

MULTIPLICATIVE EFFECTS OF HYBRID THREATS*

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Abstract. The purpose of this article is to develop methodological approaches to assess the likelihood of multiplicative effects of hybrid threat combinations based on their systematization according to the key areas of hybrid confrontation. *Methodology.* Methods of analysis and synthesis are used to identify the key areas of hybrid confrontation; methods of abstraction and generalization – to justify the multiplicative effects of implementing combinations of hybrid threats; method of mathematical modeling – to formalize the criterion of effectiveness of various hybrid aggression tools. The research is based on scientific publications, materials of the State Statistics Service of Ukraine and European analytical services. *Results of the study.* It has been proved that the transformation of modern interstate conflicts takes place in the direction of acquiring by them signs of hybridization, provided that it is understood as a process of using various means of pressure, predominantly of non-military nature. It is argued that the urgent task in the context of counteracting hybrid threats is to assess the probability of multiplicative effects from the implementation of their combinations. The military, economic and information spheres have been identified as key dimensions of the hybrid confrontation. The specifics of hybrid threats in the economic sphere are those that would allow the country initiating the aggression to disguise its participation in the conflict, and the target country to obtain critical resources for the development of its economic system. The essence of synergy and cumulation effects is considered and their interpretation in the coordinates of hybrid warfare is given. The relevant effects are defined as multiplicative, that is, those that have a multiplier effect, providing accumulation (accumulation) and synergy (amplification) from the implementation of threats in different areas of hybrid confrontation. *Practical implications.* Assessing the likelihood of the multiplier effect of a variety of hybrid threats will focus on countering those combinations of threats that can have a significant impact on the political and economic system of the state of hybrid aggression. *Value/originality.* Justification and formalization of conditions for obtaining multiplicative (cumulative and synergistic) effects from the use of various hybrid confrontation tools.

Key words: hybrid threat, spheres of hybrid confrontation, cumulation, synergy, multiplier effect, probability, forecasting.

JEL Classification: F51, F52, O38, H12

1. Introduction

The number and intensity of undisguised military conflicts around the world tends to decrease, giving way to the modern hybrid form of interstate and inter-bloc confrontation. The country initiating the hybrid war seeks to destabilize the internal (political,

economic, legal, social, etc.) environment of the other country, using mainly non-military means of influence. Covert actions and non-military measures are carried out by almost all influential geopolitical players of today as tools to achieve their goals, taking advantage, among other things, of the uncertainty of the

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treatment of hybrid (hidden) tools by international law enforcement. Hybrid threats are difficult to identify because they have their own logic of emergence and escalation, unlike direct threats posed to national sovereignty by military confrontation. The probability of such threats is difficult to assess, while the damage from their occurrence can be catastrophic. The maximum destructive potential of hybrid threats is ensured if the aggressor country implements a comprehensive hybrid war strategy, focused on obtaining negative multiplier effects in various areas of hybrid confrontation. The formation of an effective policy of countering hybrid warfare requires a comprehensive assessment of the impact of various interdependent threats to the development of the national political and economic system of the country targeted for aggression based on their systematization.

2. Analysis of the latest studies and publications

According to the 2010 NATO Strategic Concept, the *threat of hybrid warfare* is defined as an adversary's demonstrated ability to use both traditional and unconventional means, depending on the need to achieve its objectives. As noted in the European External Action Service working paper (2015), hybrid threats are easier to describe than to define terminologically. They describe it as the centralized and controlled use of a variety of overt and covert tactics implemented by military and non-military means. The European Parliamentary Research Service (2015) views hybrid threat as a phenomenon resulting from the confluence and interconnection of different elements that together form a more complex and multidimensional risk. The Joint Communication to the European Parliament and the Council (2016) defines hybrid threats as a combination of traditional and non-traditional methods used by actors to achieve specific objectives while remaining below the threshold of officially declared war. An important feature of hybrid threats, according to the Multinational Capability Development Campaign (2019), is the synchronous use of military and nonmilitary means and their targeting of the enemy's weakest assets. The use of hybrid methods and tools by state or non-state actors aims to realize their own interests, strategies and goals (Saarelainen, 2017).

Ukraine's position in a protracted hybrid conflict suggests a wide range of publications dedicated to exploring the preconditions of hybrid threats to the national economy and their systematization (Martynuk et al., 2018; Hbur, 2018; Akimova, 2018; Tryhub & Misiats, 2019; Fedyna, 2017; Hryshchuk, Zhovnovatiuk & Nosova, 2019; Busol, 2020). Moreover, as thoroughly noted (Fedyna, 2017, p. 57), methodological approaches to the regulation of

hybrid threats in the works of national scientists differ from those applied by European analytical services. In particular, identifying the most vulnerable spheres of influence of hybrid threats is the focus for systematization according to a notional "European" approach. Thus, analysts at the European Parliamentary Research Service (2015) identify hybrid threats such as terrorism, cyber security, organized crime, maritime disputes, space, resource scarcity and covert operations. The Joint Report to the European Parliament and the Council (2016) identifies areas for countering such threats: information, energy, transport and infrastructure, space, military, medical and food security, cyberspace, the financial sector, the manufacturing sector, and the social dimension. The approaches of Ukrainian scholars and analysts focus mainly on establishing the areas of application of hybrid warfare and/or factors influencing the nature of hybrid threats. Thus, Hryshchuk, Zhovnovatiuk & Nosova (2019, p. 54) classify historical, legal, political, economic, informational, technological and social processes in society to factors influencing the hybrid nature of threats in cyberspace. A research team led by V. Martynuk (2018) organizes hybrid threats in the following areas of origin: national; military; law enforcement; information; cybersphere; economy; energy; human rights, national minorities, indigenous peoples and interfaith relations; historical politics. In the papers (Hbur, 2018; Akimova, 2018) identified hybrid threats to Ukraine's economic security in the following areas: military, law enforcement, information, cybersecurity, human rights and national minorities. The lack of a unified approach to the regulation of hybrid threats is understandable, given their diversity and the comprehensive nature of hybrid aggression as an effective method of destabilizing the domestic environment of the target country in all possible directions. At the same time, defining the key areas of hybrid confrontation according to the criteria of necessity and sufficiency will make it possible to predict the amplifying (multiplicative) negative effects of the implementation of a variety of hybrid threats. Accordingly, the purpose of this article is to develop methodological approaches to assess the multiplier effects of combinations of hybrid threats based on their systematization according to the key areas of hybrid confrontation.

3. Discussion and research results

While accepting the descriptiveness of hybrid threats concept (Kofman & Rojansky, 2015; Working document of the European External Action Service of 13.05.2015; Multinational Capability Development Campaign Project, 2019) and based on the understanding of hybridity as the result of a combination of different forms, the following

characteristics of hybrid threats can be identified: combination of traditional and non-traditional methods, flexibility of strategy application, dynamic and inclusive, synchronization and systematization of actions, diversity of forms and methods (diplomatic, military, economic, technological, informational, etc.), simultaneous implementation at different levels, coverage of all spheres and processes of functioning of the target country subject to concentration on the most vulnerable aspects.

Researchers justifiably recognize the information sphere as a key dimension of hybrid warfare (Tryhub & Misiats, 2019; Fedyna, 2017; Hryshchuk, Zhovnovatiuk & Nosova, 2019), as propaganda and disinformation are classic tools for waging asymmetric war and achieving aggressor country goals by non-military means. At the same time, scholars sometimes unnecessarily overlook (Hbur, 2018; Akimova, 2018) such an important area of hybrid conflict as economic. Economic warfare, as a component of hybrid warfare, contributes to the political objectives of the aggressor country by imposing restrictive measures on the target country with different measures of trade and economic policy stringency (sanctions, embargoes, fines, trade disputes, etc.). A long-term policy of retaliatory discrimination can both deplete the economic system of the target country and cause significant damage to the economy of the country initiating the aggression. As research (Tryhub & Misiats, 2019; Kulytskyi, 2016) fundamentally points out, unlike classic warfare, economic relations during hybrid warfare are usually not completely suspended, allowing the aggressor country to disguise its involvement in the conflict and the target country to obtain resources critical to its economic development. The trade and economic relations between Ukraine and the Russian Federation, as parties to the hybrid

conflict, can be considered representative in this case. Despite the constant decline in trade turnover between the countries, both in absolute terms (Figure 1) and in relative terms (Figure 2), Russia remains one of the main trade partners of Ukraine in 2020 (table 1, table 2).

Overall, the Russian Federation accounted for 8.5 % of foreign trade in goods and services in 2020. It should also be noted that Ukraine's traditional dependence on Russian energy resources has persisted for a long time. According to the results of 2019, Russia will continue to be among the main suppliers of fuel and energy resources in Ukraine (Table 3), and in 2020, after a long break, additional imports of Russian gasoline were restored. Despite efforts to diversify sources, which is critical in the context of domestic production deficits, three quarters of imported petroleum products in the first half of 2020 were purchased by Ukraine from Belarus and Russia.

The existence of trade and economic relations with Russia confirms the high level of hybridization of the conflict in the economic sphere with an unconditional decrease in the volume of bilateral foreign trade. The economic sphere can be seen as an important operational space for aggression, since the use of discriminatory instruments of financial, economic and trade pressure can almost always be justified by the protection of national economic interests, import substitution policies, economic expediency and competition for the purposes of hybrid warfare. Thus, the economic sphere should be considered as a key bridgehead of hybrid confrontation and a source of hybrid threats. Meanwhile, equally severe hybrid threats to the country's sustainable development and economic security arise in the information sphere. Disinformation and propaganda measures are the main factor of hybrid influence in the sociopolitical context, and their rapid and precise application, unlike

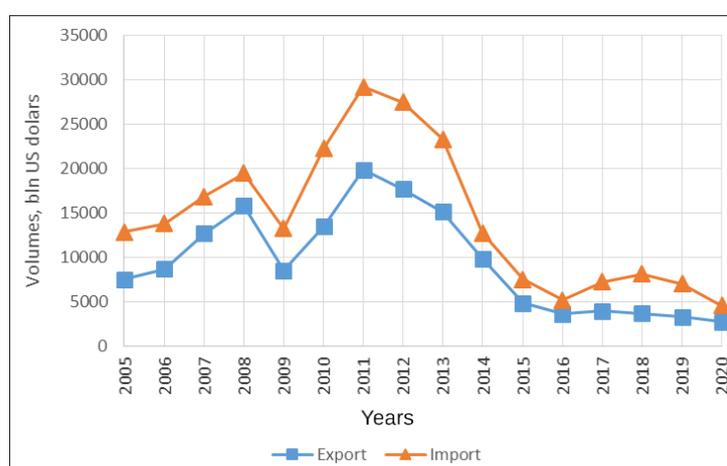


Figure 1. Volumes of foreign trade in goods between Ukraine and the Russian Federation in 2005–2020, billion USD

Source: own study based on data of State Statistics Service of Ukraine

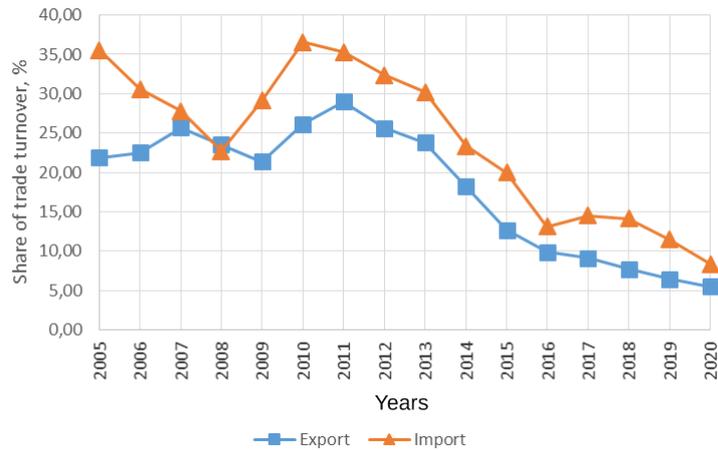


Figure 2. Share of trade turnover with the Russian Federation in Ukraine's foreign trade in goods in 2005–2020, %

Source: own study based on data of State Statistics Service of Ukraine

long-term financial and economic tools, will cause unpredictable emergence and escalation of internal conflicts on religious, ethnic and historical grounds.

Despite the fact that nonmilitary means and measures (diplomatic, legal, economic, ideological,

humanitarian, etc.) form the basis of the hybrid conflict, the military factor continues to be an important component of the hybrid confrontation. The fact that military power is a necessary condition for the realization of the geopolitical and geo-economic

Table 1

Main foreign trade partners of Ukraine in exports of goods in 2020

Country (group of countries)	Export in goods, mln. USD	2020 to 2019, %	Share of total merchandise exports of Ukraine, %
EU (28)	18612,1	89,7	37,8
China	7112,7	198,0	14,5
Russian Federation	2706,0	83,4	5,5
Turkey	2436,3	93,0	5,0
India	1972,1	97,4	4,0
Egypt	1618,2	71,8	3,3
Belarus	1335,3	86,2	2,7
USA	983,9	100,5	2,0
Indonesia	735,6	100,1	1,5
Saudi Arabia	719,0	96,6	1,5

Source: own study based on data of State Statistics Service of Ukraine

Table 2

Main foreign trade partners of Ukraine in imports of goods in 2020

Country (group of countries)	Imports in goods, mln. USD	2020 to 2019, %	Share of total merchandise imports of Ukraine, %
EU (28)	23859,7	95,4	43,9
China	8318,4	90,4	15,3
Russian Federation	4541,8	65,0	8,4
USA	3068,7	93,4	5,6
Belarus	2874,5	76,6	5,3
Turkey	2418,8	102,7	4,5
Japan	1076,4	111,8	2,0
Switzerland	876,0	55,0	1,6
Great Britain	734,2	95,4	1,4
India	721,8	97,4	1,3

Source: own study based on data of State Statistics Service of Ukraine

Table 3

The structure of Ukraine's imports of fuel and energy resources in 2019

Resource type	Importing country	Share in imports, %
Coal	Russian Federation	62,39
	USA	31,76
	Kazakhstan	4,22
	RoW	1,63
Crude oil	Azerbaijan	96,83
	Kazakhstan	1,57
	Latvia	1,40
	RoW	0,20
Petroleum products	Russian Federation	42,92
	Belarus	35,98
	Lithuania	10,80
	RoW	10,30
Natural gas	Slovak Republic	59,6
	Hungary	27,9
	Poland	12,5
	RoW	19,2

Source: based on data on energy imports to Ukraine in 2019

ambitions of the main actors of world politics cannot be eradicated by the transition of modern interstate conflicts to the use of non-military means of destabilization. Strong states implement hybrid initiatives to expand geopolitical influence, including territorial expansion by asymmetric military capabilities against weaker and more vulnerable countries. The military actions of the aggressor state acquire fundamental characteristics that simultaneously demonstrate an advantage in military power and make it difficult to identify the conflict as an open armed confrontation in the case of hybrid aggression. Irregular forces and non-state armed groups become involved actors against independent states with a wide range of destabilizing instruments (guerrilla movement, terrorist actions, subversion, extremism, recidivism, sabotage, etc.).

The rational combination of military and non-military means of hybrid warfare (recognizing the leading role of non-military instruments in achieving its objectives) provides a high level of so-called hybrid uncertainty, which requires maintaining the intensity of the conflict in the target country at a level that makes it impossible to legally justify the intervention of other countries in its resolution. The various instruments applied simultaneously by the initiator of hybrid warfare can have devastating effects on the political and economic system of the target country, by creating a synergistic and cumulative effect.

The cumulative effect (Latin: *cumulatio* – increase, accumulation) is the result of a concentration of actions in one direction and characterizes processes that have life cycles with a set of distinctive characteristics at each stage of development. Hybrid war, as a cumulative process, is characterized by the recognition of a single goal, to which all tools and

effects are subordinated – the force formation of the initiator of political and economic loyalty of the object of aggression. The process of achieving it is determined by the laws of the life cycle, as the potential for efficiency tools is different. It depends on transformations taking place in the social, political and economic life of the target country (change of government, aggravation of internal conflicts, signing of preferential trade agreements, etc.), as well as at the global level (post-pandemic crisis, loyalty of leading geopolitical actors, competition, protectionist trends, etc.). The cumulative effect is achieved by the gradual concentration of integrated factors in one place, amplification of their action by homogeneous pressure and further "explosive" demonstration at a specific moment. The cumulative effect of hybrid confrontation for the initiating country is ensured through the application of complex and interrelated military and nonmilitary means, taking into account their impact in specific socio-political and economic conditions. The controversial "Nord Stream-2", construction of which is almost finished, could be considered as real hybrid threat to Ukraine and an example of a cumulative process. The Russian energy project had seemed more or less probable at the different phases of its realization from the perspective of the periodic changes in the balance of stakeholders' power and the levers of influence they used.

Thus, European countries (primarily Germany) lobbied for the successful completion of construction, given their own economic interests, while the U.S. simultaneously imposed, expanded economic sanctions as a third party and created the greatest obstacles to its implementation. The accumulation of efforts by the European and Russian sides at the moment tilts the balance in favor of the successful completion of

"Nord Stream-2", and it will become an important source of hybrid threats to Ukraine. There is a high probability that Ukraine will lose its status as a gas transit country after its contract with Gazprom expires in 2024, which can be extended or terminated by agreement of the parties. This can become an additional lever of influence on the country in the economic sphere and a tool of hybrid confrontation.

Synergetic effect (Greek *synergetikos* – general, coordinated, active) is the total effect, which lies in the fact that in the interaction of two or more factors, their effect significantly outweighs the effect of each individual component as their simple sum. Achieving a positive synergistic effect can be seen as the goal of any system, because it demonstrates the usefulness of combining its elements and the results of their interaction:

$$E_s > \sum_{i=1}^n E_i, \quad (1)$$

where E_s is the positive synergistic effect obtained as a result of interaction of system elements; E_i means the effect obtained from the separate functioning of the i -th element of the system; n means amounts of system elements.

When studying hybrid wars, the synergistic effect can be interpreted as follows: the complex (system) of threats projected simultaneously in the key areas of hybrid confrontation has a much greater destructive power than the simple sum of its components, which usually creates a particular risk for the political and economic system of the target country. As highlighted by Busol (2020, p. 10) the focus is in using highly efficient, combined, integrated action to build up social protest potential, including: critical infrastructure sabotage, cyber-attacks and high-profile assassinations. The classic combination of hybrid threats in different spheres with high destructive potential the onset of synergistic effects may be illustrated by the following example:

The military threat refers to the presence of illegal armed groups disguised as patriotic organizations in the target country;

The economic-based threat means the control of important economic assets (primarily in critical infrastructure sectors – electricity production and supply, petroleum products, finance and banking, information and telecommunications, etc.) by residents of the aggressor country or provocative entrepreneurs of the target country;

The information threat refers to the active use of media platforms to broadcast propaganda and fake news.

The emergence of a sense of discrimination and insecurity among citizens of a particular regional (ethnic, linguistic, religious, etc.) identity is the result of targeted pressure in the information environment. Information manipulation is intensified by the threat

of a military nature, which can destabilize the internal socio-political situation and disrupt the functioning of state authorities under the pretext of protecting certain groups of the population. New mechanisms of economic dependence are created by maintaining external influence in critical infrastructure sectors of the economy, reinforced in the long term by instruments of military and information manipulation. Large groups of employees can be manipulated, under the influence of these mechanisms change the direction of economic development and foreign policy integration of the target country. Presumably, the high probability of a synergistic (amplifying) effect is a characteristic of the implementation of a combination of certain threats that can have a destructive impact on the socio-political and economic development of the target country.

It should be emphasized that the simultaneous generation of cumulative and synergistic effects not only does not contradict the requirements of sustainable functioning of any system, but, on the contrary, is a necessary condition for its transition to a qualitatively new level of development. We can consider the above effects as multiplicative (Latin: *multiplicatio* – reproduction, increase, growth), that is, multiplicative effect, providing cumulation (accumulation) and synergy (execution) from the implementation of threats in different areas of hybrid confrontation.

The identification of key areas of hybrid threats is required to formalize the conditions for generating multiplicative (cumulative and synergistic) effects from the implementation of hybrid confrontation tools including the military and defense sector; information (including cyberspace as its virtual component) area and economic (including energy as its vital part) sphere. To sum up, we have three sets of hybrid threats – military (W), economic (E) and information (I):

$$\left[\begin{array}{l} \bar{W} = \{W_k\}, k = 1, \dots, X \\ \bar{E} = \{E_l\}, l = 1, \dots, Y \\ \bar{I} = \{I_m\}, m = 1, \dots, Z \end{array} \right] \quad (2)$$

where k, l, m are the index of military, economic and information threats in the range of hybrid threats of a given type; X, Y, Z are the total number of military, economic and information hybrid threats.

Figure 3 illustrates that at a certain point in time t may be detected a threat in each of the specific areas of hybrid confrontation, could result in a multiplicative effect of hybrid aggression.

Binary function may be denoted as F_{klm} , reflecting the presence or absence of multiplier effects from the implementation of a combination of hybrid threats of different types. $F_{klm} = 1$, if combination of hybrid threats $\{W_k, E_l, I_m\}$ results in multiplicative effects from the use of hybrid confrontation tools in various

spheres, and $F_{klm} = 0$ if the corresponding effects are absent. Let Z be the number of different types of combinations of hybrid threats of different types, the implementation of which leads to multiplicative effects:

$$Z = \sum_{k=1}^X \sum_{l=1}^Y \sum_{m=1}^Z F_{klm} \tag{3}$$

If each of the possible combinations of hybrid threats is capable to produce multiplicative cumulative and synergistic effects, all such combinations meet the condition accordingly:

$$F_{klm} = 1 \tag{4}$$

As follows from (3) and (4), if each combination of hybrid threats of different types leads to multiplicative effects, then the total number of such combinations can be described by the expression:

$$Z^* = X * Y * Z \tag{5}$$

Then one of the efficiency criteria of hybrid aggression measures is defined as the requirement to obtain multiplier effects from any combination of hybrid threats of different types from the perspective of the initiating country:

$$\sum_{k=1}^X \sum_{l=1}^Y \sum_{m=1}^Z F_{klm} = X * Y * Z \tag{6}$$

Formula 6 could be linguistically interpreted as leading to the onset of multiplicative effects by combination of military threat W_k with every economic threat E_l and every information threat I_m (total, respectively X, Y ra Z), making destructive effect far greater than the separate implementation of different types of threats. Table 4 demonstrates key threats to Ukraine in areas of hybrid confrontation summarized in the work (Martynuk et al., 2018). Figure 4 shows that the implementation of combinations probably will have multiplier effects unfavorable to the country.

Taken together, these findings suggest that when a large number of hybrid threats come together, the increase (synergy) and accumulation (cumulation) of negative effects leads to an unstable situation and can have disastrous consequences for national political and economic development. Therefore, the strategy to counteract the initiating country should be aimed at

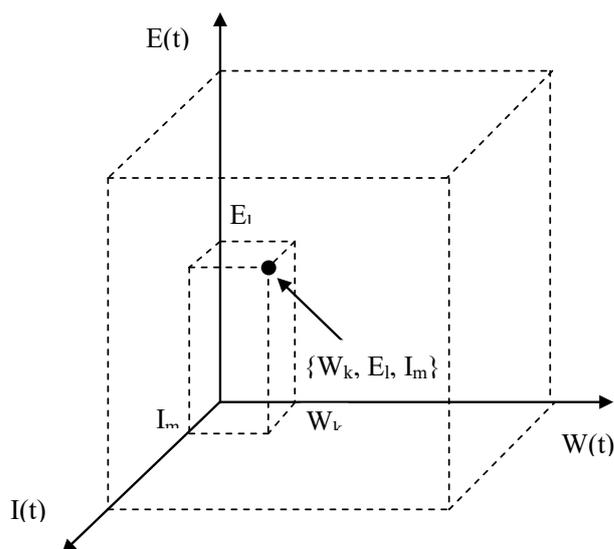


Figure 3. Combinations of threats in different spheres of hybrid conflict

Source: own study

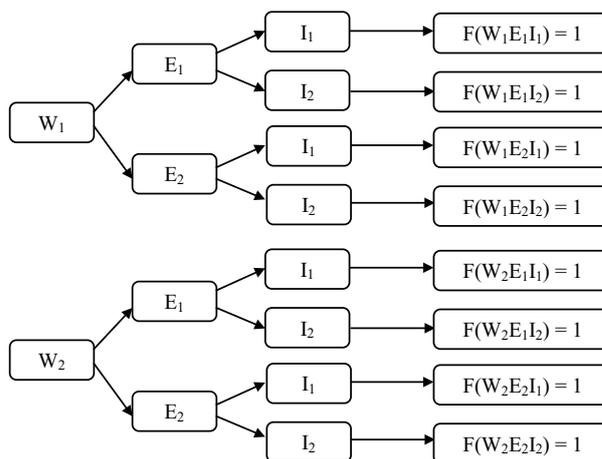


Figure 4. Combinations of threats in different spheres of hybrid conflict

Source: own study

early identification of combinations of hybrid threats that have the maximum potential for negative impact with a high probability of a multiplier effect from their implementation.

Table 4
Key threats to Ukraine in areas of hybrid confrontation (fragment)

Hybrid threats		
Military sector	Economic sphere	Information area
{W _k , k=1,..X}, X=2	{E _l , l=1,..Y}, Y=2	{I _m , k=1,..Z}, Z=2
W ₁ – presence of illegal armed groups in the territory of Ukraine under the guise of patriotic organizations	E ₁ – pro-Russian ownership of important economic assets in Ukraine	I ₁ – Active use of media platforms to broadcast propaganda and disinformation streams
W ₂ – Targeted measures to discredit the armed forces of Ukraine, the security forces and public authorities in general	E ₂ – Russia’s interruption of gas transit through Ukraine after Nord Stream-2 launches	I ₂ – creation of an isolated socio-cultural and information reality in the occupied territories of Ukraine

Source: own study based on Martynuk et al. (2018, pp. 23–27)

4. Conclusions

The presence of multiplicative effects of cumulation (accumulation) and synergy (amplification) from the complex use of destabilization tools in various spheres of hybrid confrontation should be considered a characteristic feature of hybrid war and as key it is proposed to define the military, economic and information threats. Our work has led us to the conclusion that anticipatory prediction of the probability of hybrid aggression by cumulative and/or synergetic effects arising from combinations of different types of hybrid threats (military-economic-information threats) is an important task for countering them in coordinates "0" – "no probability", "1" – "probability exists". The results show that a binary approach can be developed to predict the impact of possible combinations of hybrid threats on the

target country. This approach can be applied to create a grading scale to assess the probability of a negative multiplier effect in a wider range – for example, from "0" "no probability" up to "5" "probability is extremely high", using intermediate estimates ("low", "moderate", "high", etc.). It is necessary to identify and organize possible combinations of hybrid threats in accordance with the degree of vulnerability of the target country, corresponding to certain areas of hybrid confrontation.

The formation of comprehensive list of potential military, economic and informational threats will make it possible to assess the possibility of a multiplier effect from their implementation and focus on countering combinations of threats that will potentially have the most devastating impact on the political and economic system of the country targeted by hybrid aggression.

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