

AZERBAIJAN: DIVERSIONARY WAR THEORY QUANTITATIVE ANALYSIS

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The conflict between Armenia and Azerbaijan in Nagorno-Karabakh is one of the most intractable interstate in the Post-Soviet region. As such, analysis of the factors underlying the conflict has captured the attention of political scientists and pundits alike. Deemed largely a frozen conflict since the mid-1990s, speculations currently abound concerning reasons behind sporadic and large-scale flare-ups since 2015. One line of reasoning leverages the concept of “diversionary war theory,” which states that interstate warfare is often initiated by the incumbent leadership of at least one party to the conflict that is facing strong domestic pressure, with the goal of creating a rally around the flag effect and proving leadership competence. In particular, many posit that increasing fighting, most notably exemplified by the April 2016 clashes and the 44-day war in 2020, is a direct consequence of declining oil prices and the resulting economic woes in Azerbaijan. We set out to examine this theory using through a data scientific approach, employing proxy indicators for economic and social stability, oil price fluctuations, and diplomacy-warfare dynamics surrounding the Nagorno-Karabakh issue. Since the proliferation of mass media and advanced machine learning algorithms for natural language processing, we have the capacity to generate granular and nuanced insights concerning conflict dynamics, using open - source intelligence such as news or social media. As such, we leverage the Global Database of Events Language and Tone (GDELT) to quantify relative levels of diplomacy, warfare and social unrest. Our research shows a stark shift in the relationship between conflict dynamics and the economic situation in Azerbaijan before and after 2014. After 2014, warfare and diplomacy dynamics had a strong negative correlated with the difference between the breakeven oil price set by the government of Azerbaijan to balance its budget and the price of oil in international markets.

Keywords: *Nagorno-Karabakh conflict, diversionary war theory, mass media, oil price, machine learning, natural language processing*

Background

According to the theory of diversionary war, adverse domestic conditions may motivate leaders to divert public discontent and galvanize support (Rally Round the Flag Syndrome) by initiating armed confrontations, often against ethnic minorities [1]. The theory gains traction for natural resource rich and capital scarce developing economies that are vulnerable to fluctuations in commodity markets and impacts of the Dutch Disease Syndrome [2]. Collective wisdom among elites in these authoritarian governments based on networks of patron – client relationships financed through hydrocarbon rents contends that

progressive economic reforms and economic diversification risk destabilizing existing power structures. During sustained economic downturns they instead opt to divert attention towards minorities or external forces, presenting them as the primary culprits for hardship [3].

As presented in Table 1 Azerbaijan is a consolidated authoritarian regime and petrostate, embroiled in an intractable conflict with ethnic Armenians that claim their right for self – determination [4][5][6]. Episodic evidence corroborates the oft – cited theory that Azerbaijan uses the conflict in Nagorno-Karabakh as a diversion from domestic discontent. For example, the April 2016 clashes – on of the most violent since 1994 – took place after Brent crude prices fell below the breakeven fiscal oil price for Azerbaijan for an unprecedented 372 consecutive days, and precisely 1 day before the publication of the Panama Papers. The Panama Papers were the largest ever leak in financial documents, and prominently featured the illicit offshore holdings of the Aliyev family, worth billions of US dollars [7]. The revelations risked exacerbating economic discontent but were largely overlooked domestically as a result of unprecedented clashes on the line of contact. Conditions were similar in 2020, as oil prices reached record lows and the public began voicing widespread discontent concerning the economy. Heavy skirmishes took place along the border of the Republic of Armenia in July 2020, and full – scale war broke out in September 27, 2020.

Table 1

Consolidated authoritarian regime and petrostate

Criteria	Rank	Source
Corruption	126 180	Transparency International
Democracy	146/167	Economist Intelligence Unit
Press Freedom	168/179	Reporters without borders

This paper presents a quantitative analysis of factors underlying this theory. It leverages a novel multi – disciplinary approach that cross – examines conventional economic indicators with unconventional data concerning diplomacy and warfare, obtained by applying Natural Language Processing models on multi – language online news media. The chosen methodology is mathematically objective and completely reproducible – contentions that are difficult to make for a vast majority of scholarship concerning ethnic conflicts.

This paper presents a quantitative analysis of factors underlying this theory. It leverages a novel multi-disciplinary approach that cross-examines conventional economic indicators with unconventional data concerning diplomacy and warfare, obtained by applying Natural Language Processing models on multi-language online news media. The chosen methodology is mathematically objective and completely reproducible-contentions that are difficult to make for a vast majority of scholarship concerning ethnic conflicts.

The section entitled Quantifying Diplomacy and Warfare will describe the unconventional data used to measure the intensity of diplomacy and warfare in the Nagorno-Karabakh conflict, as well as the methodology employed to obtain this data. The section entitled Economic Trends in Azerbaijan will explore economic conditions in Azerbaijan over the last decade. The section entitled Economy, Diplomacy and Warfare will cross – examine data and trends described in the previous two sections. Finally, the section entitled Conclusion will summarize key insights and outline upcoming research in quantitative analysis of the Nagorno-Karabakh conflict.

Quantifying Diplomacy and Warfare

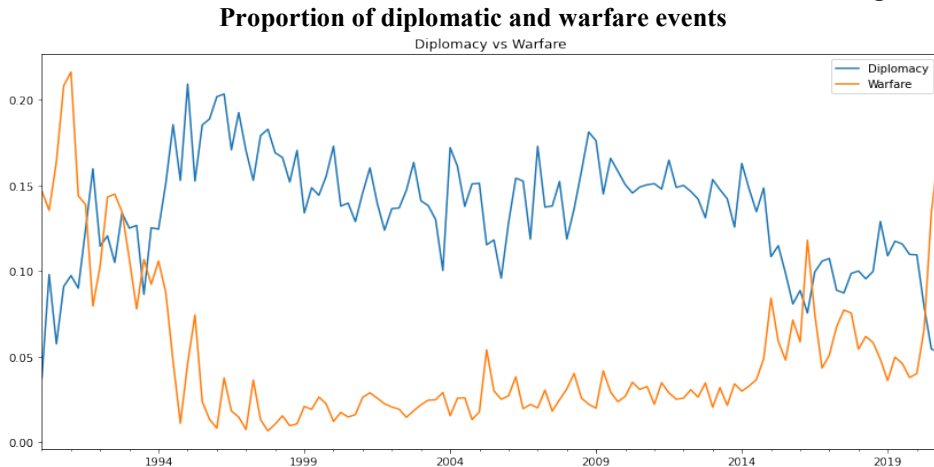
To obtain granular quantitative indicators for abstract concepts such as diplomacy and warfare, we implement a methodology based on extracting structured knowledge from online news media. The Global Database of Events, Language, and Tone (GDELT), is the world’s largest event – centered database. It crawls over hundreds of thousands of news articles from around the world every day and uses robust Natural Language Processing models to extract events, themes, locations, organizations, people and sentiment. For each event, GDELT provides variables such as event type, nations involved in the event, event location, event date, etc. To conduct our analysis, we query the GDELT event database for all events recorded between Armenia and Azerbaijan, grouping them into two groups – *diplomacy* and *warfare*. In table 3 we present the event types which were used for our analysis.

Table 3

Diplomacy and warfare	
Diplomacy	Warfare
Appeal to others to meet or negotiate	Fight with artillery and tanks
Demand meeting negotiation	Fight with small arms and light weapons
Engage in negotiation	Employ aerial weapons
Discuss by telephone	Threaten conventional attack
Express intent to meet or negotiate	Threaten with military force
Meet at a third location	Threaten occupation
Sign formal agreement	Threaten unconventional violence
	Mobilize or increase armed forces
	Use conventional military force
	Use unconventional violence
	Engage in mass killings
	Kill by physical assault

Our metric for the level of diplomacy or warfare is the proportion of daily events between Armenia and Azerbaijan that fall into each of the categories above. Figure 1 represents the time series trend of those two categories starting from 1991 to 2021. The graph is remarkably consistent with the actual dynamics of the conflict, clearly showing an escalation in violence after 2014, after 20 years of relative stability when diplomacy dominated the agenda.

Figure 1



Economic Trends in Azerbaijan

We require highly granular data to describe the state of the economy of Azerbaijan. Given its overwhelming reliance on the price of crude oil, we have chosen the difference between the price of Brent crude and the annual fiscal breakeven oil price set by Azerbaijan as our proxy for the state of the economy of Azerbaijan.

As described by Antidze M., & Bagirova N. the Azerbaijani economy is heavily reliant on oil revenues [8]. The green line in *Figure 2* denotes the spot price for Brent crude. The blue line in *Figure 2* denotes the price of oil that the government of Azerbaijan requires to balance its budget [9]. The orange line denotes the difference between the green and blue lines. This figure clearly illustrates that the government of Azerbaijan did not face extended periods of negative breakeven differences until after 2014.

Figure 2

Brent Crude Prices and Azerbaijani Fiscal Breakeven Price Benchmark

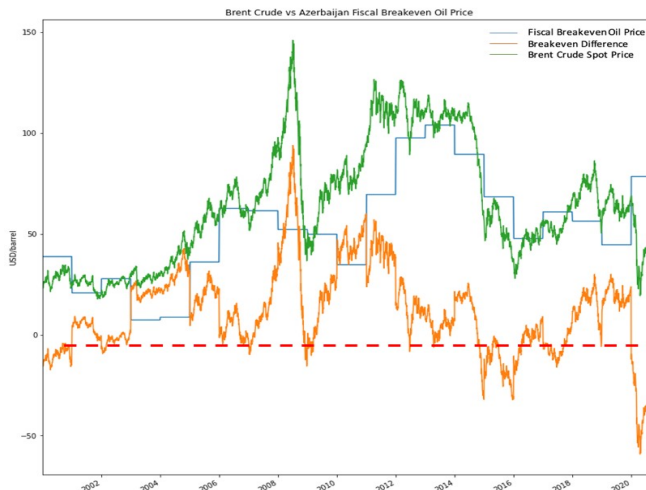


Figure 3

Time-series trend of CPI and GDP measures in Azerbaijan

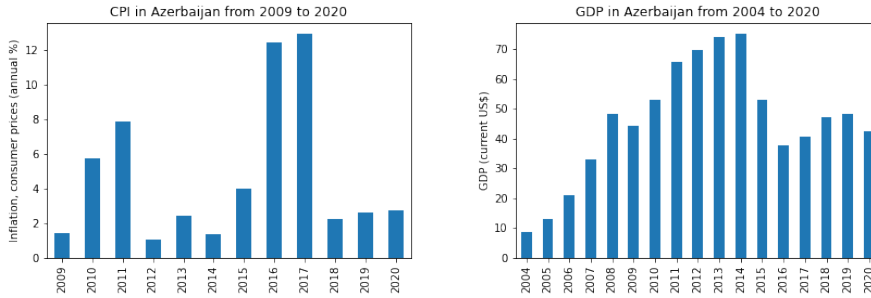


Figure 3 illustrates the effect of falling oil prices on the economy of Azerbaijan [10]. In particular, as presented in Figure 2, the year of 2014 became the cut-off point after which Azerbaijan periodically has experienced negative breakeven difference. Therefore, it becomes clear the huge jump of consumer price index and drastic decrease of GDP in Azerbaijan after 2014.

Furthermore, according to the World Bank, the economic decline resulted in increasing poverty levels between 2014 and 2020. Record – low oil prices and COVID – 19 related quarantine measures pushed poverty headcounts higher still and the trend is expected persist in the forceable future. Migration rates to Russia are a commonly cited proxy for poverty levels in the South Caucasus [11]. The figures in Table 4 show that migration from Azerbaijan to Russia increased by 17% between 2016 and 2019.

Table 4

Active Migrant Application from South Caucasus

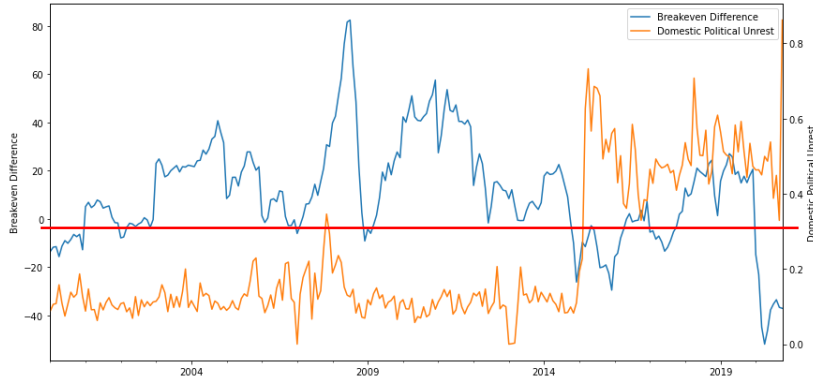
Number of Active Migrant Applications to Russia				
	2016	2017	2018	2019
Azerbaijan	594902	633765	650080	694551
Armenia	631746	657648	641618	634336
Georgia	41603	47687	47341	51926

Figure 4 illustrates a step-like increase in the level of domestic political unrest following the drastic drop of the oil price fiscal breakeven difference below zero in late 2014. The peak in political unrest between 2015 and 2016 coincides with high consumer price inflation figures for those years (Figure 3). Unrest declined after 2016, but never returned to pre-2014 figures. It is still prone to spike as breakeven differences dip below or approach zero.

The oil price fiscal breakeven difference is a decisive factor in the economic and socio – political stability and welfare of Azerbaijan. It is also a uniquely reliable and granular time series, that enables robust analysis of trends. We will therefore use it as a proxy indicator and study its relationship with *warfare* and *diplomacy* in the Nagorno-Karabakh conflict, to determine whether empirical evidence suggests the diversionary theory of war hypothesis.

Figure 4

Breakeven Difference and Domestic Political Unrest before and after 2014



Economy, Diplomacy and Warfare

Figure 3 illustrates the relationship between diplomacy in the NKR conflict and the oil price breakeven difference. Figure 4 illustrates the relationship between warfare in the NKR conflict and the oil price breakeven difference.

Figure 5

Oil Price Breakeven Difference and Diplomacy

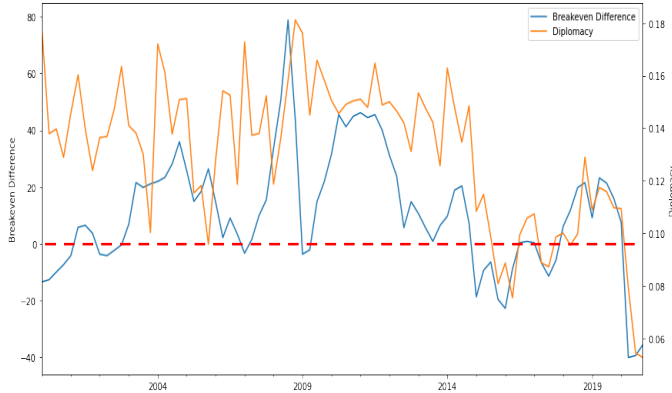
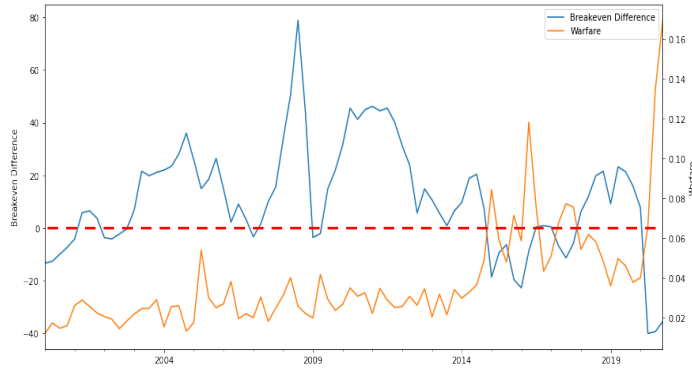


Figure 6

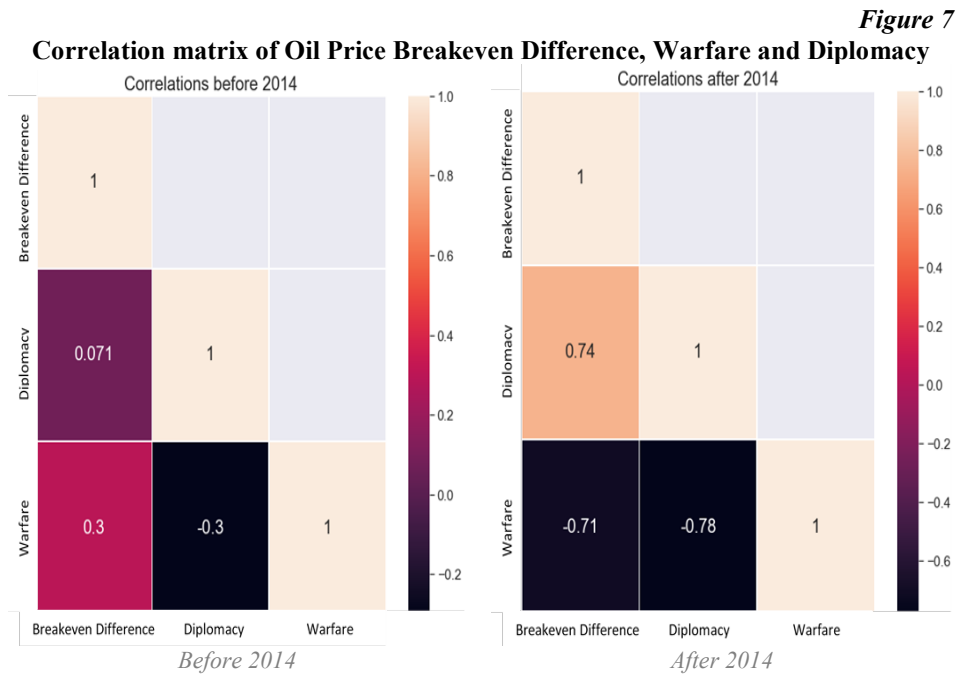
Oil Price Breakeven Difference and Warfare



These figures illustrate that after 2014, the oil price breakeven difference has a strong positive relationship with diplomacy and a strong negative relationship with warfare. *Figure 7* provides correlations between said indicators for the time periods before and after 2014.

Since Azerbaijan is a price taker in the oil markets, correlations between oil prices and diplomacy or warfare in Nagorno-Karabakh indicate a one-way direct or indirect impact of oil markets on the Nagorno- Karabakh conflict. *Figure 7* shows the heatmap of correlation matrix described above. The primary insights obtained from these heatmaps are as follows:

- Correlation between oil price breakeven difference and diplomacy grew from 0.071 before 2014 to 0.74 after 2014. This shift is significant since in the oil price breakeven difference went from having negligible influence on changes in the intensity of diplomatic efforts before 2014, to explaining 74% of linear change in the intensity of diplomatic efforts after 2014.
- Correlation between oil price breakeven difference and warfare flipped from 0.3 before 2014 to -0.71 after 2014. The shift from positive to negative correlation may implying strategic changes in the decision – making rationale of the Azeri leadership and can be investigated further.
- Correlation between warfare and diplomacy strengthened from -0.3 before 2014 to -0.78 after 2014.



Conclusion

Empirical evidence in the previous sections indicates that in the period after 2014, economic conditions within Azerbaijan were closely related to the dynamics of diplomacy and warfare in the Nagorno-Karabakh conflict. The oil price fiscal breakeven difference, our proxy for economic conditions in Azerbaijan, has a strong positive impact on diplomacy and a strong negative impact on warfare. The Nagorno-Karabakh region is devoid of any oil or gas reserves, meaning that the impact of oil prices on conflict dynamics cannot be motivated by direct economic gains. Furthermore, empirical evidence is in line with the theoretical foundations of diversionary war theory as well as episodic evidence of Azerbaijan's pursuit of diversionary war on the strategic level. This intersection of theoretical, episodic and empirical evidence makes a strong case to move beyond *big data* and conduct a *thick data* analysis of Azerbaijan's economic reliance on hydrocarbon resources and the destabilizing impact it might have in the South Caucasus and beyond.

The paper also demonstrates a reliable methodology for applying Natural Language Processing and time series analysis to explore topics in conflict studies, geopolitics and international relations. By employing deep learning models for topic classification and machine translation to process vast quantities of unstructured open source news media, we quantify abstract phenomena such as diplomacy and warfare and enable data – driven, evidence – based research that transcends human biases and cognitive limitations for processing vast amounts of multi – language text. Our methodology is scalable and easily adaptable to different contexts and we can leverage it to develop tools that track international conflicts real - time. By leveraging other economic, political and social indicators in our methodology, we can also develop tools that help forecast short – term developments in geopolitical trends around the world.

The methodology introduced herein illustrates techniques to build granular proxy metrics that describe the frequency and magnitude of a standardized taxonomy of political events. Such metrics can be further leveraged to build frequency - severity models, with inspiration from the Loss - Distribution Approach prevalent in quantitative modelling of Operational Risk. The capacity to reliably track similar risk metrics in granular time increments may help geopolitical stakeholders overcome shortcomings stemming from bounded rationality and bias, and engage in decision - making that is more data - driven and evidence based.

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ՀԵՆՐԻԿ ՄԵՐԳՈՅԱՆ, ՎԱՀԱՆ ՄԱՐՏԻՐՈՍՅԱՆ, ԳՐԻԳՈՐ ԲԵԶԻՐԳԱՆ-ՅԱՆ – Աղբրեջան. ղիվերսիոն պատերազմի տեսության քանակական վերլուծություն – Լեռնային Ղարաբաղի հակամարտությունը հետխորհրդային տարածաշրջանի ամենաբարդ հիմնահարցերից է: Հակամարտության հիմքում ընկած գործոնների վերլուծությունը արժանացել է քաղաքագետների և փորձագետների ուշադրությանը: 1990-ականների կեսերից ի վեր հիմնականում սառեցված հակամարտության պատճառները 2015 թվականի սրացումից հետո բազմաթիվ քննարկումների առիթ դարձան: Դրանցից մեկի նյութը «ղիվերսիոն պատերազմի տեսության» հայեցակարգն է, որտեղ նշվում է, որ միջպետական պատերազմը հաճախ սկսվում է հակամարտության առնվազն մեկ

կողմի գործող դեկլարացիայի կողմից: Վերջինս, բախվելով ներքին ուժեղ ճնշման, նպատակ ունի համախմբել ժողովրդին և ամրապնդել իշխանության իրավասությունը: Մասնավորապես, շատերը կարծում են, որ աճող լարվածությունը, որոնցից առավել ուշագրավ են 2016 թվականի ապրիլյան բախումները և 2020 թվականի 44-օրյա պատերազմը, Ադրբեջանում նավթի գների անկմամբ պայմանավորված տնտեսական խնդիրների ուղղակի հետևանքն է: Հողվածում այս տեսությունը քննվում է տվյալների վերլուծության միջոցով՝ օգտագործելով տնտեսական և սոցիալական կայունության, նավթի գների տատանումների և Լեռնային Ղարաբաղի հիմնախնդրի շուրջ դիվանագիտական-պատերազմական դինամիկան: Զանգվածային լրատվության միջոցների տվյալների և բնական լեզվի մշակման արդիական մեթոդայական ալգորիթմների միջոցով հնարավորություն ունենք ստեղծելու կոնֆլիկտների դինամիկայի վերաբերյալ հստակ և մանրամասն պատկերացումներ՝ օգտագործելով հանրությանը հասանելի տվյալները, ինչպիսիք են նորությունները կամ սոցիալական մեդիան: Որպես այդպիսին օգտագործում ենք Global Database of Events Language and Tone (GDELT) –ը՝ դիվանագիտության, պատերազմի և ներքին խռովության հարաբերական մակարդակները չափելու համար: Հետազոտությունը ցույց է տալիս 2014 թվականից առաջ և հետո Ադրբեջանում հակամարտությունների դինամիկայի և տնտեսական իրավիճակի միջև փոխհարաբերությունների կտրուկ փոփոխություն: 2014 թվականից հետո պատերազմի և դիվանագիտության դինամիկան ուժեղ և բացասաբար փոխկապակցված է եղել Ադրբեջանի կառավարության կողմից սահմանված նավթի նվազագույն գնի և տվյալ տարվա նավթի շուկայական գնի տարբերության հետ:

Բանալի բառեր – *Լեռնային Ղարաբաղի հակամարտություն, դիվերսիոն պատերազմի տեսություն, զանգվածային լրատվության միջոցներ, նավթի գին, մեթոդայական ուսուցում, բնական լեզվի մշակում*

ГЕНРИК СЕРГОЯН, ВААН МАРТИРОСЯН, ГРИГОР БЕЗИРГАНЯН – *Азербайджан: Количественный анализ теории диверсионной войны.* – Конфликт между Арменией и Азербайджаном в Нагорном Карабахе является одним из самых трудноразрешимых межгосударственных на постсоветском пространстве. Таким образом, анализ факторов, лежащих в основе конфликта, привлёк внимание как политологов, так и экспертов. Конфликт, считавшийся в основном замороженным с середины 1990-х годов, в настоящее время изобилует предположениями о причинах спорадических и крупномасштабных вспышек с 2015 года. действующим руководством по крайней мере одной стороны конфликта, которая сталкивается с сильным внутренним давлением, с целью создать эффект сплочения вокруг флага и доказать компетентность руководства. В частности, многие утверждают, что усиление боевых действий, наиболее ярким примером которого являются столкновения в апреле 2016 года и 44-дневная война в 2020 году, является прямым следствием снижения цен на нефть и вызванных этим экономических проблем в Азербайджане. Мы решили изучить эту теорию, используя научный подход к данным, используя косвенные индикаторы экономической и социальной стабильности, колебания цен на нефть и динамику дипломатических войн, связанных с проблемой Нагорного Карабаха. С распространением средств массовой информации и передовых алгоритмов машинного обучения для обработки

естественного языка у нас появилась возможность генерировать детализированные и детальные сведения о динамике конфликтов, используя разведанные из открытых источников, такие как новости или социальные сети. Таким образом, мы используем Глобальную базу данных языка и тона событий для количественной оценки относительных уровней дипломатии, военных действий и социальных волнений. Наше исследование показывает резкий сдвиг в отношениях между динамикой конфликта и экономической ситуацией в Азербайджане до и после 2014 года. После 2014 года динамика военных действий и дипломатии имела сильную отрицательную корреляцию с разницей между безубыточной ценой на нефть, установленной сбалансировать свой бюджет и цену на нефть на международных рынках.

Ключевые слова: *нагорно-карабахский конфликт, теория диверсионной войны, СМИ, цена на нефть, машинное обучение, обработка естественного языка*