

Global Financial Crisis and Trade Papers: Topic Analysis Via Latent Dirichlet Allocation Model

Global Finansal Kriz ve Ticaret Makaleleri: Gizli Dirichlet Ayrımı Yöntemiyle Başlık Analizi

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Abstract

We examine the trends in the studies published in international trade journals indexed in Web of Science (WoS) before and after the 2008 Global Financial Crisis (GFC). This study investigates the 5001 abstracts of trade articles starting from the post-millennium period by addressing issues in WoS database trade journals using the Latent Dirichlet Allocation (LDA) topic model. The purpose of the study is to evaluate whether topics and words differ that have been discussed in international trade literature before and after GFC. Mostly, contain topics differ when two periods are compared, although trade agreements and disputes, stock markets, and growth issues are frequently mentioned in both periods. In the post-crisis period, volatility, banks, and firm-specific issues are more popular. It is also among the findings that Asian economies gained importance after GFC. Generally, it has been revealed that the topics and titles in the trade literature can reflect current developments in international economics. Therefore, probably for next years, advances in technology as blockchain, emerging economies –especially China and India – and firm-based micro-scale papers will dominate the trade journals.

Keywords: International Trade, Latent Dirichlet Allocation, Topic Modeling, Trends of Trade.

Öz

Çalışmamızda; 2008 Global Finansal Kriz öncesinde ve sonrasında Web of Science'da uluslararası ticaret ile ilgili yayımlanan makalelerdeki trendler ele alınmaktadır. Bu çalışma, milenyum sonrası dönemden başlayarak Web of Science veri tabanında yer alan 5001 uluslararası ticaret makale özetini Gizli Dirichlet Ayrımı başlık analizini kullanarak incelemektedir. Çalışmanın amacı, global finansal kriz öncesi ve sonrası uluslararası ticaret literatüründe tartışılan konuların ve kelimelerin farklılaşp farklılaşmadığını değerlendirmektir. Çoğunlukla, iki dönem kıyaslandığında konu başlıkları farklılık gösterse de; her iki dönemde de ticaret anlaşmaları ve anlaşmazlıklar, hisse senedi piyasaları ve büyüme sorunları sıklıkla dile getirilmektedir. Kriz sonrası dönemde istikrarsızlık, bankalar ve firmaya özgü konuların daha popüler olduğu görülmektedir. Asya ekonomilerinin global finansal krizden sonra önem kazandığı da bulgular arasındadır. Genel olarak ticaret literatüründe yer alan konu ve başlıkların uluslararası ekonomideki güncel gelişmeleri yansıtabildiği ortaya çıkmaktadır. Bu nedenle, muhtemelen önümüzdeki yıllarda gelişmekte olan ekonomiler - özellikle Çin ve Hindistan'da blockchain ve teknolojiye ilişkin gelişmeler ve firma tabanlı mikro ölçekli makaleler ticaret dergilerine hâkim olacaktır.

Anahtar Kelimeler: Uluslararası Ticaret, Gizli Dirichlet Ayrımı, Başlık Analizi, Ticaret Eğilimleri.

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Introduction

“I think in our global economy; uncertainty is ever increasing. So to accommodate that, we need to build a dynamic economy and dynamic rules that can adapt to changing circumstances” (Myron Scholes).ⁱ

The story and actors of world trade have changed for years. The journey of world trade has been steadily evolved from the first existence of an Assyrian merchant colony at Kanesh in Cappadocia in 19th century BCE (Newton, 2019) to "multinational corporations," which a term first used by David Lilienthal at a conference at Carnegie Mellon University in 1960 (Chandler and Mazlish 2005) to the globalization popularized by Levitt (1983), one of the editors of Harvard Business Review and to crises like the latest one: COVID-19 Pandemic.

Between the end of World War II and 2008, GFC, a breaking point in global trade, many economic, political, and technological disruptions and changes occurred globally. World Trade Organization (WTO) report these milestones like the birth of the Bretton Woods System in the 1940s, the foundation of the European Union (EU) in the 1950s, the increase of container trade in the 1960s, and the elimination of customs duties within the EU, the oil crisis in the 1970s, rapid technological developments in the 1980s, the establishment of the WTO, the Asian financial crisis in the 1990s and, China's WTO participation, 9/11 Attacks, GFC and technological revolutions in 2000s (World Trade Report 2008). China's WTO participation and GFC can be considered one of the most significant facts affecting the economy from 2000-2009. Notably, after 15-year negotiations in the organization, membership in China has reshaped the world trade since China had disrupted the competition in the mainland for a long time by discriminating against local and foreign firms to support domestic producers. With the membership, China has liberalized its markets, improved the business environment, and reduced input and transaction costs; in that way, global trade has been accelerated for both China and its trading partners (Ianchovichina and Walmsley 2003: 261). Another event that had a more severe impact on international trade was the GFC in 2008. The impact of this crisis spread all over the world via high interdependency among countries. For 2009, world trade decreased by 12.2 % in real or volume terms. The drop in dollar terms is 23 % due to significant price drops, especially for primary commodities such as oil and minerals (Shelburne 2010). Literature has called this period “The Great Trade Collapse” because of its devastating effect on global trade. Although falling commodity prices have severe unfavorable consequences for commodity-dependent exporters, import-dependent developing countries benefited. Thus, the financial crisis has also smoothed the effects of peaking fuel and food prices. Oil prices, which rose by 100% in 2005-2008, have declined from a peak of \$147/barrel to \$40-45/barrel as of March 2009. This has a significant balance of payment implications for oil-importing developing countries, particularly for small developing countries, which have to allocate a much higher share of GDP for fuel imports than large economies (Meyn and Kennan 2009). According to Chor and Manova (2012), two aspects of the GFC are believed to be behind this significant decline in international trade:

- On the producer side, the credit crunch at the height of the crisis resulted in a severe reduction in the availability of external finance, thus curtailing firms' production and export capacities.
- On the consumer side, the gloomy economic outlook led to a slowdown in global demand in general and for imports in particular.

After the 2008 GFC, problems in the world economy have continued. Developments that have affected the global economy and trade between the GFC and 2019 are as follows: The Eurozone debt crisis, which peaked between 2010 and 2012, Brexit triggered by the vote in 2016, Trade War between China and USA started in 2018, and the effect of COVID-19 Pandemic in 2019.

UNCTAD's annual reports series "Evolution of the International Trading System and Its Trends from a Development Perspective" give significant traces in understanding the trends in international trade between 2008 and 2017. The primary outcomes of the reports are as follows:

- After the GFC, the importance of developing countries in international trade has increased,
- A more protective approach has been observed in investment policies during crisis periods,
- Technology and sustainability issues have become prominent and
- The effects of changes and fluctuations in commodity prices and exchange rates are inevitable.

These circumstances have always affected trade vulnerably. These uncertain and complex cases and trends have caused positive or negative responses such as investments, trade barriers, agreements, integrations, trade costs on the trade side.

Researchers, as well as international organizations, also examine the changes and trends in the economy and international trade in their academic studies and reports. We can observe examining these publications what changes have occurred. It can also be stated that analyzing and predicting the changing structure over the years and periods can provide essential data for stakeholders. They consider how the change and trend are essential for all stakeholders; this study has taken the global financial crisis, a crucial breakdown for international trade, as the middle point. The study, which tries to reveal the trends in the trading world before and after the crisis, also aims to present the trade dynamics between 2000-2019.

Therefore, the study reveals whether trade trends have changed after GFC in articles published in trade journals indexed in WoS between 2000-2019. For this purpose, 5001 papers from 12 different journals have been analyzed by using LDA. Articles have been analyzed on two periods (2000-2009 and 2010-2019) separated by the GFC, which is accepted as the breaking point for the global trade over these years. This is the first study analyzing the evolution of international trade with the LDA modeling method; it also has observed trends before and after the crisis; therefore, it is thought that this study is original and will contribute to demonstrate the trends in the trade literature.

The structure of this study is organized as follows. Section 2 contains a literature review on related subjects. Section 3 explains the data and methodology. Empirical results are reported in Section 4. Lastly, discussion and suggestions are presented in the conclusion part of the study.

Literature Review

Academic studies can follow the evaluation in their fields consistently and produce content related to these developments. This effort is significant for both development of science and the quality of future publications. For this aim, some text analysis methods reveal which topics stand out or are less studied. Bibliometric analysis, topic modeling, etc., are seen as prominent text analysis methods in the literature. These text analysis methods are often used in economic and financial studies due to their dynamic structure.

Bibliometric analysis, one of the text analysis methods, is also used to analyze the content of studies in the economy field. By the time the recent studies in the literature are analyzed, it is seen that topics in the economics journals are evaluated by the bibliometric method. Kosnik (2015) investigates the focus of economists in economic journals over the last 50 years to understand which topics gained importance and which ones are now ignored are revealed by text analysis. Claveau and Gingras (2016) examine

economic journals via bibliometric analysis and reveal specialties in economics. Economics changes through time, and this should be reflected in the structure of its publications. Their study defines expertise and diversity in publications. Klopotan et al. (2018) aim to provide an early warning system for economic and business crises via bibliometric analysis. They investigate the role of early warning systems in predicting and recognizing negative events, especially in the area of business, finances, and the economy. Kosnik (2018) examines the JEL codes to categorize the field of economics. This study aims to find out thematic topics and trends in economic journals via text analysis.

Although there are publications on text analysis in economics, it is challenging to come across academic studies on the evolution of international trade literature from the perspective of studied topics. Generally, the reports of organizations such as the World Bank, WTO, and UNCTAD have been trying to reveal the determinants which shape international trade.

In the framework of academic studies, only one bibliometric analysis was found in the field of international trade. Tian et al. (2018) have examined the relationship between international trade and the environment with bibliometric analysis. They have reviewed journals and articles between 1997 and 2016. They have provided carbon emissions, water consumption, environmental and international trade relations in studies, and obtained the results of interdisciplinary studies. As seen, there are not many studies that reveal the trend of the international trade field in literature. Therefore, this field can be considered an area where new academic studies can be made and contribute to the literature.

Table 1

Summary of Studies with Bibliometric Analysis

Author/s	Year	Research Aim
Kosnik	2015	investigates economic journals over the last 50 years to understand which topics gained importance and which ones are now ignored are revealed
Claveau ve Gingras	2016	examine economic journals and reveal specialties in economics.
Klopotan et al.	2018	provide an early warning system for economic and business crises
Kosnik	2018	examines the JEL codes to categorize the field of economics.
Tian et al.	2018	examine the relationship between international trade and the environment with articles

As mentioned above, another text analysis method used in economy and trade is LDA. It is also referred to as topic modeling and is among the most up-to-date text analysis in this study. This method is used in many different areas and lists the topics of academic studies.

LDA is used as an estimation model, especially in the fields of economics, tourism, finance/banking, marketing, and communication in the literature. Xing and Girolami (2007) in communication; Moro, Cortez, and Rita (2015) and Feuerriegel, Ratku and Neumann (2016) in finance and banking; Zoghbi, Vulić and Moens (2016) and Puranam, Narayan and Kadiyali (2017) in e-commerce and marketing, Guo, Barnes, and Jia (2017) in tourism and finally Ambrosino et al. (2018), Feuerriegel and Pröllochs (2018), Larsen and Thorsrud (2019), Wehrheim (2019) and Edison and Carcel (2020) in economics are some of these studies.

It can be useful to examine the economy studies in more detail, which we think maybe the closest to international trade studies. Ambrosino et al. (2018) discuss the New Neoclassical Synthesis after the global crisis, and five topics (economists, macroeconomic theories, labor economics, and debt) are defined thanks to LDA. Feuerriegel and Pröllochs (2018) contribute a holistic approach to how stock prices vary. Using the LDA technique, they explain stock reactions and present many topics about it. Larsen and Thorsrud (2019) investigate the Norwegian business newspaper topics in predicting and explaining economic fluctuations. They show many topics such as asset prices, unexpected innovation via LDA. Wehrheim (2019) purposes to demonstrate how topic models can enrich economic historians' methodology via LDA. Edison and Carcel (2020) analyze the U.S Federal Open Market Committee transcripts, discuss which economic modeling was dominant during the GFC, and decide the topics by LDA. The study of Kozlowski et al (2021) investigate directly international trade flows among countries by using LDA to detect the exported products and complexity.

Table 2

Summary of Studies with Latent Dirichlet Allocation

Author/s	Year	Research Aim
Ambrosino et al.	2018	discuss the New Neoclassical Synthesis after the global crisis
Feuerriegel and Pröllochs	2018	contribute a holistic approach to how stock prices vary
Larsen and Thorsrud	2019	investigate the Norwegian business newspaper topics in predicting and explaining economic fluctuations
Wehrheim	2019	purposes to demonstrate how topic models can enrich economic historians' methodology
Edison and Carcel	2020	analyze the transcripts of the U.S Federal Open Market Committee, discuss which economic modeling was dominant during the GFC
Kozlowski et al.	2021	Investigates the exported products, complexity and relations with countries

Although this method is used to examine different sectors and fields, up to the authors' knowledge, no other study using this method has been found in the field of international trade. Therefore, applying this method to the international trade field demonstrates the originality of the study.

Methodology

Text mining aims to discover the latent structure of documents and provides a source of information for literature. The model used here was developed by Blei et al. (2003) -LDA- allows auto clustering of text documents with a specified number of clusters referred to as "topic." Modeling assumptions and properties of LDA simultaneously discover the text assigned to the topic (Calvo-Gonzalez et al., 2018). The algorithm of the LDA model is based on a "bag of words" of text and takes co-occurrence of words that appear in similar context and frequency by ignoring grammar or single word order (Ambrosino et al. 2018).

LDA could be applied to almost all subjects of text clustering, from online reviews to open market committee transcripts (Wang et al. 2018; Edison and Carcel 2020). LDA text data analysis consists of two sections: the first model is probabilistic that accepts text as a likelihood function, whereas the

second part is an approximate inference algorithm due to the unfeasible feature of maximizing likelihood function (Schwarz 2018). The probabilistic model assumes that the probabilistic combination of topics (T) describes each document (d) of total documents (D), and probabilities are defined in a topic vector such as ψ_d of length T that contains each topic (t). $D \times T$ matrix is the output of LDA as follows:

$$\psi = \begin{pmatrix} \psi_1 \\ \vdots \\ \psi_D \end{pmatrix} = \begin{pmatrix} P(t_1 | d_1) & \cdots & P(t_T | d_1) \\ \vdots & \ddots & \vdots \\ P(t_1 | d_D) & \cdots & P(t_T | d_D) \end{pmatrix} \quad (1)$$

The probabilistic distribution of unique words in D defines t with the size of vocabulary (V). Thus, it is possible to monitor a word occurrence probability conditional on a topic. Next, word probability vectors for t are represented in a new vector ϑ with $V \times T$ dimension:

$$\vartheta = (\vartheta_1, \dots, \vartheta_T) = \begin{pmatrix} P(w_1 | t_1) & \cdots & P(w_1 | t_T) \\ \vdots & \ddots & \vdots \\ P(w_V | t_1) & \cdots & P(w_V | t_T) \end{pmatrix} \quad (2)$$

Vectors determine the observation probability of word from the vocabulary conditional on t . As a result of this, ϑ_t vector permits to judge of the content of the topic. However, it does not provide the name of each topic and requires one to evaluate the topic classification.

Text in the whole collection is defined by the following steps under the parameters of ψ and ϑ :

- Form a word probability distribution $\vartheta \sim \text{Dir}(\beta)$
- For d in the whole text collection:
 - o topic proportions reveal as $\psi_d \sim \text{Dir}(\alpha)$
 - o each of N_d words in d draw topic assignment [$z_{d,n} \sim \text{Mult}(\psi_d)$] and word $w_{d,n}$ from [$p(w_{d,n} | z_{d,n}, \vartheta)$].

β and α refer to hyperparameters in the model. The likelihood function of model parameters under a given probabilistic model is:

$$\prod_{d=1}^D P(\psi_d | \alpha) \left[\prod_{n=1}^{N_d} \sum_{z_{d,n}} P(z_{d,n} | \psi_d) P(w_{d,n} | z_{d,n}, \vartheta) \right] \quad (3)$$

The equation (3) provides the likelihood of the words in documents by observing the topic distribution of d conditional on α . On the other hand, adding up a possible topic assignment for words in all documents is required by maximizing likelihood that is not computationally feasible. Therefore, Griffiths and Steyvers (2004) have developed the Gibbs sampling method.

Gibbs sampling method repeatedly draws new samples with a Markov chain in the Monte Carlo algorithm conditional on all data. Gibbs sampler updates topic assignment of words iteratively that conditional on all other words. The Bayesian technique feature of Gibbs sampling requires hyperparameters (β and α). The Gibbs method of LDA divides documents into words (called word tokens), and later randomly, words are randomly assigned with equal probabilities to one topic. The probabilistic model of a word token is determined as follows:

$$P(z_{d,n}=t | w_{d,n}, \vartheta) \propto P(w_{d,n} | z_{d,n}=t, \vartheta) \times P(z_{d,n}=t) \quad (4)$$

Gibbs sampling takes topic assignment of other tokens to get values approximately for $P(z_{d,n}=t | w_{d,n}, \vartheta)$ and $P(z_{d,n}=t)$. Besides, the number of identical words for $w_{d,n}$ is assigned to topic split by total

words of topics gives $P(w_{d,n} | z_{d,n}=t, \theta)$. The application of Gibbs sampling provides to converge local maximum instead of a global probabilistic likelihood model.

Empirical Results

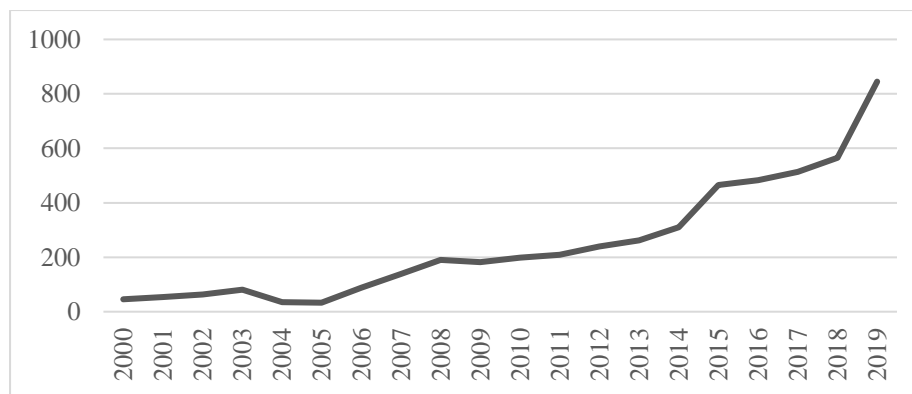
The dataset of the paper is 5,001 research articles of trade journals stored in WoS from 2000 to 2019ⁱⁱ. We determine β and α as default ($\beta = 0.1$ and $\alpha = 0.25$) to set the word and topic probability distribution. Also, we specify 1000 iterations that Gibbs sampling run and 50 iterations that Gibbs sampler ignore between samples. Lastly, our empirical analysis sets the seed as three for the random number generator that guarantees the results' reproducibility.

To observe the impact of the 2008 GFC, the dataset is divided into two parts: 2000-2009 and 2010-2019. The reason why 2009 is taken as a break is the duration of publication at WoS journals. One of the drawbacks of this study is the unequal distribution of papers in two periods. 911 out of the articles belong to the 2000-2009 period, whereas 4,090 have been published between 2010 and 2019.

The descriptive statistics of data are shown in Figure 1 that summarizes the number of articles by year for the 2000-2019 period.

Figure 1

Distribution of Articles of Trade Journals in WoS Database



The number of research papers in the field of trade linearly increases except for 2004, 2005, and 2009. Additionally, in 2015 and 2019, published trade papers rose almost 50%, according to the previous year. The largest share belongs to *Emerging Markets Finance and Trade*, followed by the *Journal of World Trade* with 17%. The details (journals and number of papers) of the WoS dataset are as follows:

Table 3

Details of Papers in WoS Database

Journals	# of Papers	Percent. (%)
<i>“Emerging Markets Finance and Trade”</i>	1955	39
<i>“Journal of World Trade”</i>	852	17
<i>“Journal of International Trade and Economic Development”</i>	558	11
<i>“World Trade Review”</i>	504	10
<i>“Journal of Korea Trade”</i>	269	5

<i>“Journal of World Investment and Trade”</i>	240	5
<i>“Global Trade and Customs Journal”</i>	195	4
<i>“Journal of Trading”</i>	145	3
<i>“Journal of Industry Competition and Trade”</i>	134	3
<i>“Journal of Chinese Economic and Foreign Trade Studies”</i>	67	1
<i>“Journal of International Trade Law and Policy”</i>	50	1
<i>“Foreign Trade Review”</i>	32	1
Total	5001	100

Source: Authors’ calculations.

Table 3 presents that the total share of the first 5 among 12 journals equals 82%. That is, 8 out of 10 papers in *Trade Journals* are published, one of the - *Emerging Markets Finance and Trade, Journal of World Trade, Journal of International Trade and Economic Development, World Trade Review, and Journal of Korea Trade.*

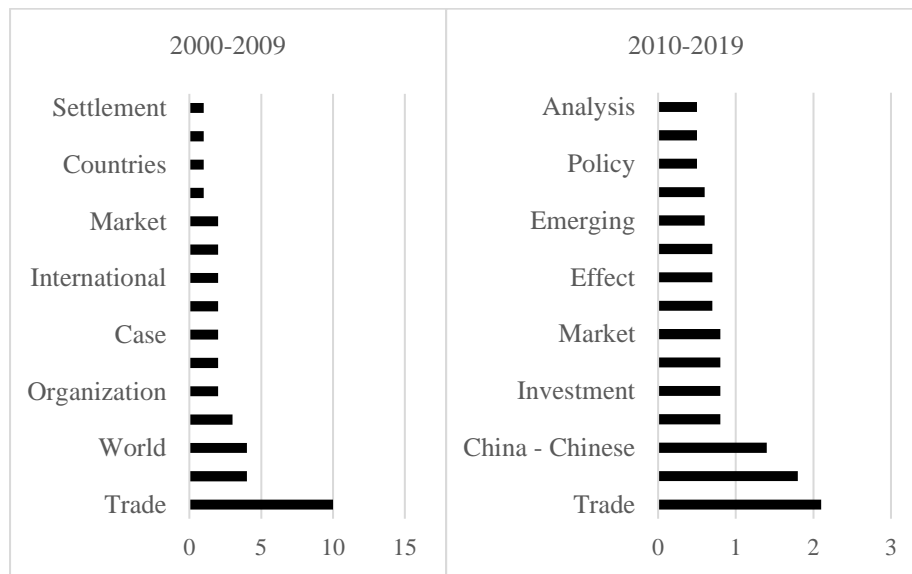
We perform the LDA by introducing the text of titles of papers without non-alphanumerical characters separately for the 2000-2009 and 2010-2019 periods. The topic modeling of LDA provides to determine the number of topics, and for our study, it is determined as five. The topics of abstracts and their similarity probabilities for the period between 2000-2009 are listed in appendix (A1). The results display the contents of trade journals' topics between 2000-2009. The first topic of that period is usually regarding the macroeconomic issues (growth, inflation) of countries as Turkey struggled with high inflation and experienced an economic crisis. The second one is related to investment (especially Foreign Direct Investment) and Asian corporates (especially Korean), whereas the third topic contains WTO and legal issues such as agreements and dispute settlements. The subjects of the fourth topic focus on emerging economies and stock markets. Lastly, the trade journals between 2000-2009 contain the goods and services trade and liberalization process.

The topic modeling results of LDA between 2010-2019 are also reported in the appendix (A2). Remarkably, trade literature after the GFC differs from the previous term in terms of topics and word classification in some fields. The LDA results report the most popular five topics of the 2010-2019 period with its words in trade journals of WoS. After the GFC, the papers in trade journals include volatility and crisis. The first topic of that period differs from the 2000-2009 period in terms of European Union legal issues on international trade. The second topic includes financial markets, banks, and Asian firms. In addition to this, China and trade have been used in the trade literature after GFC. Also, the fourth topic covers Korea and China business-based researches. Lastly, the fifth topic demonstrates the impact of GFC on the trade papers by volatility, crisis, and stock markets in emerging economies. Besides, the result of LDA for the 2010-2019 period tends to reveal a shift from a country-specific approach to business-specific.

In the final part of our analysis, we used the word frequency of titles for both periods to explain the differences before and after the GFC in trade literature in terms of titles. Figure 2 depicts the popular title words of trade journals.

Figure 2

Word Frequency of Trade Journals' Titles for 2000-2009 and 2010-2019 (%)



The most popular title word is trade for both terms. However, before GFC, titles of trade journals related to trade agreements, dispute settlements, and trade laws. For 2010-2019, the number of papers is quietly higher than 2000-2009, so the percentages of words are close to each other. Moreover, the participation of China in WTO could affect the title subjects. After the global crisis, topics of trade papers reflect the rise of Asia (China and Korea) and financial markets, according to Figure 2.

Conclusion

This paper explores the trends of international trade papers' subjects indexed in WoS for 2000-2009 and 2010-2019 to observe the impact of 2008 GFC using the LDA method. The estimation result of LDA is based on a cluster called a topic in the study and word co-occurrence in a similar context.

The study's empirical results show that the topics of the two periods have some differences from each other. The subjects of trade agreements and disputes, stock markets, and growth are popular in both terms. However, after the GFC, the dispute settlements of the EU in the scope of international trade and topics that contain volatility, financial markets, and banks become popular. Furthermore, in the same term, international trade literature evolves from country-specific macro variables (inflation, fiscal policy, etc.) to micro-scale firm-specific variables. The impact of firms' decisions probably becomes more effective than countries' for next years. The findings of the study also suggest that Asian economies (China and Korea) and business-based researches gain more popularity after the GFC. The participation of China in WTO and the rising export trend of Korea contribute to be the subject of international trade studies.

The topics imply that the contents of trade journals focus on more micro-scale subjects in the post-GFC term. In addition to this, legal issues are always popular in the literature. Topics of 2010-2019 add "volatility" to stock markets and emerging economies after the financial crisis. The integration of China into the world trade system by participating in WTO sharply increased the number of papers regarding China in trade journals. Finally, the results reflect that the international trade papers are up to date. The topics and words reveal that the literature keeps up with the current developments in the global economy. Additionally, the number of papers and journals in the field of international trade are indexed in WoS has an increasing trend, especially after 2011.

The details of topics are summarized in Table 4.

Table 4

Topics of Trade Journals Before and After GFC

Topics of 2000-2009	Topics of 2010-2019
Macroeconomy of Countries	Firms (Especially in Asia) and Financial Markets
Foreign Direct Investment and Corporates in Asia	Korea and China Business Based Researches
World Trade Organization, Agreements and Dispute Settlements	International Trade Legal Issues and European Union
Stock Markets and Emerging States	Volatility and Stock Markets in Emerging Markets
Goods and Services Trade and Liberalization	Trade and China

We probably find more technology-oriented, firm, China (probably also India), and EU studies instead of legislation and macroeconomic issues focused papers in the international trade literature for the following years. Moreover, future studies of international trade might include the crypto markets and decentralized market dynamics topics.

Compliance with Ethical Standards

Ethical approval

Not applicable.

Author Contributions

H. Ş. performed in the substantial contribution conception and design, analysis and interpretation of data, statistical analysis; B. G. performed in the acquisition of data, drafting of the manuscript. Both authors have contributed equally to the manuscript for other participations.

Declaration of Conflicting Interests

The authors declared the study was carried out in the absence of any financial/commercial relationship which could be perceived as a conflict of interest.

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Appendix

A1. Top 10 Abstracts and Words of Five Topics During 2000-2009

Topic 1: Macroeconomy of Countries	Prob.
“This paper investigates how various macroeconomic policy shocks in Turkey affect unemployment and provides evidence on the differential responses of unemployment in selected sectors of economic activity.”	0.966
“The common assumptions that labor income share does not change over time or across countries and that factor income shares are equal to the elasticity of output with respect to factors have had important implications for economic theory.”	0.962
“This paper investigates the validity of the Fisher hypothesis using data from thirty-three developed and developing countries.”	0.95
“We analyze the effects of currency crises on the industrial sectors of Korea, Turkey, and the Czech Republic.”	0.943
“In this study, we propose an explanation for why labor and capital shares do not seem to have a trend; an increasing trend in physical capital share is compensated by a decreasing trend in land share.”	0.939
“This paper constructs a quarterly inflation model for Croatia using the general-to-specific approach to model inflation dynamics.”	0.931
“This paper examines the effect of foreign direct investment FDI on manufacturing exports in four Middle Eastern and North African MENA.”	0.927
“Using the vector autoregressive methodology, we present estimates of monetary transmission for five new EU member countries in Central and Eastern Europe with more or less flexible exchange rates.”	0.918
“This paper investigates the effects of foreign trade liberalization of Turkey after 1980 on the productivity of industrial sectors.”	0.908
“This study investigates the existence of a J-curve in the Turkish data in the 1987-2000 period by using quarterly data.”	0.907
Words of Topic 1: Countries, Growth, Trade, Exchange, Economy(ies), Turkey, Capital, Inflation, Labor, Income	
Topic 2: Foreign Direct Investment and Corporates in Asia	Prob.
“In this research, we explored the relationship among Web service quality e-customer satisfaction and word-of-mouth WOM intention.”	0.985
“This paper attempts to examine the impact of Korean firms' strategic choices in entering the Chinese market on their FDI performance.”	0.957
“This paper examines the subsidiary strategy-headquarters control-subsidiary performance relationship.”	0.924
“In this paper, the multi-dimensional attributes of government export support programs for exhibitors at international trade fairs ITFs are described, and their effects on sponsored firms' performance are evaluated.”	0.923
“The main purpose of this paper is to verify the DEA (Data Envelopment Analysis) efficiency of 24 Korean container terminals for 3 Years 2002-2004 using the bootstrap method and to make policy implications to enhance the efficiency of container terminals.”	0.909
“Using data on 157 large companies in Poland and Hungary this paper employs Bayesian structural equation modeling to examine the relations among corporate governance managers' independence front owners in terms of strategic decision making exporting and performance.”	0.908
“This study emphasizes the role of affiliate programs in creating loyalty thereby helping companies to maintain their competitive advantage.”	0.877
“This paper examines the effect of corporate governance firm performance and corporate diversification on the board as well as CEO compensation and its components in the context of an emerging economy-India-where a managerial market has yet to develop.”	0.864

“Using Benford's 1938 law this study documents pervasive evidence that managers of publicly listed Taiwanese firms tend to engage in earnings manipulative activities rounding earnings numbers to achieve key reference points.”	0.844
“This paper examines the announcement effect of block acquisitions of foreign investors on firm value and the differences in market responses by the type of the purpose of acquisition using the event study methodology.”	0.830
Words of Topic 2: Firms, Foreign, Performance, Korean, Investment, Market, Corporate, Country, Government, Structure	
Topic 3: World Trade Organization, Agreements and Dispute Settlements	Prob.
“This article discusses the first GATS panel report Mexico-Telecommunications Case DS204 with particular reference to its interpretation of the meaning of the word "interconnection.”	0.968
“This article explores the issue of unilateral measures in the field of international trade.”	0.951
“This paper examines issues that came before the Appellate Body in two disputes US-Zeroing EC and the US-Zeroing Japan.”	0.951
“The EC-Biotech dispute exposed the WTO dispute settlement system to a more challenging test than any previous dispute, this paper discusses how the Panel addressed some of these issues.”	0.935
“The contents and the status of cessation is considerably the same in the law of State responsibility and the GATT/WTO. However the legitimacy of reparation especially restitution and compensation in the GATT/WTO is controversial.”	0.934
“Following the creation of the World Trade Organization (WTO) and the application of the WTO's Sanitary and Phytosanitary Agreement (SPS) Agreement concerns over health and safety have become increasingly predominant in the international trade regime.”	0.933
“This paper addresses the issues that came before the Appellate Body in the Softwood V dispute concerning an affirmative antidumping determination by the US Department of Commerce.”	0.924
“This article discusses the Court's recent extension of this well-established case law in the context of an action for compensation brought by companies subjected to retaliatory measures authorized by the Dispute Settlement Body (DSB).”	0.922
“The purpose of this article is to identify two potential difficulties in the application of Article 5.7 which appear to follow from certain statements in a de by panels and the Appellate Body in the jurisprudence under that Article so far.”	0.916
“Since 1995 World Trade Organization WTO Members have authorized trade retaliation countermeasures in six disputes and retaliatory measures have been imposed in four of these six disputes.”	0.913
Words of Topic 3: Trade, International, Agreement, Measures, Legal, Dispute, World, Rules, Organization, Members	
Topic 4: Stock Markets and Emerging States	Prob.
“This study examines the volatility of daily stock returns and the volatility of returns during trading and non-trading hours for securities trading on the Istanbul Stock Exchange.”	0.961
“This paper analyzes the forecast performance of emerging market stock returns using standard autoregressive moving average ARMA and more elaborated autoregressive conditional heteroskedasticity ARCH models.”	0.95
“This study assesses the market qualities of alternative price-formation processes for an emerging futures market-the Taiwan futures market.”	0.931
“This study extends the framework of Brennan 1986 to find the cost-minimizing combination of spot limits futures limits and margins for stock and index futures in the Taiwan market.”	0.93

“This paper investigates market behaviors such as volatility depth and volume and order-flow decomposition in a pure limit order futures market the Taiwan Futures Exchange.”	0.929
“Dealers on the Taiwan Stock Exchange are granted typical dealer trading advantages without obligations to provide liquidity and thus are ideal to test whether these advantages lead to voluntary liquidity provision earning bid-ask spreads or information trading in the direction of the market.”	0.925
“This paper investigates whether and how futures market sentiment and stock market returns heterogeneously affect the trading activities of institutional investors in the spot market in Taiwan.”	0.902
“This study examines the abnormal stock returns of pilot companies to determine if investors believed that reform of nontradable shares which began oil April 29 2005 would lead to higher stock prices.”	0.893
“This study investigates the relationship of investors' happy sentiment and overconfidence effect.”	0.889
“This paper examines whether long-run integration between the United States and many international stock markets has strengthened over time with special attention paid to the impact of the abolition of capital control in these markets and the 1987 international stock market crash.”	0.874
Words of Topic 4: Market(s), Stock, Return(s), Volatility, Emerging, Trading, Investors, Price, Exchange, Financial	
Topic 5: Goods and Services Trade and Liberalization	Prob.
“Environmental goods are a key element of the ongoing World Trade Organization WTO negotiations.”	0.948
“This paper traces the evolution of India's Regional Trading Arrangements (RTAs). From limited scope RTAs with developing countries earlier to more comprehensive agreements with neighbouring economies.”	0.912
“Temporary cross-border movement of service providers is a form of trade in labour services.”	0.862
“This article analyzes the tariff reduction modality in non-agricultural market access (NAMA) in light of the basic principle of less than full reciprocity in reduction commitments.”	0.842
“This article attempts to consolidate research on the General Agreement on Trade in Services GATS and basic social services and analyzes the impact of the GATS on the provision of basic social services in developing countries.”	0.833
“This article outlines the key elements of the prevalent regulatory measures and barriers to market access of developing country service providers and assesses how if at all the proposed disciplines would benefit in securing or easing market access of professionals in the developed country markets.”	0.832
“In this article an attempt is made to assess whether Africa is likely to benefit from the World Trade Organization's non-agricultural market access negotiations.”	0.826
“This paper speculates on how to achieve an East Asian FTA (EAFTA) especially in terms of the market access of FTAs and on how to facilitate the consolidation of the overlapping FTAs in East Asia into an EAFTA while minimizing related costs during the integration process.”	0.818
“This paper presents the results of the first survey of applied trade policies in the major services sectors of fifty-six industrial and developing countries.”	0.813
“Cotton plays a strategic role in the development policies and poverty reduction programs of a number of African countries. Several African countries have introduced reforms in the cotton sector to improve its quality and competitiveness.”	0.809
Words of Topic 5: Trade, Countries, Services, Developing, Policy, Export, Economic, Development, Goods, Liberalization	

A2. Top 10 Abstracts and Words of Five Topics During 2010-2019

Topic 1: International Trade Legal Issues and European Union	Prob.
“This article examines three issues arising out of the EU-Canada Comprehensive Economic and Trade Agreement and puts forward suggestions as to how they may be avoided in future EU agreements.”	0.977
“With the Lisbon Treaty the European Commission Commission gained a prominent role in antidumping being empowered to adopt antidumping measures with little interference by the European Parliament and the Council of the European Union.”	0.976
“This article examines the case law of the Court of Justice of the EU concerning the application of the new admissibility test to EU customs-related measures between 2011 and the first half of 2017.”	0.976
“The Trade Facilitation Agreement (TFA) stands in the wake of the Kyoto Convention and other international Conventions concluded under the auspices of the WTO and the World Customs Organization (WCO) which contributed to the development of an international customs law.”	0.971
“Opinion 2/15 provides an undisputable exclusive competence to the EU for the inclusion of labour and environmental standards in EU Free Trade Agreements (FTAs).”	0.965
“This article analyses the idiosyncrasies of the EU origin marking regime for non-food products and the latest attempt to reform it In doing so it begins with an overview of the international trade rules overseeing the entire matter as well as some insights about origin marking schemes in other countries with particular regard to the United States.”	0.963
“After seven years of negotiations the Comprehensive Economic and Trade Agreement (CETA) was finally approved and signed on 30 October 2016.”	0.96
“The Court of Justice of the European Union has long protected the integrity of the Union legal order from external impact of judicial and norm-creating processes Initially concerned with the harmonious interpretation and application of Union law the principle has gradually developed into a shield that protects the judicial prerogatives of the Court against international courts and tribunals.”	0.956
“Increased discussions at the WTO on E-commerce demonstrate a strong interest amongst many WTO Members to introduce new rules to regulate digital trade.”	0.955
“Could the United States justify its measures on aluminium and steel invoking article XXI b of the GATT ' is a paper written under the legal framework of the World Trade Organization”	0.955
Words of Topic 1: Trade, Article, Agreement(s), International, Investment, Dispute, Legal, World, Rules, Measures, System	
Topic 2: Firms (Especially in Asia) and Financial Markets	Prob.
“This study investigates whether the Korean institutional environment harms the monitoring role of independent venture capital firms while it does not significantly impact corporate venture capital firms.”	0.984
“This study examines the influence of directors who are politically connected and/or have boardroom interlocking on private equity placements PEPs in Chinese listed firms.”	0.975
“We investigate the effect of pyramidal ownership and family control on the investment-cash flow sensitivity of Brazilian firms using financial constraint indexes to classify firms.”	0.967
“The paper aims to examine the determinants of profit performance of financial holding companies (FHCs) using panel data for the period 2001-9.”	0.965
“The objective of this study was to explore the relationship between promoter ownership and capital structure of firms' using a sample of Indian publicly listed firms for the period from 2006 to 2013.”	0.964
“This study investigates whether firm donations will attract attention for firms without analyst coverage.”	0.963

“This article examines the impact of foreign shareholdings on agency costs of Chinese firms from 2006 to 2012.”	0.962
“This study explores the effectiveness of large shareholders' "voting with their feet " in motivating a listed company to alter its non-dividend payout behavior.”	0.959
“This study compares credit ratings between FHC affiliated banks and independent banks using Taiwan bank and FHC data.”	0.959
“Using a sample of Chinese-listed companies for the period 2005-10 we assess the effect of managerial compensation on overinvestment and the effect of overinvestment on managerial private benefits including future compensation and perquisites as well as on firm performance.”	0.959
Words of Topic 2: Firms, Financial, Market, Investment, Banks, Corporate, Performance, Foreign, Capital, Credit	
Topic 3: Trade and China	Prob.
“This article applies the structural decomposition analysis SDA method to identify the driving forces of CO2 emissions in four subsectors of the transportation industry in China and distinguishes the main final demand patterns that increase its emissions.”	0.975
“We quantitatively identify the direct and indirect effects of energy-intensive industries using a two-stage approach.”	0.973
“In this article we attempt to estimate whether financial inclusion expressed as financial accessibility has a positive effect on reducing income inequality.”	0.968
“This study identifies the determinants that have an observable impact over the change in carbon dioxide emissions embodied in the production of Indian exports by adopting an index decomposition analysis to address the contribution from four mutually non-exclusive factors which arise due to India's increasing export performance during the 1995-2009 period on the change in total emissions embodied in exports.”	0.967
“By establishing a foreign direct investment (FDI) technology spillover estimation model based on technology absorptive capacity and using provincial panel data of the coastal regions of East China from 2001 to 2010 we empirically conclude that FDI technology spillover effect in the coastal regions of East China is not significant.”	0.964
“This paper first measures the levels and growths of regional TFP in China using a panel dataset of China's 30 provinces from 1978-2014.”	0.962
“We analyze the determinants of value-added and productivity growth of New Member States in the period between 1995 and 2009.”	0.961
“Using China's provincial data for 1978-2011 we examine the channels through which foreign direct investment (FDI) affects China's regional growth and inequality.”	0.958
“This study identifies the determinants that have an observable impact over the change in carbon dioxide emissions embodied in the production of Indian exports by adopting an index decomposition analysis to address the contribution from four mutually non-exclusive factors which arise due to India's increasing export performance during the 1995-2009 period on the change in total emissions embodied in exports.”	0.957
“This article examines the role of US-China trade in the changes of US employment.”	0.956
Words of Topic 3: Trade, Countries, Growth, Economic, Export, Development, Investment, China, Productivity, Foreign	
Topic 4: Korea and China Business Based Researches	Prob.

“Advocating that affiliation with an export service-provider plays an important role in this phenomenon we aimed to theoretically explain how export service providers' competences and relational factors drive small and medium-sized exporters' competitive advantages in the long-run.”	0.968
“The purpose of this paper is to analyze the process of enhancing logistics performances in Korean exporters' utilizing "third-party logistics" 3PL in area of delivery service to overseas buyers.”	0.958
“The purpose of the study is to examine the factors that motivate importers to be committed to the relationship with their overseas exporters.”	0.952
“The global trade environment demands a safe and fast trade clearance system for the sake of trade facilitation and customer satisfaction.”	0.948
“The effects of E-S-QUAL (electronic service quality) and CNFU (consumers' need for uniqueness) on attitude are examined with data collected from Korean consumers who have cross-border online purchasing experience.”	0.944
“This study explores the impacts of psychological factors on entrepreneurs' preferences for causal and effectual decision-making logics.”	0.917
“This paper tried to identify the impact of electronic word of mouth (eWOM) on purchase intention (PI) of Korean-brand cars in the context of Russian consumers taking into consideration the credibility quality and quantity of eWOM while also considering the mediation effects of brand image (BI) and perceived quality (PQ).”	0.917
“Based on a survey of 317 born-global SMEs this study used characteristics of organizations environments and technologies as determinants affecting their international outcomes.”	0.913
“This study investigates the three dimensions of trust belief on policyholders' purchase intentions in a third-party online insurance platform.”	0.907
“With this background this research performed quantitative analysis after collecting and utilizing log data of 346 companies and classing the firms into 6 representative sectors.”	0.903
Words of Topic 4: Performance, Korea (Korean), China (Chinese), Business, Industry, Management, Network, Market, Export, Innovation	
Topic 5: Volatility and Stock Markets in Emerging Markets	Prob.
“This study presents empirical evidence related to futures pricing for the SGX FTSE Xinhua China A50 and HKEx H-share index futures markets.”	0.981
“This work provides new evidence of Asia-Pacific stock market integration by incorporating the regime changes of each stock market through the smooth transition autoregressive STAR model.”	0.978
“This article analyzes the economic and financial sources of fluctuations among the US federal funds rates the US economic policy uncertainty and the indices of the US, European, Asian, and Islamic stock markets.”	0.974
“This paper investigates the interaction between crude oil prices and individual investor sentiment with the Hiemstra and Jones (HJ) test the Diks and Panchenko (DP) test the time-varying parameter structural vector autoregression (TVP-SVAR) model and the nonlinear autoregressive distributed lags (NARDL) model.”	0.973
“This article investigates the asymmetric and long memory volatility properties and dynamic conditional correlations (DCCs) between Brazilian, Russian, Indian, Chinese, and South African (BRICS) stock markets and commodity gold and oil futures markets using the trivariate DCC-fractionally integrated asymmetric power autoregressive conditional heteroskedasticity (FIAPARCH) model.”	0.973
“The authors explore the sources of the resilience of the Turkish economy to the global financial crisis of 2008.”	0.972

"We empirically investigate the recent history of currency crises stress periods and the factors influencing their likelihood in India."	0.971
"This study examines the financial integration of large- and small-cap stocks in twenty-three emerging markets to determine their degree of market integration with the world market."	0.97
"This paper studies the risk-return trade-off in some of the main emerging stock markets in the world"	0.97
"This is the first study to examine the intraday price discovery and volatility transmission processes between the Singapore Exchange and the China Financial Futures Exchange Using one-and five-minute high-frequency data from May to November 2011."	0.966
Words of Topic 5: Market(s), Stock, Exchange, Price(s), Financial, Volatility, Policy, Emerging, Crisis, Shocks	

Notes

ⁱ Bush, G. W., & Glassman, J. K. (2012). *The 4% Solution: Unleashing the Economic Growth America Needs*. Currency.

ⁱⁱ Trade journals mean that containing the word "*Trade*" in the journal title.