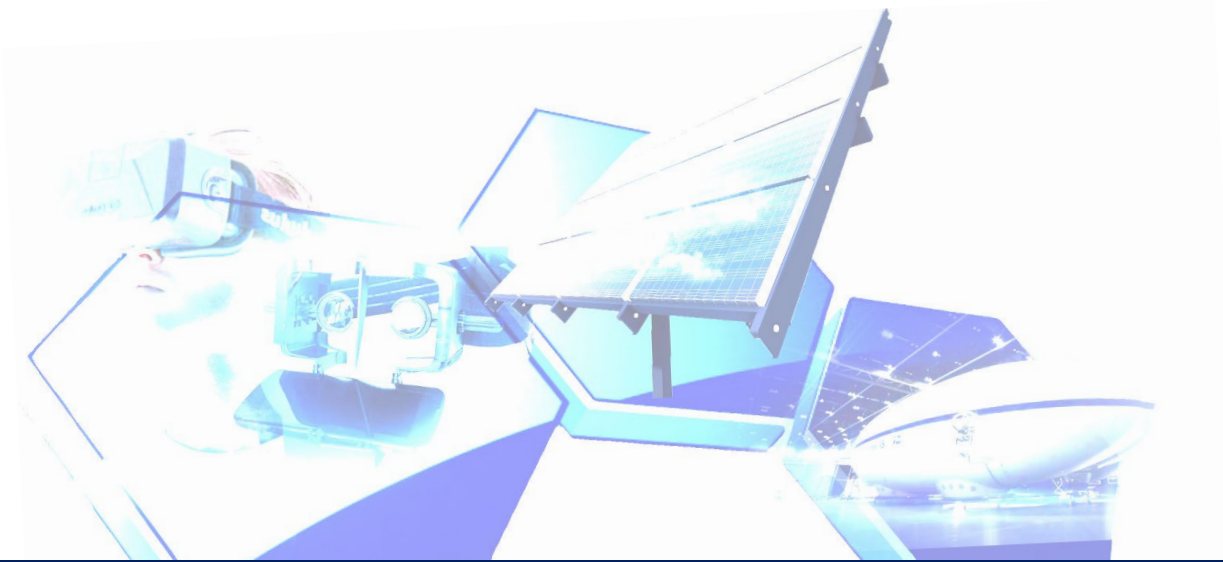




International scientific conference

ProConferenceOrg



International scientific publication

C **Scientific and technological revolution of
the XXI century '2024
onference proceedings**

APRIL '2024

*Series Conference proceedings
SW-Ger conference proceedings*

Published by:
Sergeieva&Co
Karlsruhe, Germany

UDC 08
BBK 94

Series «SW-Ger conference proceedings»

Reviewed and recommended for publication
The decision of the Organizing Committee of the conference
"Scientific and technological revolution of the XXI century '2024"
No 32 on April 20, 2024

Organizing Committee: More than 350 doctors of science. Full list on page:
<https://www.proconference.org/index.php/gec>

DOI: 10.30890/2709-1783.2024-32

Published by:
ProConferenceOrg in conjunction with
Sergeieva&Co
Lußstr. 13
76227 Karlsruhe, Germany
Articles published in the author's edition

Copyright
© Collective of authors, scientific texts, 2024
© ProConferenceOrg, general edition and design, 2024

ISBN 978-3-98924-045-2

УДК 336.27

ANALYSIS OF UKRAINE'S DEBT SECURITY: PROSPECTS AND CHALLENGES**АНАЛІЗ БОРГОВОЇ БЕЗПЕКИ УКРАЇНИ: ПЕРСПЕКТИВИ ТА ВИКЛИКИ****Vinnytska O.A. / Вінницька О. А.***PhD in Econ., as.prof. / к.е.н., доц.*ORCID: <https://orcid.org/0000-0001-6402-6451>**Korniienko T.O. / Корнієнко Т.О.***PhD in Econ., as.prof. / к.е.н., доц.*ORCID: <https://orcid.org/0000-0001-8020-0771>*Pavlo Tychyna Uman State Pedagogical University, Uman, Sadova, 2, 20301**Уманський державний педагогічний університет**імені Павла Тичини, м. Умань, Садова, 2, 20301*

Abstract. *It is substantiated that the conditions of military conflict emphasise the importance of security issues in all spheres of the State's life. The country, in the face of a budget deficit, is forced to seek assistance from Western partners and international financial institutions. The article shows that in case of a large budget deficit, foreign aid affects the functioning of the public sector of Ukraine's economy, contributing to a balanced monetary and financial state of the country. Ukraine's resilience is formed both by the functioning of the security and defence sector and by the country's economic potential. It is determined that effective management of the level of debt security is possible by optimising the structure of public debt in terms of the currency of borrowing, maturity, and also by directing the funds received from public borrowing to the development of the state economy. A successful solution to the debt problem can significantly improve the state of public finances, increase the resilience of the national economy to internal and external threats, and create favourable conditions for economic growth during the period of economic recovery in Ukraine.*

Keywords: *budget deficit, public debt, debt security, economic security of the state, financial assistance, financial resources, public finances.*

Introduction

The global financial system has undergone significant changes in recent years. Today, it is almost impossible to find a country that does not use borrowed funds. The government's use of debt is driven by a lack of its own financial resources to cover the state budget deficit, implement projects, support the national currency, etc. If used efficiently, borrowed funds can become an effective factor in ensuring economic growth. However, an excessive and uncontrolled increase in debt obligations may negatively affect the economic independence of the state and become a burden for the national economy.

February 2022 marked a new stage in the revision of key principles and norms of life in Ukraine. Full-scale aggression, which effectively replaced the hybrid war, has necessitated transformations in public policy and the functioning of public institutions. National security and defence issues have come to the fore. However, this does not justify ignoring the complex economic issues that have been accumulating throughout the years of independence. Ukraine's public debt management has become an example of such economic difficulties. For a number of objective and subjective reasons, our country has systematically resorted to borrowing. While budget deficits and public debt are commonplace in any modern

economic model, in Ukraine these issues are becoming particularly acute, largely due to the influence of political factors. Under such conditions, when the ability to execute the state budget in terms of revenues has sharply decreased, we are witnessing an extraordinary increase in various risks related to Ukraine's debt security. Thus, it becomes important to conduct research aimed at creating optimal models of public debt management in Ukraine both at the current moment and during the period of post-war recovery of our country.

The study of debt security is the subject of attention of key international financial institutions, such as the International Monetary Fund (IMF), the World Bank (WB), the Organisation for Economic Co-operation and Development (OECD), and many scholars of different periods. In Ukraine, steps are being taken to formalise the concept of "debt security", define its criteria, indicators, management methods and tools, and the determinants of achieving it within the framework of maintaining the overall sustainability of public finances.

The problems of debt security have traditionally attracted the attention of economists and management practitioners, as it is a critical component of macroeconomic stability and balanced development of public finances in the country.

Since the problems of public debt and debt security in Ukraine have been relevant for many years, they have been actively discussed in the academic community. The state of Ukraine's public debt was analysed in detail in the work of O. Stoyko and I. Shubenko (2021). The impact of public debt on the financial security of Ukraine was studied in the works of O. Brezhneva-Yermolenko and A. Kharytonenko (2021), as well as S. Moroz (2017). The level of Ukraine's debt security was assessed in M. Fominykh and A. Parfeniuk (2021). The concept and significance of Ukraine's public debt under martial law were considered by A. Garbinska-Rudenko and O. Liamzina (2022). However, in the context of the rapid increase in public debt due to the intensification of the military conflict, the recommendations developed in previous studies need to be adjusted in accordance with the changing economic situation in the country.

Main text

In the context of military conflict, security issues come to the fore in all spheres of state life. Since the army's combat capability depends to a large extent on financing its needs, the problem of finding additional financial resources is becoming more acute. However, the economy is currently unable to cope with this task due to the destruction of the material and technical base and logistics routes, military mobilisation of some employees, the outflow of labour resources abroad and other factors resulting from the armed aggression. Therefore, the search for ways to improve debt security in the context of a military conflict is of utmost importance.

By the end of 2022, Ukraine's GDP fell by almost a third, industrial production by 43.1%, agricultural production by 28.4%, construction by 67.6%, and exports by 42.4% [2]. Direct damage to infrastructure is estimated at \$144bn. [12]. About 8 million Ukrainian citizens have moved abroad, 53% of them are people of working age, and 35% are children. At least 109 large and medium-sized enterprises of various forms of ownership have suffered direct losses, and the total amount of damage is estimated at \$13 billion. Experts estimate that 19 (17%) of the large and

medium-sized enterprises were completely destroyed, while another 90 (83%) were partially damaged. Only about 40% of small and micro enterprises are operating at full capacity [8]. This situation has had a negative impact on the business activity index, which has fallen to 35%. The unemployment rate is 25-26% [14]. At the same time, defence spending has increased 9 times [3]. Every month, UAH 130 billion is spent on military needs, while revenues amount to only UAH 80 billion [15].

Since the beginning of Russia's armed aggression, external financial assistance has played a crucial role in ensuring external stability of the economy, neutralising inflation and providing public social services. External financing reached \$31.1 billion in 2022. This figure is expected to gradually increase in 2023. The main creditors of the Ukrainian government were the World Bank, the governments of Canada, the United Kingdom, Japan, France, the Netherlands, Italy, and the IMF. External loans accounted for 54% and grants for 46% of all external financing. However, such financing and the predominance of credit sources lead to high risks of a debt crisis. Moreover, only social payments and the functioning of the state are financed with international assistance. Domestic budget revenues (taxes, loans, privatisation proceeds, etc.) are used for military spending.

To assess risks and find existing threats, it is advisable to examine the indicators of public debt and state budget execution for 2022-2023 (Tables 1 and 2).

Table 1 - Ukraine's public and guaranteed debt in 2022-2023, USD bn US DOLLARS*

Indicators	2022	2023
Total public and publicly guaranteed debt	111,38	119,91
Public debt	101,59	110,62
Domestic public debt	38,00	39,51
External public debt	63,59	71,11
Guaranteed public debt	9,78	9,29

*Source: <https://minfin.com.ua/>

Table 2 - State budget execution*, UAH mn

Indicators	2022 actual	2023 plan
revenues	1787395,60	239511,10
expenses	2705423,30	4058134,95
lending	-3326,00	-3250,00
Balance (budget deficit), %	-17,62	-25

*Source: <https://mof.gov.ua/>

Thus, all public debt indicators are gradually increasing. External debt averages 60% of the total. Until 2022, the government tried to reduce the share of external debt, but the Russian invasion made adjustments. External loans are attracted in foreign currency, which makes this part of the debt extremely vulnerable to hryvnia fluctuations: as soon as the national currency starts to fall, the debt burden on the budget will grow rapidly. Table 2 shows that 2022 ended with a budget deficit of

UAH 914.7 billion, or 17.62%. Due to the war, the state is forced to increase budget expenditures, and in 2023 the situation is unfortunately similar, with a forecast of 20-30%. In the face of a budget deficit, the state is forced to seek help from Western partners and international financial organisations.

Looking at the materials on forecasting the state of Ukraine's public debt, it should be noted that the International Monetary Fund expects Ukraine's public debt to grow in the following years: in 2023, Ukraine's debt will amount to 78% of GDP, in 2023, 2024 - 78.7%, 2025 - 82.9%, 2026 - 88.7%, and 2027 - 92.3% [16].

According to the Ministry of Finance of Ukraine, foreign private investors have been asked to agree to the terms of deferred payments on public debt. At the same time, the Cabinet of Ministers of Ukraine signed an appeal to impose a two-year moratorium on the repayment of European bonds. According to the Ministry of Finance of Ukraine, since February 2022, Ukraine has already paid more than a billion dollars on its debt obligations. However, despite the financial support of Ukraine from Western countries, the government is still forced to seek help from the National Bank of Ukraine, which may increase inflationary processes in the country [6].

Conclusions

Under such conditions, the level of economic security of the state, including such a component as debt security, has significantly decreased. Despite significant international financial support for Ukraine through grants, the level of public debt has increased significantly [7]. This threatens not only to underfund military needs, but may also become an obstacle to Ukraine's post-war reconstruction. The current situation in the country has made its own adjustments to the problem of the state's debt security. In the face of a significant budget deficit, foreign aid to a certain extent ensures the functioning of the public sector of Ukraine's economy and contributes to the balance of the country's monetary and financial position. An effective solution to the debt problem can significantly improve the state of public finances, increase the resilience of the national economy to internal and external threats, and create more favourable conditions for economic growth during the period of economic recovery in Ukraine.

At the present stage, Ukraine's resilience to external aggression is shaped by the functioning of the security and defence sector and its economic potential. As military expenditures scale up, the issue of budget financing and the state's ability to perform its key functions has become an acute one. In the context of the war, it is clear that these tasks cannot be performed without financial assistance from donor countries and organisations. In such circumstances, a number of issues arise regarding the reduction of public debt risks in the post-war period. In our opinion, effective management of the level of debt security is possible through:

- optimising the structure of public debt in terms of the currency of borrowing, maturity and other parameters;
- practical application of the concept of medium-term budget planning;
- improving the practice of publicly guaranteed debt in Ukraine;
- directing the funds received from public borrowing to economic development.

Literature:

1. Brezhnieva-Yermolenko, O. V., & Kharitonenko, A. V. (2021). *Assessment of the impact of public debt on the financial security of the country*. Economic Bulletin of the Dniprovsk State Technical University, 2(3), 46-53. Available at: [https://doi.org/10.31319/2709-2879.2021iss2\(3\).254827pp46-53](https://doi.org/10.31319/2709-2879.2021iss2(3).254827pp46-53).
2. *Change in gross domestic product in 2022*. State Statistics Service of Ukraine. Available at: https://ukrstat.gov.ua/operativ/operativ2022/vvp/ind_vvp/ivvp_22_u e.xls
3. *Defence spending increased 9 times over the year*. Financial Club. Available at: <https://finclub.net/ua/news/vydatky-biudzhetu-na-oboronuza-rik-zrosly-u-9-raziv.html>
4. Fominykh, M., & Parfeniuk, A. (2021). *Assessment of the level of debt security of Ukraine and directions for its strengthening*. Scientific Notes of the National University "Ostroh Academy". Economics Series, 21(49), 109–113. Available at: [https://doi.org/10.25264/2311-5149-2021-21\(49\)-109-113](https://doi.org/10.25264/2311-5149-2021-21(49)-109-113).
5. Harbinska-Rudenko, A. V., & Lyamzina, O. V. (2022). *The concept and significance of the national debt of Ukraine in the conditions of military status*. Analytical and Comparative Jurisprudence, 4, 259-263. Available at: <https://doi.org/10.24144/2788-6018.2022.04.47>.
6. *International experience of public debt restructuring in the context of Ukraine* (2022). National Institute for Strategic Studies. Available at: <https://niss.gov.ua/doslidzhennya/ekonomika/mizhnarodnyy-dosvid-restrukturyzatsiyi-derzhavnoho-borhu-u-vymiri-ukrayiny>
7. Korniienko, T.O., Chvertko, L.A., & Vinnytska, O.A. (2020). *Analysing and assessing the state of economic security of the region*. Economics. Finance. Law, 10/2, 17-22.
8. *Lives on Hold: Intentions and Perspectives of Refugees from Ukraine #2*. Operational Data Portal. Available at: <https://data.unhcr.org/en/documents/details/95767>
9. Moroz, S. V. (2017). *National debt of Ukraine as threat to national safety*. Black Sea Economic Studies, 24, 65-70. Available at: http://bses.in.ua/journals/2017/24_2017/14.pdf.
10. Official website of the Ministry of Finance. Available at: <https://minfin.com.ua/>
11. Official website of the Ministry of Finance of Ukraine. Available at: <https://mof.gov.ua/>
12. *Over the year of war, Ukraine's infrastructure has suffered almost \$144 billion in damage - KSE*. Suspilne news. Available at: <https://suspilne.media/422019-za-rik-vijni-infrastrukturi-ukraini-zavdano-zbitkiv-majze-na-144-mlrd-kse/>
13. Stoiko, O. Ya., & Shubenko, I. A. (2021). *Assessment of the State of Ukraine's National Debt and Directions of its Optimization*. The Problems of Economy, 1(47), 123–133. Available at: <http://dx.doi.org/10.32983/2222-0712-2021-1-123-133>
14. *Unemployment in Ukraine during a full-scale war*. National Institute for Strategic Studies. Available at: <https://niss.gov.ua/news/komentari-ekspertiv/>

bezrobittya-v-ukrayini-v-period-povnomasshtabnoyiviyny

15. *Ukraine spends \$130 billion on the military campaign every month.* Ukrinform. Available at: <https://www.ukrinform.ua/rubric-economy/3688990-ukraina-somisacavitracae-na-voennu-kampaniu-130-milardiv.html>

16. *Ukrainian state debt to rise to over 85% of GDP this year - IMF.* Ukrainian Pravda: Economic truth. Available at: <https://www.epravda.com.ua/news/2022/04/20/686015/>

УДК 625.1

PREREQUISITES FOR THE INTEGRATION OF THE RAILWAY NETWORK OF UKRAINE INTO THE TRANS-EUROPEAN TRANSPORT NETWORK

ПЕРЕДУМОВИ ІНТЕГРАЦІЇ ЗАЛІЗНИЧНОЇ МЕРЕЖІ УКРАЇНИ ДО ТРАНСЄВРОПЕЙСЬКОЇ ТРАНСПОРТНОЇ МЕРЕЖІ

Balesta O.S. / Балеста О.С.

postgraduate student / аспірант

State University of Infrastructure and Technologies,

Kyiv, Kyrylivska, 9, 04071

Державний університет інфраструктури та технологій,

Київ, вул. Кирилівська, 9, 04071

Анотація. В роботі розглядаються основні передумови, які формують потребу у інтеграції української залізничної мережі до Трансєвропейської транспортної мережі (TEN-T), з урахуванням існуючих викликів, у тому числі військових, економічних та торгових тенденцій, а також існуючих законодавчих засад та ініціатив Європейського Союзу в контексті розширення мережі TEN-T

Ключові слова: Інтеграція, залізнична мережа України, Трансєвропейська транспортна мережа.

Abstract. The work considers the main prerequisites that shape the need for the integration of the Ukrainian railway network into the Trans-European Transport Network (TEN-T), considering existing challenges, including military, economic, and trade trends, as well as existing legislative principles and European Union initiatives in the context of TEN-T network expansion.

Key words: Integration, railway network of Ukraine, Trans-European transport network.

Вступ.

У сучасному світі, де глобалізація та інтеграція стають ключовими факторами розвитку, транспортні мережі відіграють важливу роль у забезпеченні ефективного обміну товарів та послуг.

За останні роки Україна стикається зі значними транспортними викликами спричиненими військовою агресією проти України [1] та економічним курсом розвитку країни в частині незворотності євроінтеграційних процесів [2]. Залізнична транспорт в Україні не є виключенням та має величезний потенціал для подальшого розвитку та інтеграції до європейської транспортної мережі.

Для успішного розгляду проблематики інтеграції національної залізничної мережі необхідно врахувати ряд важливих довгострокових та короткочасних передумов, у тому числі геополітичних, які сформували запит на здійснення відповідної інтеграції.

Основний текст

Одним із головних навантажень на транспортну систему України, у т.ч. залізничну, є значна зміна логістичних шляхів через військову агресію з боку Російської Федерації. Військова агресія Російської Федерації спричинила значні обмеження морських експортних шляхів з переорієнтацією вантажопотоків до кордонів з країнами членами ЄС. Так станом на 16 червня 2022 року на мережі АТ «Укрзалізниця» (національний залізничний перевізник та оператор інфраструктури в Україні) було зафіксовано близько 42 000 вантажних вагонів,

CONTENTS**Innovative engineering, technology and industry**

<https://www.proconference.org/index.php/gec/article/view/gec32-00-008> 3

INTERNET OF THINGS TECHNOLOGIES FOR MONITORING
ATMOSPHERIC AIR POLLUTION

Bohdan S.A.

<https://www.proconference.org/index.php/gec/article/view/gec32-00-011> 5

DETERMINATION OF THE RELATIVE SPEED FOR SCREENING
BULK MATERIALS

Fedoriv V.M., Stechyshyn M. S., Martynyuk A.V., Kurskoi V.S., Pereima A.R.

<https://www.proconference.org/index.php/gec/article/view/gec32-00-024> 10

IMPLEMENTATION OF ADVANCED SIGNAL PROCESSING
TECHNOLOGIES IN METAL DETECTORS: INCREASING
THE ACCURACY AND EFFICIENCY OF DETECTION

Vintoniak V. M.

<https://www.proconference.org/index.php/gec/article/view/gec32-00-026> 15

EXPERIMENTAL CRYOGENIC THERMISTORS BASED ON
DISPERSED GERMANIUM

Gorbachuk M.T., Khlebnikova V.O.

Computer science, cybernetics and automatics

<https://www.proconference.org/index.php/gec/article/view/gec32-00-018> 19

LOAD TESTING AND DATA RETRIEVAL OPTIMIZATION IN
ENTITY FRAMEWORK CORE

Biloborodko O.I., Voronin R.V.

Security systems in the modern world

<https://www.proconference.org/index.php/gec/article/view/gec32-00-016> 25

ANALYSIS OF UKRAINE'S DEBT SECURITY: PROSPECTS AND
CHALLENGES

Vinnytska O.A., Korniienko T.O.

Development of transport and transport systems

<https://www.proconference.org/index.php/gec/article/view/gec32-00-017> 31

PREREQUISITES FOR THE INTEGRATION OF THE RAILWAY NETWORK
OF UKRAINE INTO THE TRANS-EUROPEAN TRANSPORT NETWORK

Balesta O.S.

Architecture and construction<https://www.proconference.org/index.php/gec/article/view/gec32-00-022>

34

**NEW TECHNOLOGIES OF GREEN CONSTRUCTION:
SUSTAINABILITY OR GREENWASHING?***Lepska L.A.***Physics and mathematics**<https://www.proconference.org/index.php/gec/article/view/gec32-00-019>

37

**STUDY OF THE NUMERICAL CHARACTERISTICS OF
A RANDOM VARIABLE - KURTOSIS***Borysov Ye. M., Melnyk O.O.***Chemistry and pharmaceuticals**<https://www.proconference.org/index.php/gec/article/view/gec32-00-004>

40

**RESEARCH ON THE DEVELOPMENT OF A LIQUID EXTRACT
BASED ON FRESH AND DRY FLOWERS OF *ROBINIA
PSEUDOACACIA****Aleksandrova O. I., Tanina M. S.***Medicine and healthcare**<https://www.proconference.org/index.php/gec/article/view/gec32-00-023>

43

**VASCULAR STIFFNESS GENDER CHARACTERISTICS IN
PATIENTS WITH ARTERIAL HYPERTENSION***Zolotarova N.A.***Agriculture, forestry, fisheries and water management**<https://www.proconference.org/index.php/gec/article/view/gec32-00-003>

48

**NOVOALEKSANDROVSKAYA SUFFOLK PUNCH BREED
LINES ANALYSIS IN DIFFERENT STUD FARMS.***Brovko O.V.***Economy and trade**<https://www.proconference.org/index.php/gec/article/view/gec32-00-001>

54

**IMPROVING THE MECHANISM OF ORGANIZATIONAL ENSURING
THE FINANCIAL SECURITY OF BUSINESS ENTITIES***Yeletskykh S.Ya., Borysova S.Ye., Kruk O.M.*

<https://www.proconference.org/index.php/gec/article/view/gec32-00-010> 58

ECOLOGICAL AND ECONOMIC COMBINATION AND
COORDINATION OF ACTIONS OF THE BASIS FOR
THE DEVELOPMENT OF UKRAINE

Grakhov A., Zhuravska N.

Management and marketing

<https://www.proconference.org/index.php/gec/article/view/gec32-00-005> 61

SUPPLY CHAIN RISK MANAGEMENT STRATEGIES IN THE ERA
OF GLOBAL TURBULENCE AND ARTIFICIAL INTELLIGENCE

Smerichevska S.V.

<https://www.proconference.org/index.php/gec/article/view/gec32-00-015> 65

THE ROLE OF REFLEXIVE MECHANISMS IN THE DECISION-
MAKING PROCESS

Maksymchuk N.

<https://www.proconference.org/index.php/gec/article/view/gec32-00-021> 68

INNOVATIVE STRATEGIES FOR MANAGING DEVELOPMENT
IN AN UNSTABLE ENVIRONMENT

Leonov Ya.V.

Education and pedagogy

<https://www.proconference.org/index.php/gec/article/view/gec32-00-020> 73

INNOVATIONS OF THE INTEGRATED COURSE
«GETTING TO KNOW NATURE»

Korshevniuk T.V., Yaroshenko O. G.

Psychology and sociology

<https://www.proconference.org/index.php/gec/article/view/gec32-00-002> 78

THE ROLE OF EMPATHY IN THE FORMATION OF
INTERPERSONAL RELATIONSHIPS

Fedortchouk V.V., Shutiak I. A.

<https://www.proconference.org/index.php/gec/article/view/gec32-00-006> 81

PSYCHOLOGICAL ANALYSIS OF THE PROBLEM OF
PROFESSIONAL BURNOUT

Hradyzhna.A.M.

<https://www.proconference.org/index.php/gec/article/view/gec32-00-009> 87

LEADERSHIP QUALITIES AS AN IMPORTANT CONDITION
FOR THE TRAINING OF FUTURE OFFICERS

Holiardyk N.A.