Economic sanctions and trade dynamics: Analyzing U.S. unilateral and EU autonomous economic sanctions (1950–2019)

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Abstract

This study investigates the role of economic sanctions within contemporary national security strategies, focusing on their impact, motivations, and implications for sender states. Utilizing a mixed-methods approach, the research combines qualitative and quantitative methodologies to comprehensively analyze unilateral and autonomous economic sanctions imposed by the U.S. and the EC/EU between 1950 and 2019. The comparative and descriptive analysis examines 97 sanctions episodes, including 60 unilateral U.S. sanctions and an original dataset of 37 EC/EU autonomous economic sanctions episodes. The findings reveal that economic sanctions imposed by both entities generally yield positive economic outcomes for sender states. Endogenous motivations such as economic security concerns, geopolitical interests, and domestic political considerations emerge as significant drivers behind the deployment of sanctions. Economic sanctions are perceived as a strategic tool serving political objectives while enhancing economic security of sender states. Tangible benefits, including strengthened negotiating positions and domestic support, underscore the instrumental role of sanctions in advancing sender states' interests globally. In summary, this research contributes valuable insights into the complex dynamics of economic sanctions and their implications for sender states. The study offers pertinent guidance for policymakers, scholars, and practitioners navigating global security and economic governance challenges by examining economic sanctions' motivations, impacts, and implications within contemporary national security strategies.

Keywords: economic sanctions, economic security, national security, economic crisis, exchange rate volatility.
JEL classification: F31, F43, F5, F51, F52.

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1. Introduction

The 2017 U.S. National Security Strategy[1] emphasized the role of economic security, as "*economic security is national security.*" The government is committed to enhancing its citizens' financial sustainability and prosperity. Thus, it is ready to take proactive measures, including imposition of economic sanctions, if necessary, to achieve this goal. Within the intricate tapestry of geopolitical rivalries and economic interdependencies, the 2017 U.S. National Security Strategy underscores the vital role of economic sanctions as indispensable tools within the realm of geoeconomic and geopolitical politics worldwide. Economic sanctions serve as an effective diplomatic instrument for addressing threats and asserting influence on the global stage.

The concept of economic security as national security is rooted in the fundamental connection between a nation's economic well-being and its ability to safeguard its citizens, interests, and values in today's interconnected world. By leveraging economic tools and measures, countries can protect their national interests and promote own foreign policy objectives while deterring adversaries and preserving peace and stability.

Economic sanctions are diplomatic tools that alter behavior, counteract aggression, and protect national interests and security. They aim to disrupt illicit activities and prevent hostile actors from accessing critical resources. Furthermore, economic sanctions play a pivotal role in countering emerging threats to national security, such as cyberattacks, intellectual property theft, and illicit finance networks. By restricting access to financial resources and technology, sanctions disrupt the capabilities of hostile actors, bolstering defences against evolving security risks.

In the context of the 2017 U.S. National Security Strategy, economic sanctions are viewed as a tool that serves political purposes and enhances the sender states economic security. This adaptive approach highlights the dynamic nature of contemporary security challenges, necessitating flexible responses that use economic tools and conventional measures.

2. Literature review

Over the years, several studies have delved into the economic consequences of sanctions, focusing on their impacts on the targeted countries. These adverse effects can manifest themselves in several ways: financial instability, inflation, reduced per capita income, trade imbalances, diminished international investment and capital flows, and a decline in GDP growth within the affected country. Financial instability refers to the disruptions in a country's economic system that may arise due to sanctions. For instance, sanctions may hinder access to international finance and capital markets, leading to a decline in the value of the country's currency. Inflation can occur due to the scarcity of goods and services that are typically imported from different countries.

Furthermore, sanctions can reduce per capita income due to decreased economic activity and reduced trade, which finally leads to a decline in the overall

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[1] National Security Strategy of the United States of America, December 2017. http://nssarchive.us/wp-content/uploads/2020/04/2017.pdf

standard of living of the population in the targeted country. Additionally, trade imbalances may arise because of reduced imports and exports from/to the sender countries. Moreover, sanctions can hurt international investment and capital flows to the targeted country due to the uncertainty surrounding the country's economic future and the perceived risks associated with investing in a sanctioned country. Lastly, a decline in GDP growth can result from reduced economic activity and the other factors mentioned above, which leads to a recession or economic contraction in the targeted country (Hatipoglu and Peksen, 2018; Peksen and Son, 2015; Neunkirch and Neumeier, 2015; Afesorgbor, 2019; Crozet and Hinz, 2020; Felbermayr et al., 2020; Gutmann et al., 2022, 2023; Besedes et al., 2017; Biglaiser and Lektzian, 2011; Mirkina, 2018).

Recent research indicates that the enforcement strategies impact the efficacy of economic sanctions. When implemented, sanctions can have various economic consequences that depend on several factors. The economic structure of the targeted country and the nature of the goods or services affected by the sanctions are among the significant determinants of the impact of sanctions on the economy (Belin and Hanousek, 2021; Crozet and Hinz, 2020; Gullstrand, 2020; Kholodilin and Netsunajev, 2019; Webb, 2020; Gutmann et al., 2023). Some academic investigations propose that the enforcement of sanctions is often influenced by internal political factors, national policy objectives, and economic necessities (Drury, 2005; Waelder, 1997; Kaempfer and Lowenberg, 2007; Liou et al., 2022; Ladurner, 2023). Belin and Hanousek (2021) conducted a study on the impact of interest groups on the decision-making process of imposing sanctions. The study found that interest groups significantly influence the severity of sanctions imposed by the sender country and the targeted politically influential groups within the recipient country. As a result, the decision to impose sanctions is primarily based on the expected benefits and costs, as export sanctions can lead to the loss of foreign markets. Consequentially, sanctions are imposed based on internal political factors, national policy objectives, and domestic economic necessities.

In contrast, import sanctions can create new markets for the sender's domestic producers. When countries impose import sanctions, they can reduce competition from foreign markets, creating opportunities for domestic producers to fill the gap and satisfy demand (Brooks, 2002). Sanctions deter the targeted country or entity and convey a message to the sender and the local population (Leyton-Brown, 1987).

Jones and Portela (2014) argue that unilateral and autonomous sanctions with sender-related goals benefit the sender country's domestic economy and local businesses. Factors that prompt states to impose such sanctions include lobbying by interest groups, political fundraising demands, and more. Alternatively, ruling groups in the sender state may use sanctions to maintain domestic order, gain societal support for their broader socio-political and ideological goals, or prepare the populace for potential conflicts (Preeg, 1999; Drury, 2000; Fisk, 2000; Fayazmanesh, 2004; Gordon, 2010; Van Bergeijk, 1995; Kaempfer and Lowenburg, 1992; Helms, 1999; Barber, 1979; Jones and Portela, 2014). Therefore, both internal and external factors influence the imposition of sanctions. Economic sanctions can be imposed to protect the sender's economic and national security against potential threats. As a result, it is reasonable to assert that sanctions can serve as an effective measure to safeguard a country's interests and security.

Wang et al. (2019) indicate that imposing sanctions on a country affects its economic trade through import, export, and financial channels. An eventual surge in the value of imports and exports of the sender during the sanctions may be a result of exchange rate volatility and inflation caused by the imposition of economic sanctions, as pointed out by Wang et al. (2019) and Belin and Hanousek (2021). Using advanced econometric models across 21 targeted countries between 2002 and 2022, Alwadeai et al. (2024) demonstrate that exchange rates, which play a crucial role in a target country's trade level and economic stability, tend to become highly unstable in response to sanctions. This heightened volatility is a direct result of reduced investor confidence and disruptions in trade flows, both of which are expected outcomes of sanctions.

In light of the 2017 U.S. National Security Strategy and the scientific evidence regarding the impact of economic sanctions on the economies of targeted countries, it is worth exploring the possibility of governments using economic sanctions as a strategic tool to stimulate economic growth. Such measures can help revitalize and strengthen the sender's economy by activating the economic mechanism described before, thereby protecting national security interests.

3. The focus of the study

This study delves into the strategic and economic implications of unilateral and autonomous economic sanctions, which include refraining from providing aid or financial support and imposing financial, export and import restrictions. The research is confined to particular elements of economic sanctions, as a comprehensive viewpoint would be outside the scope of this study.

The core objective of this research is to assess the influence of economic sanctions on the nations that impose them, with a particular emphasis on their economic aftermaths. The study aims to investigate whether these sanctions have a measurable impact on the sender countries' economy by scrutinising the number of economic sanctions that had favorable versus unfavorable economic effects on the sender's economy.

According to the literature, import sanctions can significantly impact economies by reducing a country's exports, leading to inflation and exchange rate fluctuations, which, in turn, may force governments to acquire foreign currency at a higher rate. When a country imposes economic sanctions on another country, the currency of the sanctioning country may strengthen. This increase in currency value allows the sender to purchase more goods from the targeted country at a lower cost than before, as the sender can exchange their stronger currency for a more considerable amount of the targeted country's weaker currency and buy goods at a lower price (*ceteris paribus*).

Export sanctions can curtail the import of goods and escalate the expenses associated with raw materials in the target country. Consequently, such sanctions can decrease demand for the target country's currency and lead to currency depreciation. As a result, imports from the country imposing the sanctions can become more expensive.

Financial sanctions can limit investment options and cause asset freezing and credit limitations, leading to inflation, exchange rate fluctuations, and

overall economic instability. This makes it difficult for businesses to thrive and grow.

The 2017 U.S. National Security Strategy proposes using economic sanctions as a strategic instrument to boost economic growth. This approach premises that economic sanctions can initiate the before-specified economic mechanisms to revitalise the sender's economy. Therefore, governments that impose sanctions may consider this option to spur their economic growth. This suggests that economic sanctions may induce exchange rate volatility and inflation in the target country, which benefits the sender's trade with the target.

Thus, the following assumptions need to be tested:

(1) The total value of the sender's imports (ΣM) from the target during the entire period of sanctions (t) or at least three years (n) should be higher than the total value of the sender's imports (ΣM) from the target country before imposing sanctions (b):

$$\Sigma M^{tn} > \Sigma M^{b}; \tag{1}$$

(2) The total value of the sender's exports (ΣX) to the target during the entire period of sanctions (t) or at least three years (n) should be higher than the total value of the sender's exports (ΣX) to the target country before imposing sanctions (b):

$$\Sigma X^{tn} > \Sigma X^{b}; \tag{2}$$

(3) The total value of the sender's trade with the target (ΣT) during the entire period of sanctions (t) or at least three years (n) should be higher than the total value of the sender's trade (ΣT) with the target country before imposing sanctions (b):

$$\Sigma T^{tn} = \Sigma M^{tn} + \Sigma X^{tn}; \tag{3}$$

(4) In that case, it suggests that the sanctions have positively impacted the sender's economic trade with the target (*ceteris paribus*) during the entire period of sanctions (t) or at least three years (n):

$$\Sigma T^{tn} > \Sigma T^{b}. \tag{4}$$

Thus, the research focuses on a comparative analysis of U.S. unilateral sanction episodes imposed between 1950 and 2000 and EC/EU autonomous economic sanction episodes imposed from 1980 to 2019. Historical cases of past sanctions can offer helpful insights into their effectiveness and consequences. Our research may identify patterns and lessons learned to aid decision-making in imposing economic sanctions as economic and national security tools.

This study aims to provide comprehensive information on the prevalence, impact, and characteristics of unilateral and autonomous economic sanctions. It will analyze 97 instances of economic sanctions and determine if endogenous factors are the driving force behind their imposition. The research results will demonstrate the viability of economic sanctions to promote economic and national security, as outlined in the 2017 U.S. National Security Strategy.

4. Research questions and hypotheses

The present study endeavours to address the existing gaps in research through the formulation of the following research questions:

RQ1: What is the economic impact of the U.S. unilateral and EC/EU autonomous sanctions on the sender's bilateral trade with the targeted country?

RQ2: What are the similarities between the economic impact of the sanctions imposed by both senders?

RQ3: Do the senders impose sanctions for endogenous reasons?

These research questions should help to find evidence that either corroborates or refutes the hypotheses stated below:

H1: Unilateral and autonomous economic sanctions generally positively impact the sender.

H2: Unilateral and autonomous economic sanctions are partially motivated by endogenous factors.

H3: Economic sanctions serve in part to strengthen the sender's economic security.

5. Data

The present study aims to analyze 97 unilateral and autonomous sanctions imposed between 1950 and 2019. Specifically, the U.S. imposed 60 episodes of unilateral sanctions between 1950 and 2000 and EC/EU imposed 37 episodes of autonomous economic sanctions between 1980 and 2019.

Most data on U.S. economic sanctions imposed unilaterally comes from Hufbauer et al. (2009). The data for other variables originates from multiple databases, such as Macrotrends (2021), Statista (2021), Jewish Virtual Library (2023), Trade in Goods with USA (2023), United States Census Bureau (2023), World Integrated Trade Solution (2021), CEICDATA (2021), and Country Economy (2021).

The data regarding sanctions imposed by the EC/EU is original and comes from various sources, including experts, official government records, international publications, and credible news outlets such as World Integrated Trade Solution (2021), CEICDATA (2021), Country Economy (2021), the CIA World Factbooks 1982–2013, External and intra-European Union Trade EC Statistical Yearbooks 1958–2002, EC Directorate-General for Trade (2021), World Bank (2021), EU Sanctions Map (2021), European External Action Service (2023), Country Economy (2021), Kreutz (2005), Becker (1987), Portela (2005), Giumelli et al. (2020) and Hörbelt (2017).

6. Methodology

The research uses both qualitative and quantitative methods. Qualitative methods explore subjective experiences through open-ended questions and observations, while quantitative methods rely on numerical data and statistical analysis to test hypotheses.

The present study employs a comparative and descriptive analysis approach to investigate the data's similarities, differences, and primary characteristics, laying

the foundation for further exploration. This approach represents a methodological cornerstone for researchers seeking to unravel the intricacies of diverse phenomena.

However, the utility of this approach extends beyond mere validation; it fosters a deeper appreciation for the contextual nuances inherent within research paradigms. By situating findings within broader frameworks of inquiry, experts can enrich their understanding of the subject matter, discerning what sets phenomena apart and unites them across diverse contexts.

This study examines the impact of unilateral and autonomous economic sanctions on the economy of the sender, with a focus on identifying those sanctions that provide favorable economic outcomes. To this end, it analyzes various factors that may influence a country's decision to impose sanctions, including their economic implications and the extent to which economic security is a component of national security.

The research considers several variables, such as the trading connectivity between the sender and targeted nations, the economic development of the targeted countries, the political and economic stability of the targets, the type of sanctions enforced, and the Gross Domestic Product (GDP) growth rate of both the sender and target nations five years before the imposition of sanctions. Furthermore, the study will investigate the geographic location of the targets to identify any potential endogenous causes that may support or contradict the imposition of sanctions.

The restriction of the examined period until 2019 was due to the pandemic outbreak in 2020. This unprecedented event may significantly skew the comparison outcome, making it difficult to draw accurate conclusions. The reason for the limited dataset of EC/EU autonomous sanction episodes as compared to those of the U.S. is that the EU initiated the imposition of sanctions relatively later than the U.S., starting in 1980. Therefore, this analysis will compare the average data of sanction episodes imposed by the senders per decade to allow a precise comparison.

The study examines only financial (F), export (X) and import (M) sanctions from an economic and strategic point of view. Sanctions consisting of withdrawing aid are considered as financial (F) sanctions.

Our study expands on Hufbauer et al. (2009) sanctions objectives and variables classification by including additional economic and geographic factors. This classification categorizes sanctions based on the sender's policy goals, such as promoting regime change, impairing military potential, disrupting military operations, and other significant changes in the target country. The proposed use of Hufbauer et al. (2009) classification ensures that unilateral sanctions have sender-related goals, as suggested by Jones and Portela (2014).

The sanctions are identified by a number in brackets consisting of the year of imposition and the consecutive number of sanctions imposed in that year. Specifically, this study examines the following economic variables:

"*Cost to target as per cent of GNP*" refers to the cost for the target as a percentage of its GNP annually (Hufbauer et al., 2009).

"*Trade linkage*" refers to the percentage of trade flow between the targeted state and the sender. Up to 10% is low trade linkage, up to 30% is middle, and over 30% is high (Hufbauer et al., 2009).

The "*GNP ratio*" shows the sender's economic size relative to the target's GNP. A ratio up to 10% means low, up to 100% is middle, up to 1,000 is high, and over 1,000 means the sender's GNP is significantly higher (Hufbauer et al., 2009).

The impact of sanctions on a country's "*economic and political stability*" is measured on a scale of 1 to 3, where 1 represents acute economic problems and political chaos, 2 indicates severe economic problems and internal dissent, and three means the government is in firm control, and the economy is stable (Hufbauer et al., 2009).

The "*cost to sender*" classify the impact of the sanctions into four categories: "net gain (1)" for the sender by withholding aid, "little effect on the sender (2)" resulting in a net economic profit for the sender, with short public comments and trivial posting, "modest loss (3)" meaning that the sender lost some trade but not enough to provoke a political backlash, and "significant loss (4)" meaning that a large volume of trade was adversely affected and caused a loss which sparked a substantial backlash between the affected businesses and communities (Hufbauer et al., 2009).

The "*average of the target's GDP growth rate*" indicates the median GDP growth rate of the sanctioned countries five years before the imposition of the sanctions (Hufbauer et al., 2009). In addition to Hufbauer et al. (2009) classification, our study uses variables such as "the sender's average GDP growth rate" five years before imposing sanctions and the "region" (continent) of the target location. Thus, the "*median GDP growth rate of the sender*" describes the sender's median GDP growth rate five years before the imposition of the sanctions. The "*region*" shows the location of the targeted countries.

Different to Hufbauer et al. (2009) classification, the variable "*cost to target*" for the EC/EU sanctions is not estimated but represents the difference in EC/EU imports before/after the imposition of the sanctions (in billion euro) as a percentage of the EC/EU's GNP before the imposition of sanctions under *ceteris paribus* conditions.

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Different to Hufbauer et al. (2009) classification, this study's classification of economic impact consists of four categories: net gain due to withholding aid (1), net profit due to trade activities (2), modest loss (3), and significant loss (4).

Hufbauer et al. (2009) classification did not consider the sanctions' monetary and political costs to the sending country. Instead, it provided an estimated "*rough sense*" of the commercial, financial, and political costs sustained by the sender.

Thus, in this study, the data provided by Hufbauer et al. (2009) will be randomly checked by comparing the U.S. trade volume with the targeted countries during the sanction period or in at least three years. The study considers a transparent classification of the variables by differentiating between sanctions with a "net gain (1)" due to withholding aid and sanctions resulting in a "net profit (2)" due to increased economic activity to avoid confusion.

Different to Hufbauer et al. (2009), the "*average of the target's GDP growth rate*" consists of three categories: higher GDP growth rate of the target country compared to the sender country, lower GDP growth rate of the target country

compared to the sender country, and same GDP growth rate as the sender country or no available data.

The research process involves three key stages: gathering/choosing relevant data, performing comparative analysis of all variables described before, and formulating a comprehensive descriptive conclusion based on the findings. In this research, the focus is exclusively on 56 instances of unilateral U.S. economic sanctions, as opposed to multilateral sanctions, as outlined in Hufbauer et al. (2009) list, including Cuba (60-3), Indonesia (63-3), Libya (78-8), and the USSR (80-1) imposed between 1950 and 2000. The U.S. sanctions on these countries were designed to achieve multiple objectives, such as regime change, democratization, and military disruption. However, these countries were double counted, leading to the U.S. sanction dataset of 60 unilateral sanction episodes.

U.S. economic sanctions typically involve withholding aid, which is a favorable outcome for the sender to some extent. The economic impact assessment of the study is based on Hufbauer et al. (2009) study, which estimated the values of commercial, financial, and political costs and provided only a rough sense of the impact. Therefore, this analysis aims to test Hufbauer et al. (2009) estimated values by measuring the difference between the U.S. export and import volumes from the targeted countries before and after imposing sanctions. This approach will make it possible to understand better the impact of sanctions on the targeted countries' economies.

The original dataset of 37 EC/EU autonomous economic sanction episodes involves analyzing the same variables as discussed before.

This study takes a fresh approach to examining economic sanctions by analyzing them in the 2017 U.S. National Security Strategy context. It reveals that a nation's economic stability is crucial for its national security and is not limited to internal affairs but has a more extensive impact. This perspective provides a unique understanding of the consequences of economic sanctions and their effects on national security.

7. Results

7.1. Unilateral and autonomous economic sanctions generally positively impact the sender

The research shows that the economic sanctions imposed by the U.S. and the EC/EU have generally positively impacted the senders. Between 1950 and 2000, the U.S. imposed 60 sanction episodes, out of which 48 had a favorable outcome for the sender, and only 12 episodes resulted in a negative economic impact for the sender.

Similarly, between 1980 and 2019, the EC/EU imposed 37 autonomous episodes, of which 23 had a positive economic impact on the EC/EU, and only 14 episodes negatively impacted the EC/EU (Fig. 1). The lists of the analyzed U.S. and EC/EU sanction episodes are available in Supplementary material 1, Tables 1A and 2A.

This classification does not consider the sanctions' monetary and political costs to the sending country. Instead, it provided an estimated "*rough sense*" of the commercial, financial, and political costs sustained by Hufbauer et al. (2009).

The analysis of the selected 60 U.S. unilateral economic sanction episodes shows that among 48 episodes, which had a positive impact on the U.S., in
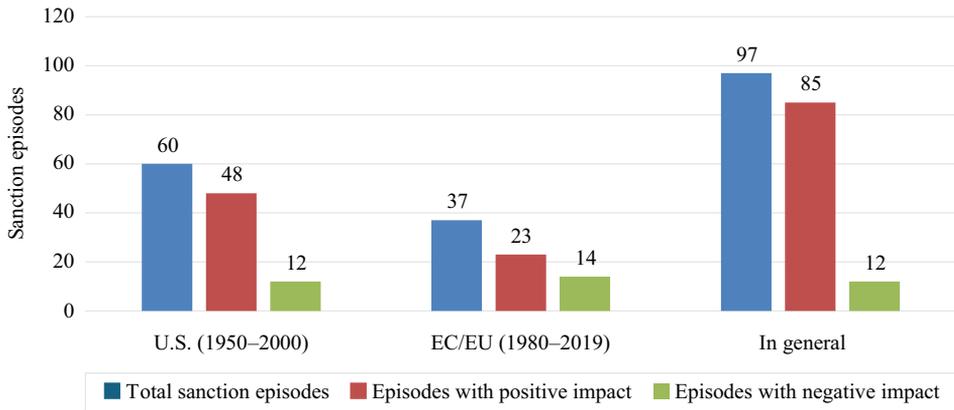
Fig. 1. Comparison between sanction episodes with positive and negative impact for the senders.

28 episodes, the U.S. withheld aid, and in 20 episodes, the trade with the targeted countries led to a positive effect for the U.S. trade. The tracking of U.S. exports and imports by country began in 1985, with some countries being tracked even later. Due to this fact, this research only analyzed data from 1985 onwards. However, an exception to this was the Israel (56-1) sanction episode, as the data was available in the U.S.–Israel Economic Cooperation: Bilateral State Statistics (1948–present) database. The data check of 11 out of 20 U.S. sanction episodes, which Hufbauer et al. (2009) classified as sanctions with "little effect on the sender (2)," resulting in a net economic profit for the sender, with short public comments and trivial postings confirms their assessment and validates the equations (1), (2), (3), and (4) outlined earlier. Indeed, the validation bolsters the credibility of their findings and reinforces the trustworthiness of their research outcomes, as the findings have undergone thorough verification, instilling greater confidence in the conclusions drawn from the analysis (Table 1).

Similarly, the study found that most of the sanctions the EC/EU imposed did not significantly impact the sender's imports and exports from/to the targeted countries. Instead, most of the sanctions ended in increased bilateral trade with the targeted countries (Table 2).

There were some exceptions to the trend of sanction episodes, especially against Ethiopia (99-1), Yugoslavia (Serbia-Montenegro) (91-1), Zimbabwe (02-1), Belarus (12-1), Russia (14-1), Iran (11-3), Syria (11-4), and Syria (13-2). In cases where the bilateral trade volume with Ethiopia, Zimbabwe, and Syria (13-2) was low, the suspension of trade relations had no real relevance for the EU. However, the opposite was true for the sanctions against the other countries, where the suspended bilateral trade volumes were significant for the EC/EU and were also noticed by the public.

In contrast, Nigeria (93-2), Belarus (06-1) and Egypt (11-2) were subject to sanctions in the form of an export ban, but the EC/EU still recorded an increase in

Table 1
Total U.S. volume of trade with the targeted countries during the sanction period or in at least three years.

Targeted country	Sanction duration	Examined period	Type of sanction	Total U.S. imports (M), million U.S. dollars		Difference		Total U.S. exports (X), million U.S. dollars		Difference		Sources
				at the beginning of the period	at the end of the period	million U.S. dollars	%	at the beginning of the period	at the end of the period	million U.S. dollars	%	
1 Israel (56-1)	1956–1983	1956–1983	F, X	19.0	2,017.0	1,998.0	10,515.79	98.0	1,255.0	1,157.0	1,180.61	U.S.–Israel Economic Cooperation: Bilateral Trade Statistics (1948–present, 2023)
2 Arab League (76-3)	1976–ongoing	2017–2022	F, X	50,514.0	63,929.0	13,415.0	26.56	60,468.0	58,231.0	–2,237.0	–3.70	Trade in goods with USA, Arab League, 2023
3 Pakistan (79-2)	1979–2001	1985–2001	F, X	273.9	2,249.5	1,975.6	721.29	1,041.7	541.5	–500.2	–48.02	U.S. Census Bureau, Trade in Goods with Pakistan, 2023
4 Poland (81-2)	1981–1987	1985–1987	F, X, M	220.2	296.1	75.9	34.47	237.9	238.8	0.9	0.38	U.S. Census Bureau, Trade in Goods with Poland, 2023
5 Romania (83-5)[a]	1990–1993	1992–1993	F, M	87.4	69.2	–18.2	–20.82	248.3	323.5	75.2	30.29	U.S. Census Bureau, Trade in Goods with Romania, 2023
6 Angola (86-2)	1986–1992	1986–1992	F	677.6	2,302.8	1,625.2	239.85	86.5	157.6	71.1	82.20	U.S. Census Bureau, Trade in Goods with Angola, 2023
7 China (89-2)	1989–ongoing	1989–2021	F, X	11,989.7	536,754.1	524,764.4	4,376.79	5,755.4	153,837.1	148,081,7	2,572.92	U.S. Census Bureau, Trade in Goods with China, 2023
8 Peru (95-1(1))	1995–1998	1995–1998	F, X	1,034.4	1,975.3	940.9	90.96	1,775.4	2,062.9	287.5	16.19	U.S. Census Bureau, Trade in Goods with Peru, 2023
9 Ecuador (95-1(2))	1995–1998	1995–1998	F, X	1,939.7	1,752.2	–187.5	–9.67	1,538.3	1,683.1	144.8	9.41	U.S. Census Bureau, Trade in Goods with Ecuador, 2023
10 India (98-1)	1998–2001	1998–2001	F, X	5,726.3	9,737.3	4,011.0	70.05	3,295.8	3,757.0	461.2	13.99	U.S. Census Bureau, Trade in Goods with India, 2023
11 Ecuador (00-1)	1999–2000	1999–2000	–	2,237.9	2,009.5	–228.4	–10.21	1,037.7	1,412.1	374.4	36.08	U.S. Census Bureau, Trade in Goods with Ecuador, 2023

Note: A number in brackets consisting of the year of imposition and the consecutive number of sanctions imposed in that year. [a] The sanction episode continued even after the end of the Cold War.
Source: Author's calculations based on the sources mentioned in the table.

Table 2

EC/EU exports/imports to/from the targeted countries during the sanction period.

Type of sanction	EC/EU imports (M)		EC/EU exports (X)	
	increase	decrease	increase	decrease
Import (M) (1 episode)	USSR** (82-1)		USSR** (82-1)	
Export (X) (13 episodes)	Libya** (86-1) only EU sanctions		Libya** (86-1) only EU sanctions	
	Syria (86-2)		Syria (86-2)	
	Myanmar** (90-1)		Myanmar** (90-1)	
	Slovenia (91-2)		Slovenia (91-2)	
	Croatia (91-3)		Croatia (91-3)	
	FYR Macedonia (91-4)		FYR Macedonia (91-4)	
	Bosnia-Herzegovina (91-5)		Bosnia-Herzegovina (91-5)	
	Zaire** (93-1)		Zaire** (93-1)	
		Nigeria (93-2)	Nigeria (93-2)	
		Ethiopia (99-1)		Ethiopia (99-1)
	Indonesia (99-3)		Indonesia (99-3)	
	Libya** (99-4) only EU sanctions		Libya** (99-4) only EU sanctions	
	Myanmar (13-1)		Myanmar (13-1)	
Financial (F) (5 episodes)	Guinea (09-1)		Guinea (09-1)	
	Bosnia-Herzegovina (11-1)		Bosnia-Herzegovina (11-1)	
	Tunisia (11-5)		Tunisia (11-5)	
	Nicaragua (19-1)		Nicaragua (19-1)	
	Turkey (19-2)			Turkey (19-2)
Financial and export (F, X) (7 episodes)	China (89-1)		China (89-1)	
		Yugoslavia** (Serbia and Montenegro) (91-1)		Yugoslavia** (Serbia and Montenegro) (91-1)
		Zimbabwe (02-1)		Zimbabwe (02-1)
		Belarus (06-1)	Belarus (06-1)	
		Belarus (12-1)		Belarus (12-1)
		Russia (14-1)		Russia (14-1)
	Venezuela (17-1)			Venezuela (17-1)
Export and import (X, M) (2 episodes)	South Africa (85-1)		South Africa (85-1)	
		Egypt (11-2)	Egypt (11-2)	
Financial, export and import (F, X, M) (5 episodes)		Iran (11-3)		Iran (11-3)
		Syria** (11-4)		Syria** (11-4)
	Guinea-Bissau (12-2)		Guinea-Bissau (12-2)	
		Syria** (13-2)		Syria** (13-2)
	Ukraine (14-2)		Ukraine (14-2)	

Note: ** The sanctions had multiple objectives.

Source: Author's calculations based on the CIA World Factbooks 1982–2013, World Bank (2021), External and intra-European Union Trade EC Statistical Yearbooks 1958–2002, EC Directorate-General for Trade (2021), and Becker (1987).

exports to these countries. Despite the financial and export ban, the EU increased imports from Turkey (19-2) and Venezuela (17-1) during the sanctions.

This study excluded four of 37 EC/EU sanction episodes due to their short-term nature (Argentina (82-2) — only one month) or the unavailability of records regarding the EC imports and exports from/to these countries (Azerbaijan (92-1), Armenia (92-2), and Eritrea (99-2)).

Table 2 contains results obtained by comparing EC/EU bilateral trade with target countries before and after the sanctions and for at least three years during the sanctions. The data evaluation includes information on the target group, duration of sanctions, their type, investigation period, the total value of EC/EU imports and exports at the beginning and end of the sanctions in million euro, the difference value in million euro, and the percentage share. For a comprehensive understanding, Supplementary material 2 contains detailed data in Table 1B, which offers granular insights into individual sanction episodes.

The research validates hypothesis H1 and provides evidence that unilateral and autonomous economic sanctions positively impact the sender.

7.2. Unilateral and autonomous economic sanctions are partially motivated by endogenous factors

The research reveals consistent patterns in the variables analyzed concerning the imposition of sanctions, indicating endogenous motives behind them in general.

7.2.1. Trade linkage

According to the research, countries with significant middle and high-level bilateral trade connections are more likely to face sanctions from the sender countries. The study suggests that the United States primarily targeted countries with middle-level bilateral trade ties, followed by those with high-level bilateral trade connections. On the other hand, the CE/EU mainly targeted countries with high-level bilateral trade connections and, secondarily, those with middle-level bilateral trade ties (Fig. 2).

The data regarding the U.S. sanctions came from the Hufbauer et al. (2009) study. The target country's total trade connection with the EC/EU was calculated as a percentage of the target country's total trade with the world before the imposition of sanctions. The data evaluation includes information on the total target's trade with the EC/EU and the world in billion euro, the difference value in billion euro, and the percentage share. Supplementary material 2 contains detailed data in Table 2B.

In the case of Slovenia (91-2), Croatia (91-3), and FYR Macedonia (91-4), which were once part of Yugoslavia, the economic data of Yugoslavia (91-1) registered before the imposition of sanctions was considered for the analysis of the trade linkage.

7.2.2. GDP ratio

The findings reveal that the sanctions of both senders are predominantly imposed on developing countries with a GDP ratio up to 1,000 times lower than that of the sanctioning countries. Next in line are countries with emerging economies with a GDP ratio up to 100 times lower than the sanctioning countries (Fig. 3).
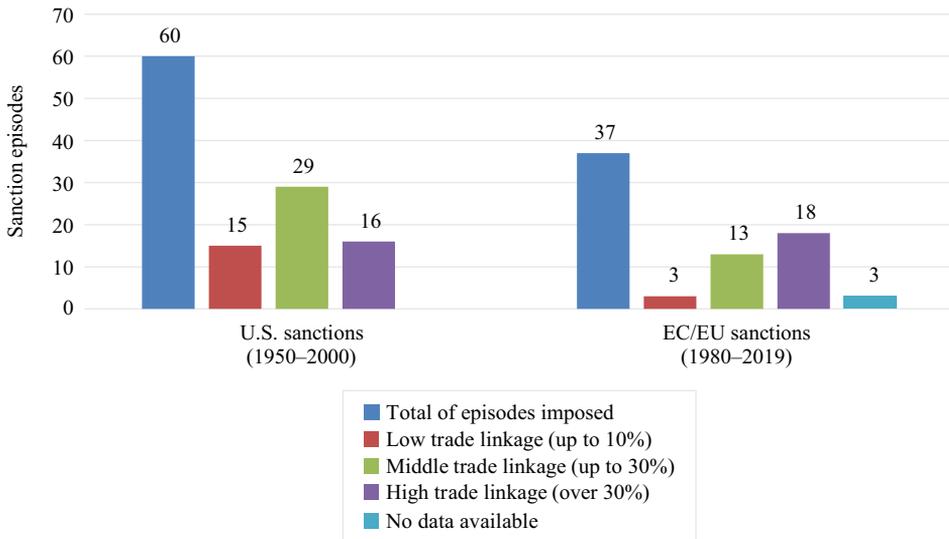
Fig. 2. The bilateral trade linkage expressed as a percentage of the target's total trade flow
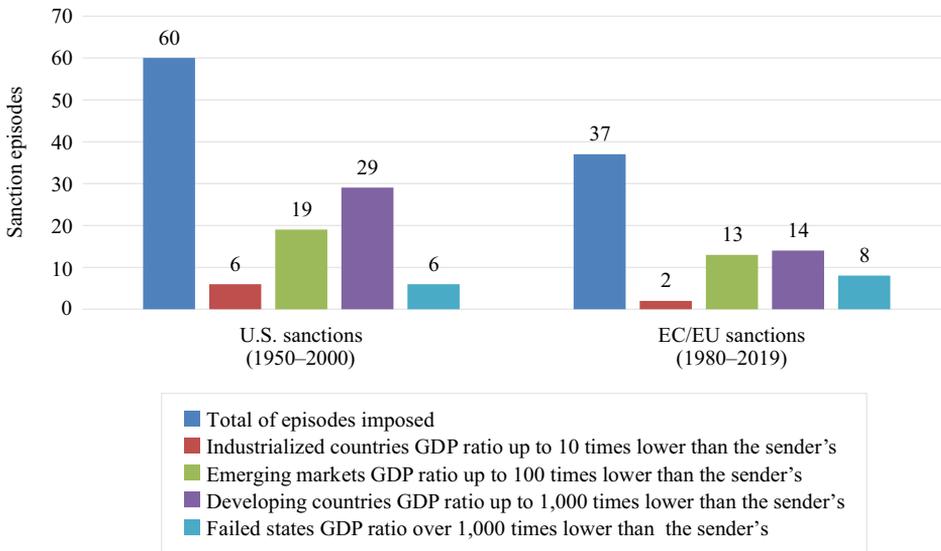in the year before the imposition of sanctions.

Fig. 3. The GNP ratio of the sender to the targeted countries
in the year before the imposition of the sanctions.

The data regarding the U.S. sanctions came from the Hufbauer et al. (2009) study. The ratio of the EC/EU's GNP to the targeted countries' GNP in the year before the imposition of sanctions is determined by comparing the registered GNP of the target country with that of the sending country. This value is expressed in billions of dollars. Supplementary material 2 contains detailed data in Table 3B.

7.2.3. Economic health and political stability of the target countries

The research shows that sanctions mainly target countries with acute economic and political instability (distressed situations (1)) or significant economic issues and internal dissent (significant problems (2)). The U.S. primarily targets the second category, while the EC/EU mainly targets the first category (Fig. 4). Supplementary material 1 contains detailed data in Tables 1A and 2A.

7.2.4. The average of the target's GDP growth rate five years before the imposition of sanctions

According to the research findings, countries are more likely to impose sanctions on other countries that have shown higher average GDP growth rates in the five years before the imposition of sanctions (Fig. 5). Supplementary material 1 contains detailed data in Tables 1A and 2A.
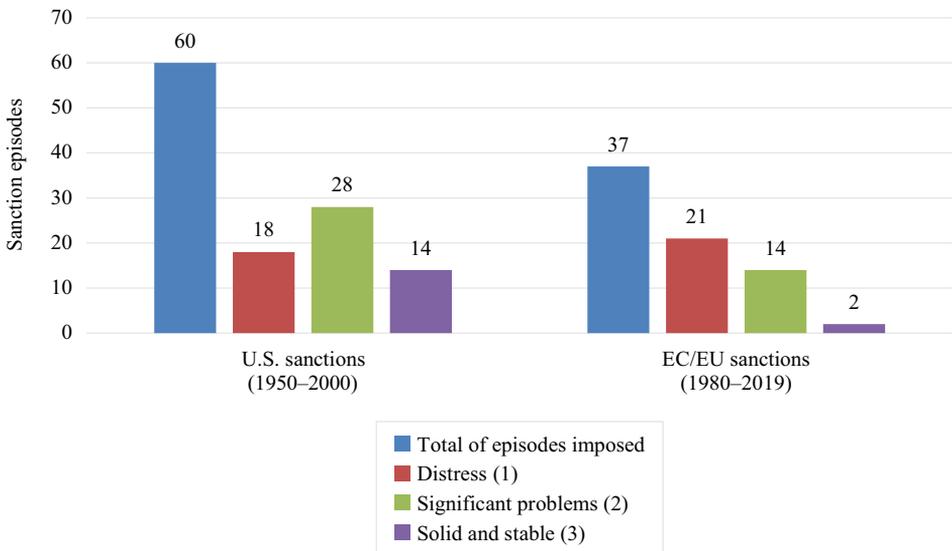

Fig. 4. The targets of economic health and political stability
before the imposition of the sanctions.

Source: Author's calculations based on Hufbauer et al. (2009), Statista (2021), World Integrated Trade Solution (2021), CEICDATA (2021), Country Economy (2021), the CIA World Factbooks 1982–2013, Jewish Virtual Library (2023), Trade in Goods with the U.S.A (2023), United States Census Bureau (2023), Kreutz (2005), Portela (2005), Giumelli et al. (2020), Hörbelt (2017), Macrotrends (2021), External and intra-European Union Trade EC Statistical Yearbooks 1958–2002, EC Directorate-General for Trade (2021), EU Sanctions Map (2021), European External Action Service (2023), and World Bank (2021).
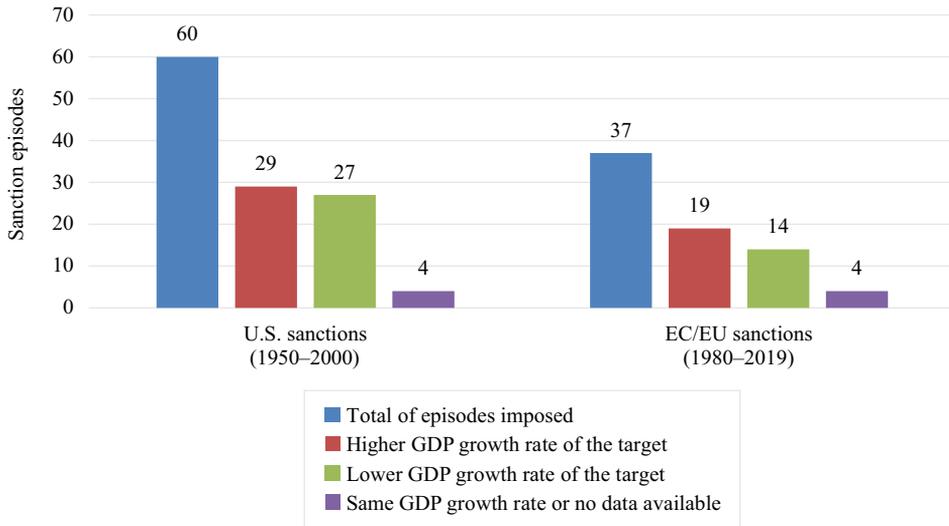
Fig. 5. The average of the target's GDP growth rate five years
before the imposition of sanctions.

Source: Author's calculations based on Hufbauer et al. (2009), Statista (2021), World Integrated Trade Solution (2021), CEICDATA (2021), Country Economy (2021), the CIA World Factbooks 1982–2013, Jewish Virtual Library (2023), Trade in Goods with the U.S.A (2023), United States Census Bureau (2023), Kreutz (2005), Portela (2005), Giumelli et al. (2020), Hörbelt (2017), Macrotrends (2021), External and intra-European Union Trade EC Statistical Yearbooks 1958–2002, EC Directorate-General for Trade (2021), EU Sanctions Map (2021), European External Action Service (2023), and World Bank (2021).

7.2.5. Location of the targeted countries

The study reveals that the senders are more likely to impose sanctions on their neighboring nations (Fig. 6). Supplementary material 1 contains detailed data in Tables 1A and 2A.

The research reveals consistent patterns in the variables analyzed concerning the imposition of sanctions, which strongly indicate endogenous motives behind the imposition of sanctions in general. The research validates hypothesis H2 and provides evidence that unilateral and autonomous economic sanctions are partially motivated by endogenous factors.

7.3. Economic sanctions serve in part to enhance the sender's economic security

The validation of hypothesis H1, which proves that most unilateral and autonomous economic sanctions positively impact the sender, indicates that there are tangible benefits to the sender country due to imposing sanctions.

The validation of hypothesis H2, which suggests that unilateral and autonomous economic sanctions are partially motivated by endogenous factors, further underscores the strategic calculus behind the imposition of sanctions. Endogenous motivations such as economic security concerns, geopolitical interests, and domestic political considerations can drive sender countries to deploy sanctions as a means to safeguard their economic interests and enhance their standing on the global stage.

In essence, the findings validate hypothesis H3 that economic sanctions serve, at least in part, to enhance the sender's economic security by providing tangible bene-
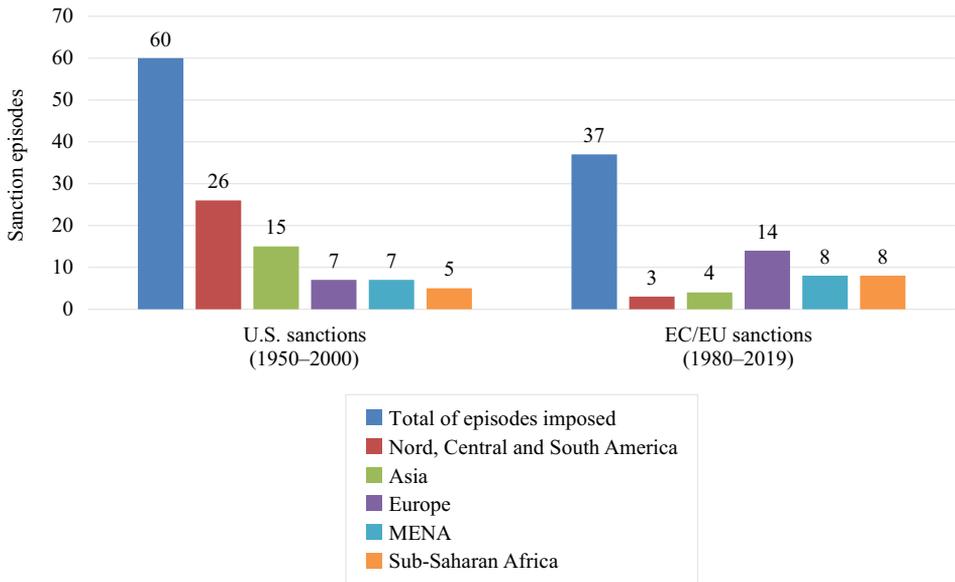
Fig. 6. Location of the targeted countries.

Source: Author's calculations based on Hufbauer et al. (2009), Statista (2021), World Integrated Trade Solution (2021), CEICDATA (2021), Country Economy (2021), the CIA World Factbooks 1982–2013, Jewish Virtual Library (2023), Trade in Goods with the U.S.A (2023), United States Census Bureau (2023), Kreutz (2005), Portela (2005), Giumelli et al. (2020), Hörbelt (2017), Macrotrends (2021), External and intra-European Union Trade EC Statistical Yearbooks 1958–2002, EC Directorate-General for Trade (2021), EU Sanctions Map (2021), European External Action Service (2023), and World Bank (2021).

fits, strengthening negotiating positions, and bolstering domestic support. However, it's important to note that sanctions' efficacy and long-term consequences can vary depending on various factors, including the target country's resilience, international responses, and unintended spillover effects on global economic stability.

8. Discussion

The research findings presented in this study emphasize the potential for economic sanctions to be used as a strategic tool to stimulate economic growth and activate specific economic mechanisms that can revitalize the sender country's economy. This concept is consistent with the 2017 U.S. National Security Strategy, which underscores the potential for economic sanctions to engender favorable economic outcomes within the sender's economy.

The study demonstrates that economic sanctions frequently positively affect the sender's economy. This revelation is pivotal for comprehending the operational mechanics of economic sanctions within the sender's economic infrastructure. The analysis indicates that exports and imports experienced an upsurge in numerous instances of sanctions, notwithstanding the explicit imposition of sanctions, as exemplified in the case of Belarus. The escalation in trade activity stemmed from the enforcement of sanctions under the *ceteris paribus* condition, as these measures can disrupt the flow of trade, precipitating fluctuations in exchange rates and inflationary pressures. Similarly, import sanctions elevate the expenses associated with imported commodities due to currency devaluation,

while export sanctions curtail access to essential raw materials, thereby driving up production costs. Additionally, financial sanctions impede investment prospects and access to international credit, thereby fomenting inflationary pressures and destabilizing the sender's economy. Thus, the research proves the equations (1), (2), (3) and (4), which describe the assumption that economic sanctions may induce exchange rate volatility and inflation in the target country. This will benefit the sender's trade with the target, under *ceteris paribus* conditions.

The results also validate the research conducted by Wang et al. (2019), Belin and Hanousek (2021), and Alwadeai et al. (2024), highlighting the impact of economic sanctions on bilateral trade flows, exchange rate volatility and inflation escalation in the affected nation. Furthermore, the findings prove the academic research conducted by Drury, 2005; Waelder, 1997; Kaempfer and Lowenberg, 2007; Liou et al., 2022; Ladurner, 2023, which proposes that the enforcement of sanctions is often influenced by internal political factors, national policy objectives, and economic necessities. Finally, the study validates the research conducted by Jones and Portela (2014), arguing that unilateral and autonomous sanctions with sender-related goals benefit the sender country's domestic economy and local businesses.

The reasons for imposing sanctions are often presented as being related to issues such as human rights violations, nuclear proliferation, or territorial disputes. However, this study uncovers a more intricate web of factors that influence the decision-making process behind sanctions. By examining both empirical data and theoretical frameworks, this research exposes the subtle and complex motivations that drive the imposition of economic sanctions.

According to the findings, one key determinant of sanction imposition lies in the strength of bilateral trade connections between sender and target countries. This research demonstrates that countries with substantial trade ties are more likely to face sanctions from their counterparts. This phenomenon underscores the strategic leverage wielded by sender countries, who may employ sanctions as a means to coerce compliance or deter undesirable behavior that threatens their economic interests. The rationale behind this is multifaceted. Thus, countries with extensive bilateral trade relationships are more economically interdependent. As a result, disruptions to trade flow caused by sanctions can have a more pronounced impact on both the sender and target countries. This heightened vulnerability can compel sender countries to resort to sanctions as a means to exert pressure and influence outcomes in their economic favour. Bilateral trade connections give sender countries a lever of economic coercion over their trading partners. By threatening or imposing sanctions, sender countries can inflict economic costs on the target nation, thereby incentivizing compliance with desired policies or objectives. This strategic use of sanctions leverages the economic interdependence between trading partners to achieve diplomatic or geopolitical aims.

However, the imposition of sanctions on countries with significant trade ties sends a clear signal of intent from the sender country. It communicates to the target nation and the international community that the sender is willing to incur economic war using sanctions to protect its economic interests. This signalling effect can shape perceptions of the sender's credibility and willingness to enforce its economic security policy objectives to protect national security. Furthermore, sender countries may perceive certain actions or policies of their

trading partners as detrimental to their economic interests. By imposing sanctions, sender countries seek to mitigate risks posed by such actions and safeguard their economic well-being. This proactive approach aims to deter behavior that could disrupt trade relations or undermine the sender's economic competitiveness.

The research findings highlight the significance of the disparity in GDP ratios between sender and target countries as a crucial factor shaping the imposition of sanctions. Specifically, the study reveals a pattern wherein sanctions are primarily directed at countries with emerging markets and developing nations that exhibit significantly lower GDPs compared to their sanctioning counterparts. This asymmetry in economic power serves as a rationale for sender countries to exert influence or penalise perceived transgressions, leveraging their economic might to enforce compliance or extract concessions.

Thus, the substantial difference in GDP ratios between the sender and target countries creates a power imbalance that tilts the scales in favour of the sender. Sender countries, typically possessing larger and more robust economies, wield disproportionate influence in international affairs. This power asymmetry provides sender countries with the means to coerce compliance or punish non-compliance through the imposition of sanctions. Further, sender countries leverage their economic superiority to enforce their policy preferences or advance their strategic and economic interests vis-à-vis target countries with weaker economies. By imposing sanctions on economically vulnerable nations, sender countries aim to exert pressure and compel changes in behavior that align with their strategic and economic objectives. Imposing sanctions on countries with lower GDP is seen as a punitive measure to punish perceived violations or non-compliance with the senders' interests. These sender countries may view sanctions as a way to discipline target countries to agree with the senders' regional, economic, and global interests.

Further, sender countries can also employ economic sanctions as a bargaining tool to extract concessions from target nations. By imposing sanctions on economically weaker countries, sender countries seek to compel concessions or policy changes that serve their interests, such as opening up markets, halting undesirable activities, or aligning with their economic and foreign policy objectives. In summary, the disparity in GDP ratios between sender and target countries shapes the imposition of sanctions by amplifying power differentials and providing sender countries with the means to exert influence, enforce compliance, or extract concessions from economically weaker nations.

The research findings underscore the significance of economic or political instability as a key factor driving the imposition of sanctions. They reveal that countries facing severe economic crises, internal dissent, or governance challenges are more susceptible to sanctions, which indicates that senders may aim to take advantage of these vulnerabilities to achieve strategic goals, such as influencing the political situation in target countries or promoting their geopolitical interests. This dynamic involves multiple facets, as economic or political instability renders countries more susceptible to external pressures, making them prime targets for sanction imposition. Countries experiencing acute economic crises, internal dissent, or governance challenges are perceived as weak or unstable, making them easier targets for sender countries seeking to exert influence or enforce compliance. Imposing sanctions on countries already grappling with instability can exacerbate existing challenges and deepen socioeconomic crises. Sanctions may worsen

economic conditions, fuel social unrest, or exacerbate political tensions, leading to further instability and fragility within the target country. This escalation of instability can serve the strategic objectives of sender nations by destabilizing rival regimes or weakening adversaries. Sender countries may view sanctions as a tool to catalyze regime change or political transformation in target countries. By exacerbating economic hardships, social discontent, or political turmoil, sanctions can create conditions conducive to regime collapse or transition. In summary, economic or political instability catalyses sanction imposition, as it amplifies vulnerabilities that sender countries may seek to exploit for strategic gain.

The research findings shed light on the strategic timing often associated with the imposition of sanctions, particularly in targeting nations that have demonstrated higher average GDP growth rates in preceding years. This trend reflects a pre-emptive approach whereby sender countries seek to curb the rise of potential challengers to their economic or geopolitical dominance. By imposing sanctions on burgeoning economies, sender nations aim to stifle their growth trajectory and mitigate perceived threats to their interests. This strategy involves implementing pre-emptive measures to restrain economic competitors, mitigate perceived threats, undermine economic resilience, and safeguard market share. By imposing sanctions on countries experiencing rapid economic expansion, sender nations seek to pre-emptively curb their rise and maintain their own economic or geopolitical dominance. They aim to disrupt the growth trajectory of these economies, thereby weakening their competitive position and safeguarding their economic interests. Sender countries may perceive nations with high GDP growth rates as potential threats to their economic or geopolitical interests. By disrupting trade flows, imposing financial restrictions, or limiting access to key resources, sender nations aim to create economic vulnerabilities and weaken the overall resilience of target economies. In summary, the imposition of sanctions on nations with high GDP growth rates reflects a pre-emptive strategy employed by sender countries to maintain their economic or geopolitical dominance.

The research findings underscore the importance of geographic proximity in determining the imposition of sanctions. The close geographic distance between target and sender nations is a key factor due to neighboring countries' complex political, economic, and security ties. This proximity makes neighboring nations particularly vulnerable to external pressure, making them prime candidates for sanctions. The imposition of sanctions is heavily influenced by geographic proximity, as neighboring countries often have intricate political, economic, and security interdependencies due to their proximity. These interdependencies create vulnerabilities that sender nations may look to exploit through the use of sanctions.

Sanctions imposed on neighboring nations often stem from concerns about regional stability and security. Sender nations may view certain actions or policies by neighboring countries as destabilizing or threatening regional peace and security. By imposing sanctions, sender nations aim to discourage behavior that could escalate tensions or undermine stability in the immediate vicinity. Security threats can also drive the geographic proximity of target countries to sender nations. Neighboring countries may present security challenges such as border disputes, terrorism, or weapons proliferation, prompting sender nations to impose sanctions to address these threats and protect their security interests. However, neighboring countries often compete to access resources, markets, and

regional influence. Sanctions imposed by sender nations may reflect efforts to gain a competitive advantage or assert dominance in strategic sectors or markets. Sender nations may prioritize regional stability, security, and economic interests when formulating sanctions policies, recognizing the potential spillover effects of instability or conflict in neighboring countries. In conclusion, geographic proximity plays a significant role in the imposition of sanctions, driven by shared interdependencies, concerns over regional stability, security threats, and competition for resources and influence among neighboring countries.

The research findings clearly show that unilateral and autonomous economic sanctions are influenced by internal factors, including domestic economic goals and geopolitical and security considerations. This study highlights the significant impact of economic sanctions on global economic and political tactics, emphasizing their ability to protect economic and national interests in accordance with the principles outlined in the 2017 U.S. National Security Strategy, which serves as the foundation for global security strategy.

The findings have important implications for policymakers and scholars in both the sender and the targeted countries. They offer valuable insights into sanctions' potential usage, impact, and effectiveness in achieving the intended outcomes. This knowledge can inform the development of more targeted and efficient sanction strategies and contribute to a deeper understanding of their broader geopolitical and economic implications.

The study uncovers discernible patterns in the selection of targets, elucidating the influence of trade dynamics on state conduct during sanctions. Moreover, the research broadens prevailing assumptions regarding the rationale behind sanction decisions, highlighting the significance of economic, political, and geographical proximity factors.

It is important to acknowledge the limitations of the research. The study's data only spans from 1950 to 2019, thus overlooking the unique challenges posed by the recent global pandemic and geopolitical tensions. Furthermore, the study relies on comparative and descriptive analysis, which may not be sufficient for due to challenges in establishing causality, depth of analysis, potential for oversimplification, generalization difficulties, and limited ability to test hypotheses. It is recommended to incorporate supplementary methods such as experimental designs, case studies, or theoretical modelling to enhance the reliability of research outcomes.

9. Conclusion and policy implications

The analysis encompassed 97 instances of unilateral and autonomous sanctions, comprising 60 unilateral sanctions imposed by the U.S. between 1950 and 2000 and an original dataset of 37 EC/EU autonomous sanctions imposed between 1980 and 2019. A detailed analysis compared and described the relationship between economic sanctions, economic security, and national security within the 2017 U.S. National Security Strategy context, which functions as the prevailing global geoeconomic framework, underscores the vital role of economic sanctions as indispensable tools within the realm of geoeconomic and geopolitical spheres worldwide. This approach aimed to explore the impact and interplay of economic sanctions on the overall economic and national security

landscape. The findings indicate that economic sanctions can bolster the sender's domestic economic strength and security and safeguard economic sovereignty. The research findings offer valuable insights for policymakers:

- *targeted sanction strategies:* policymakers must consider the socioeconomic and political context of the target nations. This approach minimizes unintended consequences and ensures that sanctions address the underlying issues. Targeted sanctions should be imposed on specific entities, industries, or sectors involved in such activities rather than blanket measures that may harm innocent populations or non-targeted sectors.
- *trade policy considerations:* policymakers must weigh the economic consequences of sanctions on both sender and target countries.
- *regional diplomacy:* it is critical to prevent conflict and promote stability, possibly reducing the need for sanctions. Policymakers should prioritize it.

Economic sanctions are integral to modern security strategy, offering states a flexible and powerful tool to address various security challenges and advance their strategic objectives. Economic sanctions can promote stability, prevent conflict, and enhance economic security when used effectively and in conjunction with other diplomatic, economic, and military instruments. However, it is essential for policymakers to consider the economic and geopolitical implications of sanctions carefully and to employ them judiciously within a broader framework of international law and diplomacy.

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Supplementary material 1

The lists of the analyzed U.S. and EC/EU sanction episodes
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Data type: Table
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Link: https://doi.org/10.32609/j.ruje.10.121368.suppl1

Supplementary material 2

EC/EU trade with the targeted countries: Some relative statistics
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Data type: Table
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