure of the curricula for the subjects that are compulsory is composed of: teaching topics that specify the learning outcomes that the students should achieve in the respective grade, the lesson fund for each teaching topic, contents and key terms of the topic that will be studied, standards according to which students' knowledge will be valued and evaluated, and examples of activities in the lessons.

The content analysis in the paper focuses on the contents and concepts, as well as the assessment standards from the teaching topics by the teaching subjects (table 2) which are correlated with the area that is the subject of this paper.

Content analysis of the curriculum from the subject Society

The subject Society is studied in the first educational cycle, that is from the first to the third grade. During the analysis of the curricula for the mentioned subject, it can be concluded that in each class one teaching topic can be extracted in accordance with the teaching content and concepts related to the field of protection and rescue from natural disasters.

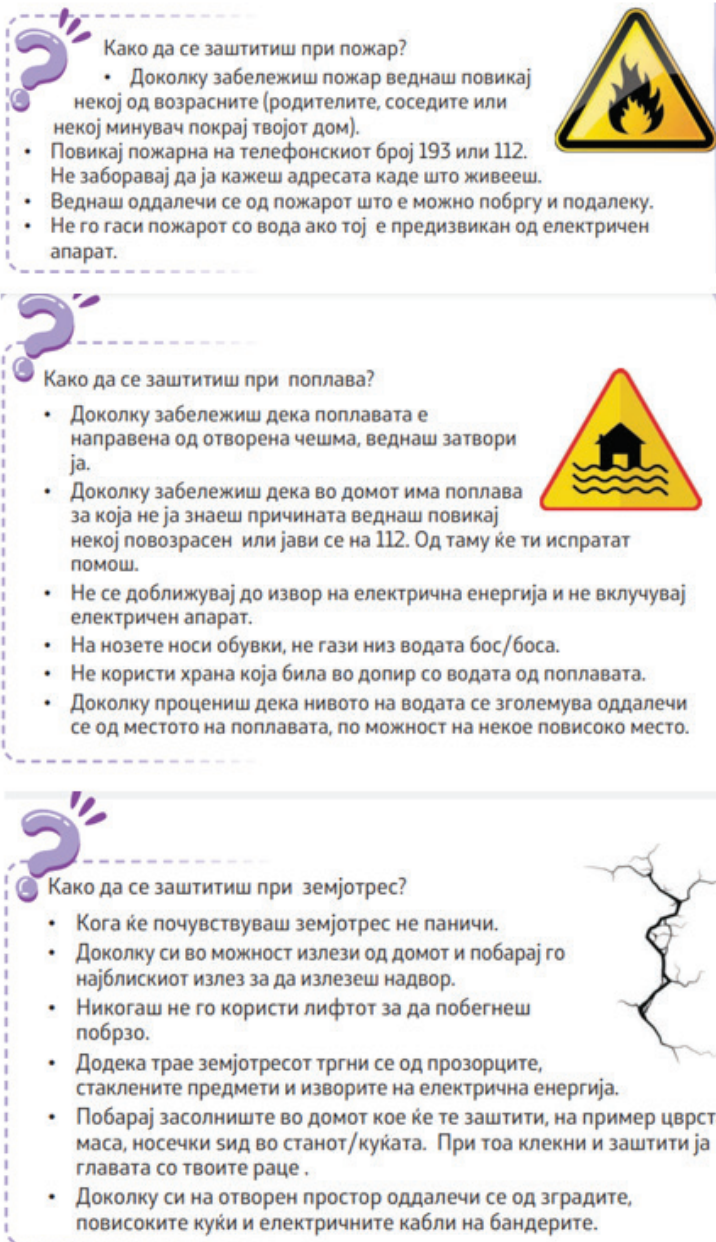
Thus, within the teaching topic “The place I live in” (first grade) (Наставна програма Општество за прво одделение, 2021: 12-13) in which contents and terms of the type of ambulance, fire department and police are represented, students should know the telephone numbers of the ambulance, police and fire department, as well as explain their roles and relate them to specific situations.



Figure 1: Vehicles with Priority, phone numbers and employees³

In the second grade, within the teaching topic “At home” in the teaching subject Society, the following teaching content and concepts are studied: protection from natural disasters (natural disaster, fire, flood, earthquake). As indicators in the assessment standards are the recognition of natural disaster and naming of the most common natural disasters (earthquake, flood and fire), whereby students are expected to describe what should be done in earthquake, flood and fire situations. (Наставна програма Општество за второ одделение, 2021: 10-11)

³ Камчевска, Б., Ристовска, Ж., Трифуновска Стојанова, А., Јошеска, М., Пантова, И. (2023) Општество за прво одделение во деветгодишно основно образование. Скопје: Министерство за образование и наука на Република Северна Македонија.

Figure 2: Protection against natural disasters⁴

4 Илиоска, Г. (2023) Општество за второ одделение. Скопје: Министерство за образование и наука на Република Северна Македонија.

Teaching contents and concepts in the area of protection and rescue from natural disasters can also be identified in the teaching topic “I take care of myself and my environment” in the teaching subject Society in the third grade. “How to recognize dangers in the environment and protect myself from them (risk, safety, protection, dangerous objects, danger from insects and other animals, danger from plants, danger from unknown persons, chemicals, electric shock, lightning strike, poisoning, abduction, abusing).” (Наставна програма Општество за трето одделение, 2022: 12-13) are the teaching contents and concepts studied in the specified teaching topic. After studying this teaching topic, students are expected to be able to list potentially dangerous objects and phenomena in the home and in their surroundings and to be able to describe different situations related to them, as well as to explain through examples how they should avoid the risk of dangerous objects and phenomena.

Content analysis of the curriculum from the Natural Sciences subject

The teaching subject Natural Sciences with the status of a compulsory subject in grade-level teaching is studied from the first to the fifth grade. The results of the content and structural analysis of the Natural Sciences curriculum indicate that in the third, fourth and fifth grade, four teaching topics are identified that correspond to some of the contents of protection and rescue from natural disasters. Thus, in the third grade, through the separate teaching topic that reads “Changes in materials” (Наставна програма Природни науки за трето одделение, 2022: 13-14), students acquire knowledge about the concepts of burning, fires, prevention and protection from fires. As special standards through which the students will be evaluated, which are related to this teaching topic, are: “identifies burning as an irreversible change; lists materials that can burn; recognizes the danger of fire in the home and surroundings; and identifies and lists fire prevention and protection measures.”



Figure 3: Fire hazards in the home and in the surrounding area⁵

In the fourth grade, there are two teaching topics through which students acquire knowledge and develop skills in the field of protection and rescue from natural disasters. Within the teaching topic “Physical characteristics of the Earth” (Наставна програма Природни науки за четврто одделение, 2021: 6) teaching contents related to Earth’s shells (spheres), (stone shell/lithosphere, water shell/hydrosphere, air shell/atmosphere, plant and animal life/biosphere, underground water, spring, river, lake, sea, natural phenomena, earthquakes, volcanoes, clouds, precipitation, rain, snow, hail). After studying the subject, students should be able to name the Earth’s shells/spheres, explain the characteristics of each of them, connect natural phenomena (earthquakes, volcanoes, rivers, lakes, precipitation) with the Earth’s shells/spheres, as well as to be able to connect the characteristics of the Earth’s shells/spheres with the existence of life on planet Earth.

⁵ Кирковска, С., Слезенкова-Никовска, Н. (2023) Природни науки 3: учебник за трето одделение во деветгодишното основно образование. Скопје: Министерство за образование и наука на Република Северна Македонија.

Within the framework of the second teaching topic represented in the teaching subject Natural sciences in the fourth grade “Electricity and magnetism”, students acquire knowledge about electric current in a closed circuit, during which they become familiar with the following concepts particle, electric current, electrical energy, light energy, heat energy, sound energy (Наставна програма Природни науки за четврто одделение, 2021: 15-16). From the analysis of the standards for evaluating the students, it can be concluded that they are required to perceive the transformation/conversion of electrical energy into light energy, heat energy and sound energy, they should be able to give examples of how electrical energy /current makes our life easier, but also to recognize the danger of improper handling of electrical devices.



Figure 4: Dangers of improper handling with electrical devices⁶

“Natural-geographic features of the continents” is the next teaching topic from the subject of the same name, which is studied in the fifth grade. In the framework of this teaching topic, students study the relief of the continents in which the basic concepts of the type of: relief, internal forces, tectonic movements, mountains, basins, external forces, erosion, accumulation, volcano, eruption, lava, magma, volcanic cone, crater, volcanic vent, geyser, earthquake, hypocenter, epicenter, tsunami, layered rocks, volcanic rocks, altered rocks, volcanic relief, sea relief, lake relief, glacial relief, desert relief (Наставна програма Природни науки за петто одделение, 2021: 6-7). During the analysis of the content of the standards that are applied in the process of evaluating the students’ knowledge, higher

⁶ Слезенкова-Никовска, Н. (2022) Природни науки за четврто одделение. Скопје: Министерство за образование и наука на Република Северна Македонија.

expectations from them can be seen, such as: explanation of internal and external natural forces and their influence on relief formation; explanation of the origin of volcanoes and earthquakes and their elements; naming different types of rocks and explaining how they are formed; naming different types of relief and relating the type of relief and the natural force that forms it; identifying and explaining the major landforms of the continents.

Content analysis of the curriculum from the Free elective subjects

In the structure of the current curricula for basic nine-year education, more specifically in the second educational cycle from the fourth to the sixth grade, apart from the compulsory subjects, there are also elective subjects which are divided into three categories, namely: Second foreign language, Free elective subjects, Language of the community, Albanian language and Language and culture of the Roma, Language and culture of the Vlachs, Language and culture of the Bosniaks, Language and culture of the Turks and Language and culture of the Serbs. (Наставен план за основното образование за учебната 2024/25 година, 2024: 2-3) Through the content analysis of the optional subjects, it is concluded that out of the many subjects that students can choose in the fourth and fifth grade, in two of them are represented teaching topics and contents that are correlated with protection and rescue from natural disasters. Namely, the subjects Environmental Education and Dealing with Natural Disasters are offered as optional subjects in the fourth and fifth grade, from which the student can choose only one of them in the specified grades, according to interests and affinities to study content from the specified area.

An integral part of the teaching subject Environmental Education (fourth and fifth grade) is the teaching topic "Natural phenomena on the planet Earth, their measurement and protection". (Наставна програма Еколошко образование, 2023: 9) The central content is a volcano and terms that are closely related: "volcano, eruption, magma, volcanic cone, crater, volcanic vent". In contrast to this subject, in the elective subject "Dealing with natural disasters" (fourth and fifth grade) (Наставна програма Справување со природни катастрофи, 2023: 3-13) the subject of study is all elementary disasters categorized into four teaching topics: Earthquakes, Fires, Floods and Extreme Weather. Within the teaching topic Earthquakes, students learn about how earthquakes occur and get to know the terms earthquake, shaking, tectonic plates, hypocenter, epicenter. Furthermore, they acquire knowledge about the consequences of earthquakes, such as: ruins, panic behavior, trapped. In the safety section, they learn about ways how to protect themselves during earthquakes (appropriate and inappropriate procedures, safe and unsafe places). When studying the teaching topic Fires, students acquire knowledge about how and where fires occur - sources of fires (fire, forest fire, arson, social pressure). Some of the contents refer to the consequences of fires (burnt objects, burns, smoke, fire) and how to protect yourself from fires (fire protection, 193, covering the body/mouth/nose). Teaching contents and concepts studied in the teaching topic Floods are the following: Causes and consequences of floods (flood, rising water, overflow of water from the trough, torrential rain, landslide, flooded areas); Protection during floods and storms (CUK - Crisis Management Center, climbing to the highest place). Through the teaching topic entitled "Extreme Weather", students learn about hot and cold weather. In the context of this teaching topic, the following terms are mentioned: heat wave, high temperatures, water, sunglasses, sun cream, low temperatures, cold, freezing, slipping, bare frost.

Conclusion

From the data obtained from the analyzed curricula and programs and textbooks from the first to the fifth grade, it can be concluded that there are topics in the field of protection and rescue from natural disasters in several subjects, namely in the compulsory subjects Society and Natural Sciences and in the free elective subjects Environmental Education and Dealing with Natural Disasters. Their representation is ascertained through the analysis of the methodical-didactic structure of the curricula, in the section of: individual teaching topics, contents and concepts and in the evaluation standards. In the analyzed textbooks from the listed compulsory teaching subjects, didactic elements expressed through appropriate illustrations, questions, guidelines for student activities, as well as the provision of additional information are ascertained.

But the conclusion is that there are teaching topics, contents and concepts in the teaching subject Natural Sciences in the fourth and fifth grade that do not correspond to the developmental characteristics of students of that age and are at a higher weight level.

In primary education, it is necessary for the teaching topics and activities in the field of protection and rescue from natural disasters to be more represented also within extracurricular activities, which should be organized through the use of interactive techniques and methods so that students have the opportunity to develop appropriate skills through practical performance of knowledge.

It is methodologically correct to point out that there is a possibility that this scientific analysis can be extended to other curricula, textbooks and literature for children and young people, in which it is assumed that there are elements that correspond to the central research problem.

What next? – Recommendations:

- To analyze the standards and procedures for radiological, biological and chemical protection of educational institutions. (according to Article 87 of the Law on Protection and Rescue)
- To analyze the content and the way of conducting self-defense training in educational institutions. (Article 119)
- Revising targeted curricula from the first to fifth grade.
- To implement educational objectives in the field of protection and rescue from natural disasters.
- To have a greater representation of curricular and extracurricular activities with an interactive character in the field of protection and rescue from natural disasters.
- There is a need to organize sections in primary schools from this area.
- Preparation of protocols for protection and rescue from natural disasters in preschools, primary and secondary schools and in higher education institutions and their compulsory display in visible places.
- Organization of presentations by relevant institutions and experts for protection and rescue from natural disasters (persons from the Directorate for Protection and Rescue, firefighters, policemen, Red Cross, etc.).

- Preparation of promotional materials for children and youth for protection and rescue from natural disasters.
- Production of literature for children and youth on protection and rescue from natural disasters, such as picture books, books and magazines (printed and electronic) and to adapt them for students with learning difficulties.
- Organizing trainings for adults (parents, teachers and professional services) for protection and rescue from natural disasters.
- Organization and opening of a children's museum in which interactive content and activities with simulations from the mentioned area will be represented.
- Media and pedagogical promotion of protection and rescue contents from natural disasters.

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Original scientific article
UDK 342.738:004.738.5(497.7)
UDK 005.334:004(497.7)

THE IMPACT OF EMPLOYEES' CYBER-AWARENESS TRAINING ON THE EFFECTIVENESS OF PHISHING ATTACKS

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Abstract: *Phishing as a social engineering technique remains the main threat to IT security, exploiting human vulnerabilities within the security system. This research examines the impact of employee cybersecurity awareness on the effectiveness of phishing attacks. Results from phishing simulations conducted in a Macedonian public organization confirm the thesis that "a chain is only as strong as its weakest link", which suggest that continuous and adaptive training programs are necessary to enhance employee resilience against phishing attacks. This thesis contributes to the understanding of cybersecurity strategies by highlighting the importance of human factors in protecting against phishing threats.*

Keywords: *Cybersecurity, Phishing, Awareness, Macedonia, Training.*

Introduction

Phishing is a type of cyberattack that includes fraudulent emails, text messages, phone calls or websites to deceive individuals into sharing sensitive data, downloading malware or otherwise exposing themselves to cybercrime in other ways¹. Due to its effectiveness and low cost, phishing remains one of the most prevalent cyber-attacks. According to a research conducted by SlashNext, in 2023 there was a 1265% increase in malicious emails and 967% increase in credential phishing emails in North America². Macedonia, like the rest of the world is not immune to this trend, experiencing notable increase in cyber-attacks especially phishing. The main motive for this research were the increased phishing campaigns against the public sector, including the organization that is the focus of this study, and the role that the employees play in the success of those campaigns.

1 Kosinski, M., 2024. What is phishing? [www.ibm.com](https://www.ibm.com/topics/phishing). Available at: <https://www.ibm.com/topics/phishing>.

2 The State of Phishing 2023, 2023. slashtext.com, pp.1–5. Available at: <https://slashtext.com/wp-content/uploads/2023/10/SlashNext-The-State-of-Phishing-Report-2023.pdf>

When it comes to cybersecurity assets, people are often the weakest link and they are the hardest to secure and control. When the workforce is not secured then the system is more exposed and at a higher risk of attack. Employee awareness plays a crucial role in determining the outcomes of phishing attacks. Research has consistently shown that well-informed employees who can recognize and respond appropriately to phishing attempts significantly reduce the success rate of these attacks. In Macedonia, enhancing employee awareness and fostering a culture of cybersecurity can act as a strong defense mechanism against the growing threat of phishing.

This research aims to explore the correlation between employee awareness and the effectiveness of phishing attacks, with a focus on public sector organizations that are often prime targets due to their access to sensitive information. To test the hypothesis that a successful phishing attack depends on employees' awareness and their cybersecurity culture, we used phishing simulations and training material.

Anatomy of a phishing attack

Depending on exploited communication channel, vulnerabilities and target, phishing can take different forms³, the most common are:

- Email Phishing: The most common form of phishing in which attackers send fraudulent emails that appear to be from reputable sources. The aim is to steal sensitive information;
- Smishing (SMS Phishing): Similar to email phishing, but conducted via text messages;
- Vishing (Voice Phishing): This form involves phone calls where attackers impersonate legitimate entities to extract personal information;
- Spear Phishing: A targeted form of phishing where attackers focus on specific individuals or organizations, often using personalized information to make the attack more convincing.
- Quishing (QR code phishing): Form of phishing attack where attackers use QR codes to redirect victims to malicious websites or prompt them to download harmful content.

Different types of phishing attacks share the same anatomy, following these steps⁴:

- Goal and Target: The attacker first identifies the goal, such as acquiring credentials, credit card numbers, or delivering malware. And then chooses the target, which may be random recipients or a specific organization;
- The Bait: This is the initial phishing email or message. The attacker carefully crafts it to appear legitimate and compelling, often mimicking a trusted

3 Goenka, R., Chawla, M. and Tiwari, N., 2023. A comprehensive survey of phishing: mediums, intended targets, attack and defence techniques and a novel taxonomy. *International Journal of Information Security*, 23(4), pp.831–836. doi:<https://doi.org/10.1007/s10207-023-00768-x>.

4 Alkhalil, Z., Hewage, C., Nawaf, L. and Khan, I., 2021. Phishing Attacks: A Recent Comprehensive Study and a New Anatomy. *Frontiers in Computer Science*, 3, p.563060.

entity (bank, government organization, company system administrator, etc.). The bait is designed to grab the victim's attention and prompt action. To achieve this, the content usually consists security update, an issue with a bank account or emotional message;

- The Hook: Once the victims take the bait, the hook is the part that pushes them to act. This usually involves clicking on a malicious link, entering credentials in a pop-up window or accessing the website, all designed to appear legitimate so the victims won't suspect anything. This stage may also involve downloading malware that can harvest data or give access to the attacker. Attackers often create a sense of urgency or appeal to curiosity to encourage quick action without too much thought.

- The Catch: Finally, the attacker collects the information provided by the victims. This data is then used for various malicious purposes, such as stealing money, committing identity fraud or selling the information on the dark web.

- The Cover-up: Some sophisticated phishing attacks also involve steps to cover their tracks. This might mean deleting evidence of the attack from the device, or further obfuscating their identity and location.

Cyber awareness

Protecting against phishing attacks requires a multi-faceted approach that includes cyber awareness training.⁵ Through this training, employees gain crucial knowledge and awareness about phishing tactics and the potential consequences of a successful attack. In the first place employees must understand why is it important to follow security policies and regularly practice cyber culture. A very effective approach to educating employees about cybersecurity is to share stories from current cybersecurity events via email or an internal web portal. Knowing the risks and consequences experienced by victims helps to increase awareness.⁶ Regular hands-on simulations of phishing attacks allow employees to experience real-life scenarios in a controlled environment, helping them recognize and respond to threats effectively. Trainings don't always have to be time consuming, they can consist of real email phishing screenshots, explaining the cues and tactics used in the email. Creating a cybersecurity culture is crucial. This means ensuring that everyone in the workplace takes cybersecurity seriously and feels responsible for it. It's important to encourage employees to report any suspicious activity without fear of retribution.⁷

5 Grimes, R.A., 2024. Fighting Phishing. John Wiley & Sons.

6 Granger, S., 2002. Social Engineering Fundamentals, Part II: Combat Strategies. [online] Available at: http://jjconline.net/PAD_750/Readings/Class9/Social_Engineering_Part_II_Symantec_Connect_Community.pdf

7 Watters, A., 2023. How to Encourage Incident Reporting with Employees. CompTIA, 5 December. Available at: <https://connect.comptia.org/blog/how-to-encourage-incident-reporting-with-employees>

Research

The research for this thesis was conducted between May and September 2024. During this period an extensive phishing campaign was executed within the organization. The primary aim of this campaign was to measure employees' awareness regarding phishing attacks and to evaluate cybersecurity posture. The research was structured into three distinct phases. After the phishing attack against the organization, the first phase involved disseminating educational materials on phishing awareness to all employees. This educational outreach was crucial in ensuring that every member of the organization had access to information for identifying and responding to phishing threats.

The second phase of the study occurred three months after the first phase. This simulation involved 400 participants from the organization. Employees were not informed about the phishing simulation, ensuring an authentic assessment of their ability to recognize and respond to phishing attempts. The high number of 400 participants, provided a more comprehensive understanding of the employees' cybersecurity culture and organization's overall cybersecurity awareness. This phase was designed to measure employees' ability to detect phishing emails and understand their role in organization's cybersecurity.

The final phase of the research involved a survey to collect detailed data about the employees who were phished. This survey gathered information on various demographic factors, including gender, age, education, and position within the organization as well as data on the employees' most recent cybersecurity training. By analyzing this information, the research aimed to identify trends and patterns that could inform future cybersecurity training and policies. The ultimate goal of this multi-phase study was to strengthen the organization's defenses against phishing attacks by enhancing employee awareness and preparedness.

To design phishing simulation we were following the NIST Phish Scale User Guide. We created a strong relationship between user context and the phishing email message, known as premise alignment⁸. Premise alignment measures how closely an email matches the work roles or responsibilities of its recipient or organization. The stronger the premise alignment of an email, the more difficult it is to detect as a phishing email. Conversely, the weaker an email's premise alignment, the easier it is to detect as a phishing email.⁹

8 Steves, M.P., Greene, K.K. and Theofanos, M.F., 2019. A Phish Scale: Rating Human Phishing Message Detection Difficulty. Proceedings 2019 Workshop on Usable Security, [online] pp.2–5. doi:<https://doi.org/10.14722/usec.2019.23028>.

9 Dawkins, S. and Jacobs, J., 2023. NIST Phish Scale User Guide. csrc.nist.gov, [online] p.10.

Available at: <https://doi.org/10.6028/NIST.TN.2276>

Phishing attack

The phishing attack that the organization was victim to has a higher number of cues, which is easier to identify the email as fraudulent:

- sender - sent from an IT administrator;
- domain - odd domain, not resembling to the organization's domain;
- odd time - sent on a National holiday;
- language - used different language then Macedonian, grammar irregularities;
- urgency - required action from the victim in a short notice;
- URL hyperlinking - the text hides the true URL.

Due to the sensitivity of the information we will not be publishing the results and outcome of the attack.

Phishing awareness training

To raise employee awareness about phishing attacks and improve the organization's resilience against cyber threats, we distributed training material with the employees. The material broke down an email message and explained in detail what to watch out for, providing step-by-step guidance on how to verify the authenticity of messages¹⁰. Starting from the header of the email, attachments, email's body (style of writing, hyperlinks, hidden URLs, pictures) to the end of the email signature and postscript (disclaimers). To effectively defend against phishing attacks, employees must understand how phishing works, how to look for cues every time and to pay more attention.

Phishing scenario

Presented in table 1 is the model of the phishing scenario based on the user action.

Table 1. Model of phishing

User Action	Phish Outcome
Downloads attachment	Successful phishing attack
Clicks hyperlink	Successful phishing attack
Enters data	Successful phishing attack
Opens the email and doesn't perform action	Unsuccessful phishing attack
Ignores the email	Unsuccessful phishing attack

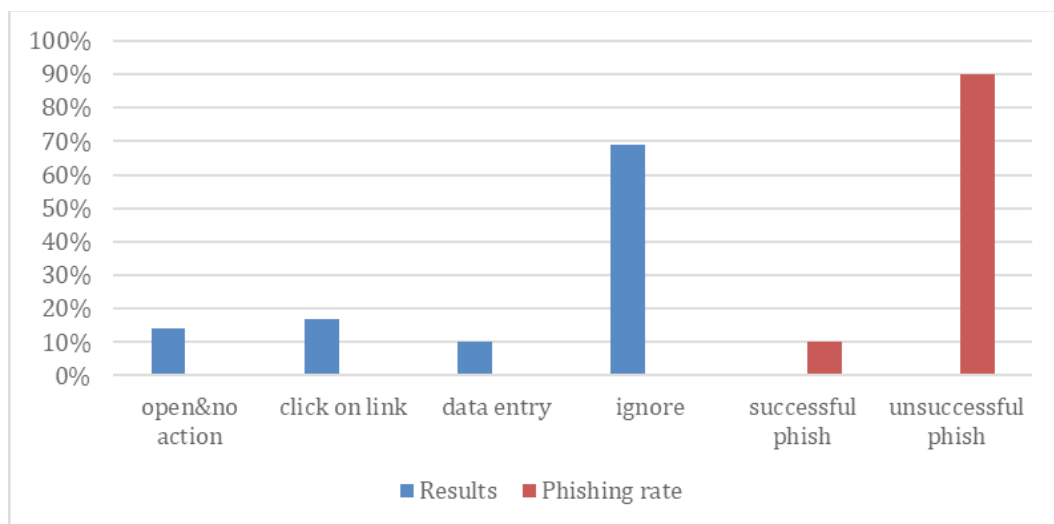
10 Muniandy, L., 2013. Phishing: Educating the Internet users – a practical approach using email screen shots. IOSR Journal of Research & Method in Education (IOSRJRME), 2(3), pp.33–41. doi:<https://doi.org/10.9790/7388-0233341>.

Because the phishing awareness training (as previously mentioned, materials were provided for the employees) happened three months before we conducted the phishing scenarios, the goal of the experiment was to have a 5% successful rate in phishing. We created four phishing scenarios, all of them related to the employee's workplace or external events that directly involve the employees.¹¹ Added in the phishing emails were two cues and they were easy to identify, one was a spoofing domain and the second cue, text that hides the true URL behind the text. For this research, participants were evenly divided into four groups, with 100 target users assigned to each simulation.

First phishing simulation

In this scenario employees received an email that seemed to be from the organization's IT department, asking from the employees to register (with their work account) for the following annual cybersecurity awareness training. The email provided a link that led to a website registration, the domain used for the website was different from the organization's domain. This phishing simulation attempted to gather username and password from the subjects. Cues were easy to detect, data from the results show that 69% ignored the email, 17% opened the email and clicked the hyperlink, 14% opened the email and didn't perform any further action. The success rate of this phishing simulation was 10%, indicating that 10 employees disclosed their credentials.

Table 2. Phishing simulation, IT department

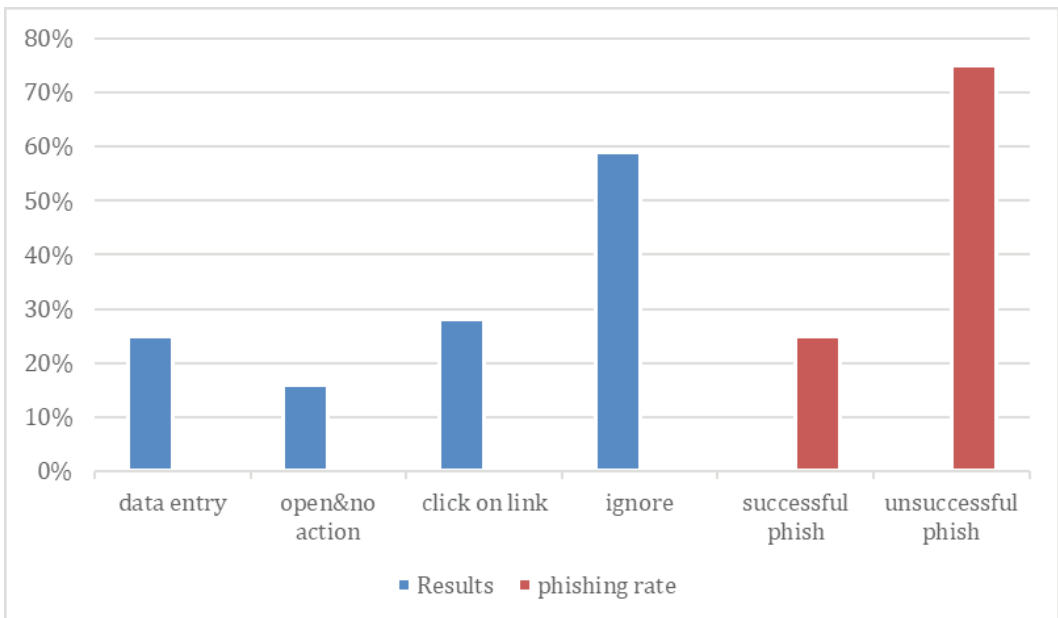


¹¹ Long, R., 2013. Using phishing to test social engineering awareness of financial employees. Research Gate, [online] pp.10–11. Available at: <https://doi.org/10.13140/RG.2.1.3846.0565>

Second phishing simulation

In the second scenario, the sender was mimicking the HR department, and sent an email to the employees asking them to complete a survey on how well the workplace conditions meet the needs of the employees. This phishing simulation attempted to gather personal information, job title, position, email address. Results from this simulation shows 25% of the targets were successfully phished, 16% did not enter data and 59% ignored the email.

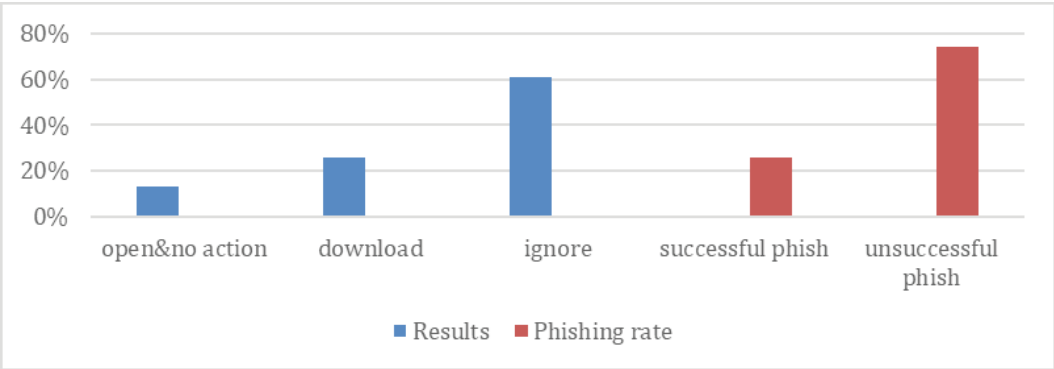
Table 3. Phishing simulation, HR department survey



Third phishing simulation

Also in this scenario, as the sender of the phishing email was the HR department, informing the employees about an entertainment event that will happen that month. The event's agenda was attached in the email and also accessible via hyperlink. This phishing simulation attempted to trick subjects into downloading a file that in a real situation would have been malicious software. The data shows that 13% opened the email and didn't download the file, 61% ignored the email and 26% downloaded the file on their computers.

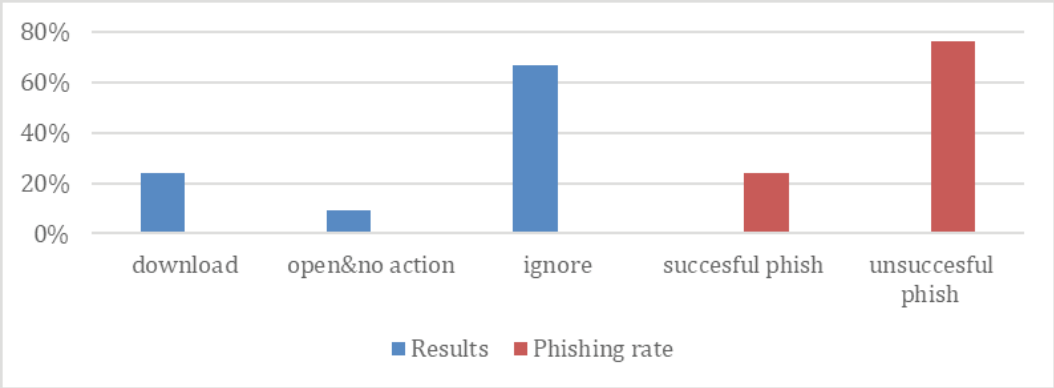
Table 4. Phishing simulation, HR department event



Fourth phishing simulation

The last scenario was about the project that the Macedonian Government is starting for all employees in the public sector. This phishing simulation attempted to trick subjects to download a file. Data from this phishing simulation show 24% successful phish and 76% unsuccessful phish.

Table 5. Phishing simulation, Government



Data from phishing simulations is truly concerning. Only 0.5% of subjects reported a phishing email to their organization’s IT department. Even more alarming, 80% of individuals who had previously fallen victim to a phishing attack were successfully phished again during these simulations.

Survey

Final step in our research was to find if there is a general pattern among phished subjects, and based on the results the organization can modify and adjust their cybersecurity awareness training program. Results from the survey don't find any pattern, there is no indicator that some category is more vulnerable than other. Except that 67% passed the cybersecurity awareness training and still failed to recognize phishing email, from which we can conclude that employees don't pay enough attention on their cyber culture.

Table 6. Survey

Category	Results			
Gender	Male	Female		
	47%	53%		
Age	18-30	31-45	46-55	56+
	12%	35%	30%	23%
Position in organization	Junior	Mid-level	Senior	Management
	32%	38%	25%	5%
Education	High school	Higher education		
	63%	37%		
Cybersecurity awareness training in last 12 months	Yes	No		
	67%	33%		

Categories "position in organization" and "age" are not connected, there is older employees on a junior position and vice versa. Also in the survey, provided training materials for phishing awareness were not taken into consideration, only organization's annual training program.

Conclusion

This research highlights the crucial role that employee awareness plays in mitigating the success of phishing attacks. Phishing remains a predominant threat to cybersecurity, exploiting human vulnerabilities. The hypothesis that the success of phishing attacks is heavily influenced by employees' cybersecurity awareness was confirmed through multiple phishing simulations conducted within a public organization in Macedonia. Across the four scenarios tested, employees who failed to detect phishing attempts were found to be the primary cause of successful phishing. The data also reveals alarming trends, such as the fact that many employees who have undergone cybersecurity training still fall victim to phishing attempts, emphasizing the need for more effective training strategies.

The research presented in this study underscores the critical influence of employee awareness on the outcomes of phishing attacks. Phishing, as a form of social engineering, exploits human vulnerabilities by tricking individuals into revealing sensitive information or performing actions that can compromise cybersecurity.

The data gathered from a series of phishing simulations conducted within a public organization in Macedonia provides clear evidence that employee behavior plays a pivotal role in the success or failure of phishing attempts. Despite the growing awareness of cybersecurity threats, human error remains the most significant factor in successful phishing attacks, validating the importance of continuous and adaptive training programs.

Phishing simulations were executed across four different scenarios to assess employee responses to various phishing tactics. The scenarios included emails requesting registration for cybersecurity awareness training, surveys related to workplace conditions, invitations to download event agendas, and information about a government project. The success rates of these phishing attempts varied, ranging from 10% to 26% depending on the scenario. The results showed that while many employees were able to avoid phishing attacks by ignoring or recognizing fraudulent emails, a substantial percentage still fell victim, giving away credentials or downloading malicious files. The success of phishing attacks in this context reaffirms the hypothesis that employee awareness and cyber culture are crucial factors in defending against phishing threats.

The simulations revealed several concerning trends. First, in each phishing attempt, a significant portion of the employees did not take any action to report the phishing emails, despite cybersecurity training. This reflects a broader challenge within organizations: employees, even when aware of cybersecurity risks, may not feel empowered or compelled to report suspicious activities. In fact, only 0.5% of employees reported phishing emails to the IT department. This suggests a lack of engagement or awareness about the importance of proactive reporting, which is critical in preventing potential attacks from spreading.

Given these results, future work should focus on refining and enhancing employee training programs. Also, organizations should update their policies to include stricter measures for employees who are repeatedly phished, particularly those who fall victim twice in a row or immediately after training. Such employees represent a higher security risk and may require additional intervention. Predictive restrictions or targeted follow-up training could be enforced for these individuals to minimize the likelihood of repeated breaches. This could include more focused monitoring, enhanced training sessions, or temporarily limiting their access to sensitive information until their cybersecurity awareness improves. Employees must feel responsible for the overall security of the organization, recognizing that their individual actions can have significant impacts on its cybersecurity posture.

In conclusion, this research demonstrates the critical role of employee awareness in defending against phishing attacks. However, it also emphasizes the need for ongoing, adaptive training and organizational support to ensure that employees not only understand cybersecurity risks but actively participate in mitigating them. By addressing these challenges, organizations can build more resilient defenses against the ever-evolving threat of phishing.

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Original scientific article

UDK 327:911.3(497-15)

UDK 355.45(497-15)

UDK 341.171.071(4-672EY:497-15)

WESTERN BALKANS COUNTRIES AND THEIR POSITION AS CONTRIBUTORS AND CONSUMERS IN THE CONTEMPORARY EUROPEAN SECURITY ARCHITECTURE

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Abstract: *Western Balkans countries, geographically part of southeastern Europe, politically remain on the periphery of Europe. The European integration of the Western Balkans countries although confirmed as one of the strategic priorities of the European Union since the Thessaloniki Summit in 2003, more than two decades after remains an unfinished project with exception of the membership of Croatia. The stalemate in the European integration of the Western Balkans countries beside the political and economic issues is also an issue of geopolitical and security nature, both for the European Union and the Western Balkans countries. This article deals with the geopolitical and security significance of the Western Balkans countries for the European security architecture as well as with the geopolitical and security consequences resulting from stalemate in the process of the European integration of the mentioned countries. The focus of the article is on the possibilities for malign influence that the stalemate creates for third, extra regional actors, hostile to the European Union and, on a long term, to the democratic development of the Western Balkan countries.*

Keywords: *Western Balkans, European Union, European integration, Geopolitics, Security.*

Introduction

In June 2003, during the EU-Western Balkans Summit in Thessaloniki, Greece (hereinafter: Thessaloniki Summit) the European Union "reiterated its unequivocal support to the European perspective of the Western Balkan countries" and declared that "the future of the Balkans is within the European Union" (Thessaloniki Declaration 2003). The term Western Balkans (hereinafter: WB) was created to replace the term referring to a larger geographical area - "South Eastern Europe", which also included countries such as Bulgaria, Romania and Slovenia. These three countries, at the time of the Thessaloniki Summit were already in the advanced stage on their path towards the EU membership. In 2004 Slovenia became an EU Member State and Bulgaria and Romania joined in 2007.

Therefore, the term Western Balkan countries referred to a group of countries not only geographically located in the western part of the Balkan Peninsula, but also in the early stages of their EU integration. The countries mentioned in the Declaration from Thessaloniki - “Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Serbia and Montenegro” (Thessaloniki Declaration 2003), with exception of Croatia that became EU Member State in 2013, will change their status and even names, however, they will continue to be in the process of EU enlargement for two decades, without an end in the foreseeable future.

From 2003 onwards, the stalemate in the European integration of the WB countries is evident both in the length of time of the accession process as well as in the negative developments in the countries connected to the process. Ahead of the December meeting of the European Council in 2023, in the “2023 Communication on EU Enlargement Policy” from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (Communication on EU Enlargement Policy 2023), once again, was reiterated that “... The Western Balkans have a historic window of opportunity to strongly bind their future to the European Union” and that “accession is and will remain a merit-based process fully dependent on the objective progress achieved by each enlargement partner”, concluding that “the enlargement countries will have to act with determination to implement the necessary reforms and make tangible and irreversible progress, starting with the fundamentals of the EU accession process... the rule of law, in particular the independence and functioning of the judiciary and the fight against corruption, fundamental rights, the economy, the functioning of democratic institutions and public administration reform continue to be the cornerstones of the enlargement policy” (Communication on EU Enlargement Policy 2023). At present, at the end of 2024, in the majority of the WB countries we cannot see some satisfying progress in the reforms.

Moreover, earlier in 2023, during the Bled Strategic Forum in Slovenia, the President of the European Council, Charles Michel, even set the year 2030 as a year when both sides, the EU and the candidate countries, must be ready to enlarge (Michel 2023). Notwithstanding these optimistic statements by EU institutions and officials, the reality check clearly shows that the situation is far less promising. This can be seen both in the track record of the past decades as well as in the present. This paper will analyze several important issues in the process - the current situation in the European integration of the WB countries, with the emphasis on the time length of the process, the geopolitical and security significance of the WB countries for the European security architecture and the geopolitical consequences resulting from stalemate in the process of the European integration of the WB countries and the European Union. The paper will also elaborate on the possibilities for different malign influences of extra regional actors, hostile to the European Union and to the democratic development of the Western Balkan countries.

The current situation in the European integration of the Western Balkans countries

The six WB countries that are moving towards the EU membership, are all in different stage of their integration. Serbia has applied for membership in 2009, got the candidate status in 2012, started the accession negotiations in 2013. More than a decade after the accession negotiations started, Serbia opened 22 out of 35 chapters, but only 2 of them are provisionally closed.¹ Montenegro applied for membership in 2008, got the candidate status in 2010, started the accession talks in 2012. Again, more than a decade after the accession negotiations started, all 33 screened chapters have been opened, of which only 3 are provisionally closed.²

North Macedonia is a unique example mainly in negative terms for the length of the time of the EU integration process.³ The country was the first among today's group of six WB countries to become a candidate country for membership already back in 2005. Nevertheless, the country couldn't start the accession talks until 2022. This was mainly due to the dispute with Greece over the constitutional name of the country (Greek veto), which was resolved in 2018 with the "Prespa Agreement" (Prespa Agreement 2018). Afterwards, the process was prolonged because of the French request for the new methodology for the accession talks in late 2019 (French veto). The French veto came in time when North Macedonia and Albania were supposed to start the accession negotiations. Finally, because of the Bulgarian objections (Bulgarian veto) on the implementation of the bilateral Treaty of Friendship, Good-Neighborhood and Cooperation (Bilateral Treaty with Bulgaria 2017) over "different readings" of various historical issues back to the early middle ages, North Macedonia has only finished the screening process, but still has not opened the chapters negotiations since the country hasn't managed yet to change the Constitution in accordance with the Conclusion of the Council.

Albania is in the same group with North Macedonia, mainly because it has followed more or less the same, but shorter path. It has applied for membership in 2009, got the candidate status in 2014, and started the accession talks in 2022 when the Commission started the screening process. In July 2023 the European Commission submitted to the Council the screening report on Cluster 1 – Fundamentals, including benchmarks for opening accession negotiations on this cluster.⁴ Because of the French request for a new methodology, Albania alongside with North Macedonia, also went through a prolongation

1 Serbia, European Neighbourhood Policy and Enlargement Negotiations, European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/serbia_en (Accessed: 15 October 2024).

2 Montenegro, European Neighbourhood Policy and Enlargement Negotiations, European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/montenegro_en (Accessed: 15 October 2024).

3 North Macedonia, European Neighbourhood Policy and Enlargement Negotiations, European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/north-macedonia_en (Accessed: 15 October 2024).

4 Albania, European Neighbourhood Policy and Enlargement Negotiations, European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/albania_en (Accessed: 15 October 2024).

of the start of the accession negotiations. This was done because Albania was informally coupled with North Macedonia and had to wait until the Negotiation framework for North Macedonia was adopted following the Bulgarian objections. In early autumn 2024 Albania opened the first cluster of the accession talks and by that was, practically decoupled from North Macedonia although a formal group never existed since the process is meant to be merit-based.

Bosnia and Herzegovina applied for membership in 2016 and in 2019, the EU Commission identified 14 key priorities that the country had to fulfil ahead of the opening of the accession negotiations. In 2022 the country was awarded a candidate status. In 2023 the European Council postponed the decision to open the accession negotiations for March 2024 until “necessary degree of compliance with the membership criteria is achieved” and, finally, the European Council reached a decision to open the accession negotiations in March 2024 and invited the European Commission to prepare the Negotiation Framework. Although there is significant development in the EU integration process in relatively short period for Bosnia and Herzegovina, one must have in mind that the country is only in the early stages of the process⁵. Kosovo applied for membership in 2022 and it is considered a “potential candidate”. EU member countries agreed to grant Kosovo a visa liberalization since beginning of 2024 and the Stabilization and Association Agreement (SAA) is in force since 2016.⁶

The geopolitical and security significance of the Western Balkans countries for the European Union

Almost a decade ago, the then US Secretary of State John Kerry told the US Senate Foreign Affairs Committee that “Serbia, Kosovo, Montenegro and Macedonia are the new front line between Russia and the West” (Derens and Geslin 2015). Since this “prophetical” statement of former Secretary Kerry many events that followed only confirmed the specific significance that the Western Balkans countries despite being small in size of their territory and in population (Basic figures on the Western Balkans and Turkey 2022) have great importance for the security architecture of the European Union. This importance goes far beyond the expected, due to the changed geopolitics in and around the European continent. The migrant crisis of 2015 and the specific role that WB countries had in “facilitating” the influx of refugees and then in supporting the implementation of the EU-Turkey (Greider 2017) exposed the importance of their cooperation with the EU institutions and the EU countries on the route in controlling the migrant waves. Record number of migrants arriving in Greece were trying to make their way via North Macedonia and Serbia to Hungary and then further on mainly to Austria, Germany, and Sweden.⁷ Many of the refugees that were

5 Bosnia and Herzegovina, European Neighbourhood Policy and Enlargement Negotiations, European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/bosnia-and-herzegovina_en (Accessed: 15 October 2024).

6 Kosovo, European Neighbourhood Policy and Enlargement Negotiations, European Commission, available at: https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/kosovo_en (Accessed: 15 October 2024).

7 During all of 2015, the region recorded 764,000 detections of illegal border crossings by migrants, a

using this route lodged asylum claims in one or more of the Western Balkans countries, but very often departed even before getting their claims processed. Another large number of migrants and refugees that were crossing the Western Balkan route were using illegal border crossings. These irregular movements which were very often connected with trafficking in persons and human smuggling, were additional concerns for the states on the migration route (Brsakoska Bazerkoska 2022). These developments only added to the hardship experienced by the Western Balkan countries, that are fragile democracies with weak institutions, and for a very long time have been the countries of origin, transit and destination of the migrants, mostly for the purposes of sexual exploitation and forced labour.

For the above stated reasons, the migrant crisis had, mainly, negative effect on the perception of EU in the WB countries. The citizens of the WB countries perceived the EU stance as “policy of trade-offs” against the European values and principles. The described situation also challenged the already weak democratic institutions and instead of strengthening the partnership based on principles and values, it contributed towards the strengthening of authoritarian tendencies in the WB countries since leaders that leaned towards such type of rule felt that the EU will prefer the cooperation with them over conflict and thus will remain silent (Spasov 2016).

Another geopolitical challenge of great security interest is the relation of the WB countries with China. The WB region is strategic for investments for China and is important as an entrance point in China’s logistical, infrastructural and economic access to the EU. All the WB countries, except for Kosovo (since it is not recognized by China), are members of the ‘14+1’ (formerly known as 17+1) framework. The WB countries importance for China has become evident with the purchase of the Greek port of Piraeus transforming it into the second largest port of the Mediterranean. With this purchase, China brings into life its plans to improve infrastructure in the Western Balkans which would further contribute to transport of goods being shipped from Piraeus through the Western Balkans and into EU’s common market (Fahey and Brsakoska Bazerkoska 2022).

China’s strategy for economic and geopolitical penetration in the WB region, consists of two main elements. Primary, those are the investments in infrastructure. For these investments China uses a strategy for crediting the projects after which the credited countries either fail to pay the debt and enter a situation of a “debt trap” (Chellaney 2017) or transfer crucial share of the ownership of the infrastructure investment to China. Second element, is using the infrastructure projects build with Chinese credits primarily for imports from China, either for the country of investment, or even more important for other countries in Europe, preferably members of the EU.

16-fold rise from 2014. The top-ranking nationality was Syrian, followed by Iraqis and Afghans. The numbers presented are according a Frontex estimate. The CoE numbers are bigger for 100.000 for the same period of time.

The above-mentioned strategy is most visible in Serbia, which is geopolitically the most important country in the region and the strategy is almost fully implemented in practice. In Serbia the China's economic presence is illustrated with the investment financing and loans of 5.62 billion US dollars, whereas the ongoing Chinese infrastructure investments are almost 5 billion euros (Vasovic 2019). What is most worrying from the Chinese investments in Serbia, is the Huawei's surveillance system of facial and license-plate recognition which has been implemented in Serbia, while police officers have taken part in joint exercises with their Chinese counterparts (Fahey and Brsakoska Bazerkoska 2022).

The geopolitical consequences resulting from the stalemate in the European integration of the Western Balkans countries

In 2017 and in 2020, Montenegro and North Macedonia respectfully became members of NATO. However, aside this development, none of the WB countries in the past decade managed to advance in the integration process to a level of joining the EU or being very close to full membership. Having in mind that the EU is above all a peace project, with ambition to constitute itself as a geopolitical entity, it clearly lacks a functional geopolitical strategy towards the Western Balkans. The past decade is a missed opportunity both for the EU and the WB countries. The WB countries bear huge responsibility for the created situation. Nevertheless, the fact that EU unlike in the case of central and eastern European countries didn't manage to push the process of the WB countries also remains (Spasov 2024).

As stated above, the relatively small countries of the WB both in area and in population, if left in a limbo, can have disproportionate negative effect on the EU. These countries are important because of their position as a crossroad of continents and geopolitical rivalries. The WB countries are part of a larger geographical area of southeastern Europe on the border between Europe and Asia Minor, the shortest road to the Middle East. The whole region is a multicultural area where South Slavs live together with Albanians and where Eastern Orthodox Christianity meets Islam and Catholicism. The region has mixed heritage of both Ottoman and Austrian and central European civilization.⁸ Historically, the region was often a center of major historical events. In the Roman times the most important road that connected the western with the eastern part of the Empire *Via Egnatia* was partially running through a territory that in the present is part of some of the WB countries. After the fall of the Byzantine Empire, the region was the main road in the advancement of the Ottoman armies that were aiming to conquer large part of Europe and managed to get to Vienna. The region was a place where former major European forces Austria-Hungary and Russian Empire with significant involvement of France and UK during the decline of the Ottoman Empire fought proxy wars by supporting different liberation movements.⁹

8 Balkans, Britannica Encyclopedia, available at: <https://www.britannica.com/place/Balkans> (Accessed: 18 October 2024).

9 Balkans, Britannica Encyclopedia, available at: <https://www.britannica.com/place/Balkans> (Accessed: 18 October 2024).

First World War started after the assassination of the Habsburg heir to the throne Archduke Franz Ferdinand in Sarajevo in June 1914. Finally, the Yugoslav wars of the nineties of the 20th century were the antipode to the optimism after the fall of the Berlin Wall when Europe was uniting while the Balkans was stuck in civil wars.¹⁰

If the stalemate in the European integration of the WB countries continues, it may result in several negative geopolitical consequences. Those consequences will have their impact on both for the WB countries and the European Union. Primarily, the WB countries are vulnerable to malign foreign influences that aim to create instability that can further also hurt the EU (Spasov 2024). To disturb the Western efforts to help Ukraine, Russian strategy is to abuse the vulnerability of the region by fueling the nationalism and reviving the old historical disputes. The strategy is applied mainly by spreading dis- and misinformation (Bashevski 2024), but in the case of Bosnia and Herzegovina also with active involvement by using local politicians, like RS president Milorad Dodik (Bechev 2024).

Moreover, China shows great interest in the region. Some of the WB countries are members of the Chinese economic initiative with geopolitical ambitions “Belt and Road”. China is intensively involved in investments in the infrastructure of the region, by offering loans, but also pushing for Chinese companies to build the infrastructure. The example of the Montenegrin highway in which project Montenegro almost ended up in debt slavery is just one of the many examples. Chinese initiative’s “Belt and Road” true goal is to easily penetrate Europe by using the WB countries as the “weakest part of the chain” (Mc Bride *et al.* 2023).

Furthermore, due to their weak institutional capacities, WB countries have weak system of checking the true nature of the Foreign Direct Investments from third countries outside EU and the West, especially to prevent money laundering and financing of terrorism and other cross border illegal activities (Spasov 2024).

Finally, although North Macedonia and Albania are already members in NATO and NATO is present in Kosovo and Bosnia and Herzegovina, still EU should be also involved in supporting the WB countries to continue contributing in the European “hard security”. The role of WB during the migrant crisis was essential since these countries are on the so called “Balkan route”, but their integration in the EU will strengthen their capacities¹¹.

10 Balkans, Britannica Encyclopedia, available at: <https://www.britannica.com/place/Balkans> (Accessed: 18 October 2024).

11 Western Balkans Route, European Council, Council of the European Union, available at: <https://www.consilium.europa.eu/en/policies/eu-migration-policy/western-balkans-route/#:~:text=The%20Western%20Balkans%20route%20refers,main%20migratory%20paths%20into%20Europe> (Accessed: 20 October 2024).

Conclusion

Western Balkans countries, although are geographically part of the European continent, politically remain on the periphery of Europe. The European integration of the Western Balkans countries was confirmed as one of the strategic priorities of the European Union since the Thessaloniki Summit in 2003. However, for more than two decades afterwards, this process remains an unfinished project, apart from the membership of Croatia in 2013. The important statements that come from the European institutions and EU Member States, that the WB countries undoubtedly belong in the EU, that are repeated for decades must become a reality to secure the future of the region, but also to avoid a situation where EU can lose part of its body in favor of other geopolitical actors. In a situation of an intensive geopolitical competition that we are living in at present, leaving the WB countries outside the EU isn't a viable option neither for the region nor the EU.

The stalemate in the European integration of the Western Balkans countries beside the political and economic issues is also an issue of geopolitical and security nature. Namely, the created geopolitical and security vacuum even if underestimated by some of the European capitals is already a space where different interests are of extra-regional actors are competing. The migrant crisis from 2015 presented the reality that even a geographical periphery of Europe can be a reason for Europewide crisis that has the potential to destabilize the democratic political orders of the EU Member States. One of the consequences is the rise of the far-right parties both in the Member States and in the EU Parliament. The true nature of the Chinese economic penetration is not of pure economic interest and aims to foster the regional and transregional cooperation. The WB is an entry point of different types of projects with emphasis on infrastructure mainly due to the strategic assessment of China that the region is a weak point where capital flow isn't controlled and can enter the EU itself without any major restrictions.

Therefore, the costs of intensifying the process of the European integration of the WB countries are by far lower compared to the costs to remedy the described negative consequences resulting from leaving the region behind.

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Scientific article

UDK 355.426:355.58(569.1)"2011/2024"

THE IMPACT OF THE CIVIL WAR ON THE CIVILIAN POPULATION IN SYRIA: A REVIEW OF PRIMARY AND SECONDARY EFFECTS

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Abstract: *Although the civil war in Syria is no longer the primary focus of the global political and media landscape, the population in Syria will feel the consequences of flagrant violations of human rights and international humanitarian law for a long time. The conflict, which began in 2011, is still ongoing, albeit at reduced intensity, while economic and social conditions in Syria continue to deteriorate. The negative consequences resulting from the war are complex and diverse, with immediate as well as long-term effects, including physical, psychological, economic, and social aspects.*

The focus of this paper is the treatment and consequences of civil war on the civilian population in Syria, viewed through the prism of specific impacts, including primary and secondary effects. The aim is to delve deeper than the obvious consequences, which are not only reflected in the loss of human lives, but also in the long-term effects on key social sectors where the impact of war is most strongly felt.

Keywords: *civil war, civilian population, primary and secondary effects, Syria.*

Introduction

Modern military conflicts create dramatic scenarios that generate complex consequences not only for the direct participants in military actions but, more frequently and significantly, for the civilian population. One of the most evident ways war impacts civilians is the loss of human life. However, beyond the loss of life, war also triggers large-scale exoduses due to security threats, resulting in overcrowded refugee camps, logistical challenges, and shortages of food, water, and other humanitarian needs. The civil war in Syria exemplifies how drastic declines in peacefulness have far-reaching consequences, affecting not only the loss of human life but also the wellbeing of the population and the economy. Wars often devastate civilian infrastructure, disrupting the functionality of roads, bridges, hospitals, communication systems, schools, electrical grids, and water supplies. These effects have severe consequences for civilians, who lose access to essential services and resources.

Wars indoubtable leads to economic losses, including livelihood disruptions caused by job losses, reduced production, trade setbacks, and other financial challenges. Additionally, war as a traumatic experience inflicts psychological effects with lasting consequences manifest in post-traumatic stress disorders, depression, and other health challenges.

Although the war in Syria is no longer a primary focus of the global political and media stage, the population of that country will endure these consequences for years to come. Despite the incredible needs among the internally displaced and among refugees outside the country, the situation with Syria seems has fallen into the shadows. Although still considered the world's largest population displacement crisis, Syria and the Syrian people have largely fallen off the media agenda, and funding levels do not match the growing needs. (UNHCR, 2023). As a complex conflict involving multiple nations, rebel groups, and terrorist organizations, the war in Syria will be remembered, among other things, for brutal violence and extensive violations of basic human rights and humanitarian law. Reports from the independent international commission of inquiry, established by the UN Human Rights Council at the onset of the conflict, have documented cases of mass executions, torture, sexual violence, violations of children's rights, recruitment of child soldiers, systematic sieges, use of chemical agents, forced displacement, shelling and bombing of civilian areas, hostage-taking, the use of civilians and wounded combatants as human shields, and the suffering of targeted groups and communities, hundreds men and boys have been separated from their families, forcibly recruited, and subjected to sexual violence. All these violations of International Human Rights Law (IHRL) and International Humanitarian Law (IHL) have had incalculable consequences for individuals and society as a whole.

Focusing on the war's impacts on civilians in Syria, the following sections will separately examine the primary and secondary effects, delving deeper into the less obvious consequences beyond civilian casualties and highlighting impacts in key areas that are expected to cause long-term repercussions.

However, for a comprehensive understanding of the post-conflict landscape in Syria, it is essential to consider the heterogeneity of the effects of the civil war, along with the present differences between areas controlled by the government of President Assad and those controlled by the opposition, ISIS, and various rebel groups. Additionally, the disparities between urban and rural areas, as well as between large and small cities, should also be taken into account.

Primary effects of the war on the civilian population in Syria

Primary effects are the immediate, direct consequences of war, including death and injury; loss of homes and forced migration; destruction of infrastructure such as hospitals, water supply and electricity supply systems.

- Civilian casualties

During the civil war, numerous settlements with predominantly civilian populations were mercilessly bombed and reduced to ruins. Some of the most important cities, such as Aleppo, Damascus, Homs, and Raqqa, became the fiercest fronts of the war between the forces of the

Syrian president and the opposition and were the most heavily affected by bombings. The city of Deraa, one of the first places where protests President Assad's regime began in 2011, was also relentlessly bombed, including the historic part of the city known as the "Old City." Johar al-Diqdah, Idlib, Douma, Hama, Hasakeh, and Tafa are just a few more of the many cities exposed to military action in Syria. Residential buildings, schools, hospitals, markets, residences, and religious buildings were bombed, leading to many civilian casualties. Relevant human rights organizations, including Human Rights Watch and the Syrian Center for Human Rights Research, have registered and documented a significant number of civilian casualties, including those who were collateral damage in military operations. In addition to the dead, many people were wounded, many of whom suffered permanent injuries and trauma. Reports on the civil war in Syria also contain data on the use of chemical weapons, which caused further casualties. Due to the complexity of the conflict and limited access to information, precise numbers are difficult to determine. However, various sources estimate that hundreds of thousands of civilians have died in the Syrian war, including large numbers of children and women. In June 2022, the UN released updated estimates, over a period of ten years, reporting that 306,887 civilians were killed between March 2011 and March 2021, of which 143,350 were confirmed civilian deaths (UN OHCHR, 2022). For each of these civilians, their names, dates, and locations of death are documented. An additional 163,537 civilian deaths are estimated to have occurred, bringing the total estimated civilian death toll to a staggering 306,887-the highest estimate of conflict-related civilian deaths in the country to date (UN OHCHR, 2022). During this ten-year period, an average of 84 civilians were killed every day as a direct result of the war in Syria (UN OHCHR, 2023). According to the latest reports from 2024, at least 400,000 people have died since the start of the civil war, with violence now largely present in northern Syria, which remains the most turbulent region with Islamic State-linked groups controlling territory and clashing with the Syrian army (Global Index of peace, 2024). These figures reveal the brutal impact of the conflict on the lives of civilians in Syria and represent the highest ever number of civilian deaths related to military conflict.

In the first decade of the war alone, nearly 12,000 children were confirmed killed or injured, meaning one child was killed or injured every eight hours (United Nations, 2022). These are only the children the UN can confirm as killed or injured, and the actual numbers are likely much higher and not final. For example, in 2021 alone, almost 900 children were killed or injured. Landmines, explosive remnants of war, and unexploded ordnance were the leading causes of child injury and death in 2021. As of 2021, the total number of children killed or injured since the beginning of the conflict has reached almost 13,000 (Touma & Hinds, 2022). These figures indicate that injuries and fatalities among children account for nearly a third of all reported casualties in Syria. Beside this, between 2011 and 2020, more than 5,700 children-some as young as seven-were recruited into the fighting (UNICEF, 2021). However, the numbers reported by various international organizations are incomplete and do not account for all incidents of violence and victims; they are not final either. These figures include both documented deaths and estimates of undocumented civilian deaths, including children, but exclude indirect deaths primarily caused by the loss of access to basic goods and services due to the conflict.

- Population Migration

The war in Syria caused large-scale migrations, with the population beginning to leave the country in large numbers in 2012. In the first year of the conflict, the UN High Commissioner for Refugees documented about 730,000 refugees, just over 26,000 of whom were registered in neighboring countries. By December 2015, the number of Syrian refugees had reached just under 4.6 million (Ferris and Kirischi, 2016). According to the latest data from the UN Refugee Agency (UNHCR), the number of internally displaced persons now exceeds 7.2 million (unrefugees.org). Additionally, data from the World Health Organization (WHO) indicates that 5.6 million people have left the country as refugees. This means more than 12 million Syrians have fled their homes since the beginning of the conflict. Some sought refuge within Syria's borders, while others fled to neighboring or more distant countries. Two-thirds of the refugees are women and children. Many refugees have fled to Jordan and Lebanon, straining already weak infrastructures and limited resources in these countries. In Lebanon alone, about 1.5 million Syrians migrated. However, according to Amnesty International's 2022/2023 report, some Syrian refugees, due to worsening economic conditions and restrictive government policies, were forced to return to Syria. Many of them faced detentions, torture, ill-treatment, and enforced disappearance (Amnesty International, 2023). More than 3.4 million Syrians have fled to Turkey, and many have attempted to seek refuge in Europe (Center for Preventive Action, 2024). With these figures, Syria continues to hold the world's largest number of internally displaced persons and refugees registered in both neighboring and distant countries. The vast majority of the displaced live in tents that offer minimal privacy or protection from extreme heat, cold, or rain, and they have limited or no access to water, sanitation, and healthcare. Basic water needs for drinking, cooking, and maintaining personal hygiene are unmet, leaving camp residents entirely dependent on aid from humanitarian organizations. Neighboring countries (mainly Turkey, Lebanon, Jordan, Iraq and Egypt) have been hosted Syrian refugees for more than a decade. However, these countries need support from the international community to continue to provide safety and protection to Syrian refugees while navigate their own economic challenges (UNHCR, 2023).

- Destruction of infrastructure

Military operations have caused significant infrastructure destruction in Syria, severely damaging the nation's physical capital. Since the beginning of the war, 17.5% of residential buildings have been destroyed, with estimated infrastructure damage amounting to 117.7 billion dollars. This is approximately double Syria's GDP in 2010. This level of destruction is expected to have serious ramifications for Syria's economic recovery and long-term growth prospects (Institute for Economics & Peace, 2021). A scenario analysis that compares the GDP Syria would have achieved in the absence of conflict indicates that the accumulated losses from the conflict are at US\$ 324.5 billion. This reaches US\$ 442.2 billion with the inclusion of infrastructure destruction (Institute for Economics & Peace, 2021). As a result of the direct consequences of the war on civilians, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) declared 2023 as one of the worst years. After more than 12 years of crisis in Syria, humanitarian needs are at their highest levels

ever. Record 16.7 million people need of humanitarian assistance, including approximately 12 million lacking basic living conditions. Twelve years of conflict have severely hindered relief efforts—the head of the World Food Program described the situation as a “catastrophe on top of catastrophe.” (Center for Preventive Action, 2024). Even before the deadly earthquake more than 15 million people – over two-thirds of the population – required humanitarian assistance. The earthquake exacerbated the perilous situation for millions of vulnerable Syrians, creating a crisis within a crisis (UNHCR, 2023). In Syria alone, the earthquake is estimated to have caused \$5.1 billion in damages. Earthquake response efforts were complicated by the territorial divisions stemming from Syria’s civil war. The northwest corner of Syria most affected by the earthquake is held by rebel forces, and the Syrian government has long restricted access to the region. Consequently, international aid needed to be approved by the Turkish government to transit the sole humanitarian aid corridor between Syria and Turkey (Center for Preventive Action, 2024). As expected, the number of people in need of humanitarian assistance increased to 16.7 million in 2024, the highest since the war began in 2011 (OCHA, 2024). Around half of those affected are women and girls, including 4.1 million women of reproductive age, whose basic rights and access to critical health and well-being services have been severely impacted by the conflict.

Secondary effects of the war on the civilian population in Syria

The secondary effects of wars are mainly the long-term, indirect consequences that affect not only individuals but also society as a whole. The most pronounced impacts in this context are economic decline and disruption of industries, trade, health, and education systems, as well as psychological disorders among the population as a direct consequence of the war.

- Economic consequences

Syria provides an example of the grave consequences of conflict on a country’s economy. The civil war, as expected, caused severe and profound economic consequences with the infrastructure destroyed and the country’s gross domestic product (GDP) dropping by 96.5 per cent from \$252 billion in 2010 to \$8.9 billion in 2020, according to the World Bank (<http://visionofhumanity.org/resources>). In terms of the cost to the overall economy, the World Bank estimated that only from 2011 until the end of 2016, the cumulative losses in GDP reached a whopping USD 226 billion, about four times the Syrian GDP in 2010 (Devadas, S., Elbadawi, I., Loayza, N.V. (2019). By 2018, Syria’s GDP had been reduced to less than 50 per cent of its 2010 level, driven by the consequences of conflict and political instability. From 2011 to 2018, Syria averaged a GDP growth of negative 12 per cent. From 2010 to 2018, exports fell from \$8.7 billion to \$0.7 billion, a decrease of 92 per cent. The collapsed export trade resulted in Syria’s trade deficit widening from -16.6 per cent of GDP to -34.6 per cent over the same period. In addition, Syria’s currency depreciated 90 per cent and inflation reached 700 per cent (Institute for Economics & Peace, 2021). According to some authors, the civil war caused a significant but temporary deviation in the trajectory of economic growth, with a sharp drop in GDP per capita until 2014, followed by a gradual

return to the previous trajectory until the onset of the virus Covid-19 pandemic (Kešeljević and Spruk, 2024). Their estimates indicate that the recovery of the Syrian economy after the first three years of the war was significantly aided by China, with much less support from Iran and Russia. However, in 2017 the World Bank estimated that from 12% of the population living in extreme poverty in 2007, it increased to 63% in 2016 (World Bank Group, 2024). For the period from 2012 to 2020, the economic losses are estimated at a total of 442 billion dollars. The World Bank's estimates for 2023 were that the dire economic situation in Syria would continue to worsen, followed by multiple overlapping shocks, including the February earthquakes and intensified fighting since September of that year when the level of loss of life was the highest in four years. This subsequently triggered a new wave of internal displacement. As predicted, Syria's long-term economic contraction continued in 2024 due to a host of challenges arising from conflicts both in Syria and the Middle East region that are expected to spill over Syria's borders

- Health sector

The conflict has significantly affected the health sector, placing it in a state of constant threat due to the destruction of health infrastructure and the inability to operate, with more than half of the health facilities closed or functioning only partially. By the end of 2020, approximately 40% of hospitals and 45% of health units were partially or destroyed because of the conflict (Mozaek, Murad, Almusa, Mehchi, Haj Ali H, Alnaqib, 2022). The war also caused a massive exodus of health workers, with about 70% leaving the country. Additionally, the number of medical personnel has decreased significantly due to the arrests and killings of health workers. For example, during the ten-year conflict, the murders of 930 medical personnel were documented.

Although there has been a relative reduction in hostilities and pressure on the health sector since 2019, the effects of virus COVID-19, together with existing economic difficulties, have led to a further deterioration in the security of health services and difficulties in accessing them (OCHA, 2021; Mozaek, Murad, Almusa, Mehchi, Haj Ali H, Alnaqib, 2022). The situation was further aggravated by the February 2023 earthquake. In northwest Syria alone, approximately 133,000 young girls, pregnant women, and nursing mothers have faced challenges in accessing essential health care and support.

- Industrial sector

The industrial sector in Syria was significantly affected during the war due to several factors: a large portion of the industrial transport networks was destroyed; large industrial facilities were looted by various warring factions; and many industrial capitalists, along with much of the industrial expertise and labor force, fled the country. Additionally, the export market collapsed; Syrians' purchasing power became limited; and financial and commercial transactions faced difficulties due to sanctions. Oil production fell by 4% in 2011, to about 50% in 2012, reaching a low in 2015. During this period, oil production dropped from 386,000 barrels per day to less than 10,000 barrels per day. Natural gas production declined from 29 million to 8 million cubic meters per day. Since 2016, the extraction industry has shown positive growth rates, though the estimated production value in 2020 was still less than 10% of what it was in 2010 (Mozayek, Murad, Almousa, Mehchy, Haj Ali H, Alnakib,

2022). Despite some improvement in 2017, production declined again in 2018. A large number of small workshops resumed operations in 2019, and oil production recorded an annual growth of more than 40% compared to the previous year. However, this progress was reversed in 2020 due to the collapse of the exchange rate, a sharp increase in energy prices, and the negative effects of COVID-19. These factors led to a 43% decrease in oil production compared to 2010 (Mozayek, Murad, Almousa, Mehchy, Haj Ali H, Alnakib, 2022).

- Impact on other social sectors

In the construction sector, the war resulted in a significant decline, with decreases of about 45% per year in 2012 and 2013. By 2017, the sector saw positive growth rates, which can be explained by the historic lows reached in 2016, making any minor improvement appear as growth. Since 2020, construction activity has increased across all Syrian regions, with growth rates reaching around 20%, driven by relative stability on internal war fronts (Mozayek, Murad, Almousa, Mehchy, Haj Ali H, Alnakib, 2022).

The financial sector has also been exhausted by the war. In 2021, official data showed that exports totaled 664 million euros, while imports exceeded 4 billion euros, resulting in a trade deficit of about 3.3 billion euros (<http://cbssyr.sy/index-EN.htm>). By the end of 2021, prices had increased by about 61 times compared to 2010, which contributed to a significant rise in annual inflation from mid-2020 to the second quarter of 2021.

The war also caused a sharp decline in services, with the sector experiencing negative growth rates across all activities. The most severe contraction occurred in 2013, with a decline of about 35%. Some positive growth was recorded in 2018 and 2019, averaging 1%. However, in 2020, negative growth returned due to the collapse of the exchange rate, shortages of goods, and a reduction in purchasing power for a large portion of Syrians (Mozayek, Murad, Almousa, Mehchy, Haj Ali H, Alnakib, 2022).

In the education sector, the war caused widespread destruction of educational infrastructure and a shortage of teaching staff, preventing many students from continuing their education. Between 2011 and 2020, over 1,300 educational and medical facilities were attacked, affecting both the buildings and their staff (UNICEF, 2021). According to the Central Bureau of Statistics, the number of primary schools in Syria dropped from more than 17,000 in 2010 to less than 9,000 in 2020, and the number of teachers decreased from around 221,000 in 2010 to less than 150,000 in 2020 (<http://cbssyr.sy/index-EN.htm>).

In addition to sector-specific impacts, Syria experienced large-scale deterioration in freedom of expression and pluralism, a weakening of political stability, an escalation of political violence against non-government forces, a decline in government effectiveness, widespread corruption, a sharp reduction of life expectancy, an increase in infant mortality, and a significant drop in population density (Kešeljević and Spruk, 2024).

- Psychological effects

The psychological consequences of war, which affect a large portion of the population, represent a significant challenge for both conflict and post-conflict societies. These effects impact not only the health and personal development of individuals but also society as a whole in the long term. The psychological effects of war are profound and include post-

traumatic stress disorder (PTSD), depression, anxiety, other trauma-related disorders, and psychological trauma in children. These consequences create a challenging psychological landscape in Syria, where many people continue to struggle with issues that negatively affect their daily lives. Projections from the World Health Organization (WHO) on mental disorders in the adult population affected by conflict estimated that around one million Syrians (4% of the population) suffer from severe psychological conditions, while approximately five million suffer from moderate psychological disorders. Additionally, a third of children in Syria have shown signs of psychological problems, including anxiety, sadness, fatigue, or frequent sleep issues (Hedar, 2017). Other estimates suggest a much higher prevalence of psychological disorders. For example, Germany's Federal Chamber of Psychotherapists found that half of Syrian refugees in Germany have mental health issues, with similar findings reported by Turkish authorities regarding Syrian refugees in Turkey. An analysis by the International Medical Corps (IMC) of IMC-supported health facilities for Syrian refugees and internally displaced persons in Syria, Jordan, Lebanon, and Turkey revealed that 54% of Syrians using these facilities have emotional disorders, and 26.6% of children have intellectual and developmental problems. Other research indicates that 50% of refugee children suffer from post-traumatic stress disorder (PTSD) or depression. Tens of thousands of combatants from all sides are also affected by mental health issues, while women and girls are particularly at risk of developing disorders due to domestic violence, sexual violence, or sexual exploitation. These figures are even higher in a study by Mohamed Bahaa Aldin Alkhafar and colleagues on oral health and the prevalence of PTSD among children. The study found that 91.5% of children in the city of Damascus suffer from PTSD, with the highest rates concentrated in the eastern and southeastern parts of the city, including Dwela, Nahr Aisha, Tabbaleh, and Yaramana (Hedar, 2019).

Conclusion

From the analysis of the presented data on the influence of the primary and secondary effects of the Syrian war on the civilian population, we can conclude that, due to the changed nature of warfare and the use of unconventional weapons and methods, civilians are increasingly becoming direct or indirect victims in modern military conflicts. The primary effects of war as immediate consequences include death and injury, loss of homes, destruction of infrastructure, and forced migration. In the case of the Syrian war, and according to statistical data, these effects are undoubtedly the highest recorded in any modern military conflict.

According to the latest reports from 2024, at least 400,000 people have died since the start of the civil war, a significant number of whom are children. Although the figures reported by various international organizations are neither complete nor final, they clearly reflect the devastating primary effects of the war, primarily for the individuals affected and subsequently for their families, communities, and the state.

The second primary effect has been the forced migration of the population, driven by insecurity or the loss of homes, which has resulted in the displacement of over 12 million Syrians, of whom more than 7.2 million are internally displaced persons, while 5.6 million

have fled the country seeking shelter in neighboring or distant countries. Children constitute a significant percentage of this displaced population, with two-thirds of refugees being women and children. According to these data, on a global level, Syria now has the largest number of internally displaced persons and refugees registered in neighboring and distant countries.

When factoring in the percentage of destroyed housing and infrastructure as well, it becomes evident why the United Nations Office for the Coordination of Humanitarian Activities marked 2023 as one of the worst years, with a record 16.7 million people requiring humanitarian assistance, including about 12 million who lack basic living conditions.

In addition to the immediate and direct effects of war, the secondary effects—long-term indirect consequences that impact individuals and society as a whole—are most pronounced in sectors such as the economy, industry, trade, health, and education. For example, Syria's GDP has plummeted by 96.5 percent, the trade deficit has expanded from -16.6 percent to -34.6 percent of GDP, and economic losses are estimated at over \$400 billion. Inflation has surged to 700 percent, oil production has declined by about 43% during critical years of the conflict, agricultural production has decreased by over 30%, and the production of basic food products has fallen by more than 50%.

The World Bank's 2023 estimates that Syria's economic difficulties would worsen have been confirmed, with the situation continuing to deteriorate in 2024. Additionally, 40% of hospitals and 45% of health units have been partially damaged or destroyed, while approximately 70% of health workers have emigrated. The number of primary schools has decreased from 17,000 to fewer than 9,000, and the number of teachers has dropped from about 221,000 to less than 150,000. Given these circumstances, it is understandable why the wave of emigration from Syria persists unabated. The secondary effects affect the entire societal infrastructure, requiring significant time to recover and even longer to stabilize.

Finally, the primary and secondary effects of the war have resulted in widespread traumatic experiences and psychological challenges, leaving many unable to live normal lives. According to data presented in this paper, approximately one million Syrians face severe psychological issues, while moderate psychological disorders affect about five million people. These challenges are also prevalent among Syrian refugees, as indicated by analyses conducted in Germany and Turkey, as well as studies carried out in health facilities supported by the International Medical Center for Syrian refugees and internally displaced persons in Syria, Jordan, Lebanon, and Turkey. According to this analysis, nearly half of the Syrians utilizing health facilities suffer from emotional disorders. Alarming are the numbers from this and other analyses, according to which a large percentage of refugee children have intellectual and developmental problems, and half of them suffer from post-traumatic stress disorder or depression.

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Scientific article

UDK 94:1:[327:176.6(497.7:4)

UDK 341.241(497.773):176.6(497.7:495)“2018”

PHILOSOPHICAL AND HISTORICAL DISCOURSE OF THE “CONCEPT OF FRIENDSHIP IN POLITICS AND IR” AND THE CASE OF NORTH MACEDONIA

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Abstract: *This paper has an aim to emphasize the concept of international friendship as legitimate category of international relations, and especially to refer on its historical and philosophical grounds. That is why the idea and the starting point for addressing the case in point, is rooted in the philosophical and historical perspective of the concept and the topic, indeed. Although the concept of friendship in foreign policy an IR, is a relevant issue in the theory of international relationsa also, here I intend to address its differential foundations, namely, on the level of its historical and philosophical attributions. This concept is particularly significant in the current foreign policy of North Macedonia, as well. Especially, that is related to the signing of the Prespa Agreement and the fulfillment of its obligations.*

Keywords: *Friendship, international relations, political history, Prespa Agreement*

Introduction

Among the multitude of interpretations, theories and discourses within the study of politics, there is a growing tendency to define the concept of friendship, known as *Friendship in Foreign Policy* or *Friendship in International Relations*. The corpus of new, referenced and empirical literature dedicated to developing a theory about **social processes** that can lead to or result in friendship (such as recognition, trust building, reconciliation, etc.), has significantly increased. This discursive novelty emphasizes the practices of cooperation and solidarity between states, as well as establishment of friendly relations. But, also important to address, is that this topic has its own **foundation in the philosophical and historical discourse**, from which the need to define and apply this concept has derived. In the following paper, the goal is to highlight the content of international friendship as a specific category of international relations. It is assumed that international friendship relations develop more easily in areas characterized stable peace and security communities. This assumption

particularly concerns the Republic of North Macedonia as a country that has committed to obligations upon its membership in the NATO alliance and its aspiration to the European Union membership.

In politics, the application of this concept is often inconclusive and undefined, influenced by various factors, but, a good example of this is the experience of the recent history of the Republic of North Macedonia in resolving bilateral disputes with the Republic of Greece and the Republic of Bulgaria. These bilateral disputes, along with the attempts to resolve them, affirm the relevance of this topic. The debates surrounding this issue, center on whether states can develop friendship and how these friendships affect the states themselves.

Philosophical and Historical Discourse of the Concept of Friendship in Politics

The philosophical, ideological and political understanding of the well-known metaphysical dichotomy of friends versus enemies occupies a significant place in modern and contemporary studies by renowned philosophers, historians, political scientists and theorists. The concept of friendship in policy-making has been present in philosophy since the time of Aristotle (384-322 BC). In his famous work *Nicomachean Ethics* (Books VIII and IX), Aristotle defines friendship (*philia*) as essential to both individual and civic life and examines it on three levels: friendships of utility, pleasure and virtue¹. He connects the political aspect of friendship with justice and the functioning of the city-state (*polis*). He presents friendship as a virtuous bond between equals, forged between friends who share common thought and similar character traits. He argues that a well-functioning political community is built on the basis of friendship among its citizens. Friendship supports the structure of political life and helps to uphold justice. According to Aristotle, it is not merely about personal affection, but about a shared sense of common good and trust that is a basic condition to maintain civil harmony. Aristotle even suggests that friendship can sometimes be more important than justice, because a society rooted in true friendships would naturally lead to justice among its members. For Aristotle, political life presupposes civil friendship, ensuring social cohesion and solidarity, presenting an idealized image of civil harmony. However, Aristotle also consider another aspect, which in today's language refers to powerful informal groups, clubs, lobby groups, etc., which can potentially harm society. In his work *Magna Moralia*, Aristotle notes that friends -meaning fellow citizens- compete for supremacy and engage in heated arguments, which may ultimately hinder the ability to remain friends. From the perspective of the community or state, the strong friendship ties and informal groups through which they are organized, sometimes to pose a threat to political stability.²

1 Aristotle (2011). *Nicomachean Ethics*. Translated by Bartlett, Robert C.; Collins, Susan D. Chicago: University of Chicago Press. (VIII, 1, 1155 a 1-IX, 12, 1172 a 15)

2 Aristotle (1935) *Metaphysics, Volume II: Books 10-14. Oeconomica. Magna Moralia*. Translated by Hugh Tredennick, G. Cyril Armstrong. Loeb Classical Library 287. Cambridge, MA: Harvard University Press. (2. 1222 a 46). Irrera, E. (2005) "Between Advantage and Virtue; Aristotle's Theory of Political." *History of Political Thought* 26, no. 4 (2005): 565–85. <http://www.jstor.org/stable/26221751>. (accessed 25 August, 2024).

In this context, it is also essential to mention that the history and culture can influence political outcomes. The earliest traces of this idea are found in ancient historical works on international politics. For example the Greek historian Thucydides (c.460 B.C.–c.400 B.C.), is often regarded as one of the earliest thinkers address what is known as “strategic culture” in modern studies. His work illustrates how the “strategic culture”, emerges from generation to generation evolving from competitive groups, to negotiations and debates.³ While Thucydides himself did not use the term, his work⁴, offers foundational insights into the relationship between culture, politics and strategy, and provided direction for modern strategic culture theory: Thucydides’ narrative⁵, emphasizes the harsh realities of power in politics. The justification provided by the Athenians for their actions- “the strong do what they can, and the weak suffer what they must”—is an early articulation of political realist thought. By documenting the “Peloponnesian War”, Thucydides has showed how history could shape a state’s identity and how historical lessons influence future actions. By learning from their historical experiences, states embed those lessons in their respective strategic culture. This knowledge is crucial for conflict resolution and the formation of alliances and friendships.⁶ The term “strategic culture” gained prominence in modern *Strategic Culture Theory*, roughly in the mid-20th century. It refers to the set of beliefs, assumptions, and habits regarding warfare and national security that are shaped by historical experience, geography, social values and political culture.⁷

Jacques Derrida approaches the concept of friendship in international politics critically, even radically. His study, *The Politics of Friendship*⁸, serves as a deconstruction of traditional notions of friendship. He first emphasizes that the concept is traditionally understood as a relationship similarities, coincidences and recognition. Accordingly, Derrida points out that in political theory, this model of friendship tends to exclude difference. He argues that political unity is always done on the basis of homogeneity, marginalization or suppression of otherness, excluding the ethical component and lacking a balance of power. Consequently Derrida advocates a more open, inclusive conception of friendship in politics, that can encompass the Other, the enemy and even those who are radically different.⁹

3 Baylis, J. et al., (1987) *Contemporary Strategy*, I-II (New York: Holmes & Meler.

4 Thucydides, *The History of the Peloponnesian War*. Indianapolis, Hackett (1998); translation by Steven Lattimore.

5 “The Melian Dialogue”, in Thucydides, *The History of the Peloponnesian War* (Book 5, Chapters 84–116).

6 Kupchan, C. (2010) *How enemies become friends: The sources of stable peace*, New Jersey, Princeton University Press.

7 Wendt, A., (1999) *Social Theory of International Politics*, Cambridge, Cambridge University Press. Wendt’s approach, similarly, embraces the traditional focus on interstate cooperation and presents friendship as a set of political values promoted in the new global order, and hence, this common perspective devoted to the politics of friendship is used to analyze both the stabilization of bilateral cooperation and the structuring of a global society. Illustrative examples of this include the relations among former Yugoslav republics, pan-Slavism, and the shared identity of the Nordic countries.

8 Derrida, J., (1994) *The Politics of Friendship*, transl. George Collins, Verso: New York.

9 Smith, G.A., (2011) *Friendship and the political: Kierkegaard, Nietzsche, Schmitt*. Charlottesville, VA: Imprint Academic.

Practise, Levels, Participants

Friendship in foreign policy or Friendship in International Relations is situated at the theoretical and empirical level of scientific thought. The practice and utility of its application in overall relations represent a synthesis of the established foreign-diplomatic objectives in international politics in the context of new global challenges, the consequence of which could lead to war.

The hypothesis that international friendship influences the creation and implementation of foreign policy that has been largely overlooked in the literature on international relations. Friendship presents the “Other/Otherness” as a familiar rather than an alienated entity, indicating a significant degree of trust. This is why analysts need to pay attention to the different ways of developing close ties across state borders. Specifically, focus should be directed toward understanding of how friendship operates, through the study of its discursive, emotional and practical expressions and their influence on decision-making in specific situations, as well as their potential for long-term cooperation¹⁰.

However, tracking these relationships¹¹ and associated practices, especially informal ones, represents an enormous analytical challenge. International friendship embodies a special relationship of mutually agreed roles and identities, rooted in a strong cognitive, normative and emotional bond, revolving around a shared idea or concept of order.¹²

The German political scientist Felix Berenskoetter, a specialist in international relations, European security and transatlantic relations, precisely identifies three types of practices that are unique to this relationship:

- **Provision of privileged access:** For instance, bilateral agreement for avoiding double taxation in the signatory state, or equal study conditions for Macedonian students in Slovenia, akin to those for Slovenian students,
- **Practices of solidarity and support in times of need:** For example, the procurement of vaccines during the Covid-19 crisis for countries unable to secure for their citizens, such as the aid that the Republic of Serbia provided to the Republic of North Macedonia.
- **Resolving disputes with adverse third parties.**¹³

These friendship relationships and associated practices can be observed at three levels: political leaders, government bureaucracies and civil society.

10 Oelsner, A., (2007) *Friendship, Mutual Trust and the Evolution of Regional Peace in the International System*, Critical Review of International Social and Political Philosophy., pp 257

11 Koschut, S. & Oelsner, A. eds. (2014). *Friendship and international relations*, U.K, Macmillan.

12 Smith, S., Hadfield, A., & Dunne, T., (2012) *Foreign policy: Theories, actors, cases*, Oxford, Oxford University Press.

13 Berenskoetter, F., (2014) Friendship, security, and power. In S. Koschut & A. Oelsner (Eds.), *Friendship and international relations*. Basingstoke, U.K.: Palgrave Macmillan. pp.10-27. In this treatise there are several examples, which are illustrative in application of the concept of friendship. For example, the year 2000 when the Netherlands celebrated 400 years of friendship with Japan, and in 2013 it marked 400 years of friendly relations with Russia, which is why it officially declared 2013 the “year of friendship”. Additionally, the United Kingdom and the United States routinely assert their “special relationship” at their bilateral meetings, and Germany and France celebrate their deep friendship on the anniversaries of the Elysee Treaty.

As Berenskoetter notes, it is not uncommon to find friendship that develop between individual political leaders and then transform into formal agreements.¹⁴ Political leaders often emphasize their personal relationships, viewing them as instrumental in facilitating diplomatic negotiations and fostering cooperation. Despite the numerous cited examples, skeptics believe that these are just cheap and rhetorical gestures. Sometimes this skepticism can be translated into reality, but often the language of friendship is accompanied by close cooperation and unusually interwoven institutionalized connections at the level of government and civil society, and even close personal ties between political leaders¹⁵.

Friendship Among Leaders and its Impact on Foreign Policy

At the level of **political leaders**, the relationships they forge can play a critical role in shaping foreign policy outcomes. The personal rapport between leaders can lead to a more favorable environment for negotiations, allowing for compromise and innovative solutions that might not be possible through more formal channels. The friendships that develop between leaders can result in a range of collaborative initiatives, from trade agreements to joint security pacts.

An illustrative example is the relationship between the leaders of North Macedonia and Greece, particularly following the signing of the Prespa Agreement. The willingness of both sides to establish a friendly dialogue was a crucial element in resolving a long-standing dispute, demonstrating how personal relationships can pave the way for diplomatic breakthroughs. This friendship between leaders set a precedent for future cooperation, reflecting the importance of mutual respect and trust.

At the level of government **bureaucracies**, friendship often manifests in formal diplomatic channels and the establishment of cooperative agreements. Civil servants and diplomats play a pivotal role in nurturing these relationships, ensuring that the intentions of political leaders are translated into actionable policies. The success of these initiatives depends on the bureaucracies' ability to maintain consistency and follow through on commitments. Moreover, friendship can also foster informal connections among diplomats, which can facilitate smoother interactions and negotiations. These relationships can be beneficial during crises when rapid responses are required, as they enable quicker communication and understanding. In this context, the role of bureaucratic networks becomes essential, as they contribute to building trust and fostering long-term cooperation between states.

Finally, friendships at the **civil society level** are crucial for sustaining and nurturing relationships between states. Non-governmental organizations (NGOs), cultural exchanges, and grassroots movements contribute to building bridges among people, creating a foundation of mutual understanding and support. These initiatives often

14 Berenskoetter, F., (2014) Friendship, security, and power. In S. Koschut & A. Oelsner (Eds.), *Friendship and international relations*. Basingstoke, U.K.: Palgrave Macmillan. pp 51-71.

15 Oelsner, A. & Vion, A. Special issue: Friendship in international relations. *International Politics*, 2011.

transcend political boundaries and foster interpersonal connections that can have a lasting impact on diplomatic relations. Various cultural and educational exchanges have taken place between the youth of North Macedonia and other countries, particularly through joint projects and initiatives. These grassroots movements help fostering a sense of belonging and community, encouraging young people to view their counterparts in neighboring countries as friends instead of adversaries. This social fabric of friendship among citizens can support the efforts of political leaders and bureaucracies in their pursuit of collaborative foreign policies.

Of course, there are many questions about these theories: whether political communities, including states, could be friends in the same way individuals are? ¹⁶Whether there is a relationship that goes beyond choosing cooperation based on shared material interests, or security or economic? In other words, can there be a form of interstate/international friendship that is deeper and stronger than a military alliance or a close trade partnership? Answering these questions is a major challenge to foreign policy analysts. Friendship, in its conventional form, implies a relationship that contains trust at its core, honesty and solidarity, as S. Keller implies - what can be called a disposition for cooperation that significantly influences the creation of foreign policies.¹⁷

Friendship, by definition, weakens the internal/external distinction (and distance) because the friend can no longer be considered a complete stranger. The theory claims that international friendship is a phenomenon that scholars should take seriously and offer an overview of its embodiment in the sphere of foreign policy.

These are the foundations of new research that shows how the existence of international friendship is possible, even though such possibility seems beyond the reach of the dominant rationalism and realism, so present in the interpretation of relations between states, and furthermore, the attachment of actors to friendship can explain their behavior.¹⁸

Considered as a configuration of a unique relationship, primarily at bilateral level, friendship is analyzed as a kind of special relationship that has a great influence on the creation and implementation of foreign policy in different ways. In the field of politics, this idea seeks to replace the outdated, but still, unfortunately, dominant perspective, according to which international relations are inherently hostile or, at least, tense. Friendship can simply be considered a legitimate goal of a foreign policy - and it is scientifically based – but it can also be factually verified. With such intent, we try to present the challenging topics related to the concept of friendship in international politics, since it is self-obvious that friendship can be an agent of change in international politics. Namely, it not only exists, but the process of building and maintaining friendship actually transforms the postulates of the international

16 Keller, S.,(2009) Against friendship between countries, *Journal of International Political Theory*. pp 59-74.

17 Keller, S.,(2009) Against friendship between countries, *Journal of International Political Theory*. pp 59-74.

18 For more, please, consult the MA thesis of Svetlana Todorovska.

system, through the discovery of alternative forms and pathways of interaction between specific actors that also affect their immediate environment. In this sense, international friendship can be considered a political reality and not an utopian ideal. In addition, equally important, there are diverse perspectives of international friendship freeing up space for diverse locating of friendship, both theoretically and empirically in international politics. International friendship is a global phenomenon, yet its meaning varies according to historical periods, cultural and social contexts, and regions. As can be seen, it largely depends on how it is conceptualized¹⁹ and contextualized.

In the context of the Republic of North Macedonia, this concept is already part of the political and scientific debate, but it seems that, especially in the part of the political debate, it is considered imposed, and not good enough for the Macedonian side to the extent of an inferior position.

The events that followed before, during and after the signing of the Prespa Agreement, Treaty of Friendship, Good Neighborliness' and Cooperation with Bulgaria, are undoubtedly an incentive for reflection, research and practical application of the mentioned concept. Let me remind you, Macedonia has a history of peaceful coexistence, and from our recent history it is known that it was the only one of the former republics to avoid armed conflict, established an equidistance policy during the war in the former Yugoslavia, and successfully managed the refugee crisis in 1994.²⁰

Of course, the practical application of this concept in the RSM has its own challenges, first of all in the area of the balance of power. So, of course, it must be taken into account that our country is weaker, economically, militarily, etc. Although friendship in international politics implies common values and common interests should not be neglected, still relations are built for strategic reasons, for example in democratic countries with authoritarian regimes.²¹

The agreement with BG and GR are nothing new and exclusive, but are the result of a historical context, several decades of continuous political actions and positioning in a geopolitical context, constant pressure from neighbors, economic challenges. It will not be an exaggeration to say that the renaming of the Highway from Alexander the Macedonian to Friendship is one of the actions that helped to break the vicious circle of crisis that Macedonia has been spinning in for decades.

19 Oelsner, A. & Koschut, S., (2014) A framework for the study of international friendship. In S. Koschut & A. Oelsner. (Eds.), *Friendship and international relations*, Basingstoke, U.K.: Palgrave Macmillan, 2014.

20 Chupeska, A., Christidis, Y., (2018) *Breaking the Hostility Discourse: Border Security Cooperation Between Athens and Skopje Since the Beginning of the Refugee Crisis*, Contemporary Macedonian Defense.

21 In this field are the theoretical, philosophical and political discussions of this concept. Derrida is relevant to the problem of exclusion and inclusion, as we noted before.

At the moment when appropriate solutions related to the agreement had to be delivered, prof. Ana Chupeska selected and provided some of the previous scientific conclusions about the *Concept of Friendship*. In this context, it is worth to mention that the Prespa Agreement, as an agreement for the final settlement of the name dispute between the two signatories, was in fact reached in the context of the admission of the Republic of North Macedonia to the NATO alliance (collective security arrangement), and in the context of enabling the Republic of North Macedonia to approach association in the European Union (the zone of stable peace).

So, the agreement itself, in fact, in article 2, prescribes in detail the conditions and guarantees for the membership of the RSM in the two entities, while article 11 deals with the provision of peace and the pacification capacities of the signatories in the context of international and regional organizations, forums:,The parties they will cooperate closely, bilaterally and within regional organizations and initiatives, in order to ensure that Southeast Europe becomes a region of peace, growth and prosperity for its peoples. They will promote and cooperate in the definition of cooperation at the regional level, and among other things, they will cooperate on the mutual support of their candidacies in the context of international, multilateral and regional organizations and institutions, such as the United Nations, the OSCE and the Council of Europe”.²²

Conclusion

In conclusion, the concept of friendship in politics is multifaceted and deeply embedded in both political and social contexts. It serves as a vital component of diplomacy and international cooperation, influencing foreign policy decisions and shaping bilateral and multilateral relationships. The experiences of North Macedonia highlight the importance of fostering friendships at multiple levels—between political leaders, government bureaucracies, and civil society. As the Republic of North Macedonia continues progressing on its path toward European Union membership and strengthening ties with NATO allies, the cultivation of friendships will be essential in navigating the complexities of contemporary international politics. By promoting trust, mutual respect, and cooperation, North Macedonia can continue building a more stable and secure future, founded in the principles of friendship and solidarity.

In conditions of tense and complex geopolitical processes, the concept of friendship in international politics is not the only one, but one of the possible ways of peaceful settlement of disputes and achieve stability and well-being through diplomatic means. From a philosophical point of view, Aristotle sees friendship as a basis for justice and community, while Derrida urges us to question the political implications of friendship, especially its tendency to divide rather than to unite. The transformative value of this concept is certainly the advancement in politics, especially in bilateral disputes, and if

22 Full text of the Final Agreement on the Settlement of the Macedonian-Greek Name Dispute and Strategic Partnership, available through the link: <https://vlada.mk/node/17422>

the procedures cannot produce results in the short term, they certainly will in the long term. Enemies of the concept of friendship are nationalism, radicalism, which have been on the rise in recent years at the global level. However, the attitude and commitment to this concept depends on the political actors (primarily the government, position, and the opposition, NGOs, etc.) of each country. If it is accepted by those stakeholders as a priority method in resolving disputes, it will be a contribution to peace processes on a more global level. All these debates, theories and actions converge in one point, which is that the concept of friendship in politics has evolved from an idealized vision of civic harmony to a more critical exploration of exclusions and power dynamics. Of course, the perspective still dominates, according to which international relations are inherently hostile, or at least alliances, i.e. friendships are based on strategic interests and depend on the balance of power. Although, each of those positions has its own foundations both in theory and in practice, the commitment to strong networking, transnational solidarity, etc., can show that this concept is not an utopia, but it is applicable.

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DEFENCE DIPLOMACY

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Abstract: *'Defence diplomacy' is relatively new term, created in response to post-Cold War needs to name new tasks and international functions completed by armed forces and leadership of the Ministries of Defence. Lack of universally recognised definition of 'defence diplomacy' means that states try to adapt its content to the needs of their own security policy. Defence diplomacy is generally considered as nonviolent use of state's defence apparatus to advance the strategic aims of government through cooperation with other countries. Activities as diverse as officer exchanges, ship visits, training missions, and joint military exercises have all been denoted as practices of defence diplomacy. Apart from strictly political issues, contemporary diplomacy concentrates on problems of trade, economic, scientific or military contacts. The main objective of analysis is to focus on the role of defence diplomacy in shaping and implementing security policy. This problem is addressed in two aspects – the first one is the evolution of defence diplomacy as a tool and, the second, its role in the process of shaping and implementing security policy.*

Keywords: *Defence diplomacy, military forces, international relations, NATO, civil-military relations.*

Introduction

Contemporary diplomacy surveys are notable for complexity of definitional approaches and the width of analytical field. Beata Surmacz, a Polish researcher, aptly notices that the concept of 'diplomacy' in public discourse is generally understood in an intuitive way, while the attempt at analytical conceptualisation shows its complexity (Drab, 2018, p.57, p.58). Paul Sharp claims that it is 'an ambiguous term that can be the carrier of many different meanings'. The matter is further complicated by the modern 'so-called' paradigmatic debates in the science of international relations. Generally speaking, they relate to an extended circle of these relations and the scope of their subjectivity, understood primarily as awareness of their own interests, the ability to act on behalf of their collectiveness and the effects of this measure in scale in relations with other international actors (Drab, 2018, p.58). Within this process, these changes must also affect diplomacy as a (foreign) policy tool of countries and its related instruments developed – with specific consequences – by other 'international' players (Drab, 2018, p.58).

According to Peter Marshall, at least some basic meanings can be distinguished in which concept of diplomacy is used. First, as a synonym of foreign policy or manner of conducting this (instrumental) policy. Secondly, as a regulatory process in international relations through negotiations or other measures of a peaceful nature. Thirdly, as a team of people employed in foreign services. Finally, the term specifies the talent or skills of professional diplomats (Drab, 2018, p.58).

The area of diplomacy is systematically expanding. Apart from strictly political issues, contemporary diplomacy concentrates on problems of trade, economic, scientific or military contacts. The main objective of analysis is to focus on the role of defence diplomacy in shaping and implementing security policy (Drab, 2018, p.58). This problem is addressed in two aspects – the first one is the evolution of defence diplomacy as a tool and, the second, its role in the process of shaping and implementing security policy.

The genesis of the term ‘defence diplomacy’ is closely related to the post-Cold War change in understanding international security and related national security policies. The demilitarisation of this sphere of international relations on the one hand was characteristic of it, and on the other, a broader perception of the roles of the armed forces, going beyond their offensive, defensive or deterrent roles (Drab, 2018, p.58). In British reality from the end of twentieth century, military strength guaranteed achievement of immediate military goals, or ‘winning battles’. However, it showed weakness as a policy tool. After the end of Cold War, its role had to be extended to secure peace, using various instruments related to operation of the army, its command structures, or civilian political factor that could oversee them. This was also connected with prospect of strengthening the role of diplomacy and its specialisation as a mechanism of international prevention and shaping international security. Within this framework, defence diplomacy was recognised as an effective crisis prevention instrument (Drab, 2018, p.59).

‘Defence diplomacy’ is a relatively new term with its roots strongly associated with the needs of a new political language describing cooperation of states and international organisations after the end of Cold War. Although it is quite widely used in political debate and science, it lacks universally-recognised definition. Different countries try to give it content, usually strictly adapted to the needs of their own security policy. The growing role of defence diplomacy, as tool for implementation of foreign policy of the state, also results in displacing and replacing the hitherto widely used term ‘military diplomacy’ as a term inherently narrow in meaning and in no way either in the objectives or the potential of the former (Drab, 2018, p.59).

Defence diplomacy has emerged as one of the most important tools of military statecraft. Although exact definition of defence diplomacy, sometimes labeled military diplomacy, remains uncertain, it is generally considered as nonviolent use of state’s defence apparatus to advance the strategic aims of government through cooperation with other countries (Winger, 2014, p.1). Use of ‘defence diplomacy’ or ‘military diplomacy’ is typically determined by author’s preference. For example, K.A. Muthanna prefers ‘military diplomacy’ while Tarak Barkawi uses ‘defence diplomacy’. However, in recent years an argument has been advanced by Anton du Plessis that ‘military diplomacy’

refers strictly to the actions of military diplomats like military attaches while ‘defence diplomacy’ encompasses the entirety of a country’s defence establishment (Winger, 2014, p.14). Activities as diverse as officer exchanges, ship visits, training missions, and joint military exercises have all been denoted as practices of defence diplomacy. However, the elasticity with which the term has been employed belies the importance of the underlying concept and its increasing salience in world affairs. Every major world power, including the United States, France, China and the United Kingdom, has adopted defence diplomacy as a core mission of their military doctrine and a primary component of their global strategy (Winger, 2014, p.1, p.2).

Despite its burgeoning prominence in world affairs, the formal study of defence diplomacy remains in its infancy and has been beset by a number of conceptual ambiguity that has made deeper analysis of the issue virtually impossible. The term ‘defence diplomacy’ was first used by United Kingdom’s Ministry of Defence, but not as an intellectually distinct concept, but rather as means of consolidating a series of cooperative military activities being conducted by Ministry of Defence under single heading (Winger, 2014, p.2).

As consequence of this original envisioning, efforts to define defence diplomacy have centered on being expansive enough to encompass all of the activities currently classified as ‘defence diplomacy’ rather than developing an understanding of what defence diplomacy actually is. Defence diplomacy not only lacks meaningful definition, but has been contorted and stretched to the extent that it is now both descriptively vacuous and analytically hollow (Winger, 2014, p.2).

What is Defence Diplomacy?

Term ‘defence diplomacy’ first gained prominence in 1990s. Immediately following the end of the Cold War, the nations of Eastern Europe posed a unique challenge to their Western counterparts. Western governments feared that the large Soviet-style armies of former Warsaw Pact countries would be major obstacles in the delicate transition to democracy (Winger, 2014, p.2). Not only could unreformed militaries derail the transition process, but they could also reignite historic grievances which had been suppressed by Soviet domination. The fear that Eastern Europe would sink into chaos led Western governments to embrace bold strategy which utilized their own military forces to help reconstruct armed forces of former Warsaw Pact countries. Through nonviolent activities like officer exchanges and educational programs, Western governments mobilized their own defence establishments in order to reform the militaries of Eastern Europe (Winger, 2014, p.2, p.3). Programs like NATO’s Partnership for Peace were implemented in order to help instill democratic norms of civil-military relations and to integrate Eastern Europe into existing collective security organs like European Union and NATO (Winger, 2014, p.2, p.3). Success of Western efforts to reform the militaries of Eastern Europe was predicated not on the capacity of Western forces to impose their will, but rather their ability to constructively engage their Eastern brethren and use cooperation to bring about a mutually desirable outcome. United Kingdom’s Ministry of Defence, in attempt to bring clarity to

the wide variety of cooperative programs and activities undertaken by its military during the transition of the 1990s, sought to consolidate these new military missions under single conceptual framework. They called it defence diplomacy (Winger, 2014, p.3).

Table 1. Defence Diplomacy Activities

• Bilateral and multilateral contacts between senior military and civilian defence officials.
• Appointment of defence attaches to foreign countries.
• Bilateral defence cooperation agreements.
• Training of foreign military and civilian defence personnel.
• Provision of expertise and advice on democratic control of armed forces, defence management and military technical areas.
• Contacts and exchanges between military personnel and units, and ship visits.
• Placement of military or civilian personnel in partner countries defence ministries and armed forces (exchanges).
• Deployment of training teams.
• Provision of military equipment and other material aid.
• Bilateral or multilateral military exercises for training purposes.

Military exercises for training purposes are important activities through which NATO Alliance tests and validates its concepts, procedures, systems and tactics. More broadly, they enable militaries and civilian organisations deployed in theatres of operation to test capabilities and practice working together efficiently in a demanding crisis situation (NATO exercises, 2023).

Exercises serve a number of specific purposes: Training and experience: Exercises allow forces to build on previous training in a practical way, thereby heightening forces level of proficiency in a given area. Exercises have varying levels of complexity but most assume that basic training is complete and that a sufficient number of trained personnel are available (NATO exercises, 2023).

• Testing and validating structures: Exercises are designed to practice the efficiency of structures as well as personnel. This is particularly true when periodically the NATO military command structure is reformed and new headquarters need to test their ability to fulfil new responsibilities. A structure consists of many components – concepts, doctrine, procedures, systems and tactics—that must function together. Supply structures, for instance, require specialised training, equipment and operating procedures, which must be combined to effectively support a mission’s objectives. Putting these structures into practice allows them to be tested and, if need be, refined (NATO exercises, 2023).

- **Interoperability:** NATO-led forces must be able to work together effectively despite differences in doctrine, language, structures, tactics and training. Interoperability is built, in part, through routine inter-forces training between NATO member states and through practical cooperation between personnel from Allied and partner countries. Exercises are as open as possible to all formal partners, either as observers or as participants, and in some cases even as hosts of an exercise. Endorsement by the Military Committee and approval by the North Atlantic Council are, however, required before a partner can observe or participate in an exercise (NATO exercises, 2023).

- **Defence reform:** Participation in NATO exercises is one of the options available to help with defence reform. They provide the possibility for NATO member countries to test reforms implemented nationally and give partner countries the opportunity to be involved in and observe the structures and mechanisms that Alliance members have in place (NATO exercises, 2023).

During an exercise, forces are asked to respond to a fictitious scenario that resembles what might occur in real life. Exercises cover the full range of military operations, from combat to humanitarian relief and from stabilisation to reconstruction. They can last from a day to several weeks and can vary in scope from a few officers working on an isolated problem, to full-scale combat scenarios involving aircraft, navy ships, artillery pieces, armoured vehicles and thousands of troops (NATO exercises, 2023).

Alliance exercises are supported by NATO countries and partner countries, which provide national commitments in form of troops, equipment or other types of support. The participating countries are normally responsible for funding any form of national contribution. Each exercise has pre-specified training objectives, which drive the selection of activities. Objectives may be to build skills and knowledge, practice coordination mechanisms or validate procedures. At the conclusion of an exercise, commanders and, in many cases, troops collectively review their performance. This process allows them to identify areas that work well ('best practices') and areas that can be improved ('lessons learned'). In this way, exercises facilitate continuous improvement of interoperability, efficiency and performance (NATO exercises, 2023).

In order to secure its Eastern Flank, NATO has deployed multinational battle groups in Estonia, Latvia, Lithuania, Poland, Slovakia, Hungary, Romania and Bulgaria. This battle groups consist of 40.000 troops under direct NATO Command, 100.000 US troops deployed to Europe, 130 Allied Aircraft at high alert and 140 Allied ships at sea as a part of aircraft carrier strike group under the flag of USA, Great Britain and Spain (NATO's Eastern Flank, 2022).

Picture 1: NATO's Eastern Flank: Stronger defence and deterrence



First attempts to define the concept of defence diplomacy.

British political scientists, Andrew Cottey and Anthony Forster, rightly believe, however, that sources of defence diplomacy should be sought in military diplomacy. Following definition of Berndt von Staden, former foreign minister of Federal Republic of Germany, military diplomacy 'relates to the issues of military missions, as well as participation of military representatives in disarmament negotiations and arms control' (Drab, 2018, p.59, p.60). Military diplomacy could therefore be understood as a specific set of tasks only for military representatives, defence attachés, or other military representatives in the course of their peace missions and operations and for international military cooperation. In contrast, in the opinion of the British, military diplomacy referred only to the tasks and role of military attaché (Drab, 2018, p.60). Also, from traditional perspective represented in Poland by Julian

Sutor, military diplomacy is activity of Ministry of National Defence in the sphere of security and defence of the state in international arena, that is implementation of tasks by the Ministry of Defence only outside the state, not taking into account for example, the role of armed forces, military education or cooperation of defence industries (Drab, 2018, p.60). Therefore, it implies existence of wider tasks carried out for security and defence of states by its specialist foreign apparatus. Concept of military diplomacy (maintaining its integrity within the above-mentioned area of issues and types of work) had to become part of a more capacious concept – defence diplomacy. In fact, it is easier to say today which areas of cooperation cannot be included in defence diplomacy, rather than to calculate them precisely (Drab, 2018, p.60). Defence diplomacy is in fact susceptible to adaptation to conditions of action, expanding in a way, along with change of paradigm of contemporary international relations, its range of impacts and their necessary forms. It is focused on minimising hostility and building trust between states. However, in contrast to classical military diplomacy, it defines as many needs as possible opportunities, supported by achievements of civilisations that make exchange of information and interpersonal contacts possible (Drab, 2018, p.60).

First attempts to define the concept of defence diplomacy were taken by the British, introducing this concept to the ‘Strategic Defence Review’ announced by Defence Ministry in 1998. Britain defines defence diplomacy as a peaceful use of defences in order to achieve positive results in development of bilateral and multilateral relations with a given country/countries. In their opinion, defence diplomacy does not include military operations, but promotes forms of cooperation such as: exchange of personnel, ships and aircraft, high-level visits and senior commanders, bilateral meetings and dialogue, training and exercises, regional defence forums, military assistance, confidence-building measures and non-proliferation (Drab, 2018, p.60, p.61). Its main purpose is to build and maintain trust and help in development of democratic armed forces. It makes a significant contribution to prevention and resolution of conflicts (Drab, 2018, p.61).

A. Cottey and A. Forster, Irish and British researchers, proposed an expanding definition of defence diplomacy in 2004 as ‘peaceful (non-confrontational) use of armed forces and related infrastructure (primarily defence ministries) as a foreign policy and security tool’. This approach to the matter thus extends its scope of meaning, taking into account both peaceful use of armed forces, role of Ministry of Defence, and use of defence attachés to prevent conflicts (Drab, 2018, p.61).

Tan See Seng and Bhubhindar Singh from Singapore went much further on this issue, pointing to leading role of the managerial staff of defence department and the armed forces. They defined defence diplomacy as ‘joint and coordinated application of peaceful initiatives of cooperation between defence and armed forces leadership to build trust, counteract crises and resolve conflicts’ (Drab, 2018, p.61).

They also distinguished two functions of defence diplomacy: pragmatic and transformational. The first, in their opinion, focuses on maintaining the existing state of cooperation and security, between two or more countries in the selected region. The second is focused on implementation of tasks related to solving the crisis and returning to balance, security and cooperation (Drab, 2018, p.61). In Tan See Seng’s opinion, defence diplomacy

should be conducted on many levels. The first one is the involvement and personal actions of political leaders, ministers, heads of defence / heads of general staffs and headquarters and strategic staffs. The second level is military academies, educational, analytical and R & D centres as well as those associated with Ministry of Defence think tank. Level three is representatives of civil non-governmental organisations (civil society) (Drab, 2018, p.61, p.62). Singaporean authors focused on the role of head staff of Ministry of Defence and armed forces, without indicating tasks for armed forces, international organisations and defence attachés in this area (Drab, 2018, p.62).

One of the latest proposals for definition of defence diplomacy can be found in Spanish Ministry of Defence documents, which describes it as ‘a diverse international activity based on dialogue and cooperation, implemented bilaterally by defence ministry with allies, partners and other friendly countries to support achievement of goals of defence policy and Spanish foreign policy’ (Drab, 2018, p.62). This understanding of role and function of defence diplomacy, however, excludes the importance of multilateral relations or the joint implementation of tasks within international organisations. Thus, it eliminates an important area of international cooperation, limiting itself only to the efforts made by its own defence department (Drab, 2018, p.62).

United States of America Defence Diplomacy.

According to Winger, ‘US defence diplomacy is peaceful use of the armed forces, through activities such as officer exchanges or ship visits, and the promotion of international order in a country’. In Winger’s opinion, defence diplomacy is the most important military tool for managing external relations and state security (Drab, 2023, p.72). He considers the tasks carried out within its framework as belonging to the sphere of soft power and the armed forces play the most important role in this respect in their peaceful functions. It is difficult not to agree with Winger’s assessment that the armed forces are the most important instrument of US defence diplomacy (Drab, 2023, p.72). As a superpower, the US not only plays a central role in shaping security in all regions of the world but is also a leading member of various regional structures of broadly defined security such as NATO, Organization for security and co-operation in Europe (Drab, 2023, p.72, p.73).

United States maintains formal security and defence alliance relationships and ties in Europe, through NATO, in the Asia-Pacific region in cooperation with Japan and South Korea, or Taiwan, in the Oceania region in alliance with Australia, and by maintaining military bases in various regions of the world. Regional commands of US Armed Forces cover Europe and Africa, the Middle East, Asia and Pacific and North and South America, maintaining bilateral and multilateral military relations with countries located in these regions (Drab, 2023, p.73).

Another form of US defence diplomacy are Offices of Defence Cooperation operating in selected partner countries. These are located at US Embassies. For example, Office of Defence Cooperation in Poland reports to US Ambassador in Warsaw and the Commander-in-Chief of US Forces in Europe (Drab, 2023, p.74). Office’s main

tasks are to support implementation of security tasks, international arms cooperation, and management of selected cooperation programmes between US and Polish armed forces (Drab, 2023, p.74). Support in security sector includes funding through sale of US equipment and armaments, their servicing and training abroad and management of programmes and grants under the International Military Training Programme (Drab, 2023, p.74).

Main instruments used by United States in its defence diplomacy to enhance cooperation between states are: military education and training, provision of combat management training, military assistance provided in various forms (budget, advice, programmes), civil-military cooperation and military cooperation on military law, military interaction and visits by high-ranking officers / generals, international financial support in form of grants and loans, conducting combined special forces exercises and training, sale of military equipment and armaments, joint sales (by agreement between governments) of equipment and armaments to other countries, sale and transfer of equipment and armaments and training of other countries in crises, strengthening capabilities of other states and preparing them to participate in international peacekeeping missions (Drab, 2023, p.74).

United Kingdom Defence Diplomacy.

The UK Ministry of Defence has begun to see defence diplomacy as an effective tool in the country's foreign and security policy. In its view, effectively conducted defence diplomacy makes it possible, well in advance, to identify threats in inflamed regions of the world and to prepare appropriate instruments to prevent emergence of possible crises (Drab, 2023, p.75). Therefore, in addition to arms control or non-proliferation, new areas of cooperation were sought, such as: military education and training, the provision of loans for the training of personnel and the organisation of short courses for civilian and military advisers, visits of ships and aircraft and other types of troops, visits by defence ministers and military and civilian personnel, staff talks, organisation of conferences and seminars, exchange of civilian and military personnel, military exercises (Drab, 2023, p.75).

In British view, defence diplomacy activities should be used effectively to guarantee better and faster information from regions of British interest. More effective detection, prevention and monitoring of negative developments are the main tasks of defence diplomacy and should be achieved by strengthening bilateral and multilateral relations. In particular, attention is paid to military assets that could be used globally and strategically (Drab, 2023, p.76). Military instruments used in defence diplomacy should build and maintain trust between states and support efforts to build cooperative democratic armed forces. Defence diplomacy aims to build and maintain trust, provide military advice and assistance, assist in developing responsibilities and competent and democratically accountable forces, educate and train the UK facilities, and cooperate with allies and partners (Drab, 2023, p.76).

Within the armed forces, the main tasks related to defence diplomacy are

performed by Defence Staff. Chief of Defence Staff is responsible to Minister of Defence for functioning and combat readiness of the entire armed forces and coordinates implementation of tasks by specific types of armed forces. Chief of Defence Staff and the Permanent Under Secretary – the highest civilian official in the MoD – are principal advisers to Minister of Defence, including on matters relating to defence diplomacy. Defence attaché plays an important role in implementing tasks within defence diplomacy (Drab, 2023, p.77).

The British see defence diplomacy as a tool to strategically achieve their objectives in international relations. Therefore, they constantly look for new areas and instruments to realise their stated objectives. At the same time, they emphasise that implementing tasks within the framework of defence diplomacy requires the coordinated involvement of almost all ministries, especially Ministry of Defence and Foreign Affairs (Drab, 2023, p.77).

French Defence Diplomacy.

The role and tasks of French defence diplomacy are set out in the 2013 White Paper on French Defence and Security, which defines it as the ‘participation of the armed forces in French diplomacy endeavours aimed at preventing crises and working together to achieve France’s objectives abroad through the use of diverse diplomatic and military means’ (Drab, 2023, p.77).

Such defined defence diplomacy emphasises the importance of: conducting strategic dialogues, implementation of security-related tasks, by military and civilian diplomats, in international organisations, conduct of arms control, performance of tasks within a broadly defined civil-military cooperation (CIMIC) framework, continuous capacity building of the armed forces of allied countries (Drab, 2023, p.77).

French Ministry of Defence develops and assigns tasks to be carried out as part of defence diplomacy, and the Minister of Defence is responsible for preparing and implementing defence policy. Working body of Minister of Defence is Civil and Military Cabinet, while the advisory, consultative, and executive bodies are Committee of the Chiefs of Staff, Directorate-General for Armaments and the General Secretariat for Administration. National Assembly’s Defence Committee exercises civilian control of the armed forces (Drab, 2023, p.78).

Spanish Defence Diplomacy.

Ministry of Defence of Spain defines defence diplomacy as a ‘diverse international activity based mainly on dialogue and cooperation, carried out bilaterally by Ministry of Defence with allies, partners and other friendly countries in order to help achieve the objectives of defence policy and Spanish foreign policy’ (Drab, 2023, p.79).

Tasks to be carried out within the framework of defence diplomacy include: conducting permanent dialogues with countries that play an important role in Spain’s foreign and security policy, supporting with material and institutional to countries of Spanish interest in order to maintain or ensure security in the region, promoting and supporting the efforts made by other countries (particularly those with historical or

cultural ties to Spain) in field of defence, providing appropriate legal framework that promotes and regulates development of defence cooperation, supporting and promoting the Spanish defence industry (Drab, 2023, p.79).

According to the Spanish Ministry of Defence, the most important instruments of defence diplomacy are: cooperation agreements – a key instrument of defence diplomacy, presence of Ministry of Defence representatives in friendly countries, top-level visits, visits by military vessels and aircraft, visits by land-based military units, security sector reform, defence capacity building, education and training, participation in military exercises, bilateral meetings, technical cooperation and defence industries (Drab, 2023, p.79, p.80).

Conclusion

United States, the United Kingdom, France and Spain see implementation of defence diplomacy tasks as one of the most important instruments for crisis prevention and international security policy-making. These states define defence diplomacy as peaceful engagement of civilian and military structures of defence ministries, and the armed forces are seen as one of the most important instruments of tasking in provision of international security. Each of these states uses different instruments to achieve their objectives.

According to all analysed countries, high-level visits by both civilian and military representatives of defence ministries and cooperation agreements/contracts are the most important instruments of defence diplomacy outside the armed forces. Top-level visits are the foundation of strategic and political dialogue. In view of all states, participation of friendly states in military exercises is an increase in transparency and promotion of confidence-building measures. Moreover, joint execution of tasks by the armed forces strengthens bilateral relations between friendly states and enhances their interoperability.

Military education and training are areas of defence diplomacy cooperation prioritised by all states. Engagement in this area is believed to guarantee establishing and maintaining longer-term partnerships between states. Good cooperation in this area is an important element in strengthening closer relations between the armed forces of friendly states.

In this perspective, Lech Drab proposes working definition of defence diplomacy: ‘diverse international peaceful activity based on dialogue and cooperation, implemented in bilateral, multilateral and international security organisations by national defence ministry and institutions and forces subordinate to it. Armed forces with allies, partners and other friendly countries to support the achievement of the objectives of foreign and security policy’ (Drab, 2023, p.82).

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Scientific article

UDK 327:911.3:[004.9:004.8(100)]

DIGITAL GEOPOLITICS

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Abstract: *Contemporary geopolitical power is increasingly based on access to and the use of data and technology, but the source of this power is often contested. Since firms and governments are fundamental actors in geopolitical power dynamics. Geopolitics are changing, as they always do. Digitalisation is feeding into that, but the digital future is also going to be affected by it. Today, the world is at war — hot war, cold war, technological war, trade war, social war and internecine political war in a changed geopolitical environment. The lack of boundaries in cyberspace contributes to geopolitical disputes, as data and technology are weaponized across borders, and hacking of critical infrastructure becomes pervasive. AI, digital technologies, and digitalization have become the epicentre for geopolitical conflict. They are the future for the world and whoever becomes leader in that sphere will become the next ruler of the world. controls them.*

Keywords: *geopolitics, data, technology.*

Transformation of geopolitics and technology

In effect, the technological and economic conditions of the data-driven economy transformed geopolitics. The wave was at first modest, but grew rapidly. Since February 24, 2022 (one could perhaps backdate this to February 4, 2022, when the Xi-Putin “no limits” pact was announced), the cumulative impact has been epochal. It is one thing to look back and seek to puzzle out why and how this happened; it is another to attempt to comprehend what this means as we go forward. This is because yet another technological revolution is upon us with the pervasive introduction of artificial intelligence (AI), with myriad economic, social and military applications (Ciuriak, 2023). Technology has become the most pressing question of our time. Who creates it, who controls it, who has access to it, and who doesn’t are the new parameters that determine emerging power structures around the world.

As data-driven digitalization transforms business models and societal norms, states and firms vary in the level of control exercised. While states grapple with digital economy oversight, cyberspace remains borderless. Consequently, data are the foremost and most fundamental assets of the digital world, underpinning corporate success and national security. They are a driver of business development, bolstering

the creation of new business models and markets. Big data and digital technology have revolutionized international business, and many global platform-based businesses, such as Amazon and Uber, are founded on the ability to access and harness both (Lawton et al., 2023:1-5).

But the current crisis around technology has also laid bare how unequipped most regulators, politicians, policy makers, and diplomats are to engage in a conversation with the tech industry on equal footing. In international affairs, even the most digitally literate diplomats and government officials find themselves often ill-suited to navigate all aspects of digitalization and its effects on citizens. New technologies have impacted our world in a much more profound and permanent way than foreign policy institutions often seem to be aware of. Traditional fields of diplomacy such as geopolitics, security policy, international law, multilateralism, human rights, development cooperation, consular affairs, as well as cultural diplomacy could benefit from some of the innovative spirit that laid the groundwork for Silicon Valley's success story in order to keep up with the increasing pace of emerging technologies. If they don't adapt, new forms of cyber warfare and advances in artificial intelligence will increasingly create unprecedented vulnerabilities for entire countries and the international system as a whole (Blume and Rauchbauer, 2022:101-106).

Digital technologies are transforming the economy and society. Digital innovations are likely to have a major impact on the productive capacity of industry across the world. The so-called fourth industrial revolution (4IR) is gradually integrating not only large amounts of data into industry, but a host of new technologies such as AI, robotics and gene editing, thereby beginning to shrink the boundaries between the digital and physical worlds. Similarly e-commerce is transforming the ways we buy and sell goods and services, while other e-services ranging from online education, e-health to digital finance are transforming wider social and economic interactions. The superiority in digital innovation and the ability to set global digital standards have now become geopolitical issues due to the increasing impact of digitalisation on the global economy and state sovereignty. This threatens to split the world into competing power blocs with differing conceptions of how to manage the generation, extraction, utilisation and flow of data, as well as innovation and oversight over digital infrastructure (Teevan and Shiferaw, 2022:1-2).

The role of digital communication has been given a lot of credit and influence in its presumed power to bring about change in society, on a local or national or global level. When this presumed power for change or disruption is applied to the existing world order, there is a more nuanced outcome. In the current global order, the United States remains the unipolar hegemonic power. However, it is becoming visibly weakened, much of the harm coming from the results of its own foreign policy actions that are more guided by values and norms, rather than interest. Digital communication plays a role in both defending the current world order and challenging it. It is done in a way that renders the traditional restraints and constraints of geopolitics impotent by making space and time irrelevant, and by opening up the potential for creating global networks and relationships (Simons, 2019:108)

The analysis of internetworked information systems together with the geographic features of Earth and space are all important to monitor with the purpose of identifying threats, vulnerabilities, and related risks to the same. The purpose is to ensure that information that is created, processed, stored, retrieved and disseminated by information systems and humans, remains confidential, has its integrity untouched, and is available to those that have the right to access that information. It is evident that as technology has had huge positive transformational impacts on societies, the same can be misused by threat actors, ranging from states, state-sponsored threat actors, to organised crime groups and lone-wolf actors. Thus, as 5G-technologies are implemented, 6G-technology-seminars are held, to ensure that societies still thrive from these technologies, it is important that current and future leaders, professionals and technologists, work to ensure a safe, secure, and trustworthy Internet (Huskaj, 2023:152-161).

In fact, geopolitics has been influenced by the technological changes throughout history. The advancements in steel and powder technology enabled the European countries to establish and expand its colonial empires. The nuclear bomb ended the Second World War and nuclear deterrence maintained the bipolar world order for decades. Currently, digital technologies created a platform arena in which the articulation of political voices, the collection of individual identities, and national security are carried out. These duties once belonged to the nation-states, are mostly shifted to digital arena, creating a hybrid of the Westphalian nation-state and cloud state. In line with the hybrid character of the state, the geopolitical struggle carries same hybrid characterization. The term of geopolitics denotes the struggle among fixed territorial units, but the term digital includes multinational companies and transnational networks. A definition of digital geopolitics is provided by Annegret Bendiek, Nadine Godehardt, and David Schulze. According to their conceptualization, digital geopolitics “involves decentralised transnational networks that consist of the connectivity between non-state actors and multinational companies, platforms, hubs, content and infrastructures, extending beyond politically fixed territorial units (Tekir, 2020:113-135).

Digital geopolitics

Mankind's political, scientific and technological progress operates on the principle of escalation. Technology solves problems but it also gives rise to new ones. The more technology we have at our disposal, the more technology we need to deal with the consequences (Hulsman and Liedtke, 2019:27-32). We begin this latest new era with a geopolitics forged in the data-driven economy, one that is inherently unstable (the three-body problem), and that is already being reshaped by the battle to dominate AI. The international institutional structure has not kept pace. What we have was developed under American tutelage during its unipolar moment and no longer reflects the actual power structure of the world (Ciuriak, 2023).

Digital Geopolitics is defined as the analysis of information systems (computers that create, process, store, retrieve and disseminate information, interconnected in networks of networks to build a large, global network (Cyberspace), that together with

the geographic features of Earth and space impact world politics, the military, economic, social, informational and infrastructure (PMESII) systems and subsystems. This is also why it is important to discuss digital geopolitics: cyberspace is ubiquitous and affects all domains of human life (Huskaj, 2023:152-161).

In today's complex world many forces have the potential to affect the development of digital geopolitical conflicts. 'Drivers' are what we call the factors that may influence the future. To identify and prioritize the large number of potential drivers, we used a combination of AI-based natural language processing algorithms, traditional research and expert interviews. The drivers range across all seven of the STEMPLE categories (social, technological, economic, military, political/legal and environmental factors) ensuring a holistic outlook on current and future complexities (Klein and Lux, 2019:6). The notion of digital geopolitics brings together two opposing trends in international politics. On the one hand, digital geopolitics is based on the power politics of territorial units — for example, nation states such as the US and China or regional actors such as the European Union. On the other hand, digital geopolitics involves decentralized transnational networks that consist of the connectivity between non-state actors and multinational companies, platforms, hubs, content and infrastructures, extending beyond politically fixed territorial units. Neither of these developments is new, but they are often discussed separately. What's new, however, is the increasing entanglement of these two trends, as is seen in the case of Huawei. This also reveals how power and order increasingly lie at the heart of digital geopolitics. Therefore they require particular attention on our part (Bendiek, Godehardt and Schulze, 2019).

Despite the involvement of other actors, the states remain the major players in digital geopolitics. Yet, their goals and methods change. The network flows, unlike fixed territorial units, cannot be contained and controlled, but influenced. States gain power in the networks by building and cultivating dependencies. Creating dependencies is related with generating the source of flow. This enables the generator of the network to leverage the flow to other participants of the networks. A first-mover advantage, gained through being the first to network, therefore, is vital for influencing the operationalization of networks. It is expected that states race to gain the advantage of being a first mover in the creation of the technological networks (Tekir, 2020:113-135).

The standards development process is crucial for 5G geopolitics. The country that dominates this sector will be leading the way in establishing standards and patents for a global supply chain of emerging technologies. Less than ten years ago, the 4G market was a US dominated enterprise. The so-called "sharing economy" enabled by the fourth generation of mobile telephony has structured productive chains of immense profitability dominated by U.S. companies such as Uber, Lyft, Airbnb, and other cloud-based services. Apple, Google, Facebook, Amazon, Netflix, and countless others have created new applications and services that are now the founding elements of the new global digital economy.

There is, therefore, a twofold movement: countries are adopting different technological development strategies for 5G (from their respective economic and social formation) while developing globally applicable standards for fifth-generation device and spectrum technologies. For these reasons, the export of Chinese 5G equipment and standards are firmly associated with the Belt and Road Initiative plan, which has been dubbed the New Silk Road. The New Silk Road initiative ensures that large Chinese technology companies, such as Alibaba, Tencent, Baidu, and Huawei, and the major state-owned telecom operators, enhance their influence in emerging and developing countries, consolidating a set of opportunities for national technology companies to expand their global business footprints, especially on those projects. The plan consists in integrating the services of Chinese telecom equipment (including ZTE, Huawei, and China Datang Corporation), the service of state-owned operators and e-commerce (Alibaba, JD.com), to project regional connectivity in those countries assisted by the New Silk Road based on the export of digital infrastructures, such as cross-border optical cables and 5G base stations. Through the combination of setting the standards and building the infrastructure, China controls the equipment, the technical assistance, and the ability to shape developing technology.

In short, it is understood that the race for 5G has just begun, and it will be a marathon and not a sprint. However, the technological trajectories resulting from this process have a direct linkage with industry, and this is a matter of concern for the US: if the country lags behind in the implementation of 5G networks, this could potentially undermine its hegemonic position in the global technology market when faced with China.

Nation-states continue to be the main actors in geopolitics, although their goals and methods change according to the restructuring of the international conjuncture. Network data and flows cannot be contained or controlled but influenced. Thus, governments and firms gain hegemony by building and cultivating technological dependencies. Because we are dealing with a technological frontier, all 5G-tech holders conjugate their market advantages with those pioneering the establishment of necessary infrastructure. Not by chance, there is a US-China technological “decoupling” over the dominance of digital geopolitics that feeds a growing tension (Prestes, 2022:11-13).

Global powers and digital geopolitics

Emerging technologies in particular have become both an object and a driver of international cooperation and competition, shaping the global landscape in different and sometimes unexpected ways. To put it simple, high tech has come to signify high politics, too. Today, digital and tech advancements are geopolitical issues of the highest order, even more so with the second wave of digital innovations, which are more systemic in reach and will determine future economic and technological supremacy as well as respective security environments (Burrows et al., 2022:5).

Today's major powers engage in comprehensive global technology politics. The weaponisation, mastering, and control of digital technologies is the new ‘Great Game’. These power dynamics are helping shape technological spheres of influence. Countries

in Latin America and the Caribbean, Africa, and the Indo-Pacific – but also in central Eastern Europe and the Balkans – have fallen or may soon fall under Chinese or Russian technological influence or dominance.

AI has become the epicentre for geopolitical conflict, with the United States and China going head-to-head with asymmetric capabilities. The United States is again at the leading edge of this technological revolution, with 14,700 AI startups, compared with 2,017 in China. The United States also had 52 AI unicorns to 19 for China, at the end of 2022. The Sullivan Doctrine stipulates that the United States sees it as essential that it not only maintain a lead in AI but that that this lead be as large as possible (Ciuriak, 2023).

These are more dangerous times in geopolitics than we've known in a while. There's a tussle underway between today's great powers for global influence, political and economic. The last four years have harmed America's prestige. They've seen accelerated Chinese reach. Tussles at the top of global geopolitics are inherently destabilising. There is also a tussle between visions of digital power, between established (US) and growing (Chinese) digital behemoths, with different strengths in different parts of digitalisation, competing platforms, and divergent visions, based on different kinds of market and different roles for government. Few other countries have major irons in this fire. The European Union's important and can play a part in setting global standards, as it's done with data privacy. It's way behind in many areas of tech, but has important parts to play in others. India, Russia, a few other countries have strengths in depth in certain areas, but not the breadth of China or America. The majority of countries are left to look for niches in which they can seek prosperity or influence. Commercial businesses are also major players in this geopolitics, especially the biggest global platforms and data corporations. Their clout's much bigger than the large majority of countries. As Facebook has just demonstrated, they're quite prepared to challenge powerful governments, so what about those that are less powerful? There are important issues here of national sovereignty. Economies of scope and scale enable global businesses to take dominant positions in national communications sectors far beyond their homelands, especially in developing countries with small digital sectors. This raises issues of dependence and what has been called 'data colonialism'; echoes too of the arguments around a New World Information and Communication Order that racked UNESCO forty years ago. What scope is there in this for developing country participation? Twenty years ago I reported on developing countries' lack of influence in international ICT policymaking institutions. How much has changed since then? Decision-making processes that will determine the future digital society – on standards, for example, or e-commerce – are still dominated by the global North. How far will they reflect the needs of countries in the global South? What role is there in this for the United Nations? Its Secretary-General has been promoting its potential role in digital cooperation. Powerful countries, though, are wary of multilateral approaches, seeing more advantage for themselves in bilateral agreements. What does that mean for international standardisation or for global power-broking? (Souter, 2024).

Since networks have huge effect in organizing economy, political, and social order, the power struggle over the networks shapes geopolitical confrontation. Technological changes, which fueled network society also affect the dimension of geopolitics. Social media applications such as Twitter, Facebook, and Instagram are the platforms where billions of people share experiences and opinions by interacting with each other. In the past three years, the effects of social media over the Russian meddling into U.S. elections, the polarization in U.S. domestic politics, and spreading hatred towards ethnic groups in Myanmar, India, and other countries have been widely discussed. These examples were the selected cases, which show the influence of digital technology over geopolitical events. As digital technology becomes more entrenched in the lives of people, its effect will increase (Tekir, 2020:113-135).

Today's societies and economies hinge on secure digital technologies and interconnections within and between countries. As a result, technological vulnerabilities have become some of the greatest security risks for states, companies, and citizens. The threats of cyber-attacks, technical backdoors, and coercion or espionage resulting from one-sided dependencies in critical technologies and infrastructures are undermining political processes, economic development, and digital trust. Beyond 'peacetime' geopolitics, digital technologies and cyberspace also play a central role in ongoing military conflicts (Ringhof and Torreblanca, 2022:15-16).

Another issue connecting foreign and security policy to the digital realm are advanced military and dual-use technologies. New military technologies, such as unmanned drones and autonomous weapon systems, can swiftly change the course of war. However, China is also on a mission, having filed 389,571 patents in the area of AI, or 74.7 percent of the world total, over the period 2011–2020.

Digital power conveys diplomatic and geopolitical power. It resides and interacts with economic power. In future, it's likely to reside and interact more, too, with military power. The internet is not a replacement for geopolitics, but digitalization is increasingly a part of geopolitics.

The economic power that's generated by digitalisation is highly (and, of late, increasingly) concentrated. As UNCTAD's pointed out, China and the United States, have more than 75% of the world market for public cloud computing, and 75% of blockchain patents. China's the world leaders in 5G, the US in semiconductors. China has about 50 percent of the world total of installed industrial robots and registered 44 percent growth in 2021; this positions China to deploy ever-smarter robots into an existing robot-using production system. China has 2.73 million 5G base stations as of May 2023, more than 60 percent of the world total, which positions it with the most extensive infrastructure for autonomous machine use. Chinese drone manufacturer DJI holds approximately 70 percent of the global market for drones; this positions China for the deployment of low-level autonomous devices. Two hundred thousand companies and 5.35 million developers are using Baidu's AI development platform PaddlePaddle — presumably most of them Chinese (Ciuriak, 2023). Those two countries account for 90% of market capitalisation of the world's top 70 platforms, leaving 4% for Europe and 1% for Africa and Latin America combined. Seven

platforms – five American and two Chinese – account for two thirds of that market value.

Developing countries and their businesses face great difficulties in building spaces for autonomy within this digital power divide. Even the European Union finds itself dependent on foreign technologies: hence all the angst about reliance on Chinese technology and lax data protection by Big Tech brands from Silicon Valley (Souter, 2024).

The geopolitical struggle among states has undergone changes as a result of technological developments. Networks, which consists of several interconnected nodes, have become centers where social and economic life occur. Gaining first access to networks and outperforming other players offer enormous advantage for influencing the operationalization of the networks. Thus, the new geopolitical competition takes places on transnational networks instead of fixed territorial units. Power struggle among great powers remain but it metamorphoses (Tekir, 2020:113-135).

With different narratives, each regional trading bloc is developing its own roadmap to achieve global digital success and indeed global supremacy. Be it President Biden signing an executive order strengthening the “Buy American” provisions, China asserting its primacy in digital matters and global trade, India promoting a technonationalistic agenda, or Russia developing its offensive cyber capabilities, it is as if global trade in the twenty-first century was bound to be a discordant zero sum game. What’s more, this global competition is not only industrial, technological, or economic but also about visions, values, and methods. Whether trade irritants can dissolve in good intentions remains to be seen (Werthner, 2022:241-248).

Today’s geopolitical struggle over the networks mainly concentrated on the development of 5G technology. 5G technology introduces leaping changes in economic and social life by providing faster connections in an unprecedented scale in machine-to-machine connectivity and machine-to-human connectivity. From health sector to industrial production almost every sector will be upgraded through 5G networks. It is predicted that 5G networks will unleash fourth industrial revolution (Tekir, 2020:113-135). Given the growing strategic importance of emerging technologies, be they new generation networks such as 5G, the Artificial Intelligence that will fuel them or the Internet of Things (IoT), primacy in the standardization of this sector has become the main preoccupation of national strategies (Blancato, 2019:2).

The challenge from China

The significance of digital technologies has increased. China unveiled a gigantic project called the Belt and Road Initiative in 2013. This project aimed at providing infrastructural, financial, trade, people to people, and digital connectivity among the participant countries. The term of connectivity is, thus, placed at the center of this initiative. Providing digital infrastructure is also an important component of China’s endeavors. Besides laying out cross-border cables for Central Asian countries, China aims to upgrade and expand information exchanges and cooperation. The Belt and Road Initiative, is a project, which aimed at connecting China with the rest of the regions by emphasizing financial, infrastructure, policy, and people-to-people connectivity. Digital

connectivity is one of the components of the project. By laying out fiber optic cable networks the digital infrastructure of the participant countries is being strengthened. Utilizing these fiber optic cable networks Huawei is able to penetrate 5G networks of Belt and Road's participant countries.

The Belt and Road Initiative consists of two main parts: The Silk Road Economic Belt which provides land connection between China and Russia, Central Asia, Europe, Southeast Asia, and South Asia. The Maritime Silk Road connects China's ports with the other ports located in the Indian Ocean, the Mediterranean, the South China Sea, and the Pacific Ocean. The connectivity laid out in these projects is mainly related to physical infrastructure connectivity, involving constructing roads, railways, trade hubs, and ports. The main focus of the Belt and Road Initiative in the literature has been diverted to railroads, roads, and ports. However, the Vision and Actions paper also mentions information connectivity planned to be upgraded through building cross-border optical cable networks (Tekir, 2020:113-135).

China is luring countries into technological dependencies to undermine their political sovereignty through its Digital Silk Road (DSR) initiative. Beijing also shields its own citizens from foreign influence with its 'great firewall' and develops industrial strategies to secure its technological autonomy from the West. It uses digital disinformation to influence public opinion in other countries, mounts cyberattacks and cyberespionage to strengthen its industrial base, strategically deploys attractively-priced 5G technologies abroad to gain control of telecom networks, and tries to impose its technical standards through international organisations. Together with Russia, China is attempting to ingrain authoritarian values into the global cyberspace. Russia is also leveraging and restricting mass media and social networks to protect its interests, shielding its population from democratic temptations, and waging an information war against the West and its allies with the aim of undermining citizens' faith in democracy. Meanwhile, the United States tries to offset Chinese and Russian influence, seeks to maintain its cutting-edge advantage on military artificial intelligence (AI) and other technologies, and backs and protects the interests of its major technology companies globally. It also denies other nations access to key technologies, monitors critical investments in the technology sector to avoid security risks, seeks to secure and control critical supply chains (especially of semiconductors), and imposes export controls and even embargoes on sensitive technologies. As for the European Union, the Brussels institutions are trying to shape global standards of privacy and data protection, digital platforms, and AI according to European values using the attractiveness and power of its internal market. The EU also promotes digital partnerships with like-minded countries and allies – and announced, in December 2021, the "Global Gateway" initiative as the EU version of China's DSR (Ringhof and Torreblanca, 2022:2).

Conclusion

Geopolitics has been influenced by the technological changes throughout history. It shapes the world we live in. In the modern age, that role has been left to digital geopolitics. Digital geopolitics will restructure the global geopolitical space and order and will affect on geopolitical actors in the broader sense of the word.

As the digital economy grows, and control over its infrastructure becomes more contested, cooperation between states and firms will be necessary. Geopolitical stability requires countries that hold structural power to exercise this power with due consideration for those that do not.

Nation-states continue to be the main actors in geopolitics, although their goals and methods change according to the restructuring of the international conjuncture. Network data and flows cannot be contained or controlled but influenced.

Digital power conveys diplomatic and geopolitical power. It resides and interacts with economic power. In future, it's likely to reside and interact more, too, with military power.

There's a tussle underway between today's great powers for global influence, political and economic as well as military.

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Professional paper

UDK 305.5-055.2:[341.24:341.14-055.2(100)]

THE FUSION OF STANAG 6001 AND BLOOM'S TAXONOMY: INTERSECTING LANGUAGE PROFICIENCY AND COGNITIVE SKILLS

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Abstract - This paper introduces and describes a framework that integrates STANAG 6001, the NATO-standardized scale of linguistic proficiency with Bloom's Taxonomy, one of the most popular models used for describing cognitive skills. Integrating these two frameworks offers a fresh approach to language education by drawing a parallel between linguistic proficiency and cognitive complexity. The model considers the interdependence between language acquisition and the development of higher-order thinking to be mutual, with competence elements in skills like critical analysis, evaluation, and creative thinking touted to be developed hand in glove with language learning. A framework such as this offers new ways of curriculum development, assessment design, and lifelong learning because language education in itself takes on a holistic and multi-dimensional nature.

Consequently, the following ideas will have practical connotations in language classes, professional development, corporate training, and international relations since good communication and cognitive flexibility bear relevance for mutual understanding, adaptability, and effective collaboration across diverse contexts. Besides, this framework specifies the learner's autonomy to make them responsible for their learning process and "continuously redefine their language and cognitive competencies". The theoretical underpinnings, practical applications, challenges, and future directions of this STANAG 6001-Bloom's integrated model place the emergent model as a paradigmatic shift in language education bound to shape the face of the field in several years to come.

Keywords: STANAG 6001, Bloom's Taxonomy, language instruction, curriculum development

Introduction

This crossing point between proficiency in language and cognitive development has become more and more recognized as an important point of concentration, both in education generally and within cognitive science (Swain, 2006). Traditionally, language learning has been seen in terms of communication skills—vocabulary acquisition, grammar, and conversational fluency. However, recent research in educational psychology and linguistics emphasizes that language is closely intertwined with cognition, especially in critical thinking, problem-solving, and creative innovation (Naeini et al., 2023; Ye et al., 2024), highlighting how language processes are essential for complex reasoning and overcoming cognitive biases.

The NATO STANAG 6001 proficiency scale offers an extremely structured and demanding framework in relation to a test of language proficiency (NATO Standardization Agency, 2010). The five levels, ranging from No Proficiency at Level 0 to Highly Articulate Native at Level 5, take in the progress of increasing language difficulty from basic, survival-level expression to near-native fluency encompassing everyday interactive, as well as advanced professional discourse.

In contrast, Bloom's Taxonomy of Learning is an acme in hierarchical complexity of cognition, introduced by an educational psychologist Benjamin Bloom in the middle of the 20th century and revised in the 21st century (Bloom et al., 1956; Anderson & Krathwohl, 2001). Under Bloom's schema, remembering is the most basic cognitive function, while creating was taken to be the highest level of intellectual engagement. For instance, the revised Bloom's Taxonomy that was initially developed (Bloom et al., 1956), has been employed in setting the learning objectives, development of curriculum and establishment of student learning outcomes for educational institutions across various educational systems.

Both can be integrated for a holistic approach in language education and advance both the aspects of linguistic proficiency and cognitive development. Such a blending of STANAG 6001 and Bloom's Taxonomy would take the learner gradually through more complex linguistic tasks to develop critical cognitive skills that are so important in academic, professional, and personal life. The model provides a comprehensive pathway to attain both language mastery and intellectual agility that is needed for sending students into the increasingly interconnected world.

Literature Review

The integration of language learning with cognitive development is a central theme in linguistics, psychology, neuroscience, and education. This literature review examines recent contributions that support the interrelationship between cognitive processes and language acquisition, focusing on frameworks such as Cognitive Academic Language Proficiency (CALP), Basic Interpersonal Communication Skills (BICS), bilingualism and multilingualism, and Cognitive Load Theory. These studies underscore the relevance of cognitive skills in language learning, thereby supporting the combined application of Bloom's Taxonomy and STANAG 6001 in fostering higher-order cognitive skills alongside linguistic proficiency.

Cognitive Academic Language Proficiency (CALP) and Basic Interpersonal Communication Skills (BICS)

Recent research has validated and extended Cummins' concepts of CALP and BICS, highlighting their relevance in modern language learning. García & Kleifgen (2018) emphasized that CALP-oriented instruction enhances students' analytical and critical thinking abilities, critical for academic achievement. Baker and Wright (2021) explored BICS in developing foundational conversational skills, while CALP was shown to significantly correlate with students' long-term success in academic and professional contexts. Additional studies (Schleppegrell (2020) and Ortega (2019)) underscore that CALP aids learners in developing metacognitive strategies, which support comprehension and abstract thinking

essential in higher-order learning. These insights affirm that CALP, beyond BICS, enables learners to manage complex cognitive tasks and achieve cognitive depth in language proficiency.

Bilingualism, Multilingualism, and Cognitive Flexibility

Research into bilingualism and multilingualism has documented numerous cognitive benefits, particularly in executive functions. Costa and Sebastián-Gallés (2018) found that bilingual individuals exhibit superior task-switching abilities due to the mental flexibility needed to alternate between languages. De Bruin and Della Sala (2020) reported that multilinguals outperform monolinguals in tasks requiring inhibitory control and cognitive flexibility, essential for managing complex environments. Furthermore, Barac and Bialystok (2011) confirmed that bilinguals show heightened cognitive resilience, especially in problem-solving contexts. This cognitive flexibility supports integrating cognitive skill development with language proficiency, as multiple language acquisition strengthens higher-order thinking and adaptability (Marian & Shook, 2012; Grundy et al., 2021).

Cognitive Load Theory and Language Learning

The application of Cognitive Load Theory (CLT) to language learning has evolved to optimize instructional design for complex linguistic tasks. Recent studies by Leppink et al. (2013) demonstrated that managing cognitive load is crucial in helping learners progress from basic to advanced skills without overwhelming cognitive capacity. Mayer and Moreno (2003) emphasized scaffolding in language tasks, suggesting that incremental increases in complexity support retention and prevent overload.

Executive Functions and Cognitive Control in Language Learning

Executive functions such as working memory, inhibitory control, and cognitive flexibility are crucial in language acquisition. Kroll et al. (2012) identified that bilingualism enhances executive function by training the brain to handle multiple linguistic and cognitive demands. Bialystok et al. (2012) demonstrated that bilingual children outperform monolinguals in tasks involving cognitive control, which supports the development of high-level language skills. Xie et al. (2021) further explored how cognitive control influences language proficiency, finding that stronger executive function correlates with better language learning outcomes.

Synthesis and Implications for Language Education

Recent studies highlight the importance of integrating cognitive skills into language learning. The frameworks of CALP/BICS, cognitive flexibility, cognitive load management, and executive functions collectively illustrate that language acquisition involves significant cognitive engagement. This convergence supports a holistic language education model that aligns with Bloom's Taxonomy and STANAG 6001, advocating for curricula that cultivate critical thinking, adaptability, and problem-solving skills. Integrating these insights with foundational theories discussed in the subsequent theoretical framework section offers a comprehensive approach to language learning that develops both linguistic competence and cognitive complexity, essential for academic and professional success.

Theoretical Framework: Merging Cognitive and Linguistic Development

STANAG 6001 combined with Bloom's Taxonomy is embedded in a number of key theoretical positions, all of which underline the interrelationship between language acquisition and cognitive development. This section continues to explain how the theories by Vygotsky, Piaget, and Chomsky support that language learning is both a cognitive and social process and how the combination of the latter two frameworks furthers higher-order cognitive skills development.

Vygotsky's Sociocultural Theory and Zone of Proximal Development (ZPD)

Sociocultural theory by Lev Vygotsky explains the central role of social interaction and a cultural setting in the development of cognition. Learning for Vygotsky occurs within what he termed the Zone of Proximal Development-the gap between what a learner can manage on his or her own and what is attained under the guidance of a more knowledgeable other, such as a teacher or peer. Vygotsky considers language as a very important way of encouraging cognitive development whereby the learner can express ideas, reflect on the thought processes, and communicate with others (Vygotsky, 1978).

STANAG 6001 in combination with Bloom's Taxonomy vividly represents what Vygotsky calls scaffolding: guiding the learner from simple language use to higher-order thinking. The tendency of the STANAG 6001 levels is to support learners as they gradually make the transition from a more concrete mode of understanding toward more abstract reasoning, with language serving both as a medium of instruction and as the instrument of intellectual functioning (Vygotsky, 1978).

Piaget's Theory of Cognitive Development

Jean Piaget developed the cognitive development theory, which describes how a child actively constructs his knowledge in progression through four developmental stages: sensorimotor, preoperational, concrete operational, and formal operational. The four stages of learning reflect the child's advancement from a highly concrete manner of thinking, based directly on the physical experiences, to one of abstract reasoning based on logical thought (Piaget, 1954). Whereas Piaget's stages are based on the cognitive development of children, several of his observations on the sequence of cognitions do provide useful principles which can be more circumspectly extrapolated to language learning regardless of age.

In a broader context, Piaget's concept of development-from the concrete to the abstract-can help to provide context on how language tasks themselves are structured for adult language learners. For instance, in the STANAG 6001-Bloom context, language proficiency development is similarly progressed. There, learners progress from more basic or concrete uses of the language, like basic communication and task-oriented conversation, to more abstract uses of the language which involve analytic thought, cultural nuance, and negotiation in a professional setting.

Such an adaptive approach would mean that the instructors in linguistics could scaffold the curricula to support adult learners in their progress from basic use of language into a higher-order cognitive use. It could be that in practical tools the learners use the language, for instance,

at STANAG 6001 Level 2, to solve simple problems, and deal with everyday situations. By STANAG 6001 Level 4, they should be able to negotiate at an advanced level and ‘manifest subtle linguistic competencies’ such as stating the norms of a culture appropriately or critically evaluating opinions from a discussion. The type of tasks that requires moving toward more abstract and analytical modes of thinking, precisely appealing to Piaget’s stages of transition in moving from the concrete to more complex cognitive functions.

In all, although Piaget’s theory explicitly relates to developmental stages in children, the principles of progression underlying cognition and active engagement can be used in adult language learning only with caution. The STANAG 6001-Bloom model exploits these ideas to their fullest in a language-learning trajectory that gradually increases cognitive and linguistic complexity, guiding learners from basic language comprehension toward advanced, abstract linguistic capabilities.

Chomsky’s Universal Grammar Theory

Noam Chomsky’s theory of Universal Grammar provides that humans possess this hard-wired innate ability to acquire a language, a capacity within the cognitive structure of the brain. Further, this biological predisposition will enable people, according to Chomsky, to pick up a language intuitively just by exposure; this would imply that certain linguistic structures and syntactical rules are available to all humans universally. While primarily a biological perspective on language acquisition, UG also supports the cognitive aspects of language development by proposing that language is intrinsically tied to cognitive function, offering a structural framework for complex thought processes. Within the context of the STANAG 6001-Bloom’s integrated model, Chomsky’s theory contributes to understanding the baseline cognitive readiness for language learning that allows learners to engage with increasingly complex tasks. UG theory postulates that all learners, regardless of their language background, enter the learning process with an innate ability to understand and acquire linguistic structures. It innately underpins the linguistic competence that STANAG 6001 lays out in its structured progression: it takes learners from basic level comprehension of grammatical forms and vocabularies at Levels 1-2 to more sophisticated levels of argument construction and abstract reasoning at Levels 3-4.

In this model, Chomsky’s UG provides a theoretical foundation that supports the notion of a universal starting point in language acquisition, allowing STANAG 6001 to apply its hierarchical structure universally across diverse linguistic backgrounds. As learners advance through the STANAG 6001 levels, they rely on the cognitive framework posited by UG to facilitate the integration of new vocabulary, syntactic structures, and abstract concepts. This aligns with Bloom’s Taxonomy in that learners progress from understanding and remembering language to applying, analyzing, and evaluating complex ideas through language. At higher STANAG 6001 levels, this innate capacity interacts with developing cognitive skills, enabling learners to achieve tasks such as producing original arguments, engaging in persuasive discussions, and analyzing nuanced content in professional or abstract contexts (Chomsky, 1965).

In sum, while UG does not offer a stage-by-stage developmental model, it supports the STANAG 6001-Bloom's integrated approach by grounding language acquisition in a shared cognitive capability. This universal foundation allows for a structured language learning model, where innate language processing abilities enable learners to move from fundamental linguistic comprehension to high-level cognitive and linguistic functions.

Integrating STANAG 6001 and Bloom's Taxonomy

Synergistic Model

The integration of STANAG 6001 and Bloom's Taxonomy provides a unique approach: one whole and integrated methodology by which learning a language advances linguistic proficiency while developing the cognitive flexibility that enables higher-order thinking tasks. STANAG 6001 provides that such learners will achieve balanced development of proficiency in listening, speaking, reading, and writing via structured levels on a clear progressive scale. However, STANAG 6001 in itself does not take into consideration the mental load that language learning imposes on the brain. This is where Bloom's Taxonomy plays an important role.

Bloom's Taxonomy is more critical as a hierarchical framework in guiding the cognitive development that occurs along with language learning. By including Bloom's cognitive levels of Remembering and Understanding and going further to Evaluate and Create, this STANAG 6001 framework provides a rich engagement in which learners are really much more than mere passive recipients of pure vocabulary or grammatical rules; they would be able to apply these language skills in performing the high-order intellectual processes. For instance, STANAG 6001 levels 1-2 test-takers are preoccupied with simple activities like listing words or building sentences. This falls within the domain of Bloom's cognition skills of Remembering and Understanding. Consequently, the cognitive load increases as learners progress through the higher levels of STANAG 6001 into more complex activities that embody critical thinking and creativity by meeting higher-order cognitive skills in Bloom's Taxonomy.

This integration allows learners to move from basic communicative tasks—such as ordering food or asking for directions (basic language functions)—to more complex tasks like participating in a debate, negotiating a contract, or analyzing a scientific paper. By combining linguistic proficiency with the development of critical thinking, problem-solving, and creativity, the integrated STANAG 6001-Bloom model prepares learners for real-world communication and decision-making. The model is not just about learning a language; it is about using language as a tool to think, reason, and create, thus ensuring learners develop the full range of intellectual capabilities necessary for personal, academic, and professional success.

Gradual Progression

The advantage of combining STANAG 6001 and Bloom's Taxonomy is a gradual, structured development from simpler to more complex activities, which allows learners to build up both their language and cognitive competencies step by step. At the foundational levels of

STANAG 6001 Levels 1-2-learners are focused on basic language tasks corresponding to Bloom's lower levels of cognition, namely Remembering and Understanding. Activities at this level target the assurance of learners gaining basic fluency for everyday situations, such as greeting, self-introduction, and making basic requests. Basic vocabulary acquisition includes grammatical structures and simple conversational skills.

Working one's way up through more sophisticated STANAG 6001 levels, namely Levels 3-4, learners would be introduced to increasingly complex language tasks that correlate with higher-order cognitive functions in Bloom's Taxonomy, namely Applying and Analyzing. Also at these stages, learners are expected to use their language not only routinely but to sustain more challenging activities that involve deeper cognition. For instance, at Level 3, for example, learners would be engaged in reading and analyzing professional documents, understanding abstract ideas, discussing controversial topics, etc.-all of which require the application of higher-order thinking. These activities also call for the learner to employ his/her language skills in tandem with such cognitive strategies as comparison, contrast, and problem-solving.

Finally, at STANAG Level 5, the learners would obtain near-native proficiency and use their language skills to evaluate and create-the highest levels of Bloom's cognitive hierarchy. At this level, the learner should be able to conduct complex intellectual activities such as writing comprehensive reports on analytical findings or engaging in high-level negotiations or drafting persuasive, compelling arguments for intricate issues. On this level, for example, a student could well be listening to a political speech and providing a critical critique, considering how rhetorical devices and language usage were used, and discussing implications of what was involved in the said speech. These complex tasks require the learner to synthesize knowledge, critically evaluate information, and develop original insights through advanced language ability and cognitive skills in solving elaborate real-life situations.

Thus, STANAG 6001 integrated with Bloom's Taxonomy provides a path in a very systematic way so that the learner moves from simple comprehension and reproduction of language forms to complex, abstract uses of language which require deep engagement with cognition. The latter also makes sure that the learner is not only capable of using language but is also equipped with cognitive tools necessary to negotiate the modern academic, professional, and personal ecologies.

Practical Applications: Shaping the Future of Education and Professional Training

The combination of STANAG 6001 and Bloom's Taxonomy brings far-reaching implications into formal education, professional development, and corporate training, among other applied fields in which language proficiency and cognitive skills are central features of the learning process. Furthermore, this synergy allows for more dynamic and relevant curricula to better reflect both aspects: language acquisition and cognitive skill development. This paper explores practical applications within a number of key sectors.

Curriculum Design for Educational Institutions

STANAG 6001-Bloom's integrated model will prove its applicability in a pedagogical environment by redesigning language curricula to express the cognitive development that is occurring parallel to language learning (Cummins, 1979). This merging of such two concepts should encourage educators to shift from the traditional grammar-based approaches onto a model which integrates critical thinking, problem-solving, and creative tasks in the process of language learning.

For instance:

- **Beginner Courses (STANAG 6001 Level 1):** The curriculum at beginner courses may focus on Remembering and Understanding, with simple recall-type tasks such as vocabulary exercises, basic sentence construction, and listening comprehension activities. Cognitive tasks at this level should be designed to make sure learners are building foundational understanding of both language and cognitive skills, such as basic reasoning (Anderson and Krathwohl, 2001).

- **Intermediate Courses (STANAG Levels 2):** At this level, the learners shall be introduced to Applying and Analyzing activities such as reading at an intermediate level, holding simple conversations, and applying their language skills in practical contexts. For instance, such work could involve role plays, description of people, places and things, providing detailed instructions or basic problem-solving using the language (Cummins, 1979).

- **Advanced Courses (STANAG Levels 3-4):** These courses should consequently focus on more Evaluating and Creating-type activities. In this respect, the learners may be tasked to analyze some very complex professional documents, synthesize various sources of information into something coherent and meaningful, or even create an original piece of writing that is representative of their current state of nuanced use of not only the language but also the subject matter at hand. The cognitive challenge increases at these higher levels of cognitive demand to prepare the learner for real-life professional communication and decision-making that is likewise complex (Anderson and Krathwohl, 2001).

Corporate and Professional Training

Effective communication and critical thinking are always crucial in professional dealings. Businesses involved in international environments require individuals who can transcend language barriers and, concurrently, analyze data, review strategies, and create novel solutions (Krashen, 1982).

- **Corporate Training Programs:** Companies can implement the STANAG 6001-Bloom's model to develop both language proficiency and strategic thinking in their employees. For instance, employees in international sales might be trained not only in language skills but also in persuasion techniques and negotiation strategies that require higher-order cognitive functions. Training programs could include simulations, case studies, and role-play scenarios that challenge participants to think creatively while using their language skills in a real-world professional context (Bialystok, 2009).

- **Diplomatic and Government Training:** The integration of STANAG 6001 and Bloom's Taxonomy clearly finds applications in areas to do with diplomacy and international relations. In light of the operations that take place, diplomats and public officials are often at the front lines in the need to work across languages and cultures, requiring much more than linguistic proficiency: an ability for geopolitical analysis, evaluation of competitive perspectives, and negotiating compromise. It would also be useful to design a training module for diplomats in which the more analytical tasks of analyzing policy documents or debating foreign policy strategies are included alongside more basic language development activities (Swain, 2006).

Military and Defense Training

Since STANAG 6001 is already a NATO-developed standard, it finds widespread application in military contexts. On the other hand, the integration of Bloom's Taxonomy elevates military language training to a whole new level, with critical thinking and strategic decision-making abilities now found right at its core. Military personnel are frequently faced with real situations that are not only complex but usually rapidly changing, where effective communication and receipt, assessment, and strategic planning of intelligence information is at a premium (Sweller, 1988).

Thus, the STANAG 6001-Bloom's model could be used in military language programs to train military personnel not just to communicate simple ideas but also in how to think analytically, for example, interpreting intelligence reports, identifying potential threats, and making decisions based on incomplete or ambiguous information (NATO Standardization Agency, 2010).

Fostering Lifelong Learning and Learner Autonomy

Among the most important strengths of the STANAG 6001-Bloom model is that it provides a great potential means whereby learners can reach both learner's autonomy and life-long learning. Precisely as observed in today's faster moving interdependent world, people need to update their skills constantly for them to be competitive in the job market and cope with the emerging problems (Krashen, 1982; Cummins, 1979). It combines language proficiency with cognitive development and, as such, helps the learner to take ownership of learning and view language acquisition as integral to the lifelong process of growth and self-improvement.

Learner Autonomy

Bloom's Taxonomy integrated into language education would provide the learner both linguistic and cognitive development through clearly pre-defined and highly structured benchmarks (Anderson and Krathwohl, 2001). In such dual foci, learners are able to conceptualize their improvement, recognize areas that require attention, and set feasible and realistic goals. In working their way through the STANAG 6001 levels, learners are increasingly expected to create complex tasks that call for application, analysis and evaluation, and even creation—again, moving from passive learning to active engagement (Cummins, 1979).

This begets active learning-approach wherein a feeling of agency and self-efficacy is developed among learners. For instance, students at STANAG 6001 Level 2 may be asked to establish personal goals concerning practical, functional usage of language, like preparing for job interviews or traveling to a foreign country. Moving to higher levels, such as STANAG 6001 Level 3, for example, may also include more cognitively demanding activities related to the writing of essays which include analysis of abstract concepts from various areas (such as economics, culture, science, and technology). Such a goal-oriented approach enables learners to assume ownership of their learning curve and thus become autonomous and motivated social actors in their own learning process (Swain, 2006).

Lifelong Learning

STANAG 6001-Bloom's model closely shares affinity with the principle of lifelong learning, given that it fosters continued development in language and cognitive skills long after formal instruction has stopped (Krashen, 1982). Since the model provides clear guidelines through which language proficiency and intellectual growth are planned, it ensures that a growth mindset is instilled-the belief that one's intelligence and skills can continually be developed through dedication and effort (Dweck, 2006). This method, therefore, cultivates a love for lifelong learning by encouraging individuals to pursue more learning either through schooling or self-study to develop skills throughout life continuously (Swain, 2006).

Motivation for lifelong learning in professional settings allows career growth. Employees possess better linguistic and cognitive flexibility, so they can reach better positions at their place of employment, bringing more organizational achievements. Persons who welcome lifelong learning, considering the globalization pressures on effective communication and critical thinking, set themselves up for success through varied industries and roles (Illeris, 2018; Kyndt & Baert, 2013; Poorkavoos & du Plessis, 2019).

Real-World Applications of Lifelong Learning

This is especially underlined for professional contexts, where there is a great urge to constantly update and expand the skill portfolio for full functionality in fast-developing fields (Illeris, 2018). The special relevance of STANAG 6001 is in industries that presuppose multilingualism and cognitive flexibility for successful performance. Unlike the more traditional models of multilingual learning, which have a heavy emphasis on language proficiency, the STANAG 6001-Bloom model is uniquely integrated with the development of cognitive skills along with language acquisition. This merges into providing professionals with dual skills-enhanced language proficiency, combined with advanced cognitive abilities-which enables them to rise to higher levels of complexity within their respective fields. Specific examples of sectors that benefit from this unique model are highlighted below:

Global Business: Within the global economy, an employee able to communicate effectively across cultures and to present high-level analytical skills is priceless. The model STANAG 6001-Bloom's for business people enables them to acquire their multilingual

skills and to be capable in critical analysis, strategic thinking, and negotiation. STANAG 6001 levels coupled with the cognitive stages of Bloom train professionals in tackling complex scenarios relating to business, such as data analysis, negotiation of contracts, and the creation of strategy that requires synthesis and innovation.

This systematic, step-by-step approach ensures that language ability is progressive with the cognitive capability to enable working professionals to cope with dynamic cross-cultural interactions and to make strategic decisions for enterprise success (Bialystok, 2009).

Medical field: Multilingualism greatly contributes to communicating with patients speaking different languages and interaction with the staff from other parts of the world. Health professionals, however, need to take urgent decisions concerning patient's life, which requires them to be precise at the same time work with partial and uncertain information. The STANAG 6001-Bloom's model aims to satisfy these demands by ensuring linguistic proficiency and cognitive competencies for critical thinking and solving problems under pressure. Such capabilities include, but are not limited to, complex diagnostic discussions between a health professional who has undergone the training in the model, reading medical research across diverse languages, and applying analytical thinking to patient care. The STANAG 6001-Bloom's model, therefore, goes beyond mere language acquisition and equips health professionals with critical thinking and decision-making qualities central to effective patient management in multicultural and high-pressure situations (Swain, 2006).

Academia and Research: Lifelong learning for academics and researchers is inclusive not only of creating original knowledge but also synthesizing information from various sources and critically evaluating research findings. The STANAG 6001-Bloom's model will provide academics with both linguistic dexterity and cognitive skills in preparation for meeting expectations in international scholarly environments. By this alignment of the STANAG 6001 levels with Bloom's cognitive hierarchy, in turn, this model will allow the researchers not only to consider complex ideas in many languages, to collaborate with their international peers, but also to critically evaluate interdisciplinary studies. Such a double focus provides them with the opportunity to be meaningfully involved in worldwide research and to effectively participate in scholarly discussion, with both language and cognition creating and communicating impactful research insights (Illeris, 2018; Cummins, 2019).

In brief, STANAG 6001-Bloom's model presents certain privileges peculiar to integrating language proficiency and cognitive skill development. It aims to equip professionals from diversified backgrounds for a successful career by arming them with the ammunition of effective communication and critical thinking so as to handle with ease the most complex demands of their particular professions. It offers a systematic and progressive framework that aligns cognitive skills with language acquisition and thus lifelong learning, enabling individuals to be successfully operating in an increasingly interconnected and cognitively demanding global environment.

Technological Integration: Leveraging AI and Digital Tools in Language and Cognitive Learning

Nowadays, AI-powered tools and digital-era adaptive learning technologies open new pathways to improving the STANAG 6001-Bloom's model in a way that allows educators to scale up the implementation of the model and offer learners personalized, interactive experiences better aligned with each learner's progress (Luckin et al., 2016). The new online learning environments, interactive simulations, and virtual learning environments shape the educational landscape by continuing to advance real-time feedback in order to provide individual learning opportunities not only in the development of language competence but also for cognitive development (Johnson et al., 2011).

Adaptive Learning Platforms

With centralism in providing personalized learning experiences, AI-powered adaptive learning platforms draw from the continuous data created by the individual learners to dynamically regulate the task difficulty and type in correspondence with the development of the learner (Fisher et al., 2019). It ensures a student is always confronted with a challenge that is neither more nor less burdensome than the student's cognitive complexity and linguistic proficiency can bear.

For example, while a trainee at STANAG Level 3 may be dealing with tasks that are some form of critical analysis of professional texts or debate, whereby there is a need to weigh points of view, at STANAG Level 4, the online learning platform has them create original presentations or even write reports showing critical thinking and creativity. This form of adaptiveness in learning ensures parallel development in cognition, just like in language acquisition, and provides the best possible and personalized learning experience (Johnson et al., 2011).

AI-Powered Assessments

AI has increasingly become part of assessment, especially in the area of language proficiency and cognitive activity. While traditional assessments focus on linguistic accuracy, AI-powered assessments could use systems such as Natural Language Processing not only to grade grammatical correctness but also to go a step further in identifying the depth of critical thought a learner is demonstrating. These assessments include immediate feedback, not only on how effectively one communicates, but on how effectively an individual engages with higher-order cognitive activities (Gikandi et al., 2011).

For instance, an AI-powered test at the STANAG 6001 Level 4 may have the learner evaluate complicated argumentation or synthesize information from varied sources. It has the capacity to grade the learner for their understanding, critique, and construction of meaningful responses such that they develop high-order cognitive skills necessary to thrive both in the profession and academia (Luckin et al., 2016).

Online Learning and Virtual Classrooms

Increased access to online learning platforms and virtual classrooms has eased implementation of the STANAG 6001-Bloom's model in various educational settings

whereby tutors can reach students anywhere in the world (Johnson et al., 2011). In this regard, online learning environments provide very effective platforms for collaborative learning and skills development in higher order thinking.

Application, analysis, and creation by the learner will be provided through learning activities including discussion forums, interactive simulations, and group projects. An extremely good example could be a group project wherein learners would be engaged in a virtual project to analyze complex issues, considering solutions for a problem orally and in written presentations of the findings (Gikandi et al., 2011). Interaction and collaboration of this type deepen engagement both with the language and with the cognitive skills necessary for academic and professional accomplishment.

Interactive Simulations and Virtual Reality (VR)

Virtual Reality (VR) and interactive simulation in this respect are increasingly revolutionizing language and cognition tuition, putting the student into a virtual environment where they can take part in real-life situations in the target language. Such a simulation would require learners to navigate not only linguistic difficulties but also cognitive tasks involving problem-solving and decision-making (Merchant et al., 2014).

This could also afford, for example, VR training on how the trainee goes about negotiating in a place of work or attending a meeting where they are bound to use only the target language to get their way, analyze information, and make decisions on incomplete and evolving data. Virtual reality immersion naturally makes sure that learners do more than just apply their language; they enjoy real-time cognitive engagement to nurture their ability for critical thinking in the most complex situations (Johnson et al., 2011).

Gamification in Language Learning

So far, gamification has proved to be one of the strong means to integrate the STANAG 6001-Bloom's model into the digital learning environment (Deterding et al., 2011). Gamification uses game-like elements, points, levels, challenges, and rewards-so that learners have an active engagement with the learning material, showing measurable progress.

In this gamified system, learners may be taken through stages of challenges that align with Bloom's stages of cognitive development: early, simple recall and understanding exercises and higher-order challenges that require creative tasks like the writing of a persuasive essay or solution design for a real-world problem in the target language (Deterding et al., 2011). Such embedding of language learning into gamified cognitive tasks provokes continuous engagement that promotes proficiency and the development of higher-order thinking.

Data Analytics for Personalized Feedback

Data analytics from AI-powered learning platforms may provide insight into the process of learning through such metrics as time on task, success rates, and patterns of language use. Such data can feed back into personalized feedback both for learners and educators themselves (Gikandi et al., 2011).

Also, it allows the learner to get instant feedback concerning progress. With data analytics,

learners receive real-time feedback on their progress, insights into how they are progressing on both STANAG 6001 levels and Bloom's cognitive stages, and thus make informed decisions regarding their learning pathway and further actions (Zawacki-Richter et al., 2019). Data analytics tools enable the educator to tailor instruction so that each student is appropriately challenged by considering the student's demonstrated strengths and weaknesses.

Data analytics make feedback and instruction more personalized and effective in meeting specific needs, therefore enhancing the efficiency of STANAG 6001 through Bloom's model by improving the effectiveness of the overall learning experience (Luckin et al., 2016). The combination of AI-powered tools, adaptive learning platforms, interactive simulations, VR, gamification, and data analytics has brought an immense change to the way languages and cognitive skills are taught. Such technologies underpin the model of STANAG 6001-Bloom through personalized, immersive, and engaging learning experiences that foster proficiency in both languages and higher-order cognitive competencies. As these tools continue to evolve, it will be around them that the future of language education is shaped; they will afford new opportunities for the learner and educator to excel in linguistic and intellectual development (Merchant et al., 2014; Johnson et al., 2011).

Conclusion

STANAG 6001 combined with Bloom's Taxonomy effects a conceptual transition in the direction of language education. This model connects linguistic proficiency to cognitive development in ways that previous approaches have not, and in so doing, it offers greater depth necessary to prepare learners for the complexities facing them in the modern world.

This unique paradigm encourages teachers to treat language not only as a means of communication but also as a determinant in the development of cognition. Higher-order thinking tasks, such as analysis, evaluation, and creative expression, are represented in language teaching, which thus arms learners with the necessary equipment to face everyday challenges. Applications go further than the school, incorporating corporate training, diplomatic service, as well as military education and training.

It targets learner autonomy and lifelong learning in that a person will continuously be upgrading his or her skills throughout his or her life. In a world characterized by multilingualism and cognitive flexibility, the STANAG 6001-Bloom's model places the learners in the driving seat concerning their learning process, in that they become critical thinkers, innovators, and communicators.

Perhaps most exciting, though, is that technology itself is integrated in a way to make learning outcomes even better. AI-powered tools, adaptive platforms, and virtual simulations bring interactions with customized learning environments which makes language education more accessible and impactful for the learner.

Fundamentally, the integration of STANAG 6001 and Bloom's Taxonomy offers a future focus in language education that develops proficiency, intellectual resilience, and innovative capability in living in an interdependent world. This model, therefore, in application during education, can make teaching and learning of the language vibrant enough to match the rapidly increasing need to bring up individuals capable of leaving a mark globally.

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*papers in the journal:

Butler, S. (2020) 'Women's fashion manufacturer to make reusable gowns for NHS', *The Guardian*, 28 April. Available at: <https://www.theguardian.com/society/2020/apr/28/womens-fashion-manufacturer-to-make-reusable-gowns-for-nhs> (Accessed: 29 April 2020).

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Skopje, 23.12.2024

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