

EXCHANGE

Global Trade Frontiers: Innovation, Collaboration, and Dispute Resolution



Exploring the Trade of Raw
Materials for Electric Vehicles
Batteries

The Legal Frameworks that
Govern International Business
Arbitration and Notable
Arbitration Cases in the Past
Decade

The Role of Emerging Economies
in Shaping Global Sustainable
Trade Development: Evidence
From Latin America

The Role of the International
Court of Arbitration in Resolving
Trade Disputes

PREFACE

The intricate and continuously changing realm of international trade serves as a fundamental pillar for global economic integration and advancement. Over recent decades, there has been an extraordinary growth in cross border commerce, driven by significant technological progress, heightened globalization, and an increase in conflicts arising from disparate legal frameworks, cultural differences, and varying economic objectives. As nations and businesses maneuver through this complex network of trade interactions, the necessity for strong mechanisms to resolve disputes and promote collaboration becomes increasingly crucial.

Arbitration stands out as a favored method for settling international trade disputes, playing an essential role in delivering equitable, efficient, and enforceable outcomes. By providing a neutral platform for adjudication, arbitration fosters trust and cooperation among countries, corporations, and other stakeholders, even in times of geopolitical tensions and economic instability. Beyond its procedural benefits, arbitration represents a broader dedication to sustaining stability and predictability within the global trading system, which is vital in today's era marked by economic unpredictability.

The intersection of emerging economies, technological innovations, and sustainable development has further reshaped the contours of international trade. Countries once considered peripheral to the global trading system now emerge as key players, contributing not only to economic growth but also to the pursuit of sustainable and equitable trade practices. Meanwhile, technologies such as blockchain, coupled with innovative approaches to resource management, have introduced novel possibilities for enhancing transparency, reducing inefficiencies, and fostering accountability in global supply chains.

Nonetheless, the swift transformation of trade systems has introduced several challenges, including resource limitations, environmental issues, and the complexities associated with economic fluctuations and crises. Addressing these multifaceted problems requires a sophisticated understanding and the creation of interdisciplinary solutions that integrate law, economics, technology, and sustainability.

This journal brings together a collection of thoughtprovoking papers that explore the breadth and depth of these challenges and opportunities. Written individuals with diverse perspectives, these contributions provide a comprehensive examination of the mechanisms, dynamics, and innovations shaping international trade and arbitration today. Through rigorous analysis and practical insights, the papers illuminate the interconnected nature of trade systems and their profound implications for global development.

China has emerged as a pivotal force in shaping the modern global trade landscape, leveraging its economic resilience, technological advancements, and unwavering commitment to fostering international collaboration. Through its proactive engagement in global trade frameworks and its leadership in pioneering sustainable practices, China has demonstrated an exemplary ability to address the multifaceted challenges of the 21st century. As a nation that has embraced innovation while preserving its rich cultural heritage, China continues to set benchmarks in areas ranging from arbitration frameworks to sustainable trade initiatives and technological integration in commerce.

Central to this progress is the invaluable contribution of the nation's academic community, particularly its brilliant students, whose intellectual rigor and innovative thinking have become hallmarks of China's ascent on the world stage. The research papers presented in this collection stand as a testament to the dedication and ingenuity of a new generation of Chinese scholars. These students, hailing from some of the country's most prestigious universities, have undertaken internships with our organization, applying their academic training and unique perspectives to tackle some of the most pressing issues in international trade and arbitration.

We extend our deepest gratitude to these interns for their tireless efforts and their commitment to excellence. Their work not only enhances our understanding of international trade and arbitration but also inspires hope for a future characterized by innovation, collaboration, and progress. As the torchbearers of tomorrow, their contributions will undoubtedly leave an indelible mark on the global stage, furthering the mission of fostering a fairer, more inclusive, and sustainable trading world.

The research papers in this volume reflect the breadth and complexity of contemporary issues in international trade and arbitration. To guide readers through this rich array of studies, the collection has been organized into five overarching themes, each addressing a pivotal facet of the field. These themes serve not only to structure the discussion but also to highlight the interconnectedness of the challenges and opportunities explored within:

- 1. Arbitration and Legal Frameworks**
- 2. Emerging Economies and Global Trade Dynamics**
- 3. Technological Innovations and International Trade**

PREFACE

4.Resource and Sustainability Challenges in Trade

5.Economic Patterns and Trade Resilience

Arbitration and Legal Frameworks

Arbitration plays a crucial role in resolving international trade disputes, serving as a foundational element of the global economic framework. The studies within this theme investigate the underlying principles and methodologies that make arbitration a neutral and effective tool for addressing cross border conflicts. They analyze the evolution of legal structures governing arbitration, highlighting their flexibility and resilience in tackling the intricate challenges of modern trade. Additionally, these papers assess how arbitration institutions and legal systems uphold fairness, consistency, and enforceability in an increasingly dynamic global environment. By combining theoretical perspectives with practical case analyses, this theme elucidates the essential role of arbitration in building trust and fostering cooperation across different jurisdictions.

Emerging Economies and Global Trade Dynamics

Emerging economies have risen to prominence as influential actors in the global trade arena, challenging established norms and introducing new dynamics. The contributions within this theme examine the transformative effects of these economies, particularly their commitment to sustainable trade practices and their integration into global value chains. They demonstrate how emerging markets harness their unique advantages, such as abundant resources and innovative policy frameworks to drive economic stability and growth. Furthermore, the discussions delve into the geopolitical and socioeconomic factors that empower these nations to become key participants in international trade, promoting collaboration and initiating reforms on a worldwide scale.

Technological Innovations and International Trade

Technological advancements are revolutionizing the operations of global trade, providing solutions to issues related to transparency, efficiency, and security. This theme explores the incorporation of cuttingedge technologies into international trade systems, emphasizing their capacity to enhance supply chain visibility and dependability. The studies focus on the impact of distributed ledger technologies in boosting traceability, lowering costs, and reducing risks. They also address the challenges associated with regulatory compliance, scalability, and interoperability, while highlighting the significant opportunities these innovations present for small and medium sized enterprises and developing economies to engage more effectively in global markets.

Resource and Sustainability Challenges in Trade

The pressing need for sustainable practices in global trade is a recurring concern addressed within this theme. The studies examine the environmental, social, and ethical dimensions of sourcing and trading raw materials critical to international commerce. They offer insights into the challenges posed by resource depletion, human rights violations, and ecological degradation, while also exploring innovative approaches to mitigate these issues. The discussion highlights the importance of transparency, accountability, and collaboration among stakeholders to create more ethical and environmentally sustainable supply chains. Through addressing the complexities of resource management, these contributions provide actionable strategies for promoting sustainability in a resource intensive world.

Economic Patterns and Trade Resilience

The recurring nature of economic cycles and their influence on global trade are the primary subjects of this theme. The studies examine the resilience of trade systems during economic downturns, comparing the adaptive strengths of developed and emerging markets. They identify industries that maintain strong performance during crises, providing valuable insights into strategies for ensuring stability amid volatility. Additionally, the discussions consider the broader implications of economic fluctuations on international trade policies and practices, evidencing the importance of adaptable frameworks that can mitigate risks and support sustained growth during challenging periods.

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GLOBAL TRADE FRONTIERS:
INNOVATION, COLLABORATION, AND DISPUTE RESOLUTION
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Exploring the Trade of Raw Materials for Electric Vehicles Batteries

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Abstract

This article examines the complex and evolving nature of the trade of raw materials for electric vehicle (EV) batteries, highlighting the need for sustainable and ethical practices in the extraction, processing, and trade of these materials. The study draws on industry reports and interviews with experts to identify challenges and concerns associated with the trade, including environmental impacts, human rights abuses, and lack of competition. The research also identifies opportunities for innovation in recycling technologies, new battery chemistries, and ethical sourcing practices. The findings suggest that companies and governments must invest in new technologies, responsible sourcing initiatives, and transparent supply chain models to ensure that the growth of the EV industry is sustainable, responsible, and beneficial for all stakeholders. The implications of these findings for the future of the EV industry are discussed.

Keywords: electric vehicles, batteries, raw materials, trade, sustainability, ethics, recycling technologies, human rights, competition, responsible sourcing, supply chain.

1. Introduction

The introduction will provide a brief overview of the importance of raw materials for electric vehicle batteries and the research question. It will also discuss the significance of the study and the need for further research.

1.1. General statement

The growing popularity of electric vehicles has brought significant changes to the automotive industry. One of the key components that enable electric vehicles to operate is the battery. Electric vehicle batteries are complex systems that require a variety of raw materials to function efficiently. The availability and sustainability of these materials are crucial for the performance and sustainability of electric vehicles.

Raw materials such as lithium, cobalt, nickel, manganese, and graphite are commonly used in electric vehicle batteries. Lithium is a critical component in the production of electric vehicle batteries, and it is mainly sourced from countries such as Chile, Argentina, and Australia. Cobalt is another essential material used in the production of electric vehicle batteries, and it is primarily sourced from the Democratic Republic of Congo. Nickel is also an important material used in the production of electric vehicle batteries, and it is mainly sourced from countries such as Indonesia, the Philippines, and Russia. Manganese is another material used in the production of electric vehicle batteries, and it is primarily sourced from South Africa. Finally, graphite is also used in the production of electric vehicle batteries, and it is mainly sourced from China.

The trade of these rare earth metals has significant sustainability issues that need to be addressed. For example, the mining of these materials often involves environmental degradation, human rights violations, and child labor. Additionally, the extraction and transportation of these materials require significant amounts of energy and contribute to greenhouse gas emissions. Therefore, it is essential to ensure that the trade of these materials is conducted sustainably and ethically to avoid negative impacts on the environment and society.

1.2. Research question

The research question that this study aims to address is “Exploring the Trade of Raw Materials for Electric Vehicles Batteries”. The trade of rare earth metals used in electric vehicle batteries has become an increasingly important topic due to the growing demand for electric vehicles and the need for sustainable transportation solutions. However, the trade of these materials is not without its sustainability issues.

This study is significant because it highlights the need for further research to better understand the global trade of these raw materials, the sustainability issues surrounding their extraction and transportation, strategies for promoting sustainable trade of raw materials, and prospects. By exploring these issues, we can gain a better understanding of the impact of rare earth metal trade on the environment and society, and identify ways to mitigate negative impacts and promote sustainable trade.

The findings of this study can inform policymakers, industry stakeholders, and consumers about the sustainability issues surrounding the trade of rare earth metals used in electric vehicle batteries. It can also contribute to the development of sustainable trade policies and practices, and support the transition towards a more sustainable and equitable future. Overall, this study is an important step towards promoting sustainable trade of raw materials and achieving a more sustainable and equitable global economy.

2. Literature Review

2.1. The introduction of the literature review

The trade of raw materials for electric vehicle batteries is a topic of increasing importance as the demand for electric vehicles continues to grow. Raw materials such as lithium and cobalt are essential components of electric vehicle batteries, and the sustainability and ethical sourcing of these materials are critical considerations for the industry.

The existing literature on the topic of raw materials for electric vehicle batteries covers a range of themes, including the environmental impact of raw material extraction and processing, the potential for monopolies and lack of competition in the market, the need for sustainable and circular economies, and the ethical issues associated with the trade of these materials.

Many studies (Flexer, Baspineiro, & Galli, 2018; Fallah & Fitzpatrick, 2022) have focused on the environmental impact of raw material extraction and processing, highlighting the need for more sustainable and responsible practices. Others (Zhao, B., Shi, Y. & Dong, X. D., 2014) have examined the potential for monopolies and the need for greater competition in the market, as well as the emergence of new supply chain models (Rajaeifar, M. A., Ghadimi, P., Raugei, M., Wu, Y., & Heidrich, O., 2022) that promote transparency and sustainability.

There is also a growing body of research (Almeida, Sousa, & Coutinho-Rodrigues, 2019; Harper, Somerville, Kendrick, et al., 2019; Neumann, Petranikova, Meeus, et al., 2022) focused on the development of new battery

chemistries and recycling technologies, as well as the increasing demand for recycled materials in battery production (Martins, L. S., Guimaraes, L. F., et al., 2021). Additionally, there is a growing awareness of the ethical issues associated with the trade of raw materials (Galaś & Galaś, 2016; Mancini, Eslava, Traverso, & Mathieux, 2021; Cheyens et al., 2014), particularly around the use of child labor and other human rights abuses.

Overall, the literature on the topic of raw materials for electric vehicle batteries highlights the complexity and importance of this issue, and the need for greater collaboration, innovation, and responsible practices to ensure the sustainability and ethical sourcing of these critical materials.

2.2. Environmental and social impact of raw materials trade

The key raw materials used in electric vehicle batteries include lithium, cobalt, nickel, and manganese. These materials are primarily sourced from countries such as China, Australia, Chile, the Democratic Republic of Congo (DRC), and Indonesia. However, the extraction and trade of these materials are associated with a range of environmental and social issues.

In the DRC, for example, the extraction of cobalt has been linked to child labor and other human rights abuses (Brown, C., Daniels, A., Boyd, D. S., Sowter, A., Foody, G., & Kara, S., 2020). Additionally, the production of lithium and cobalt can have significant environmental impacts (Schmidt, Buchert, & Schebek, 2016), including water pollution and deforestation. The transportation of raw materials and finished batteries also contributes to carbon emissions and other environmental impacts (Elbel, Bose O'Reilly, & Hrzic, 2023).

The trade of raw materials for electric vehicle batteries also has economic and geopolitical implications (Charlier & Guillou, 2014). As demand for these materials grows, there is a potential for resource conflicts and the concentration of market power in a few countries or companies. This could lead to higher prices and supply chain disruptions, as well as geopolitical tensions.

The social impact of the trade of raw materials for electric vehicle batteries is also significant. The extraction of these materials can have a negative impact on local communities, including displacement and loss of livelihoods (Bauchowitz, S., 2014). There is also a risk of human rights abuses in the supply chain, particularly in countries with weaker labor laws and regulations (Sethi, S.P., Lowry, D.B., Veral, E.A. et al., 2011).

Overall, the trade of raw materials for electric vehicle batteries has significant environmental, social, economic, and geopolitical implications. To address these issues, there is a need for greater transparency and accountability in the supply chain, as well as the development of more sustainable and responsible practices for the extraction, processing, and trade of these critical materials.

2.3. Assessing literature

While there is a significant body of literature on the topic of raw materials for electric vehicle batteries, there are still gaps in our understanding of the environmental and social impacts of raw materials sourcing, as well as the need for more sustainable sourcing practices.

For example, there is a need for more comprehensive data on the environmental impacts of raw material extraction and processing, particularly in countries with weaker environmental regulations. There is also a need for more research on the social impacts of the trade of raw materials, including the impact on local communities and workers, as well as the potential for human rights abuses in the supply chain.

In addition, while there is growing awareness of the need for sustainable and responsible sourcing practices, there is a need for more research on the effectiveness of these practices and their potential to promote sustainability and ethical sourcing in the electric vehicle battery industry.

The research question addressed in this study is of critical importance, as the demand for electric vehicles continues to grow and the trade of raw materials becomes increasingly globalized and consolidated. By addressing the gaps in the literature and promoting more sustainable and responsible practices in the industry, we can help to ensure that the growth of the electric vehicle industry is sustainable, responsible, and beneficial for all stakeholders.

3. Key Areas of Research

3.1. Overview of these raw materials and their sources

Electric vehicle batteries rely heavily on a few key raw materials, including lithium, cobalt, nickel, manganese, and graphite. Lithium is the most commonly used material in electric vehicle batteries, followed by cobalt and nickel. Manganese and graphite are also used but in smaller quantities.

These raw materials are mainly sourced from countries such as Chile, Argentina, Australia, the Democratic Republic of Congo, Indonesia, the Philippines, Russia, and South Africa (Egan, 2023). For example, Chile is the world’s largest producer of lithium, while the Democratic Republic of Congo is the largest producer of cobalt. Australia and Indonesia are also significant producers of nickel.

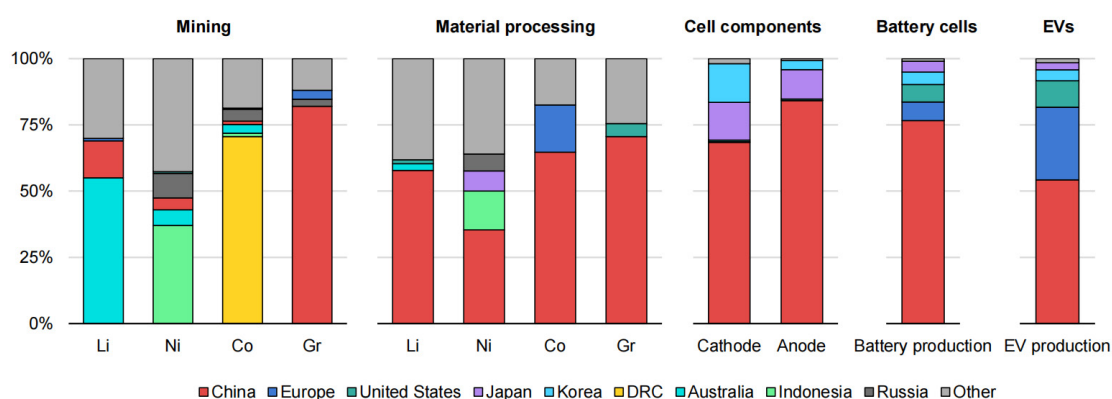


Figure 1. Geographical Distribution of the Global EV Supply Chain
 Source: International Energy Agency (IEA)

The supply chains for these raw materials are complex and involve multiple stages, including mining, processing, and transportation. The mining and processing of these materials can have significant environmental impacts, such as soil erosion, water pollution, and deforestation (Robert et al., 2022). Additionally, there are concerns about human rights abuses associated with the mining and processing of some of these materials, particularly in the Democratic Republic of Congo, where child labor and forced labor have been reported in cobalt mines.

Given the significant environmental and social impacts associated with the extraction and processing of these raw materials, it is essential to ensure that the supply chains for these materials are sustainable and ethical. This involves promoting responsible mining practices, reducing waste and pollution, and ensuring that workers are treated fairly and have access to safe working conditions. As the demand for electric vehicles continues to grow, it is crucial to address these issues to ensure that the transition to sustainable mobility is truly sustainable and equitable.

3.2. The global trade of these raw materials: major markets and players

This area will analyze the global trade of raw materials for electric vehicle batteries, identify the major markets and players in the trade, and discuss the trends and patterns in the trade.

3.2.1. Major markets and players

The global trade of raw materials for electric vehicle batteries has become increasingly important in recent years due to the growing demand for electric vehicles and the need for sustainable transportation solutions. Major markets for these materials include China, the United States, Europe, and Japan, with each country playing a pivotal role in the production and consumption of these materials.

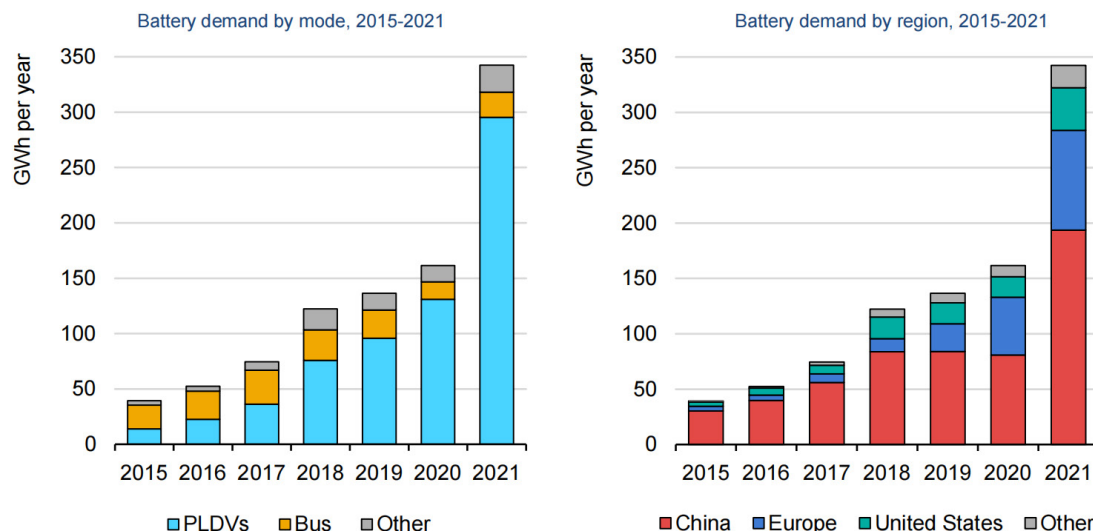


Figure 2. Global Battery Demand by mode and region
Source: International Energy Agency (IEA), 2023

China is the world’s largest producer of electric vehicles (Schmidt, 2021) and is also the largest consumer of raw materials used in electric vehicle batteries. The country is a major player in the global trade of lithium, cobalt, and nickel, with significant reserves of these materials within its borders. China also dominates the production of graphite, which is used in the anodes of lithium-ion batteries (Bloomberg News, 2023).

The United States is another significant market for raw materials used in electric vehicle batteries, particularly for lithium and cobalt (NS Energy Staff Writer, 2021). The country has significant reserves of lithium, but most of its cobalt is imported from the Democratic Republic of Congo, where there are concerns about human rights abuses associated with its mining and processing.

Europe is also a major player in the global trade of raw materials for electric vehicle batteries (Colonna et al., 2023). The European Union has set ambitious targets for the adoption of electric vehicles, and the region is investing in the development of a domestic supply chain for raw materials used in electric vehicle batteries. The EU is particularly interested in developing a sustainable and ethical supply chain for these materials, with a focus on reducing the environmental and social impacts of their extraction and transportation.

Japan is another significant market for raw materials used in electric vehicle batteries, particularly for lithium and cobalt. The country has limited reserves of these materials within its borders and relies heavily on imports to meet its demand. Japan is also investing in the development of a domestic supply chain for these materials and is exploring alternative sources of raw materials, such as deep-sea mining.

3.2.2. The trends and patterns in the trade

One of the main trends in the trade of raw materials for electric vehicle batteries is the increased demand for lithium, which has led to rising prices and competition for supply. Another trend is concerns about cobalt, which has been associated with environmental and human rights concerns. As a result, there is a growing interest in developing alternative materials and technologies that reduce the reliance on these raw materials. Overall, the global trade of raw materials for electric vehicle batteries is complex and involves multiple players and stages, and there is a need for further research to better understand the sustainability issues surrounding their extraction and transportation.

Trend 1: Increased Demand for Lithium. The increased demand for electric vehicles has led to a surge in demand for lithium, as it is a key component of lithium-ion batteries, which are commonly used in electric vehicles. This increased demand has led to rising prices and competition for supply, particularly in countries such as China, the United States, Europe, and Japan, which are major markets for these materials. As a result, there is growing interest in

developing alternative materials and technologies that reduce the reliance on lithium and other rare earth metals.

According to a report by BloombergNEF (McCrone, 2018), the demand for lithium is expected to increase by more than 40 times by 2030, driven by the growth of the electric vehicle market.

The International Energy Agency (International Energy Agency, 2023) estimates that the number of electric vehicles on the road could increase from 3 million in 2017 to 125 million by 2030, which would require a significant increase in the production of lithium-ion batteries.

The price of lithium has increased significantly in recent years, with the average price of lithium carbonate increasing from around \$6,000 per tonne in 2015 to over \$17,000 per tonne in 2021, according to the United States Geological Survey (U.S. Geological Survey, 2022).

Salient Statistics—United States:	2017	2018	2019	2020	2021^e
Production	W	W	W	W	W
Imports for consumption	3,330	3,420	2,620	2,460	2,500
Exports	1,960	1,660	1,660	1,170	1,900
Consumption, estimated ¹	3,000	3,000	2,000	2,000	2,000
Price, annual average, battery-grade lithium carbonate, dollars per metric ton ²	15,000	17,000	12,700	8,000	17,000
Employment, mine and mill, number	70	70	70	70	70
Net import reliance ³ as a percentage of estimated consumption	>50	>50	>25	>50	>25

Figure 3. Domestic Production and Use of Lithium in the US
Source: U.S. Geological Survey, 2022

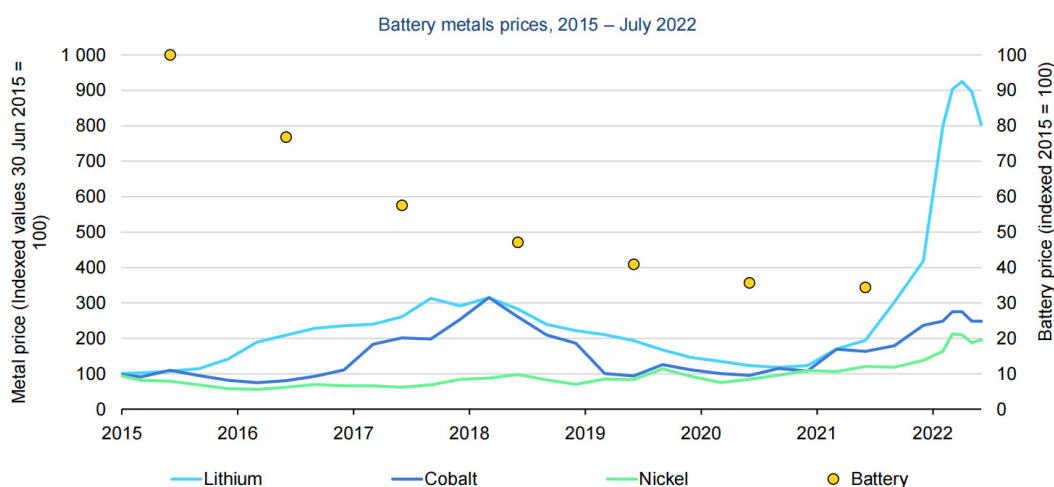


Figure 4. Battery Metals Prices, 2015 – July 2022
Source: International Energy Agency (IEA), 2023

According to a report by World Economic Forum (Shine, 2022), dividing lithium production by the amount needed per battery shows that enough lithium was mined in 2021 to make just under 11.4 million EV batteries. Using the same kind of calculation shows that global reserves are sufficient to produce just under 2.5 billion batteries. The IEA’s Net Zero by 2050 roadmap says the world will need 2 billion battery electric, plug-in hybrid, and fuel-cell electric light-duty vehicles on the road by that date to hit net zero. However, not all of the world’s lithium can go into EV batteries. The metal is also used in batteries for a host of other items, such as laptops and mobile phones, as well as to make planes, trains, and bikes.

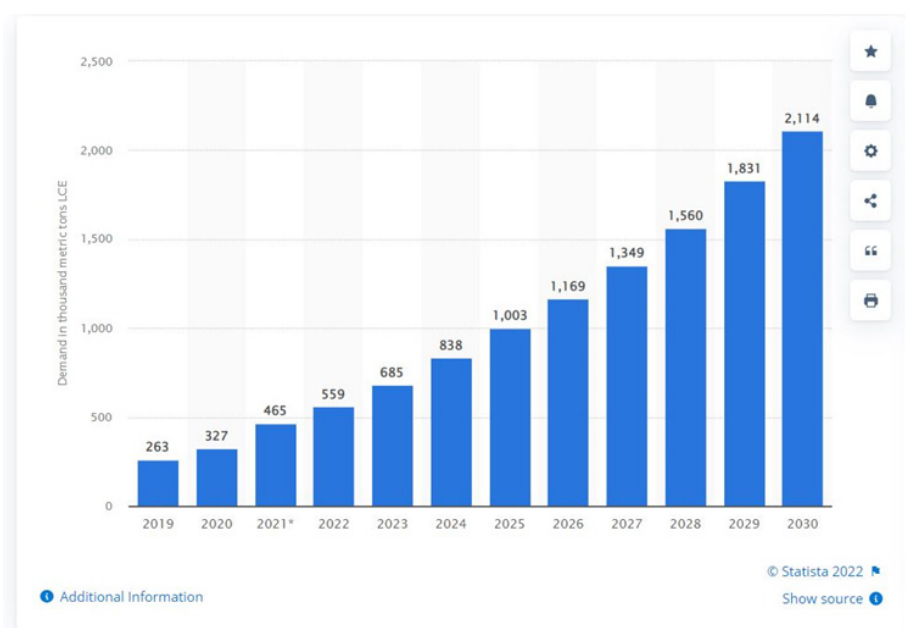


Figure 5. Projection of Worldwide Lithium Demand from 2019 to 2030
Source: International Energy Agency (IEA), 2023

Major automakers such as Tesla, Volkswagen, and General Motors have announced plans to significantly increase their production of electric vehicles in the coming years, which will further drive the demand for lithium and other rare earth metals used in electric vehicle batteries.

Overall, these data highlight the significant increase in demand for lithium due to the growth of the electric vehicle market, which has led to rising prices and competition for supply.

Trend 2: Concerns about Cobalt. Cobalt is a key component of lithium-ion batteries, which are used to power electric vehicles and other electronic devices. However, the mining and production of cobalt have been associated with environmental and human rights concerns, particularly in the Democratic Republic of Congo (DRC), which is the world's largest producer of cobalt (Campbell, 2020).

In the DRC, cobalt is often mined by hand by workers who are paid very low wages and work in dangerous conditions. Many of these workers are children, and they are often forced to work long hours in mines that are not safe. In addition, the mining of cobalt has been linked to environmental damage, including deforestation, soil erosion, and water pollution.

There have also been concerns about the supply of cobalt. The DRC currently produces about 60% of the world's cobalt, and there are fears that the supply could be disrupted by political instability or conflict in the region. In addition, the demand for cobalt is expected to increase significantly in the coming years as the production of electric vehicles and other electronic devices continues to grow.

As a result of these concerns, there has been a push to reduce the amount of cobalt used in batteries or to find alternative sources of the mineral. Some companies are working to develop new battery technologies that use less cobalt or that use other materials instead. Others are exploring the possibility of recycling cobalt from old batteries to reduce the need for new mining. There is also a growing interest in developing ethical and sustainable supply chains for cobalt and other minerals used in electronics. According to a report by McKinsey & Company (Breiter et al., 2023), with about four times lower virgin materials, recycled materials reduce the carbon footprint.

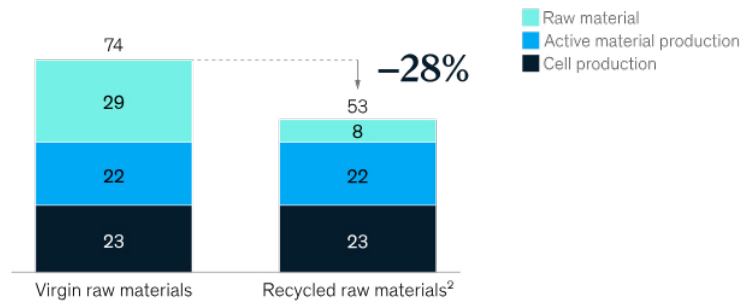


Figure 6. Total CO₂e Battery Cell Production Emissions from a Nickel-based Lithium-ion Battery with Virgin Versus Recycled Materials
 Source: McKinsey & Company

Trend 3: Development of Domestic Supply Chains. The development of domestic supply chains for raw materials used in electric vehicle batteries is becoming increasingly important as the demand for electric vehicles continues to grow. Many countries, particularly in Europe, have been investing in the development of these supply chains to reduce their reliance on imports and to ensure a more sustainable and ethical supply chain.

For example, the European Union has launched a program called the European Battery Alliance (European Battery Alliance, 2022), which aims to develop a competitive and sustainable battery industry in Europe. This includes investing in the development of domestic mining and processing of raw materials such as lithium, cobalt, and nickel. The European Commission (European Commission, 2023) has also proposed a new regulation (European Critical Raw Materials Act) that would require companies to demonstrate that their supply chains for raw materials are environmentally and socially sustainable.

Several countries in Europe are also investing in the development of domestic mining industries. Portugal (World Wildlife Fund, 2019), for example, intends to create a lithium and battery manufacturing industry in the border areas between Portugal and Spain, to meet the growing demand for batteries for electric vehicles. Portugal is currently the main lithium producer in the European Union and has the largest known reserves in the continent, occupying the 8th position worldwide.

BIGGEST LITHIUM RESERVES (TONS)

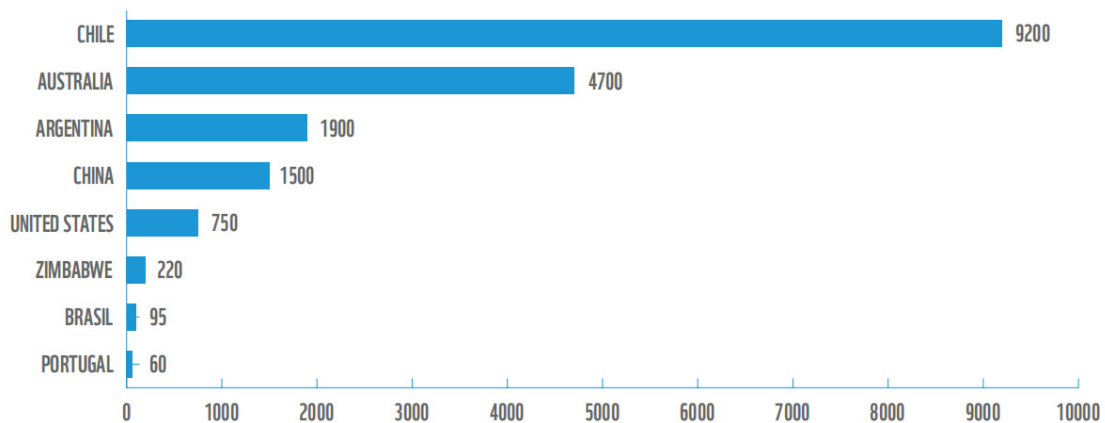


Figure 7. Biggest Lithium Reserves (Tons)
 Source: U.S. Geological Survey

In addition, Germany is investing in the development of a domestic supply chain for raw materials used in electric vehicle batteries (International Energy Agency, 2021). The country invested EUR 1 billion (USD 1.2 billion) in funding through 2022 was allocated by the Federal Ministry for Economic Affairs and Climate Action to establish the country as a global leader in battery cell production. For example, BASF (Germany) is building a major cathode material precursor plant in Finland and already has a long-term nickel supply agreement with Norilsk Nickel.

Other countries outside of Europe are also investing in the development of domestic supply chains. For example, Australia is investing in the development of a domestic lithium mining industry, and China is investing in the development of a domestic rare earth mining industry.

Overall, the development of domestic supply chains for raw materials used in electric vehicle batteries is becoming increasingly important as the demand for electric vehicles continues to grow. While there are challenges to developing these supply chains, such as the high cost of developing new mines and processing facilities, the potential benefits in terms of job creation, economic growth, and a more sustainable and ethical supply chain are significant.

Trend 4: Consolidation of the Market. The market for raw materials used in electric vehicle batteries is becoming increasingly consolidated, with a few key players dominating the market. This consolidation has been driven by several factors, including the high cost of developing new mines and processing facilities, the complexity of the supply chain, and the significant capital investments required to enter the market.

One key player in the market is China, which is the world's largest producer of rare earth metals, including the metals used in electric vehicle batteries. China currently produces about 80% of the world's rare earth metals and has been accused of using its dominance in the market to manipulate prices and restrict exports (CSIS, 2021).

Another key player in the market is the Democratic Republic of Congo, which is the world's largest producer of cobalt. The DRC currently produces about 60% of the world's cobalt, and there are concerns about the environmental and human rights impacts of cobalt mining in the country (Murray, 2022).

The consolidation of the market has led to concerns about the potential for monopolies and the need for greater competition in the market. Some experts have called for greater investment in the development of domestic supply chains for these raw materials, as well as greater investment in research and development of alternative materials and technologies that could reduce the reliance on these raw materials.

There are also concerns about the potential for geopolitical tensions and conflicts over access to these raw materials. For example, there have been concerns about the potential for conflict between China and the United States over access to rare earth metals, which are used in a wide range of electronic devices, including electric vehicles.

Overall, the consolidation of the market for raw materials used in electric vehicle batteries is a complex issue that requires careful consideration of the potential risks and benefits. While there are concerns about the potential for monopolies and geopolitical tensions, there are also opportunities for greater investment in the development of domestic supply chains and alternative materials and technologies.

Trend 5: Innovative Recycling Solutions. As the use of electric vehicles continues to grow, there is a need for

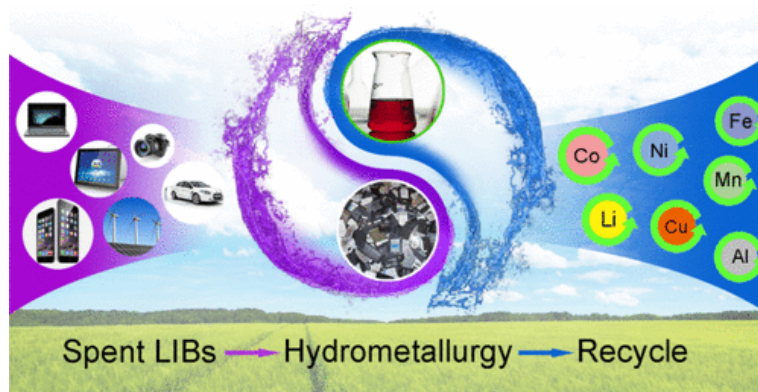


Figure 8. Hydrometallurgical Recycling

Source: Yao, Y., Zhu, M., Zhao, Z., Tong, B., Fan, Y., & Hua, Z. (2018). Hydrometallurgical Processes for Recycling Spent Lithium-Ion Batteries: A Critical Review. *ACS Sustainable Chemistry & Engineering*, 6(11), 13611-13627. <https://doi.org/10.1021/acsschemeng.8b03545>

innovative recycling solutions for batteries once they reach the end of their lifespan. This is because electric vehicle batteries contain a range of valuable raw materials, including lithium, cobalt, and nickel, which can be recycled and repurposed for use in new batteries or other applications.

One innovative recycling solution is known as hydrometallurgical recycling (Yao et al., 2018), which involves dissolving the raw materials in the battery in a liquid solution and then separating the different metals. This process can be used to recover up to 95% of the raw materials in the battery, making it a highly efficient and sustainable recycling solution.

Another innovative recycling solution is known as pyrometallurgical recycling (Zhou et al., 2021), which involves heating the battery to high temperatures to separate the different metals. While this process is less efficient than hydrometallurgical recycling, it can still recover a significant amount of the raw materials in the battery.

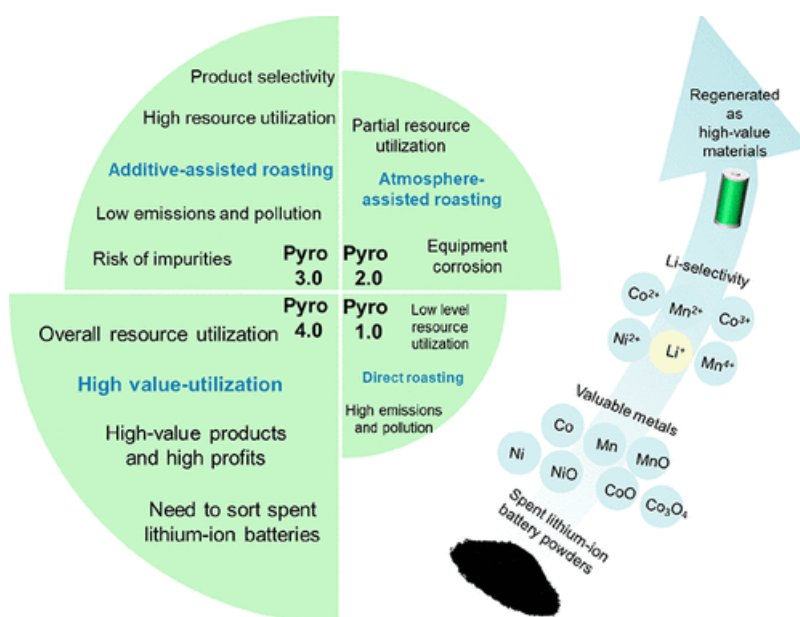


Figure 9. Pyrometallurgical Recycling

Source: Zhou, M., Li, B., Li, J., & Xu, Z. (2021). Pyrometallurgical Technology in the Recycling of a Spent Lithium Ion Battery: Evolution and the Challenge. *ACS EST Engg.*, 1(10), 1369-1382. <https://doi.org/10.1021/acsestengg.1c00067>

In addition to these recycling solutions, there are also efforts underway to repurpose the raw materials in electric vehicle batteries for use in other applications. For example, lithium can be used in the production of ceramics and glass, while cobalt can be used in the production of jet engine parts.

Overall, the development of innovative recycling solutions for electric vehicle batteries is an important step toward creating a more sustainable and circular economy. By recovering and repurposing the raw materials in these batteries, we can reduce our reliance on virgin materials and minimize the environmental impact of the electric vehicle industry.

3.3. The sustainability issues related to the extraction and trade of these materials

This area will analyze the environmental and social impacts of the extraction and trade of raw materials for electric vehicle batteries, identify the key sustainability issues related to the trade, and discuss the initiatives and policies aimed at promoting sustainable trade.

3.3.1. Environmental impacts

The extraction and processing of raw materials for electric vehicle batteries can have significant environmental impacts. For example, the production of lithium, which is a key component of lithium-ion batteries, often involves the use of large amounts of water and chemicals, which can lead to water pollution and soil erosion. In addition, the mining of lithium can require the clearing of large areas of land, which can lead to deforestation and the destruction of natural habitats.

According to a report by the International Energy Agency (International Energy Agency, 2023), the production of lithium-ion batteries for electric vehicles is expected to increase significantly in the coming years, with demand for lithium expected to increase by a factor of 40 by 2040. This growth in demand could lead to significant environmental impacts, particularly in regions where lithium is mined and processed.

The production of electric vehicle batteries also requires large amounts of energy, which can contribute to climate change. According to a study by McKinsey & Company (Linder et al., 2023), producing the large lithium-ion batteries used to power EVs is the biggest source of embedded emissions for both electric cars and trucks, accounting for about 40 to 60 percent of total production emissions. This is because the production of electric vehicle batteries requires the mining and processing of raw materials, as well as the manufacturing and transportation of the batteries themselves.

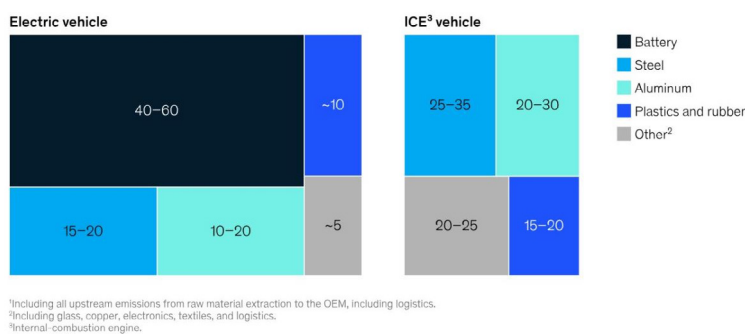


Figure 10. Typical Upstream Battery-electric-vehicle emissions
 Source: McKinsey & Company

In addition to the environmental impacts of battery production, there are also concerns about the environmental impacts of battery disposal. While efforts are underway to develop innovative recycling solutions for electric vehicle batteries, many batteries still end up in landfills, where they can release toxic chemicals and heavy metals into the environment.

Overall, the environmental impacts of the production and disposal of electric vehicle batteries are complex and multifaceted. While the growth of the electric vehicle industry has the potential to reduce greenhouse gas emissions and improve air quality, it is important to carefully consider the environmental impacts of the entire lifecycle of electric vehicle batteries, from extraction and processing to disposal and recycling.

3.3.2. Human rights abuses

The extraction of raw materials for electric vehicle batteries has been associated with human rights abuses, particularly in countries where labor laws are weak and worker protections are limited. This includes issues such as child labor, forced labor, and unsafe working conditions.

One key example of this is the mining of cobalt, which is a key component of lithium-ion batteries. According to a report by Amnesty International (Amnesty International, 2016), over half of the world's cobalt comes from the Democratic Republic of Congo, where child labor is common in the mining industry. The report found that children as young as seven were working in mines, often in hazardous conditions, and were exposed to high levels of cobalt dust, which can cause respiratory problems and other health issues.



Figure 11. Children sorting cobalt ore in the neighborhood of Kasulo
Source: Amnesty International and Afreewatch

In addition to child labor, there have also been reports of forced labor and unsafe working conditions in the cobalt mining industry. According to a report by the International Labour Organization (International Labour Organization, 2017), many cobalt miners work in informal and unregulated mines, where they are not provided with adequate safety equipment or training. This can lead to accidents and injuries, as well as long-term health problems such as lung disease and cancer.

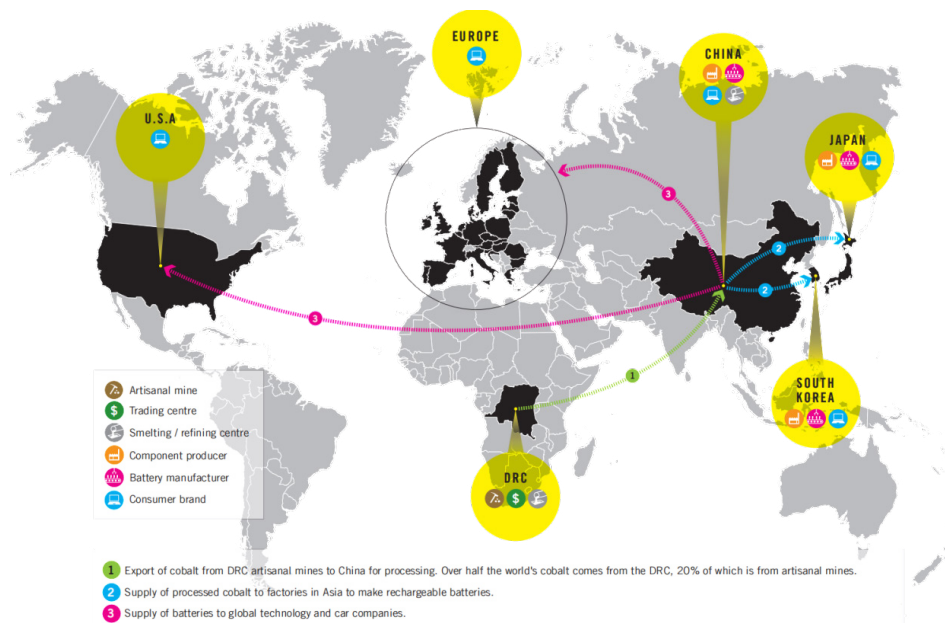


Figure 12. Movement of cobalt from artisanal mines in the DRC to the global market
Source: Amnesty International and Afreewatch

The issue of human rights abuses in the cobalt mining industry has been widely publicized in recent years, leading to increased scrutiny of the supply chains for electric vehicle batteries. Many companies have committed to improving the transparency and traceability of their supply chains, and efforts are underway to develop more sustainable and ethical supply chains for raw materials used in electric vehicle batteries.

However, the issue of human rights abuses in the mining industry is complex and multifaceted, and there are no easy solutions. Companies and governments need to work together to address these issues and to ensure that the production of electric vehicle batteries does not come at the expense of human rights and worker protections.

3.3.3. Supply chain transparency

The supply chains for raw materials used in electric vehicle batteries can be complex and opaque, making it difficult to ensure that the trade is sustainable and ethical. There is a need for greater transparency and traceability in the supply chain to ensure that environmental and social standards are being met.

One key challenge in achieving greater transparency in the supply chain for electric vehicle batteries is the complexity of the industry. The production of electric vehicle batteries involves multiple stages, from the mining and processing of raw materials to the manufacturing and distribution of the batteries themselves. This can involve a large number of different players, including mining companies, battery manufacturers, and transportation companies, making it difficult to track the movement of raw materials and ensure that environmental and social standards are being met.



Figure 13. Flow chart of the cobalt supply chain
Source: Amnesty International and Afreewatch

To address this challenge, there have been efforts (Rajaeifar et al., 2022) to develop more transparent and traceable supply chains for electric vehicle batteries. One example of this is the Responsible Minerals Initiative, which is a multi-stakeholder initiative that works to promote the responsible sourcing of minerals, including those used in electric vehicle batteries. The initiative has developed a set of due diligence guidelines for companies to follow, which includes steps such as identifying risks in the supply chain, engaging with suppliers to address these risks, and monitoring and reporting on progress.

In addition to industry-led initiatives, there have also been efforts by governments and non-governmental organizations to promote greater transparency in the supply chain for electric vehicle batteries. For example, the European Union (Colonna, E., Dekimpe, V., Duffau, E., Calvetti, R., & Bertsch, M., 2023) has developed regulations requiring companies to conduct due diligence on their supply chains to ensure that they are not contributing to human rights abuses or environmental degradation. Similarly, non-governmental organizations such as Amnesty International (Amnesty International, 2016) have called on companies to be more transparent about their supply chains and to take steps to address human rights abuses and environmental concerns.

Overall, the issue of supply chain transparency in the electric vehicle battery industry is complex and multifaceted, and there is no easy solution. However, efforts are underway to promote greater transparency and traceability in the supply chain, which can help to ensure that environmental and social standards are being met and that the trade is more sustainable and ethical.

3.3.4. Resource depletion

The extraction of raw materials for electric vehicle batteries can contribute to the depletion of natural resources, particularly if demand continues to grow at current rates. This can lead to environmental degradation and social conflicts over access to resources.

One key example of this is the mining of lithium, which is a key component of lithium-ion batteries. Accord-

ing to a report by the International Energy Agency (International Energy Agency, 2023), the production of lithium is expected to increase significantly in the coming years, driven by the growth of the electric vehicle market. This growth in demand could lead to significant environmental impacts, particularly in regions where lithium is mined and processed.

In addition to lithium, other raw materials used in electric vehicle batteries, such as cobalt and nickel, are also subject to resource depletion concerns. According to a report by the European Commission (Alves Dias et al., 2022), the demand for cobalt is expected to increase significantly in the coming years, driven by the growth of the electric vehicle market. This growth in demand could lead to environmental degradation and social conflicts over access to resources in regions where cobalt is mined.

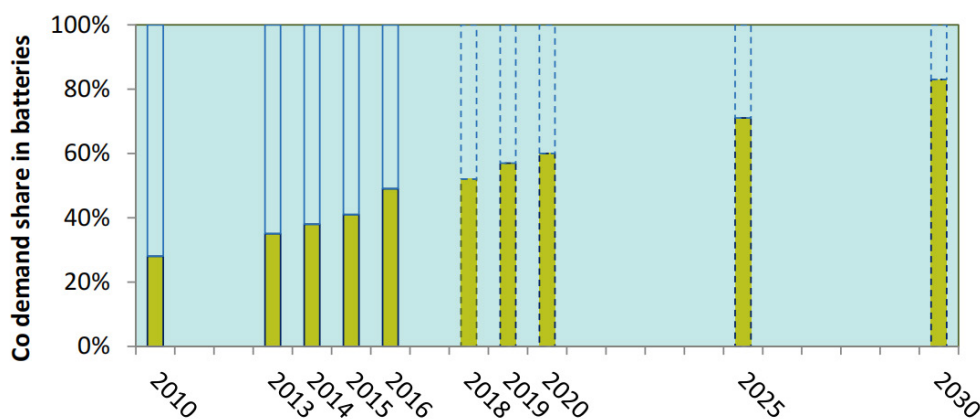


Figure 14. Cobalt Demand Share in Rechargeable Batteries
Source: the European Commission

The issue of resource depletion is complex and multifaceted, and there are no easy solutions. However, there are efforts underway to promote more sustainable and responsible mining practices and to encourage the development of alternative materials and technologies that can reduce the demand for these resources.

Overall, the issue of resource depletion in the electric vehicle battery industry is an important one, and companies and governments need to work together to address these concerns and promote more sustainable and responsible practices. This can help to ensure that the growth of the electric vehicle market does not come at the expense of the environment or social well-being.

3.4. Strategies for promoting sustainable trade of raw materials

This area will identify the strategies for promoting sustainable trade of raw materials for electric vehicle batteries, discuss the effectiveness of these strategies, and analyze the challenges and limitations of implementing these strategies.

3.4.1. Certification schemes

Several certification schemes aim to promote sustainable practices in the mining and processing of raw materials used in electric vehicle batteries. These schemes set environmental and social standards that companies must meet to receive certification.

One example of a certification scheme is the Responsible Minerals Initiative (RMI), which is a joint initiative of companies and NGOs working to promote responsible mineral sourcing. The RMI has developed a set of standards for responsible sourcing of minerals, including those used in electric vehicle batteries, and provides a certification process for companies that meet these standards. The RMI's standards cover a range of issues, including labor rights, environmental impacts, and community engagement.

Another example of a certification scheme is the Initiative for Responsible Mining Assurance (IRMA), which is a multi-stakeholder initiative that aims to promote responsible mining practices. The IRMA has developed a set of standards for responsible mining, including those related to the mining of minerals used in electric vehicle batteries, and provides a certification process for companies that meet these standards. The IRMA's standards cover a range of issues, including human rights, labor rights, environmental impacts, and community engagement.

Overall, certification schemes can play an important role in promoting more sustainable and responsible practices in the mining and processing of raw materials used in electric vehicle batteries. By setting clear standards and providing a certification process, these schemes can help to ensure that companies are meeting environmental and social standards, and can provide consumers with greater confidence in the sustainability and ethicality of the products they purchase.

3.4.2. Responsible sourcing initiatives

Responsible sourcing initiatives are becoming increasingly common in the electric vehicle battery industry, as companies and governments seek to promote sustainable and ethical trade in raw materials. These initiatives seek to ensure that environmental and social standards are being met throughout the supply chain.

One example of a responsible sourcing initiative is the European Union's Raw Materials Alliance, which was launched in 2021. The Raw Materials Alliance aims to promote sustainable and responsible sourcing of raw materials, including those used in electric vehicle batteries, by bringing together companies, governments, and civil society organizations to work towards common goals. The initiative seeks to promote sustainable and ethical trade by improving transparency, promoting responsible sourcing practices, and promoting the development of domestic supply chains.

Another example of a responsible sourcing initiative is the Global Battery Alliance, which was launched in 2017 by the World Economic Forum. The Global Battery Alliance aims to promote sustainable and responsible trade in batteries, including those used in electric vehicles, by bringing together companies, governments, and civil society organizations to work towards common goals. The initiative seeks to promote sustainable and ethical trade by improving transparency, promoting responsible sourcing practices, and promoting the development of circular economies.

In addition to these initiatives, many companies in the electric vehicle battery industry have launched their responsible sourcing initiatives. For example, Tesla has committed to using only responsibly sourced materials in its batteries and has developed a due diligence process to ensure that its suppliers are meeting environmental and social standards. Other companies, such as BMW and Volkswagen, have also launched responsible sourcing initiatives aimed at promoting sustainable and ethical trade in raw materials.

Overall, responsible sourcing initiatives are an important tool for promoting sustainable and ethical trade in raw materials used in electric vehicle batteries. By bringing together companies, governments, and civil society organizations to work towards common goals, these initiatives can help to ensure that environmental and social standards are being met throughout the supply chain, and can promote the development of more sustainable and responsible practices.

3.4.3. Recycling and circular economy

Recycling and circular economy solutions are becoming increasingly important in the electric vehicle battery industry, as companies and governments seek to reduce their environmental impact and promote more sustainable practices. This includes initiatives aimed at increasing the recycling rate of batteries and repurposing the raw materials used in these batteries.

One example of a recycling initiative is the Closed Loop Fund, which is a public-private partnership that aims to invest in recycling infrastructure in the United States. The Closed Loop Fund has invested in several projects aimed at increasing the recycling rate of batteries, including a project to recycle lithium-ion batteries from electric vehicles.

Another example of a recycling initiative is the ReLieVe project, which is a European Union-funded project aimed at developing new recycling technologies for electric vehicle batteries. The project aims to increase the recycling rate of batteries to more than 95% and to develop new technologies for repurposing the raw materials used in these batteries.

In addition to recycling, there are also initiatives aimed at promoting the circular economy by repurposing the

raw materials used in electric vehicle batteries. For example, the Finnish company Fortum has developed a process for recovering cobalt (Fortum, 2023) and other metals from lithium-ion batteries, which can then be repurposed for use in new batteries or other applications.

Overall, recycling and circular economy solutions important tools for promoting more sustainable and responsible practices in the electric vehicle battery industry. By increasing the recycling rate of batteries and repurposing the raw materials used in these batteries, companies and governments can reduce their environmental impact, conserve natural resources, and promote a more sustainable and circular economy.

3.5. Future prospects

This area will analyze the innovations and trends shaping the trade of raw materials for electric vehicle batteries, discuss the potential impact of these innovations and trends on the trade, and identify the areas for future research.

3.5.1. Development of new battery chemistries

There is a growing interest in developing new battery chemistries that can reduce reliance on scarce or problematic raw materials. These new battery chemistries have the potential to reduce the environmental impact of electric vehicle batteries, as well as reduce the cost and improve the performance of these batteries.

3.5.2. Increased demand for recycled materials

As the market for electric vehicles grows, the demand for recycled materials to be used in battery production is also increasing. This is creating new opportunities for companies that specialize in battery recycling and driving innovation in recycling technologies. Companies are investing in new recycling processes and technologies to increase the efficiency and scale of battery recycling, as well as improve the quality of the recycled materials. This increased demand for recycled materials is also driving down the cost of recycled materials, making them more competitive with virgin materials.

3.5.3. The emergence of new supply chain models

The supply chains for raw materials used in electric vehicle batteries are becoming increasingly complex, with new models emerging that seek to promote transparency and sustainability. One example is the use of blockchain technology to create transparent supply chains, which can provide a secure and transparent record of the movement of raw materials from extraction to production. This can help to promote ethical and sustainable practices by enabling companies to trace the origin of raw materials and ensure that they are sourced responsibly. Other models include certification schemes and responsible sourcing initiatives, which aim to promote sustainable and ethical trade in raw materials.

3.5.4. The growing importance of ethical sourcing

There is a growing awareness of the ethical issues associated with the trade of raw materials for electric vehicle batteries, particularly around the use of child labor and other human rights abuses. This is driving innovation in ethical sourcing practices, with companies investing in responsible sourcing initiatives and certification schemes to promote sustainable and ethical trade in raw materials. Companies are also working to increase transparency in their supply chains and trace the origin of raw materials to ensure that they are sourced responsibly. This growing importance of ethical sourcing is creating new opportunities for companies that can demonstrate ethical sourcing credentials, and is promoting more responsible and sustainable practices in the electric vehicle battery industry.

4. Conclusion

In conclusion, the research highlights the complex and evolving nature of the trade of raw materials for electric

vehicle batteries. As the demand for electric vehicles grows, there is an increasing need for sustainable and ethical practices in the extraction, processing, and trade of raw materials. This is driving innovation in recycling technologies, new battery chemistries, and ethical sourcing practices, and creating new opportunities for companies that can demonstrate sustainability and ethical credentials.

However, there are also challenges and concerns associated with the trade of raw materials for electric vehicle batteries, including environmental impacts, human rights abuses, and the potential for monopolies and lack of competition. To address these challenges, future research should focus on developing new technologies and solutions that promote sustainability and ethical practices, as well as exploring new supply chain models and policy frameworks that can support more responsible and sustainable trade in raw materials.

Overall, the findings have important implications for the trade of raw materials for electric vehicle batteries, and highlight the need for greater collaboration and innovation to promote sustainability and ethical practices in this important and rapidly growing industry. By investing in new technologies, responsible sourcing initiatives, and transparent supply chain models, companies and governments can help to ensure that the growth of the electric vehicle industry is sustainable, responsible, and beneficial for all stakeholders.

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**GLOBAL TRADE FRONTIERS:
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Impact of Economic Cycles and Crises

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Abstract

This paper offers a comprehensive analysis of economic cycles and crises, shedding light on their effects on both emerging and developed markets. It outlines the inherent patterns of economic cycles, marked by crisis, depression, recovery, and prosperity, which are fundamental to capitalist economies. These cycles are characterized by their repetitive nature, driven by various global economic crises over history.

A key focus is on the contrasting responses of emerging and developed markets to economic instability. Emerging markets, defined by metrics such as per capita Gross National Product, are shown to experience greater volatility and a heightened sensitivity to global economic shifts. Their financial systems, being less mature and heavily reliant on foreign capital, are more prone to external shocks. Developed markets, in contrast, exhibit a stronger resilience due to their more sophisticated and stable financial infrastructures. Despite this, their deep integration with the global economy does not render them immune to worldwide economic crises. These markets, however, are better positioned to leverage strong monetary and fiscal policies to mitigate economic downturns.

The resilience of certain sectors during economic recessions is also highlighted. Industries such as healthcare, food and beverage, e-commerce, and online education have demonstrated adaptability and sustained demand, even under recessionary pressures. They continue to provide essential services and adapt to new market demands, reflecting robust consumer demand.

The paper concludes with an emphasis on the need for ongoing research into economic cycles and crises. This research is vital for governments to develop effective strategies for economic stability and growth. Furthermore, understanding the resilient nature of certain sectors can provide valuable guidance for businesses and individuals, aiding in making strategic decisions amidst economic uncertainties.

Keywords: economic crisis, economic cycle, developed markets, emerging markets.

1. Introduction

Economic cycles and crises have long been a subject of study in economics. Understanding their dynamics is

crucial for predicting future trends and mitigating negative impacts.

In the cycle of the economy, where there is a rise, there naturally follows a decline; a blazing fire fueled by oil cannot last forever. As people enjoy the speed and convenience brought by the modern economic system, it is impossible to completely avoid the costs required to sustain this system, especially considering the numerous historical precedents. From the Tulip Mania, the Great Depression, the Oil Crisis, to China's Reform and Opening-up, the deepening of economic globalization, and then to "trade wars," embargoes, and technological blockades... the recurring economic crises are the main theme of the modern economic world.

Cyclical economic issues represent the dark side of the modern economic system, the price we must pay while enjoying the benefits brought by the modern economy. The impact of economic crises is not merely economic; they bring about comprehensive social instability. Looking back at history is to scrutinize the present. Studying past economic crises allows us to accumulate experience to face the challenges of today's world. Only by better understanding our history can we better control and confront current and future crises.

1.1. Research background

In today's world, the modern economy is highly globalized, with exceptionally tight economic connections between nations. An economic crisis in one country or region can rapidly affect the global economy (Huang, 2014). At the same time, the application of the internet and artificial intelligence has increasingly shifted economic activities to digital platforms, altering traditional economic structures and operational methods, thereby introducing new points of economic growth and crisis risks. Currently, modern financial markets are highly developed and complex, with rapid capital flows and a variety of financial instruments, making these markets more sensitive and quick to react to economic crises. Persistent social inequalities and political factors around the world also significantly impact economic stability.

1.2. Research purpose

Studying economic crises can lead to a better understanding of fluctuations in economic cycles, enabling the prediction of potential economic downturns or recessions. This provides critical information and warnings for policymakers, businesses, and individuals. For national policymakers, such as governments and central banks, researching economic crises is instrumental in devising effective macroeconomic policies and responses to mitigate the impact of crises and stabilize financial markets and the economy. For economic researchers, the study of economic crises is vital for the development of economic theories, challenging and enriching existing theories, and fostering the emergence of new ones.

Additionally, as economic crises are often accompanied by rising unemployment and increasing living costs, this research helps policymakers find solutions to these social issues, thereby enhancing social stability and public welfare. For individuals and businesses, understanding the characteristics and causes of economic crises can assist them in making more informed investment, consumption, and career decisions, reducing the risks associated with economic volatility.

2. Economic Cycles and Economic Crises

2.1. Economic cycles

2.1.1. Definition

Economic cycles refer to the fluctuations in economic activity over a period of time.

This overproduction is not absolute but relative, meaning it is in excess relative to the paying capacity of the working people and the needs for capital value appreciation.

An economic crisis typically manifests as a large accumulation of unsold goods, sharp reductions in production,

widespread factory closures, massive unemployment among workers, severe disruption of credit relationships, and extreme chaos and paralysis in the entire socio-economic system (Huang, 2014).

Although the possibility of a crisis has existed since the advent of money, it only becomes a reality under the capitalist mode of production. This is determined by the fundamental contradiction of capitalism: the contradiction between the social nature of production and the private ownership under capitalism (Borio, 2012).

2.1.2. Types

Some scholars divide economic crises into two types: "passive" and "active."

Passive crisis: This refers to a situation where a country's macroeconomic management authorities face a severe economic downturn or significant currency devaluation without prior preparation, leading to a financial crisis that evolves into an economic crisis. In such passive crises, it is difficult to expect the currency to rebound after the crisis, as the process is essentially about re-evaluating and re-establishing the value of the nation's currency.

Active crisis: An active crisis is the result of policy actions taken by macroeconomic management authorities to achieve a specific goal. The emergence of the crisis is entirely anticipated by the authorities, and the crisis or economic recession is considered an opportunity cost of reform.

According to the theory of a bipolar world, economic crises during periods of internal transformation in the capitalist world system are mainly resolved by expanding domestic effective demand, while crises during periods of external expansion are resolved by expanding international effective demand (He, 1990).

Theoretical Research: Karl Marx wrote in "Capital" that the market economy cannot eliminate the root causes of economic crises, which therefore erupt periodically. This cyclical nature of economic crises also manifests in the cyclical nature of capitalist reproduction, encompassing four phases: crisis, depression, recovery, and boom.

Crises often erupt at the height of capitalist economic prosperity, when the various contradictions of capitalism are most acute. They first appear in a particular link of commodity circulation and then rapidly spread to all sectors, eventually leading to severe chaos in the entire socio-economic activity. The crisis phase is decisive in the economic cycle, marking the end of one economic cycle and the beginning of the next. The crisis is followed by a depression phase.

During the depression phase, the phenomenon of supply exceeding the paying demand eases, production no longer continues to decline, and unemployment does not increase further. However, surplus goods have not been completely sold off, purchasing power remains very low, and the socio-economic system is in a state of stagnation. After the depression phase, the market situation improves, production gradually recovers, and the economy slowly moves out of stagnation, transitioning into the recovery phase.

In the recovery phase, the expansion of the market leads to rising prices and gradually recovering profits, stimulating capitalists to increase investment and expand production. As production continuously expands, the capitalist economy accelerates, surpassing the pre-crisis peak, and enters the boom phase of the economic cycle. In this phase, the entire capitalist economy appears prosperous. However, the prosperity of the capitalist economy is temporary and contains the precursors of a new crisis. As social production continues to expand and the various contradictions of the capitalist economy sharpen, a crisis will inevitably erupt again, leading the capitalist economy into the next cycle.

In the development of the capitalist economy, economic crises are cyclical, with intervals between crises showing certain regularities. Since the first general overproduction crisis in 1825 in England, subsequent crises occurred in 1836, 1847, 1857, 1866, 1873, 1882, 1890, and 1900. In the phase of capitalist free competition and the transition to monopolistic capitalism, such economic crises occurred roughly every decade. In the 20th century, following the 1900 crisis and before World War II, crises occurred in 1907, 1914, 1921, 1929-1933, and 1937-1938, with a crisis about every seven to eight years.

3. Global Economic Crises (1788-2020)

This section provides an overview of major global economic crises that have occurred from 1788 to 2020, highlighting their characteristics, causes, and impacts. The period spans over two centuries of economic history, encompassing various types of crises, including financial crashes, depression, and systemic economic meltdowns.

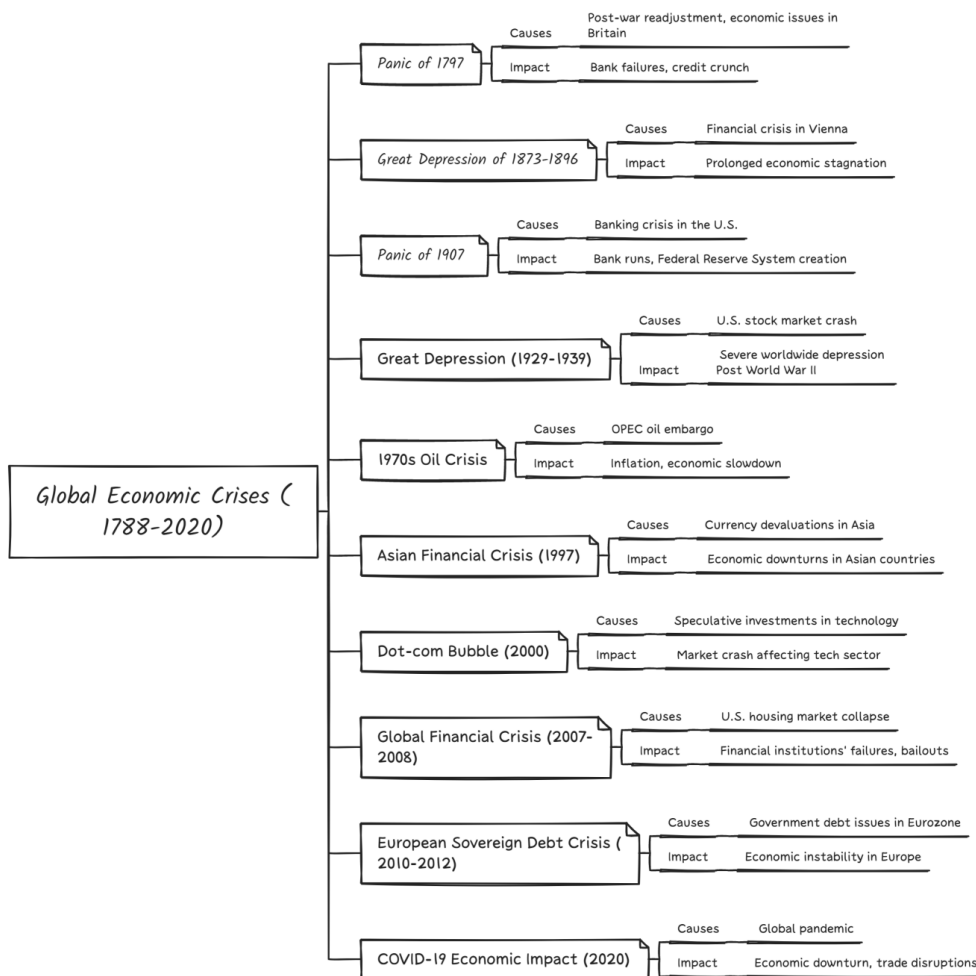


Figure 1. Global Economic Crises (1788-2020)

3.1. 18th and 19th centuries

The Panic of 1797: Triggered by post-war readjustment after the American Revolutionary War and economic problems in Britain, it led to a series of bank failures and a credit crunch.

The Great Depression of 1873-1896: Started with a financial crisis in Vienna and spread to the rest of Europe and the United States, this was a prolonged period of economic stagnation.

3.2. Early 20th century

The Panic of 1907: A banking crisis in the United States, it led to bank runs and the creation of the Federal Reserve System.

The Great Depression (1929-1939): Originating from the U.S. stock market crash in 1929, it was a severe worldwide economic depression that had profound effects globally.

3.3. Post World War II crises

1970s Oil Crisis: Caused by the OPEC oil embargo, it led to high inflation and a global economic slowdown.

3.4. Late 20th and early 21st century

Asian Financial Crisis (1997): Began in Thailand and spread across East Asia, it caused currency devaluations and economic downturns in several Asian countries.

The Dot-com Bubble (2000): A stock market bubble burst, primarily affecting technology companies and investors.

3.5. 21st century

Global Financial Crisis (2007-2008): Originating in the United States with the collapse of the housing market, this crisis quickly spread globally, leading to significant financial institutions' failures and government bailouts.

European Sovereign Debt Crisis (2010-2012): Characterized by the struggle of several Eurozone countries to repay or refinance their government debt.

3.6. Recent crises

COVID-19 Economic Impact (2020): The pandemic caused a significant global economic downturn, with widespread lockdowns and disruptions to trade and supply chains.

Each of these crises has unique causes, from systemic issues in financial systems to geopolitical events or technological changes. They have led to reforms in financial regulation, shifts in economic policy, and have shaped the modern economic landscape. Studying these crises provides insight into the cyclical nature of economies and the inter-connectivity of global financial systems.

4. Analysis of Major Economic Crises

This section will overview the major global economic crises within the specified period, highlighting their global influence.

4.1. 2020 U.S liquidity crisis

4.1.1. Origins

The 2020 U.S. liquidity crisis originated from a combination of economic disruptions caused by the COVID-19 pandemic and pre-existing vulnerabilities in the financial system.

4.1.2. Trigger: global pandemic

The outbreak of the COVID-19 pandemic acted as a trigger, causing widespread economic shutdowns, uncertainty, and panic, which in turn strained the liquidity of financial markets.

4.1.3. Impacts: stocks and bonds plummet, gold price decline, liquidity crisis

The immediate impacts included a sharp drop in stock and bond markets, decline in gold prices, and a severe liquidity crunch as investors rushed to sell assets for cash.

4.1.4. Responses

The Federal Reserve and other central banks responded with aggressive monetary policies, including cutting

interest rates to near zero and injecting trillions of dollars into the financial system through various means.

4.2. 2007 U.S subprime crisis and 2008 international financial crisis

4.2.1. Origins

The crisis originated from the collapse of the housing bubble in the United States, which was largely driven by the widespread issuance of high-risk subprime mortgages.

4.2.2. Trigger

The trigger was the increasing default rates on subprime mortgages, leading to massive losses for financial institutions.

4.2.3. Impacts

The impacts included the collapse of major financial institutions, a sharp downturn in global stock markets, and a severe credit crunch.

4.2.4. Responses

Responses involved significant government interventions, including bailouts of banks and other financial institutions, and large-scale stimulus packages to revive the economy.

4.3. 1997 Asian financial crisis

4.3.1. Origins

This crisis had its roots in excessive real estate and stock market investments fueled by easy credit and hot money inflows in Asian economies.

Economic Structure of Asian Countries;

Influence of American Economic Interests and Policies.

Economic structure of Asian countries: Countries like Singapore, Malaysia, Thailand, Japan, and South Korea are export-oriented economies with a significant dependence on the global market. As a result, any turbulence in the Asian economy is likely to have a domino effect. Taking Thailand as an example, the trading of the Thai baht in the international market is not controlled by the government. Thailand, lacking sufficient foreign exchange reserves, is extremely vulnerable to speculation by financiers. Consequently, as the economy dictates politics, this also leads to instability in Thailand's political situation.

4.3.2. Trigger

The trigger was the devaluation of the Thai baht after the government was forced to float it due to lack of foreign currency to support its fixed exchange rate.

4.3.3. Impacts

The crisis led to severe currency devaluations, stock market crashes, and economic recessions in several Asian countries.

4.3.4. Responses

Responses included IMF-led bailout packages, structural reforms in the affected economies, and tighter financial regulations to restore confidence and stability.

5. Analysis of Major Economic Crises

5.1. Economic recession indicators

Economic recessions are periods of economic decline and can be identified by various indicators. Understanding these indicators is crucial for economists, policymakers, and investors to anticipate and mitigate the impacts of a recession. Here are some key indicators of an economic recession:

Gross Domestic Product (GDP) Decline: The most significant indicator of a recession is a decline in GDP for two consecutive quarters. GDP measures the total value of goods and services produced in a country and is a primary indicator of economic health.

Rising Unemployment Rates: During a recession, companies often reduce their workforce to cut costs, leading to higher unemployment rates. An increase in unemployment is a strong indicator of economic slowdown.

Decrease in Consumer Spending: Consumer spending drives economic growth. A decrease in consumer spending, often due to reduced consumer confidence or increased savings, indicates that an economy might be heading towards a recession.

Reduction in Housing Market Activity: A slowdown in housing construction and sales can indicate a recession, as the housing market is closely tied to broader economic conditions.

5.2. Sectors resistant to economic downturns

Economic recessions or financial crises and other negative economic shocks can have lasting effects on household and public spending, and negatively impact industries such as real estate, banking, manufacturing, and transportation (Fuster et al., 2023; Sabljic et al., 2023; Ali, 2022). However, there are still some industries that remain unaffected. Over the years, these sectors have proven to be the most robust in the face of any such level of global economic crisis.

5.2.1. Healthcare industry

The healthcare industry provides high-demand essential services. Regardless of the economic situation, people fall ill, and they do not cease seeking emergency or routine healthcare. The healthcare industry has always been one of the most in-demand sectors, not severely impacted during economic downturns. In fact, certain healthcare sectors like mental health services may even thrive during financial and social turbulence.

5.2.2. Food and beverage industry

The food and beverage industry is closely linked to people's daily activities and is a necessity for life. In times of global economic recession, stores that offer trade consumer goods and daily necessities can survive economic storms, even though their costs may relatively increase during economic downturns. On the other hand, restaurants serving luxury meals or stores offering expensive foods might face losses due to customers' unwillingness to purchase or shifting towards buying what they truly need.

5.2.3. E-commerce and transportation services

E-commerce stores primarily receiving customer orders and forwarding them to other shops are not greatly affected by economic crises, as they do not need to pay for storage or maintenance costs. These platforms, acting merely as intermediaries between customers and sellers in e-commerce, are less impacted compared to direct retail stores.

5.2.4. Online education

With the onset of economic recession leading to a significant rise in unemployment rates, unemployed individuals often tend to learn new skills to secure a well-paying job in the short term. Hence, the field of online education often

sees an increase in demand during economic downturns.

6. A Comparative Analysis of Economic Cycles' Effects on Emerging Markets and Developed Countries

6.1. Overview of emerging markets and developed countries

In a 1994 research report, the U.S. Department of Commerce classified Mainland China, India, ASEAN countries, South Korea, Turkey, Mexico, Brazil, Argentina, Poland, and South Africa as emerging markets. The Morgan Stanley Capital International (MSCI) Emerging Markets Index in 2009 listed the following countries and regions as emerging markets for statistical purposes: Brazil, Chile, Mainland China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, Morocco, Peru, the Philippines, Poland, Russia, South Africa, Thailand, and Turkey. The list of emerging market countries (regions) by the UK's "The Economist" magazine is similar to this. In summary, as long as a country or region's per capita Gross National Product (GNP) does not reach the high-income country level as defined by the World Bank, then its stock market is considered an emerging market. Some countries, despite their economic development level and per capita GNP reaching the high-income countries' category, are still considered emerging markets due to their stock market's lagging development and immature market mechanisms.

6.2. Performance of emerging markets during economic cycles

During periods of global economic instability, emerging markets often face greater economic and financial volatility. Compared to developed markets, the financial systems in emerging markets may be less mature and more susceptible to external shocks. Additionally, due to a lack of effective policy tools to combat economic crises, emerging markets are more reliant on foreign capital inflows, which can further exacerbate their economic difficulties.

6.3. Performance of developed markets during economic cycles

Developed markets typically possess more mature and stable financial systems, which helps maintain a certain level of economic stability during crises.³ At the same time, developed countries have powerful policy tools and fiscal capabilities to address economic downturns, such as monetary policy adjustments and fiscal stimulus. Additionally, consumers and businesses usually have stronger savings and credit capacities, providing a buffer during economic recessions. However, due to the closer relationship of developed markets with the global market, global crises can have a more direct impact on them.

7. Conclusions

This paper provides a systematic overview of economic cycles and crises, offering insights into their impact on emerging and developed markets. The main conclusions drawn from the analysis are as follows: Economic cycles, characterized by phases of crisis, depression, recovery, and prosperity, reflect the intrinsic fluctuations in economic activities. These cycles are cyclical and inevitable in capitalist economies, as emphasized by the historical analysis of various global economic crises. Emerging markets, identified by per capita Gross National Product (GNP) and other economic indicators, exhibit greater volatility and sensitivity to global economic instability. Their less mature financial systems and reliance on foreign capital make them more susceptible to external shocks. In contrast, developed markets, with their more mature and stable financial systems, demonstrate stronger resilience to economic downturns. However, their close integration with the global economy means they are not immune to global crises. They benefit

from stronger policy responses, including monetary and fiscal measures, to stabilize their economies.

Certain sectors, such as healthcare, food and beverage, e-commerce, and online education, have shown resilience in the face of economic recessions. These sectors adapt and continue to provide essential services or meet new demands, even during economic downturns, maintaining robust consumer demand.

Looking forward, governments must continue researching economic cycles and crises to develop more effective strategies for economic stability and growth. Understanding the characteristics of resilient sectors can guide businesses and individuals in making informed decisions during periods of economic uncertainty.

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**GLOBAL TRADE FRONTIERS:
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The Legal Frameworks that Govern International Business Arbitration and Notable Arbitration Cases in The Past Decade

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Abstract

This paper focuses on the legal frameworks that govern international business arbitration and notable arbitration cases in the past decade.

The article first interests in the meaning of arbitration, international arbitration, and how it works. Secondly, it analyzes the application of the law in international commercial arbitration. Lastly, it shows two notable arbitration cases in the past decade to present specific international arbitration cases.

Keywords: international arbitration, legal frameworks, notable arbitration cases.

1. Introduction

Arbitration is a process in which parties to a dispute agree to have a neutral person or panel reach a binding decision that settles their dispute based on previously agreed-upon norms and rules¹.

International arbitration is similar to domestic court litigation but instead of taking place before a domestic court, it takes place before private adjudicators known as arbitrators. It is a consensual, neutral, private, and enforceable means of international dispute resolution, which is typically faster and less expensive than domestic court proceedings. Unlike domestic court judgments, international arbitration awards can be enforced in nearly all countries of the world, making international arbitration the leading mechanism².

1. International Arbitration: What it is and How it Works. <https://www.pon.harvard.edu/daily/international-negotiation-daily/international-arbitration-what-it-is-and-how-it-works/> (last visited Nov, 21, 2023).
2. International Arbitration Information by Aceris Law LLC. <https://www.international-arbitration-attorney.com/what-is-international-arbitration/> (last visited Nov, 21, 2023).

There are three main types of international arbitration, writes Salacuse in the *Negotiation Journal*³. The three types have principles and processes in common, and often the same people serve as arbitrators or legal counsel in all three types. But the details of the types of international arbitration vary based on the nature of the participants and the rules they have agreed to apply to their dispute. Each type of international arbitration will be considered in turn.

1.1. Interstate arbitration

In interstate arbitration, nations, represented by their governments, resolve their disputes through arbitration. Though interstate arbitration is essentially a legal process, viewing it only in legal terms “overlooks its tactical and strategic importance in enabling contending states under appropriate conditions to settle significant international conflicts,” writes Salacuse in the *Negotiation Journal*⁴. To take one example, the Red Sea Islands Arbitration between Eritrea and Yemen was aimed at settling competing claims to some uninhabited rocks in the Red Sea. But the international arbitration had the broader advantage of providing “a face-saving way to end a dangerous military confrontation in 1995 that threatened an important global trade route,” according to Salacuse.

Despite its potential power as a means of resolving international conflict, interstate arbitration is little used and “remains a largely forgotten item at the bottom of the dispute settlement toolbox, overlooked in books, articles, and courses in conflict resolution,” Salacuse writes. He argues that international peacemakers and the programs that train them should pay more attention to the ability of interstate arbitration to “give diplomacy a helping hand.”

1.2. Investor-state arbitration

Investor-state arbitration is “a revolutionary innovation in international litigation,” writes Salacuse in the *International Lawyer*⁵. This fast-growing category of international arbitration adjudicates between nations and private foreign investors, such as foreign nationals or companies.

Investor-state arbitration came about in the second half of the 20th century through nation’s negotiations of bilateral and multilateral investment treaties. In these treaties, nations make commitments regarding how they will treat investors and investments from other states and agree to enforcement mechanisms, particularly arbitration of disputes with foreign investors.

Investor-state arbitration gives foreign investors the right to “sue a host government for compensation before an international arbitration tribunal when they have been aggrieved by that government’s actions,” according to Salacuse. As such, it marks a “radical departure” from earlier methods of settling such disputes, which required investors to rely on “diplomatic protection” from their home countries. By 2021, investors had sued 124 governments in over 1,100 cases brought to investor-state arbitration. Many, though not most, of these international arbitration cases, resulted in an arbitration award totaling hundreds of millions of dollars, writes Salacuse.

1.3. International commercial arbitration

International commercial arbitration, the most common form of international arbitration, occurs between parties based in different countries. Most commercial arbitration cases involve contractual disputes between corporations.

Businesses from different countries generally prefer to arbitrate their dispute rather than adjudicate them in the courts of one side or another. This is because they believe an international tribunal is likely to be more independent of national prejudices and more knowledgeable about international business practices than an ordinary national court of law would be.

As a result, most contracts between corporations from different countries contain a dispute resolution clause

3. Jeswald W. Salacuse, Interstate Arbitration: “... Settling Disputes Which Diplomacy Has Failed to Settle” *Negotiation Journal*/Volume 38, Issue 2 /p. 179-197.

4. Id.

5. Jeswald W Salacuse, Anatomy of an investor-state arbitration: The case of Aguas Argentinas, *INTERNATIONAL LAWYER*, Journal Article.

specifying that any disputes arising under the contract will be handled through arbitration rather than litigation, writes Charles Bjork in an article for the Georgetown University Law Library. The parties can and should specify the forum for the arbitration, procedural rules, and governing law when negotiating their initial contract. The types of law applied in arbitration include both procedural and substantive international treaties and national laws, as well as the procedural rules of the relevant arbitral institution.

2. The Legal Frameworks

The various laws, rules, and guidelines governing the arbitral process will be dealt with extensively in later chapters, but a brief overview is in order. One way to envision the regulatory framework of arbitration is in the form of an inverted pyramid. The point is facing down, and at that point is the arbitration agreement, which affects only the parties to it. This agreement is the underpinning for the regulatory framework governing the private dispute resolution process. If the arbitration agreement is not valid, then the framework becomes irrelevant, because there is no legal basis for arbitration.

On the pyramid above the arbitration agreement, the framework expands in terms of scope and applicability beyond the immediate parties. At one step above are the arbitration rules chosen by the parties. These rules, which apply to the arbitrations of all the parties who choose them, may be varied in a particular case by the arbitration agreement. Frequently, a rule will contain a provision that says, “unless otherwise agreed in writing by the parties.” This means that the rule is not mandatory, but rather a default rule that will apply if the parties have not reached their own agreement on the particular topic⁶. Therefore, if the parties have agreed on a particular matter, their agreement will trump the arbitration rules, unless the particular rule is considered mandatory by the institution.

At the next level of the pyramid are the national laws. Both the arbitration law of the seat of the arbitration (the *lex arbitri*) and substantive laws will come into play, and they are likely to be different national laws. Many countries have adopted as their arbitration law the UNCITRAL Model Law on International Commercial Arbitration⁷. The Model Law is meant to work in conjunction with the various arbitration rules, not to conflict with them. Thus, the Model Law also has many provisions that are essentially default provisions: that is, they apply “unless the parties have agreed otherwise.” If the parties have chosen arbitration rules that provide for a process or rule that is different from the Model Law, normally the arbitration rules will govern, because they represent the parties’ choice of how to carry out the arbitration, that is, they indicate how the parties have “otherwise agreed.”

The substantive law chosen by the parties is the national law that will be used to interpret the contract, determine the merits of the dispute, and decide any other substantive issues. If the parties have not chosen a substantive law, then the tribunal will determine the applicable substantive law.

At the next step above the national laws in the regulatory pyramid is international arbitration practice, which tends to be utilized to various degrees in all arbitrations. This includes various practices that have developed in international arbitration, some of which have been codified as additional rules or guidelines. There are, for example, rules that have been developed by the International Bar Association on the Taking of Evidence, and Rules of Ethics. The IBA has also produced Guidelines on Conflicts of Interest in International Arbitration. The American Arbitration

6. See, e.g., LCIA Rules, art. 17.1 (“The initial language of the arbitration shall be the language of the Arbitration Agreement, unless the parties have agreed in writing otherwise. . . .”).

7. UNCITRAL is the United Nations Commission on International Trade Law. Its mandate is to further the progressive harmonization and unification of the law of international trade. The following countries, territories, or states within the United States have adopted the UNCITRAL Model Law on International Commercial Arbitration: Australia, Austria, Azerbaijan, Bahrain, Bangladesh, Belarus, Bulgaria, Cambodia, Canada, Chile, in China: Hong Kong Special Administrative Region, Macau Special Administrative Region; Croatia, Cyprus, Denmark, Egypt, Germany, Greece, Guatemala, Hungary, India, Iran (Islamic Republic of), Ireland, Japan, Jordan, Kenya, Lithuania, Madagascar, Malta, Mexico, New Zealand, Nicaragua, Nigeria, Norway, Oman, Paraguay, Peru, the Philippines, Poland, Republic of Korea, Russian Federation, Singapore, Spain, Sri Lanka, Thailand, Tunisia, Turkey, Ukraine, within the United Kingdom of Great Britain and Northern Ireland: Scotland; in Bermuda, overseas territory of the United Kingdom of Great Britain and Northern Ireland; within the United States of America: California, Connecticut, Illinois, Louisiana, Oregon and Texas; Zambia, and Zimbabwe. Available at http://www.uncitral.org/uncitral/en/uncitral_texts/arbitration/1985Model_arbitration_status.html. See Appendix B for text of 1985 UNCITRAL Model Law.

Association and the American Bar Association have also produced a Code of Ethics for Arbitrators. UNCITRAL has produced Notes on Organizing Arbitral Proceedings, “to assist arbitration practitioners by providing an annotated list of matters on which an arbitral tribunal may wish to formulate decisions during arbitral proceedings. . . .”⁸ Although the Notes do not impose any obligation on the parties or the tribunal, they potentially contribute to harmonizing arbitration practice.

Arbitrators and parties may agree that some of these international practices will be followed, or arbitrators may simply use them as guidelines. International arbitrators are a relatively small group, and international practices both those that are codified by various international organizations and those that are merely known and shared in the arbitration community as good practices – tend to create a relatively coherent system of procedures.



Finally, at the top of the inverted pyramid are any pertinent international treaties.

For most international commercial arbitrations, the New York Convention will be the relevant treaty because it governs the enforcement of both arbitration agreements and awards, and because so many countries are parties to the Convention⁹. In addition to the New York Convention, three other important conventions are the Inter-American Convention on International Commercial Arbitration (the Panama Convention)¹⁰, the European Convention on International Commercial Arbitration¹¹, and the Convention on the Settlement of Investment Disputes between States and Nationals of other States (the “Washington Convention” or the “ICSID Convention”)¹².

The Panama Convention, which has been ratified or adopted by fourteen South or Central American countries and by the United States and Mexico, is similar in intent and effect to the New York Convention. It has been influential in making arbitration much more acceptable in Latin American countries.

The European Convention supplements the New York Convention in the contracting states. It provides for several general issues concerning the party’s rights in arbitration and also provides specific limited reasons for when the setting aside of an award under the national law of one Contracting State can constitute a ground for refusing to recognize or enforce an award in another Contracting State¹³. The European Convention’s effect on awards that have been set aside will be discussed more fully in Chapter IO¹⁴.

The Washington Convention on the Settlement of Investment Disputes between States and Nationals of other States is also known as the ICSID Convention because the Convention created the International Center for the Settlement of Investment Disputes (ICSID). The ICSID Convention was promoted by the World Bank, which wanted to encourage investors to make investments in developing countries. Historically, investors could not bring any kind of action against a government and had to depend upon their government to take up their cases against a foreign gov-

8. Available at www.uncitral.org.

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11. 484 U.N.T.S. 349 (1961).

12. 575 U.N.T.S. 159, T.I.A.S.6090, 17 U.S.T.1270 (1965).

13. European Convention on International Commercial Arbitration (1961), 484 U.N.T.S. 349, art. IX. Not all EU countries are parties to the Convention, and some distinctly non-European countries are parties, such as Cuba and Burkina Faso. List of countries available at <http://untreaty.un.org/sample/EnglishInternetBible/part/ chapterXXII/treaty2.htm>.

14. See *infra*, Chapter 10, Section 10(D)(5)(f).

ement. The ICSID Convention provides the opportunity for the country and the investor to arbitrate any dispute directly, either under an arbitration agreement in a state contract, or by a bilateral investment treaty that includes a clause whereby the state consents to arbitrate with investors covered by the treaty. The ICSID Convention, and treaty arbitrations generally, will be discussed more fully in Chapter II.

Thus, as seen above, the regulatory framework for international commercial arbitration includes private agreements, agreed-upon rules, and international practice, as well as national laws and international conventions. Although parties have substantial autonomy to control the arbitration process, the supplementation and reinforcement of the process by both national and international laws help ensure that the process functions fairly and effectively. The regulatory framework also gives parties confidence that they will have a reasonable method of recourse when problems develop in their international business transactions.

3. Notable Arbitration Cases

3.1. Hulley Enters Ltd v. Russian Fed'n

3.1.1. Case summary

Yukos shareholders v. Russia are several international courts and arbitral cases seeking compensation from the government of Russia to the former shareholders of Yukos based on the claim that Russian courts were not acting in good faith in launching tax evasion criminal proceedings against Yukos, which led to the bankruptcy of the company.

The Yukos Oil Company's former shareholders and management filed a series of claims in courts and before arbitration panels in various countries, seeking compensation for their expropriation. The largest, for over \$100 billion, was filed at the international Permanent Court of Arbitration in The Hague in 2007¹⁵ and resulted in the arbitrators awarding Yukos majority shareholders over US\$50 billion in damages. This decision was appealed by Russia and overturned by the Hague's district court, before being upheld by the Court of Appeal of the Hague¹⁶. On 5 November 2021, the Dutch Supreme Court struck down the order for Russia to pay \$50 billion to former shareholders and referred the case back to the Amsterdam Court of Appeal¹⁷.

The case concerns the claimant's stake in the Russian oil company Yukos, which declared bankruptcy in 2006. In 2004, the claimant initiated international investment arbitration proceedings against Russia under Article 26 of the Energy Charter Treaty, claiming that Russia's conduct constituted an expropriation. On 18 July 2014, the Netherlands-based arbitral tribunal rendered three essentially similar awards, ruling that Russia was ordered to pay more than \$50 billion in compensation to shareholders. Russia applied to the Dutch courts to set aside the arbitral awards on a number of grounds, while sniping at Yukos shareholders' enforcement applications elsewhere. Enforcement proceedings in the U.S. began in 2014. In 2015, Russia filed a motion to dismiss the Yukos shareholders' application for enforcement of the award for lack of subject matter jurisdiction, citing Russia's immunity under the Foreign Sovereign Immunities Act (FSIA). In 2016, proceedings were stayed pending the conclusion of the Dutch setting aside proceeding. In November 2021, the Dutch Supreme Court rejected essentially all of Russia's grounds of appeal (the remaining grounds were unrelated to jurisdiction), and the U.S. court then resumed hearing the case. Russia argued that the enforcement proceedings should be dismissed. First, its foreign sovereign immunity precluded the district court from exercising jurisdiction *ratione material*; second, there was no basis for jurisdiction to enforce the award under the New York Convention. Third, there was no arbitration agreement between the parties covering the dispute in question, and the district court should have re-examined the existence of such an agreement.

15. Gregory L. White (September 21, 2011), *European Rights Court Delivers Split Yukos Ruling*.

16. Puertas, Omar. "The Yukos Appeal Decision on the Role of Arbitral Tribunal's Secretaries".

17. AFP, Danny Kemp for (2021-11-05). "Russia Wins Latest Round of \$50-Bln Yukos Case"

3.1.2. United States court judgments and their rationale

The D.C. District Court held that a foreign state is presumptively immune from the jurisdiction of U.S. courts unless the district court determines that one of the exceptions to the Foreign Sovereign Immunities Act (FSIA) applies. Under *Belize Social Dev. Ltd. v. Gov't of Belize*, 794 F.3d 99 (D.C. Cir. 2015), if a plaintiff asserts that the court has jurisdiction under the Foreign Sovereign Immunities Act (FSIA), it is up to the defendant's foreign state to prove that the plaintiff's claim does not fall within an exception to the FSIA. *Creighton Ltd. v. Gov't of State of Qatar*, 181 F.3d 118 (D.C. Cir. 1999), on the other hand, states that for a foreign arbitral award to be enforceable against a sovereign state, there must be a legal basis (e.g., the New York Convention) upon which the award can be enforced by a U.S. court and the foreign state may not be entitled to immunity. *LLC SPC Stileks v. Republic of Moldova*, 985 F.3d 871 (D.C. Cir. 2021), on the other hand, makes it clear that for the arbitration exception to the Foreign Sovereign Immunities Act (FSIA) to apply and to establish a court's jurisdiction over a foreign sovereign, there must be an arbitration agreement, an arbitral award, and an international treaty governing the award. The shareholders of Yukos in this case bear the burden of proof for their claim that the arbitration exception to the Foreign Sovereign Immunities Act applies.

In the present case, the Yukos shareholders had fulfilled their obligation to submit the arbitral award, and Russia's challenge to the application of the New York Convention had been rejected, although it had been made. On the issue of the existence of the elements of an arbitration agreement, the Court held that the facts of the case demonstrated the existence of an arbitration agreement between the parties for the following reasons: Russia was a signatory to the Energy Charter Treaty, which provided for an arbitration mechanism, and the parties had been "actively participating" in arbitration under the Treaty for a period of up to ten years. The parties had chosen to delegate to the arbitral tribunal issues relating to jurisdiction under the Energy Charter Treaty. This is demonstrated in two ways: first, by the agreement to adopt the 1976 UNCITRAL Arbitration Rules, which provide in Article 21 that the arbitral tribunal is empowered to rule on its jurisdiction, including any objections to the existence or validity of the arbitration agreement. The second is that Russia wrote to the arbitral tribunal in 2005 to make clear that it had decided to "accept the jurisdiction of this Arbitral Tribunal to determine its jurisdiction ..." ("accept the jurisdiction of this Arbitral Tribunal to determine its jurisdiction ...")

To find that the parties had not referred the issue of jurisdiction to the arbitral tribunal would essentially mean that Russia could renege on the issue of jurisdiction "despite having expressly agreed to arbitrate". The arbitral tribunal's finding that an arbitration agreement existed between the parties was not only well-reasoned but also binding on the district court. If the agreement between the parties assigns to the arbitrator the responsibility for determining whether a dispute is arbitrable, the court has no authority to rule on the issue, regardless of its view of the arbitrator's jurisdictional ruling.

Accordingly, the district court rejected Russia's claim for a de novo review of the existence of an arbitration agreement between the parties, finding that such a review was not only unnecessary but also inappropriate. To establish jurisdiction under the Foreign Sovereign Immunities Act, a district court must treat an international treaty (in this case, the Energy Charter Treaty) as an ordinary contract, and it is sufficient if the parties agree that the arbitrator will decide the jurisdictional issue in the dispute. The factual question of whether an arbitration agreement exists is precisely the issue that the parties are entrusted to and for the arbitral tribunal to decide.

The district court further rejected Russia's other arguments regarding the non-existence of an arbitration agreement (the history of ratification of the Energy Charter Treaty in Russia, procedural aspects of the arbitration proceedings, and fraud allegedly committed by the shareholders before the arbitration proceedings). All of these arguments were presented to and rejected by the arbitral tribunal.

Ultimately, the district court denied Russia's motion, ruling that the arbitration exception to the Foreign Sovereign Immunities Act applied and that the New York Convention provided a basis for enforcing the award. After rejecting Russia's sovereign immunity defense, the district court directed that the case be continued to review how the shareholders had applied for relief as well as Russia's alternative motion to deny confirmation of the award.

3.1.3 Analysis

This case is the latest chapter in a series of cross-border enforcement battles over the \$50 billion Yukos arbitral

award. The application to set aside the Yukos award in the Dutch courts is still ongoing.²⁰²³ On 1 November, the Commercial Division of the UK High Court also issued a judgement finding that Russia could not invoke sovereign immunity to resist the enforcement of the Yukos award in the UK¹⁸.

The D.C. District Court's treatment of this case differs from its previous case, *Basket Renewable Invs., LLC, v. Kingdom of Spain*, 2023 WL 2682013 (D.D.C. Mar. 29, 2023), in which it refused to enforce an Energy Charter Treaty award against Spain on the grounds that there was no valid arbitration agreement under EU law and therefore the court could not enforce the award. In that case, the District Court in Washington refused to enforce an Energy Charter Treaty award against Spain on the grounds that there was no valid arbitration agreement under EU law and therefore the court could not enforce the award. This result is markedly different from the present case. The reason why the District Court in that case was not bound by the arbitral tribunal's decision on jurisdiction was that the European Court of Justice held that the EU Treaties prohibited arbitration between EU Member States and EU nationals, in other words, that Spain was not entitled to enter into an arbitration agreement. Consequently, the arbitral tribunal was also not authorized to decide on its jurisdiction. In the present case, there was no similar impediment to the conclusion of an arbitration agreement in Russia, and the power of the arbitral tribunal to decide on its jurisdiction was not similarly limited, hence the very different results.

3.2. Yamal-ING JSC v. Baker Hughes Rus Infra LLC

3.2.1. Case summary

The applicant in this case, Yamal-LNG JSC, is a sanctioned Russian enterprise. The respondent, Baker Hughes Rus Infra LLC, is the Russian subsidiary of an American oilfield services company. The contract between the parties provided for ICC arbitration. The Claimant intends to initiate an ICC-administered international commercial arbitration with the International Chamber of Commerce (ICC) under Article 10.2 of the Contract, and on 9 August 2023 applied to the Arbitration Court of the Yamal-Nenets Autonomous Okrug of Russia for preliminary interim measures for the seizure of Baker Hughes's cash, movable and immovable property in the amount equivalent to \$50,703, at the exchange rate of the Central Bank of the Russian Federation (CBRF). 534.03 United States dollars (USD), including the cash balance on Baker Hughes' account and cash to be received in the future. The claimant asserted that if preliminary interim measures were not granted, the arbitral award would not be enforceable because: 1. the respondent was acting in bad faith, which demonstrated that, under the pretext of unlawful and unilateral sanctions imposed by an unfriendly State, it did not intend in principle to fulfill its obligations towards its Russian counterparties, which, taking into account the center of the respondent's economic interests, meant that it was not possible to enforce the arbitral award outside Russia 2. there is a high probability that the Respondent will continue to disregard the Claimant's rights and legitimate interests, will not contribute to the mitigation of the Claimant's losses and will not act to voluntarily compensate for them; 3. the Respondent is actively disposing of its assets in Russia and refuses to take part in projects in Russia, which means that future arbitral awards may not be effectively enforced in Russia. If the preliminary interim measures requested by the Claimant were not granted, the Claimant would not be able to recover all the damages it had suffered from the Respondent's property for the reasons mentioned above. Therefore, the non-granting of the interim measures could result in significant losses for the Claimant.

The Claimant plans to commence an international commercial arbitration administered by it at the ICC under Article 10.2 of the Contract. Previously, on 29 March 2023, it filed a claim against the Respondent, requesting the Respondent to 1) return the advance payment of USD 11,021,710.31 (including VAT) for undelivered parts; 2) return the cost of repair services paid in advance, but not rendered, in the amount of USD 6,505,186.93 (including VAT); and 3) pay compensation for the 12 dry gas seals valued at USD 1,000,000.00 (including VAT), which had been wrongfully withheld and given to the Respondent for repair. dry gas seals valued at USD 1,445,360.76 (excluding VAT); 3. compensation for the loss of a substitute transaction for the purchase of 12 dry gas seals by OAO Yamal LNG for USD 155,951.41 (excluding VAT); 4. compensation for the value of the blades in the first stage of the blade set in the amount of USD 17,683.62 (excluding VAT); and 5. the return of funds transferred to Respondent of

18. *Hulley Enterprises Limited and others v The Russian Federation* [2023] EWHC 2704 (Comm) (1 November 2023) (Cockerill J).

47341938.52 roubles (including VAT) to compensate for the customs duties under the contract. In addition, as a result of the Respondent's serious breaches of its obligations, the Claimant gave the Respondent notice of termination of the contract and filed a claim for compensation of USD 31,557,641.17 against the Respondent.

3.2.2 The Court's judgment and its reasoning

The court held that: under article 90 (1) of the Arbitration Procedure Code of the Russian Federation, the arbitral tribunal may, at the request of the parties to the case, take urgent interim measures to safeguard the claimant's claims or property interests. Under Article 90 (2), interim measures were permitted if the absence of an interim measure might make it difficult or impossible to enforce a judicial act, as well as to prevent significant prejudice to the claimant. At the same time, the interim measure must fulfill the required conditions, i.e. be directly related to the matter in dispute, proportionate to the required conditions, necessary and sufficient to ensure the execution of the judicial act or to prevent damage. The application for interim measures must contain the grounds for the application. When filing an application for interim measures, the applicant must state the need for the interim measure and provide evidence to substantiate the existence of a real threat of future failure to carry out the judicial act or of causing substantial prejudice to the judicial act.

Under Article 99 (1) of the Code of Arbitration Procedure of the Russian Federation, an arbitration court has the right, at the request of an organization or a citizen, to take a preliminary interim measure to secure the claimant's property interests pending the initiation of arbitration. Under Article 99 (2), the arbitration court adopts preliminary interim measures following the rules set out in Chapter 8 and observes the special features set out in this article. According to article 99 (3), an application for the preservation of property shall be filed with the arbitration court at the address of the claimant, at the location of the funds or other property in respect of which the claimant applies for the preservation of property, and at the location of the place where the claimant's rights have been violated.

Under the interpretation of paragraph 13 of resolution No. 11 of the Plenum of the Supreme Arbitration Court of the Russian Federation of 9 December 2002 "On several issues in the course of the development of the Arbitration Procedure Code of the Russian Federation", the application of the preliminary interim measures provided for in article 99 is permissible where the grounds referred to in Article 90 (2) exist and the failure to take such measures may make it difficult or impossible to carry out a judicial act.

The Plenum of the Supreme Arbitration Court of the Russian Federation, in paragraph 9 of its resolution No. 55 of 12 October 2006, "On the application of interim measures by arbitration courts", stated that, in applying interim measures, the arbitration court proceeds from the fact that, according to article 90 (2) of the Arbitration Procedure Code of the Russian Federation, the adoption of an interim measure is permissible at any stage of the proceedings if one of the following reasons exists: 1) if the failure to take such measures might make it difficult or impossible to enforce judicial acts, including in anticipation of their enforcement outside the Russian Federation; and 2) to prevent significant prejudice to the claimant.

In assessing the applicant's claim under article 90 (2), the arbitral court shall pay particular attention to the following: 1. the reasonableness and validity of the applicant's request for an interim measure; 2. the likelihood that the applicant will suffer significant loss if the interim measure is not granted; the balance of the various interests of the stakeholders; and 3. the prevention of encroachment on the public interest and the interests of third parties in the granting of the interim measure.

In the present case, the Court assessed the arguments and evidence put forward by the applicant, took into account the circumstances of the case and the nature of the provisional measures requested, and, based on an analysis of the legal rules referred to above, concluded that it was necessary to take the preliminary provisional measures requested by the applicant. The Court considers that the measures requested by the applicant are justified and reasonable in the light of the circumstances enumerated by the applicant, are related to the subject matter of the application that the applicant intends to make, and are aimed at preserving the existing state of relations between the parties (the status quo ante) and at preventing the infringement of the interests of third parties. The Court noted that the seizure was valid for 15 working days from the date of the decision (i.e. until 31 August 2023). For the sequestration to continue, Yamal LNG must apply to the ICC within this period. Baker Hughes has until 10 September 2023 to appeal the court's decision.

3.2.3. Analysis

This case provides valuable lessons for sanctioned enterprises in applying for property preservation before initiating international commercial arbitration abroad. The main points of review of an application for interim measures in Russia are the reasonableness and effectiveness of the interim measure; the likelihood that the applicant will suffer significant losses if the interim measure is not granted; the balance of interests of stakeholders; and the prevention of infringement of the public interest and the interests of third parties. These points of review are not fundamentally different from the practice in other countries or jurisdictions. In this case, the application for pre-arbitration property preservation was a preliminary interim measure with higher requirements than an application for an interim measure, and the sanctioning of the case and the stripping of the respondent's assets were sufficient to prove that failure to take these measures could make it difficult or impossible to effectively enforce future decisions, so the Russian court granted the application. This point can also serve as a reference for the relevant judicial practice in China.

4. Conclusions

This research paper is regarded in three parts. First, I explained what arbitration is, what international arbitration is, and how international arbitration works. The second part presented the legal frameworks that govern international arbitration. In the last part, I used two recently notable cases to analyze international arbitration.

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**GLOBAL TRADE FRONTIERS:
INNOVATION, COLLABORATION, AND DISPUTE RESOLUTION**
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The Role of Emerging Economies in Shaping Global Sustainable Trade Development: Evidence from Latin America

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Abstract

With the rapid development of the economy, emerging economies' vital influence in today's international trade cannot be ignored. However, I find that in past studies, there was little to systematically talk about how those economies sustainably shape global trade. Especially sustainable development has been set as one of the United nation's goals, as researchers, we should consider this to ensure we are on the right development track. In the following parts, I mainly discuss the background of the research, proving emerging economies' significant role in trade and other potential risks emerging economies may face. Finally, I illustrate how emerging economies can enhance the stability and sustainability of global trade.

Keywords: international trade, sustainable development, emerging economies.

1. The Background of Global Trading

1.1. Main topic

Apart from the highly developed economies, which always work as leaders in global trade, the emerging economies seem to have less effect on formulating standards. Because they are totally 'new' to the trading world which has been dominated by developed economies for a long time. Therefore, there is a question: what is the current role of emerging economies in shaping global trade? Are they being followers, participants, or contributors? Based on those questions, I try to figure out the role of emerging economies in shaping global sustainable trade development.

1.2. Reasons for the study

For one thing, geopolitics and the post-pandemic era pose challenges for international trade, which urgently

needs to be put back on track. Due to the Covid-19 pandemic, the global supply chains are weakened and fragile which is harmful to global trade. Not the pandemic itself, but the side-effect it brings become a barrier to segregating countries' economic communication. Meanwhile, the geopolitical tensions in our world also create a hurdle. No one would take risks to make a deal with traders whose country is involved in a war or whose society is in chaos. Considering those two factors, the quantity of international trade is shrinking. From Figure 1, I can see the whole trend of total trade is increasing. However, focusing on a particular time, such as 2016 or 2020, the total trade is unstable. On Oct.10 2023, the United Nations Conference on Trade and Development (UNCTAD) published a report Trade and Development Report 2023, which says the world economy is flying at "stall speed", with projections of a modest growth of 2.4 per cent in 2023, meeting the definition of a global recession. The prospect of global trade is uncertain.

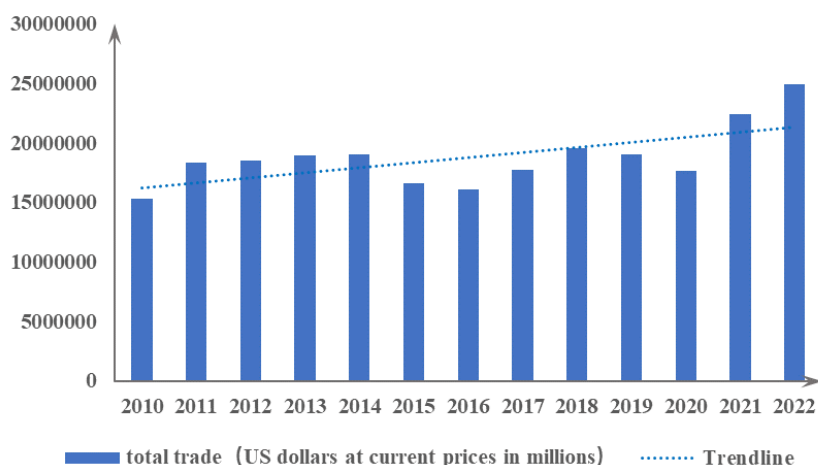


Figure 1. The Total Trade and Share during 2010-2022

Note. From the UNCTAD Data Centre (<https://unctadstat.unctad.org/datacentre/dataviewer/US.TradeMerchTotal>)

For another, as researchers, we need to pay attention not only to the quantity of development but also to the quality of trade and the need for sustainable trade development. Assuring that international trade could recover to the same level as before the pandemic, we still need to do a host of things to make our trade more environmentally friendly. United Nations (UN) published a sustainable development goal to achieve a better and more sustainable future for all, including those related to poverty, inequality, climate change, environmental degradation, peace, and justice. Those



Figure 2. Sustainable Development Goals

Note. From the UN's Website (<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>)

goals are clearly illustrated in Figure 2. The UN also stressed that the 17 Goals are all interconnected, and to leave no one behind, we must achieve them all by 2030. One of the goals is to ensure sustainable consumption and production patterns, which are closely related to the international trade chain.

Besides, there is a digitalization and greening trend in the economy. Trading is not confined to agriculture or manufacturing but enlarged to high-tech and some green industries. Organization for Economic Co-operation and Development's (OECD's) database indicates that economic growth is becoming greener with more efficient use of natural capital and to capture aspects of production. But in Figure 3, I can see this trend has slightly declined in the last two years. All in all, the first thing needed to do is reduce the environmental impacts of trade for sustainable trade development. Meanwhile, there is a strong need to develop high-tech trade.

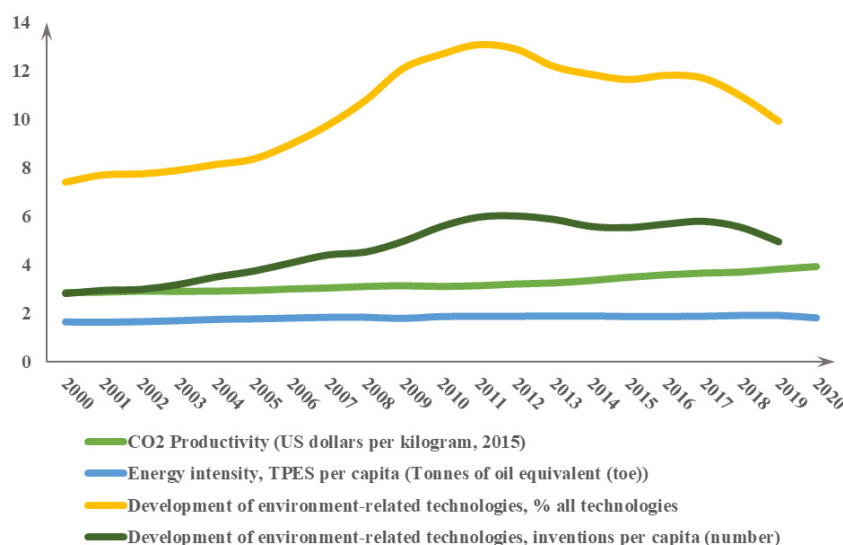


Figure 3. Green growth indicators
 Note. From the OECD's Website (<https://data-explorer.oecd.org/>)

1.3. Economic condition in Latin America

The economy in the Latin American region has risen quickly in recent years. It appears to be a promising place in

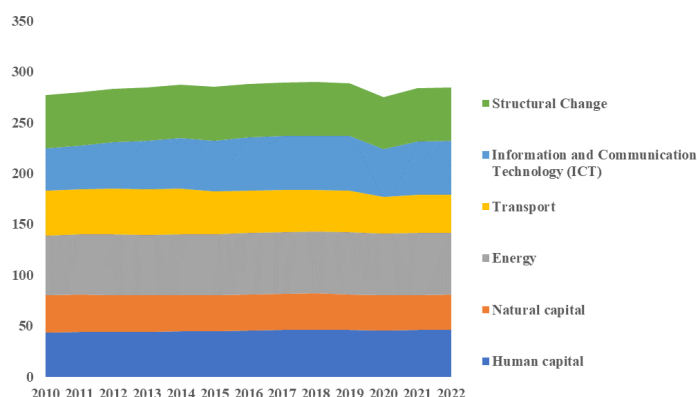


Figure 4. The Productive Capacities Index, annual in Latin American
 Note. From UNCTAD's Website (<https://unctadstat.unctad.org/EN/Pci.html>)

this changeable world. Latin America possesses a vast and dynamic market due to its substantial economy and extensive population. This expansive market beckons international traders with its enormous demand for various goods and services, and Latin America boasts a wealth of products to offer to the global market. Moreover, Latin America holds the promising potential to cultivate a thriving digital economy and eco-friendly practices, thanks to its extraordinary natural resources, progressive policies regarding digital enterprises, and diverse and multilateral trade relationships. Figure 4 depicts the productive capacity of Latin America. Capacities such as energy, human sources, and ICT account for a large proportion. All of them are the main factors of trade as well.

As Latin America assumes a significant position in the contemporary global trade landscape, it stands as a typical subject for in-depth investigation. This region can serve as a compelling model for research, offering valuable insights into the realms of economic stabilization, trade liberalization, and the vital pursuit of sustainability within the sphere of international trade.

2. How Emerging Economies Shape Global Trade

Compared to studying the whole of Latin America, I chose two countries, Mexico and Brazil. It doesn't mean other parts of Latin America are ignored, just because considering the GDP, population, and territory, the two countries are typical. Meanwhile, their potential developing ability is higher than other countries in Latin America. The main industries we talk about are Manufacturing, agriculture and livestock. The rationales lie in three aspects. The first one is all of them are the world's major traded products, so measuring them is easier. Given our paper's topic, those industries are strongly linked to sustainable trade, such as some biological materials.

product	exports	RCA
Oil seeds and oleaginous fruits (excluding flour)	\$47,056,836K	27.5
Sugar, molasses and honey	\$11,168,825K	17.4
Tobacco, unmanufactured; tobacco refuse	\$2,295,544K	16.2
Coffee and coffee substitutes	\$9,243,448K	11.5
Cotton	\$3,703,940K	11.1
Ingots, primary forms, of iron or steel; semi-finis	\$6,428,525K	9.6

Brazil's top six RCA products, 2022

product	exports	RCA
Motor vehicle. For transport of goods, special purpose	\$32,816,905K	8.2
Radio-broadcast receivers, whether or not combined	\$1,806,579K	6.8
Television receivers, whether or not combined	13,815,952K	5.8
Meters&counters, n.e.s	\$2,060,575K	4.9
Vegetables	\$8,960,866K	4.4
Alcoholic beverages	\$9,773,795K	4.2

Mexico's top six RCA products, 2022

Figure 5. Revealed comparative advantage in Brazil and Mexico

Note. From UNCTAD's stat and collected by manual (<https://unctadstat.unctad.org/EN/RcaRadar.html>)

Most importantly, they have a Revealed Comparative Advantage (RCA) over other regions (see Figure 5). When a country has a revealed comparative advantage for a given product ($RCA > 1$), it is inferred to be a competitive producer and exporter of that product relative to a country producing and exporting that good at or below the world average. With those industries, we could better understand the role Latin America played in international trade.

2.1. The development of Environmental Goods and Services (EGS)

As I mentioned above, Latin America has comparative advantages in agriculture, livestock and manufacturing. Those industries are included in the EGS product list published by the World Trade Organization (WTO). From 2009 to 2022, in Mexico, the environment-related objectives involve general environmental protection, energy conservation, sustainable agriculture management, etc. In Brazil, there are chemical, toxic and hazardous substances management goals. In Mexico, they consider more about animal protection, MEAs implementation and compliance, and plant protection. All the notifications and measures show their concern for environmental issues while trading (see Figure 6).

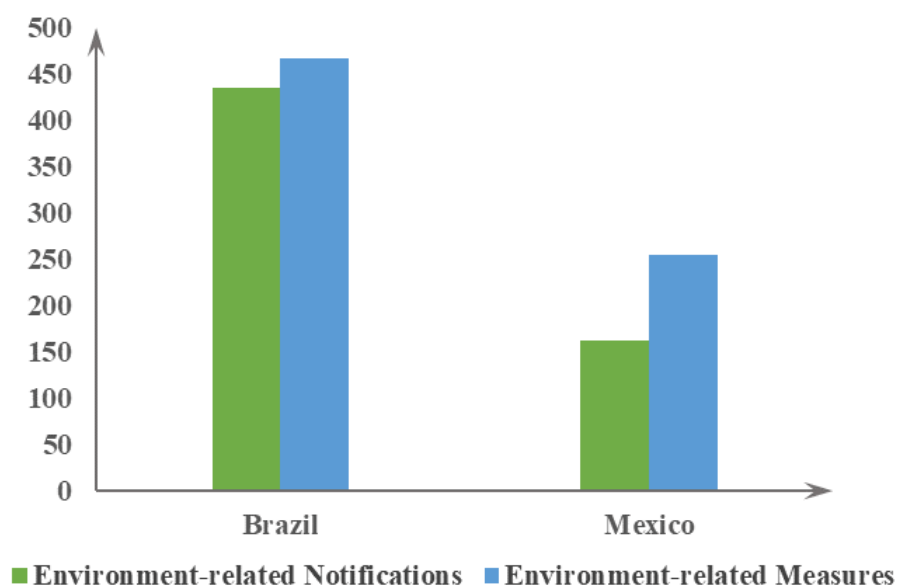


Figure 6. Environment-related Notifications and Measures
Note. From WTO's stat and collected by manual (<https://edb.wto.org/charts>)

Latin America holds the awareness of green trading. Technological progress and innovation positively contribute to sustainable trade in Latin America, where companies make several breakthroughs. With the progress in high-tech products, the deal no longer concerns the classical trading products. The quality of trading improves by consuming fewer natural resources to protect the environment. Another factor worth noticing—the green technology spillovers from developed countries in the process of global trade. The idea creates a virtuous circulation, the green technology contributes to the emerging economies becoming environmental-friendly, and reversely when they export greener products, it requires the developed economies to do better. Then, the whole level of environmental care will be accumulated.

2.2. The BRICS

BRICS is an acronym that stands for Brazil, Russia, India, China, and South Africa. It represents a group of five major emerging economies that have come together to promote mutual cooperation, dialogue, and collaboration in various fields. BRICS serves as a platform for these nations to discuss and address global economic, political, and social issues, as well as to enhance their individual and collective influence on the international stage. This group-

ing is significant for its potential to shape global governance, foster economic development, and facilitate strategic partnerships among its member countries. The formation of BRICS reflects the growing importance of these emerging economies in the global arena.

2.3. Significance

BRICS countries collectively represent a substantial portion of the world’s population and GDP. Their economic significance is further underscored by their increasing trade and investment ties (see Figure 7), making them vital players in the global economy. Brazil, a Latin American country, participated in BRICS to make a difference and seize opportunities.

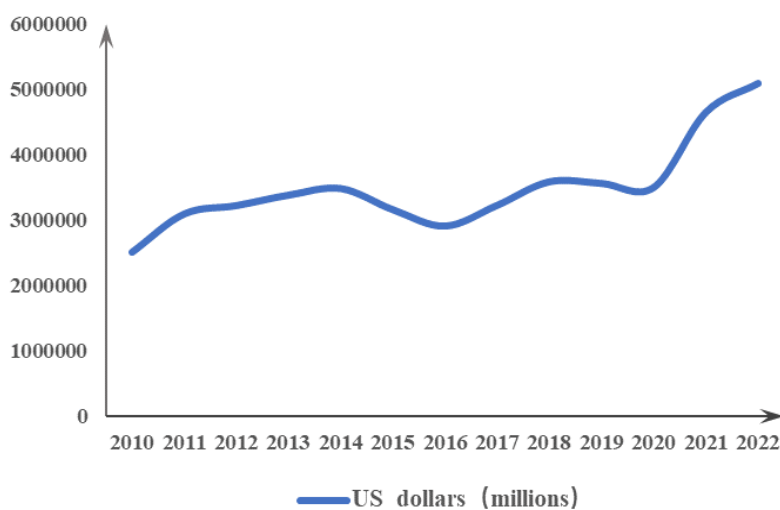


Figure 7. Merchandise: Total trade and share, annual in BRICS
 Note. From UNCTAD’s stat (<https://unctadstat.unctad.org/datacentre/>)

BRICS holds significant importance in the realm of global trade due to the economic heft of its member countries, which collectively account for a substantial portion of the world’s population and GDP.

Market Potential: The BRICS countries collectively represent a massive market with over 40% of the world’s

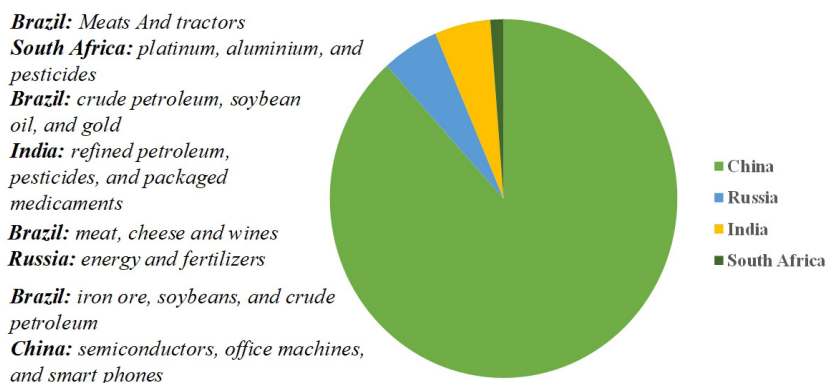


Figure 8. Brazil’s intra-BRICS trade
 Note. From Silk Road Briefing (<https://www.silkroadbriefing.com/news/2023/08/21/intra-brics-trade-and-analysis-2023/>)

population. This demographic advantage offers tremendous opportunities for international businesses looking to expand their market reach. Companies from around the world are keen to tap into the burgeoning middle class and consumer base in BRICS nations. In addition, the intra-BRICS Trade is developing quickly. The member nations of BRICS engage in significant trade with each other. They have actively worked to enhance trade and economic cooperation among themselves. This intra-BRICS trade has been steadily increasing, reflecting the growing economic interdependence among these nations. As for Brazil, it is a major global exporter of agricultural products such as soybeans, coffee, and beef, and it plays a crucial role in global food security. Also, it is actively involved in intra-BRICS trade (see Figure 8), which includes not only exporting its commodities to fellow BRICS members but also importing goods and services from them. This trade contributes to economic interdependence and cooperation among BRICS nations.

New Development Bank (NDB): The NDB, established by BRICS, plays a role in funding infrastructure projects and sustainable development initiatives in member countries and other emerging economies. It aims to support projects that promote economic and social development, reduce poverty, and foster sustainable development. Therefore, the New Development Bank plays a significant role in the global financial architecture, offering an alternative source of financing for infrastructure and development projects in emerging and developing economies. This facilitates trade by improving the infrastructure necessary for the movement of goods. Brazil benefits from NDB financing for its own infrastructure needs, and it plays a role in the decision-making and governance of the bank (see Figure 9).

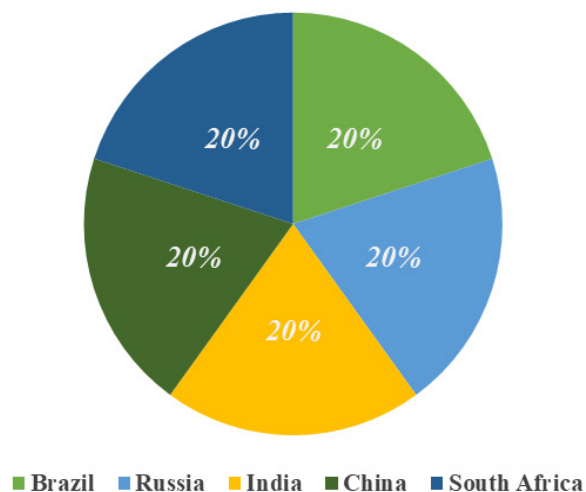


Figure 9. Equal distribution of shares between the shareholders of the NDB
Note. From NDB's Website (<https://www.ndb.int/>)

Global Trade Relations: The collective influence of BRICS nations gives them a stronger voice in international trade negotiations. They can advocate for policies that align with their interests, such as fairer trade practices and market access for their exports. BRICS has, at times, taken positions on global trade issues, such as advocating for reform of international financial institutions like the IMF and World Bank. BRICS has taken steps to promote trade and investment among its member countries. For instance, they have discussed reducing trade barriers, increasing investment cooperation, and promoting trade in local currencies to reduce dependence on the U.S. dollar. As BRICS countries seek to reduce their reliance on Western markets, they are exploring new trade partnerships with each other and with other emerging economies. This diversification of trade relationships contributes to a more balanced global trade landscape. Normally, it is called South-South Cooperation. Brazil, as a leader in Latin America, participates in initiatives aimed at fostering economic and political ties between BRICS and other nations in the Global South.

In summary, BRICS holds significant significance in global trade due to the economic size and growth of its member countries, their potential as both markets and sources of demand, and their efforts to enhance trade cooper-

ation and reduce trade barriers. These nations collectively contribute to shaping the landscape of international trade, providing opportunities and challenges for businesses and governments around the world. Brazil's role in BRICS is characterized by its economic influence, resource richness, active participation in intra-BRICS trade and sustainable practices. Brazil's involvement in BRICS helps shape the collective actions and policies of the BRICS group.

2.4. Influence

BRICS nations, due to their collective economic clout, have a stronger voice in international trade negotiations. They advocate for policies that align with their interests, including reforms of international financial institutions and a more equitable global trade system. For example, they have called for a more significant role for emerging economies in organizations like the International Monetary Fund (IMF) and the WTO. For BRICS, it holds annual summits, where leaders from the member countries meet to discuss and coordinate their policies on a wide range of issues, from trade and investment to security and climate change.

2.5. A transition from NAFTA to the USMCA

The transition from NAFTA (North American Free Trade Agreement) to the USMCA (United States-Mexico-Canada Agreement) represents a significant evolution in the trade relationships among the United States, Mexico, and Canada. NAFTA was initially signed in 1992 and came into effect in 1994, creating a free trade zone between the United States, Canada, and Mexico. It sets as an example for the cooperation between developed economies and emerging economies. However, over the years, there were concerns and criticisms about NAFTA's impact on jobs, labor standards, and environmental regulations. The transition from NAFTA to the USMCA aimed to address some of the criticisms and concerns related to NAFTA while maintaining the overall framework of a trilateral trade agreement between the three North American countries. The USMCA has continued to support the integration of supply chains and economic ties between the United States, Canada, and Mexico.



Figure 10. The process of the transition

Note. From Wikipedia (https://en.wikipedia.org/wiki/North_American_Free_Trade_Agreement)

2.6. The transformation has brought to the Mexico economy

The transition changes several aspects. As intellectual property, includes provisions on intellectual property rights, digital trade, and copyright protection, reflecting developments in the digital economy, which may encourage innovation and the growth of the digital economy in Mexico. Another part is Labor and Environmental Standards. The USMCA includes stricter labor and environmental standards, addressing concerns about low-wage labor and lax regulations. Actually, it is beneficial to Mexico's labors' welfare. This could potentially lead to better working conditions for Mexican laborers and address concerns about low-wage competition. There are also some agreements about Dairy and Agriculture. The agreement offers more favorable access to Mexican agricultural products in the U.S. and Canadian markets. This could benefit Mexican agricultural producers, particularly in the dairy and poultry sectors. The USMCA includes environmental standards and commitments that can impact Mexico's environmental policies and practices. It makes the economy greener. Especially for the Automotive Industry, New rules of origin for the

automotive industry, including higher regional content requirements, are designed to support domestic manufacturing. Considering that the automotive industry is the most competitive one in Mexico, those rules probably cause potential disadvantages to Mexico's development. Although there are some bad effects in the automotive industry, we still find its advantages weigh more.

Overall, USMCA has preserved Mexico's access to its two largest trading partners, the United States and Canada, which are crucial export destinations for Mexican goods. This trade continuity is vital for Mexico's economy. The USMCA provides a level of economic stability by maintaining a predictable trade environment and dispute resolution mechanisms, which can be attractive to foreign investors looking to invest in Mexico.

2.7. Mexico's role in this transition

Mexico played a pivotal role in the transition from NAFTA to the USMCA (United States-Mexico-Canada Agreement) and continues to be a central actor in the new trade agreement. Mexico actively participated in the renegotiation of the trade agreement. The Mexican government engaged in extensive negotiations with the United States and Canada to reach a consensus on various aspects of the USMCA. Mexico's willingness to engage in dialogue and compromise was essential to finalizing the deal. Besides, Mexico continues to engage with its USMCA partners to address issues that may arise during the implementation of the agreement. This ongoing engagement is essential to ensuring the smooth operation of the trade agreement while Mexico is adapting its trade and economic policies to align with the provisions of the USMCA, ensuring compliance with the new rules and regulations. By endeavors, it is obvious that emerging economies also could play a significant role in global trade with developed economies.

3. Emerging Economies are Facing Risks

Inevitably, emerging economies are facing challenges in the fast-changing world. Like inner inflation, which increases the interest rate, and then costs. Therefore, the price of cheap products will lose their advantages. The challenge also possibly comes abroad, other countries' protectionism and even the Fed's tightening monetary policy will alter international trading plans. Additionally, there are Black Swan and Grey Rhino risks, though they are few and far between. However, if take recent global political and economic events into account, there is a need to pay more attention to this.

To settle risks, Latin American countries seek loads of ways to respond. Some choose the "Nearshoring"-a concept of a new economy in Latin America. More have access to join international organizations or sign regional agreements to embrace international trading trends. links among the different parts of the world become tight which enormously benefits not only bilateral but multilateral trading.

4. Conclusion

Through the analyses above, I summarize two conclusions:

Emerging economies can enhance the stability of global trade. By graph and statistical analysis, it is obvious that emerging economies play a significant role in shaping global trade. For other types of economies, learning about their numerous experience and achievements is the best choice. Especially, for high-developed economies, emerging economies are helpers and partners, so it is unnecessary to be too arrogant and domineering. Only by equal cooperation, can we share a better future.

Emerging economies can enhance the sustainability of global trade. There is a good sign that emerging economies possess an awareness of green trading and invest a large amount of funds to research high-value-added products. Considering emerging economies are the majority in the world, the trend promotes the quality of trading. Compared with high-developed economies, they are youths who have more brilliant possibilities to explore. In a nutshell, it shapes our global trading into a sustainable and continuous mode.

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The Role of the International Court of Arbitration in Resolving Trade Disputes

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Abstract

In recent years, with the implementation of the concept of international commercial arbitration and the increase of international trade disputes, international arbitration courts have become an effective way to resolve disputes. This paper explores the importance and function of the International Court of Arbitration and its role in handling international disputes and promoting the development of international law. The dissertation is divided into the following five parts: Chapter 1 presents the creation and background of the International Court of Arbitration and the basis of arbitration agreements and their validity. Chapter 2 analyzes the mechanisms of the dispute resolution process, including procedural fairness, flexibility, and legal binding and enforceability. Chapter 3 discusses the impact of the International Court of Arbitration on international trade relations, including the expeditiousness and efficiency of dispute resolution, the consistency and transparency of rules, respect for pluralistic legal systems, the improvement of investment climate and business confidence, and the strengthening of the principle of the rule of law. Chapter IV highlights the effectiveness of the ICA in providing fair and enforceable solutions, including independence and impartiality, professionalism, and enforcement and international collaboration. Chapter 5 discusses the impact of the International Court of Arbitration on international trade relations, including the expeditiousness and efficiency of dispute resolution, consistency of rules and transparency. This paper will provide a legal analysis of the role of the International Court of Arbitration in the settlement of trade disputes in light of practical cases.

Keywords: arbitration rules, arbitration institution, International Commercial Arbitration.

1. An Overview of the International Court of Arbitration

Arbitration, like litigation, is a long way to resolve conflicts and disputes, which can be traced back to the ancient Rome. The International Court of Arbitration is one of the institutions of the International Chamber of Commerce and is headquartered in Paris. It is one of the oldest and most influential international commercial arbitration institutions

in the world.

The International Court of Arbitration is an independent body focused on resolving international commercial disputes. It was created to provide businesses and organizations with an effective, efficient and reputable way to resolve cross-border business disputes. The International Court of Arbitration has formulated and implemented a set of arbitration rules to guide the arbitration process. These rules are often regarded as one of the standards of commercial arbitration, providing the parties with transparent, fair and efficient arbitration procedures.

Arbitration conducted under an international court of Arbitration is usually handled by an arbitration tribunal consisting of one or more arbitrators. Arbitrators are usually experts in the international commercial field and are selected to hear and adjudicate disputes independently. The rulings of the International Court of Arbitration are recognized and enforced worldwide. Under international conventions such as the New York Convention, the enforcement of the rulings is usually guaranteed, allowing the parties to pursue their rights on a global scale.

The international arbitration court handles various types of commercial disputes, involving multiple industries and regions. This makes it one of the preferred institutions for firms to resolve disputes in cross-border transactions and international investments.

1.1. Creation and background

The creation and context of the International Court of Arbitration dates back to the late 19th century when the international movement for the peaceful settlement of disputes, and the first Hague Peace Conference. It is an independent international judicial body, responsible for resolving various international disputes and disputes, making decisions in accordance with international law, and contributing to the maintenance of international peace and security.

The International Arbitration Law was established in 1899 and dates back to the international movement for the peaceful settlement of disputes in the late 19th century. Early pioneers of the movement included the Swiss Henry Dunan, who founded the International Committee of the Red Cross in 1864 and promoted the signing of the Geneva Conventions. These efforts laid the foundation for the peaceful settlement of international disputes and encouraged countries to resolve disputes through negotiation and mediation.

In 1899, the first Hague Peace Conference was held in The Hague, The Netherlands, to find a peaceful solution to wars and disputes. As part of the conference, the International Court of Arbitration was formally established and became an important outcome of the conference. The International Court of Arbitration, based in The Hague, is the first permanent international arbitration tribunal with a universal jurisdiction. Its establishment marked the formal establishment of the international arbitration system.

The International Court of Arbitration originally consists of state-appointed judges, and each member state may appoint up to four judges. Judges do not represent their country on the basis of their independence and neutrality. Their task is to adjudicate disputes under international law. As of 1 September 2023, 193 countries were members of the International Court of Arbitration.

1.2. Base of arbitration agreement

An arbitration agreement is an agreement reached by the parties in a contract or in an independent agreement, which chooses to submit possible future disputes to arbitration rather than the court for settlement. If the parties agree to submit it to arbitration in accordance with the arbitration rules of the International Chamber of Commerce, they shall be deemed to be virtually willing to conduct arbitration in accordance with the arbitration rules in effect on the date of the arbitration, unless they have agreed to conduct arbitration in accordance with the arbitration rules in effect on the date of the arbitration agreement. The parties agree to conduct arbitration in accordance with the arbitration rules, that is, to accept the administration of the arbitration by the arbitration court.

To ensure the validity of the agreement, the arbitration agreement is usually required to be in writing. This can be a contract, a clause attached to the contract, or an independent arbitration agreement. The arbitration agreement clearly stipulates that the parties choose arbitration as the way of dispute settlement, rather than through court litigation. This is one of the core elements of the agreement. An arbitration agreement usually specifies how to select the members of the arbitral tribunal, which may include the appointment of a specific arbitrator, the selection of an arbitration

institution to appoint the arbitral tribunal, or other designated procedures. The agreement may clearly specify the applicable rules of arbitration procedures, such as the rules of specific arbitration bodies, or conduct arbitration under the rules of international organizations such as UNCITRAL.

As a special contract clause, the provisions of the arbitration agreement on the written form have also experienced a similar development process to the written provisions of the contract. In early theory and legal practice, arbitration agreement for the requirements of form elements is relatively strict, often adopt more strict, standard of written form, such as the British professor Redfern thinks that the arbitration agreement has the legal effect of excluding the jurisdiction of national judicial organs, belong to the parties highly reflect the autonomy, so must apply the specification, standard in writing, and not by the behavior to assume the existence of the meaning. This view is recognized by most scholars and legal practitioners. However, under the background of the opening of written contract, the written requirements of arbitration agreement are being gradually liberalized. From the New York Convention to the Model Law, and then to the British Arbitration Law, the new forms of arbitration agreement such as oral arbitration agreement and implied arbitration agreement have been gradually recognized, and the following will be elaborated in detail and in detail below.

2. Dispute Resolution Process Mechanism

International commercial arbitration as a kind of special international business dispute litigation system, in the 13th and 14th century, after the period of the early 19th century by the worldwide economic, political and ethical value, began its rapid growth and improvement, the international commercial arbitration began to comprehensive institutionalization and legislation after the century over one hundred years, the international commercial arbitration has become the most important means of dispute resolution, method and mechanism.

As Tibolwarad said, arbitration is a kind of dispute settlement mechanism, but soon after the birth of the court, the arbitration to resolve social disputes after the court in the historical development process of the human social conflict system, experienced brilliant arbitration system also faced the plight of decline, and history after repeated game, finally established the arbitration system in the field of international commercial dispute settlement indisputable advantage literally said, international commercial arbitration has almost become a kind of self-improvement system.

The speed and flexibility of dispute resolution by arbitration method conform to the pursuit of efficiency in international commercial activities, therefore, With the advent of international commercial activities, International commercial arbitration also naturally became the first choice for dispute resolution in medieval Europe, In order to resolve the disputes between each other, the commercial state gate has set up a purely folk commercial court since the end of the century, Countries around the world and many international commercial arbitration institutions gradually began to conduct international legislation on international commercial arbitration, To eliminate legislative differences between States and between arbitration bodies, Promoting the process of the world unified legislation of the international commercial arbitration system, International commercial arbitration has eventually become a sound and complex legal system for resolving transnational commercial disputes.

2.1. Procedural impartiality

The International arbitration Court is an alternative dispute resolution mechanism for resolving international disputes, and its procedural impartiality is a key aspect to ensure the fairness, impartiality and transparency of the arbitration process. The procedural fairness of the dispute resolution process mechanism of the International Arbitration Court is reflected in many aspects.

The selection of arbitrators is the first step in the procedure of the international arbitration tribunal. The impartiality of this process ensures that both parties to the dispute have confidence in the choice of the arbitrator. Usually, the arbitration rules stipulate the selection process of arbitrators, which may include joint selection by the parties or selection by the chairman of the arbitration tribunal to ensure impartiality and neutrality. The International Court of Arbitration treats the parties equally in the procedure, and each party has sufficient opportunity to present its own case, provide evidence, and refute the views raised by the other party. Equal treatment helps to avoid discrimination

or unfair treatment on one party.

The arbitration procedure is transparent, that is, the parties should have a clear understanding of the entire arbitration process. This could include public hearings, public instruments and rulings, etc. Transparency helps to maintain the fairness of the procedure and ensure that both the parties and other interested parties can understand the progress of the case and the reasons for the decision. And both parties have an equal opportunity to collect and present evidence. This enables the parties to investigate and provide relevant evidence, and to challenge the evidence provided by the other party, helping to ensure that the decision of the case is based on sufficient, fair, and reasonable evidence.

2.2. The flexibility

International court of dispute resolution mechanism has flexibility is one of its characteristics, embodied in program selection, process design, language use, rules of evidence and mediation mechanism, and other aspects, this flexibility helps to better adapt to different types of disputes, and make the dispute resolution process more efficient and in the interests of the parties.

The parties may choose the arbitration procedure according to their own needs, including the arbitration rules, the members of the arbitration tribunal, the arbitration venue, etc. This selectivity allows the dispute resolution procedures to be customized according to specific circumstances to meet the specific needs of the parties. Arbitration procedures are often more flexible than traditional proceedings. The parties may determine the specific procedures of the arbitration procedure through consultation, such as evidence submission and hearing arrangement, so as to better adapt to the characteristics of the dispute and the interests of the parties.

Compared with the proceedings, the international arbitration courts are usually more flexible in handling the rules of evidence. In international commercial arbitration, the continuous promotion of evidence disclosure and disclosure is the key to the effective development and promotion of arbitration procedures. The degree of disclosure of evidence by the parties in the arbitration process is the key to form the prediction of the arbitration award. In the commercial arbitration evidence procedure, the time period of submitting evidence materials is one of the most prominent uncertainty factors, because the arbitration parties can choose any time node to submit evidence materials after entering the arbitration procedure, which can easily lead to the occurrence of evidence raid phenomenon. The emergence of evidence raid will destroy the arbitration participants' prediction and control of the arbitration result, and even easily lead to a dramatic reversal of the verdict. Therefore, the too vague and flexible rules of evidence for international commercial arbitration will hinder the arbitration tribunal from making a fair award, and at the same time will hinder the parties' reasonable expectation of the arbitration award, and affect the predictability of the arbitration result on the whole.

2.3. Legal binding force and executive force

The legal binding force of the international arbitration court first originates from the arbitration agreement reached by the parties. Arbitration agreements are voluntarily reached by the parties, and they determine the authority of the arbitration court, the procedural rules and the legal binding force of the award. If one party breaches the arbitration agreement, the other party may seek legal relief, including requiring enforcement of the arbitral award.

The award of the international court of Arbitration also enjoy certain binding force in international law. For example, under the United Nations New York Convention, the signatories are obliged to recognize and enforce arbitration awards made in other signatories. This provides a certain degree of legal binding force for the international arbitration award.

However, the award of the international arbitration tribunal needs to be recognized and enforced by the state to be practical effect. Most countries recognize and enforce international arbitration awards under the provisions of the New York Convention, so the awards are legally binding in these countries. However, some countries may refuse to recognize and enforce the arbitral award under certain conditions, such as the award violates public policy or the fundamental rights of the parties. Although the international arbitration tribunal plays an important role in resolving international disputes, it is not omnipotent. Some disputes may be limited by the regional or sovereign nature, making the international arbitration awards not legally binding in specific fields or within countries.

3. Methods of Dealing with Common Problems in Trade Disputes

When dealing with trade disputes, international arbitration courts usually adopt a variety of ways to solve various common problems. Including procedural issues, evidence issues, legal application issues, timeliness issues. The effective use of these methods helps to resolve disputes and ensure fair and effective outcomes.

3.1. Procedural problems

The international arbitration court will handle trade disputes in accordance with international arbitration rules. These rules are usually formulated by international organizations, trade associations or specific international arbitration bodies to ensure the fair, effective and efficient resolution of disputes. In the handling of trade disputes, the international arbitration court will review the application to determine whether it has jurisdiction and decide whether to accept the case. This step usually involves a review of the documents and arguments submitted by the parties to determine meeting the admissibility criteria.

In most cases, the procedural law applicable to international commercial arbitration is the arbitration place law. The logic is that if the parties choose a place for arbitration, the law of the place will become the most closely related to the arbitration procedure; the parties choose a place as the arbitration place itself, also means that they are willing to accept the constraints of the arbitration law. Since the parties usually choose a neutral third country as the arbitration place, the procedural law applicable to the arbitration may be different from the substantive law applicable to the dispute.

It is precisely because of the significance of arbitration that the parties usually make an agreement in the arbitration agreement. According to the 2021 International Arbitration Survey, London, Singapore, Hong Kong, Paris and Geneva are the preferred arbitration places. The International Chamber of Commerce, Singapore International Arbitration Centre, Hong Kong International Arbitration Centre, London International Arbitration Centre and China International Economic and Trade Arbitration Commission were rated as the top five most favored arbitration institutions. The main reason is that the arbitration legal system in these places is relatively mature and friendly.

Of course, in practice, there is no lack of the parties did not agree on the arbitration place because of the lack of experience or unable to reach an agreement. The main arbitration rules also stipulate how to determine the arbitration place in this case. In principle, the right to choose will be awarded to the arbitration institution or the arbitration tribunal, but there are some differences in the specific mechanism. Many arbitration rules provide that the place of arbitration is the place of the arbitration institution, unless the arbitration rules of the Court of Arbitration in London (LCIA), HKIAC, SIAC and China International Economic and Trade Arbitration Commission (CIETAC) directly grant the right to the arbitration court or the arbitration court, such as Article 18 of the “arbitration place shall be determined by the arbitration court, unless otherwise agreed by the parties”.

Besides the law of the place of the arbitration, the arbitration rules have made more detailed and specific provisions on the development of the arbitration procedures. For the problems in the arbitration procedure, when the law of the arbitration place and the arbitration rules applicable to the arbitration are inconsistent, which one should be applied first? This has something to do with whether the legal provisions of the place of arbitration are forcibly applicable. Generally speaking, the mandatory laws in the arbitration place have priority over the selected arbitration rules, while the selected arbitration rules have priority over the non-mandatory laws in the arbitration place.

3.2. Evidence issues

In litigation or arbitration proceedings, evidence generally refers to all materials submitted to the court or arbitration tribunal to prove or overturn a disputed matter or claim and can prove the true situation of the case. The judge or arbitrators are not the person of the facts of the case, so it is impossible to have an intuitive feeling of the facts of the case. Therefore, in the process of the trial, evidence plays a vital role in the identification of the facts of the case and the application of relevant laws. In international commercial arbitration procedures, a series of norms and related criteria concerning the types and effectiveness of normative evidence, collection, opening and presentation, review and evaluation can be collectively referred to as the evidence rules of international commercial arbitration. In the context

of international commercial arbitration, because the parties involved in the arbitration usually come from different countries and regions or even different legal systems, the evidence issue becomes a more complex and rich theoretical and practical issue.

Usually, the international commercial arbitration evidence problem as a part of a procedural law, in domestic procedural law, the arbitration law or evidence law, in Anglo-American law national judicial cases also constitute a part of arbitration law, at the same time in some domestic or international arbitration institutions of arbitration rules will be more detailed specific provisions. After more than two centuries of evolution and development of the theory and practice of international commercial arbitration, the evidence issues in the field of international commercial arbitration have been constantly collided and integrated, and some specific universally applicable evidence principles and rules have emerged. These specific principles and rules will be reflected in bilateral arbitration treaties or multilateral treaties, model laws and model rules of arbitration (e. g. in the Model Law on International Commercial Arbitration and the Model Rules on International Commercial Arbitration).

In the author's opinion, the evidence system of international commercial arbitration is a set of operation mechanism for evidence collection, evidence presentation, cross-examination and certification in international commercial arbitration activities. In terms of connotation, the international commercial arbitration evidence system should include the following specific contents: in the process of collecting evidence, the obligation of collecting evidence, the arbitration tribunal, the assistance of the court, the collection of material evidence, the witness and the witness, and the expert evidence; in the process of providing evidence, the standard of evidence, the type and effectiveness of evidence, and the rules of evidence acceptance. Of course, the above is only a list of some common and main problems in the evidence system of international commercial arbitration, and does not represent its full connotation.

3.3. Application of law

The same international commercial arbitration case usually involves the application of multinational laws, which is not only because the dispute itself contains transnational factors, but also the characteristics of the dispute resolution method of arbitration itself.

In the issue of the application of law, people often pay the most attention to the substantive application of law in dispute, that is, the issue of quasi-law, that is, under which the arbitration tribunal decides on the substantive issues involved in the dispute. Most disputes in international commercial arbitration are contract disputes. There are two main situations in which the contract law determines, one is that the parties make a choice of the contract law, and the other is no choice.

3.3.1. The parties choose the substantive law applicable to the dispute

International commercial contracts usually include choice-of-law clauses, such as the " This Agreement shall be governed by and construed in accordance with the laws of the State of New York, U.S.A., except such laws as require the application of the laws of another jurisdiction."The laws and arbitration rules of all countries are based on the principle of autonomy of the parties, and the arbitration tribunal intends to fully respect the choice of the parties unless the choice violates mandatory law or public policy of the place of arbitration. Of course, there are different views on what is mandatory law and public policy, which will not be repeated here.

3.3.2. The parties have not choose the substantive law applicable to the dispute

The national laws and arbitration rules mostly stipulate that the parties shall not choose the substantive law of the international arbitration tribunal, which is determined. In the past, the arbitration tribunal usually determined the substantive law of the arbitration country, or directly applied the substantive law of the country where the arbitration is. However, this traditional practice has been abandoned, and now there are three main modes for countries to deal with this issue.

The first model is to specify the norms of the conflict of law (such as the principle of the closest connection) that the arbitration tribunal should apply in such cases. Switzerland, Germany, Italy and Japan all belong to this pattern. For example, Swiss private international law stipulates that the arbitral tribunal should make a decision on a dispute according to the legal rules of the parties, and if the parties do not choose, it shall follow the legal rules that are most

closely related to the case. China does not have similar provisions specifically on the application of substantive laws in international arbitration, but Article 41 of the Law on the Application of Laws in Foreign Civil Relations stipulates that "the parties may agree to choose the law applicable to the contract. If the parties have no choice, the law of the habitual residence of the party that best reflects the characteristics of the contract or the other laws most closely related to the contract shall apply."

The second model is to authorize the arbitration tribunal to apply the conflict of law norms that it considers appropriate to determine the law to be applied. UNCITRAL Model method and the UK are this model. UNCITRAL Article 28 of the Model Law stipulates that "the arbitration tribunal shall make a decision on the dispute in accordance with the legal rules chosen by the parties to apply to the disputed entity". "If the parties do not specify any applicable law, the arbitration tribunal shall apply the law determined by the conflict of law norms deemed applicable".

The third model is to authorize the arbitral tribunal to directly apply the substantive laws as they see fit, without applying any conflict of law norms. France, countries such as India and the Netherlands have adopted this model.

In this issue, the arbitration rules mostly adopt the third model. As stipulated in Article 21 of the Arbitration Rules of the International Court of Arbitration (ICC), "the parties have the right to freely agree on the legal rules that should be applied by the arbitration tribunal to handle the substantive issues of the case. If the parties do not agree on this, the arbitration tribunal shall decide to apply the rules of law as it considers appropriate". Article 27 of the Arbitration Rules of Singapore International Arbitration Centre (SIAC) stipulates that "the arbitration tribunal shall apply the legal rules of law designated by the parties as the basis of the disputed entity; if the parties do not designate, the arbitration tribunal shall adopt the legal rules as it considers appropriate". UNCITRAL Arbitration rules in this respect have also made different provisions from the UNCITRAL model law, adopting the third model. A few arbitration rules adopt the first model, requiring the arbitral tribunal to apply the laws of the countries most closely related to the dispute, such as the Arbitration Rules of the German Court of Arbitration and the Swiss International Arbitration Rules.

3.4. Timeliness problem

The timeliness of the international arbitration court in handling trade disputes covers the setting of litigation procedures, the application of mediation mechanism, the reasonable arrangement of case management, and the clear provisions of the ruling period, aiming to ensure the timely settlement of disputes, safeguard the trade order and the rights and interests of the parties concerned.

International arbitration courts usually set clear procedures and time limits to ensure that disputes are resolved in a timely manner, including submission of applications, submission of evidence, and arrangement of hearings. The time limit helps to ensure that disputes do not delay too long and facilitate the timely settlement of all parties.

Some international arbitration courts provide rapid mediation or mediation procedures to resolve disputes as soon as possible. These procedures, usually beginning at the beginning of a dispute, aim to negotiate a mutually acceptable settlement and thus avoid lengthy proceedings. For some trade disputes that are particularly important or more influential, the International Court of Arbitration may prioritize these cases to ensure their timely resolution. This approach can help avoid long-term uncertainty and damage to the parties involved.

When dealing with trade disputes, international arbitration courts will take reasonable case management measures to improve efficiency and timeliness, including ensuring timely submission of evidence, effective arrangement of hearings, and reasonable trial arrangements. The international court of Arbitration usually sets a clear time limit in the award to be made within a certain period of time. This helps to guarantee the timeliness of the ruling and avoid the adverse effects of the delay.

4. Provide the Effectiveness of Equitable and Enabling Solutions

The effectiveness of the international arbitration Court in providing fair and enforceable solutions to trade disputes stems from its independence, impartiality, professionalism, the enforcement mechanism of adjudication and the support of international treaties and conventions, namely international collaboration. Together, these features and

mechanisms ensure the fairness, acceptability and enforceability of the solution, and help to maintain the trade order and the rights and interests of the parties concerned.

4.1. Independence and impartiality

The independence and impartiality of the international court of Arbitration in dealing with trade disputes are crucial, and these two principles are the cornerstone of ensuring a fair and just settlement of disputes.

The International Court of Arbitration shall be a legal body independent of the national government and economic interests. This means that the court's ruling is free from political interference, it can exercise its functions independently, and it is not influenced by external forces. The referees of the court are experienced, non-partisan, non-interested professionals. Their independence ensures that they can make objective, fair decisions based on the law and facts, without other pressure. The courts have sufficient financial independence not to be affected by the source of funding. This ensures that the courts can operate independently of the influence of external funds on their decisions.

The court treats the parties equally in handling trade disputes, without taking sides. This includes ensuring that parties have equal opportunity in the proceedings to present their case, present evidence and the right to a full hearing. The procedure of the court is transparent to ensure public hearings, publication of the reasons for the award, etc. Transparency helps to build trust and let all parties know the trial process and the reasons for the decision. The court's ruling should be based on a clear legal basis and be in accordance with the principles of international law. This helps to ensure the legitimacy and impartiality of the rulings.

In general, the independence and impartiality of the international courts of Arbitration are the key elements for safeguarding the international rule of law and promoting global trade. The adherence of these principles helps to ensure equitable and enforceable solutions to trade disputes, thus promoting economic cooperation and stability among countries.

4.2. Professionalism

The professionalism of international arbitration courts in handling trade disputes is the basis for ensuring a fair and enforceable solution. It guarantees the legal correctness of the court's ruling and enhances the trust of all parties to the ruling.

The arbitrators and judges of the International Arbitration Court have a high degree of professional quality and rich legal experience. They are usually experts in the field of international law, and they are familiar with the relevant international trade law, public international law, and the rules and procedures for resolving trade disputes. This allows them to accurately understand the case, apply the law, and make professional decisions.

Since international arbitration courts deal with trade disputes, their arbitrators and judges should also have deep expertise in the field of trade. This includes an understanding of international business practices, trade contracts, international transport of goods and other laws and practices. The reserve of expertise contributes to a better understanding of the substantive issues of disputes and thus more effective resolution.

The procedural rules formulated by the International Court of Arbitration are professional to ensure that the rights and interests of all parties can be fully protected in the handling of trade disputes and promote the prompt and fair resolution of cases. This includes the application of clear, explicit rules, and the flexibility to adapt them accordingly. The secretariat of the International Court of Arbitration is also professional in providing case support and management. The professional work of the secretariat helps to ensure that the arrangement of materials and procedures of the case can operate efficiently and provide full support for the arbitrators and judges.

In view of the continuous development and change in the field of international trade law, the arbitrators and judges of the international arbitration court need to update their legal knowledge through continuous learning. This includes participation in training, seminars, academic exchanges, etc., to maintain sensitivity to the latest developments in the field of trade law.

4.3. Executive power and international collaboration

Through enforcement and international cooperation, international arbitration courts ensure that their rulings are

both legally binding and widely recognized on the international stage. This provides a solid foundation for the fair settlement of trade disputes and promotes the cooperation and development of the international community in the field of trade.

The decisions of the International Court of Arbitration are generally upheld by the United Nations Convention on International Arbitration (the New York Convention). The Convention ensures the enforcement of arbitral awards worldwide. States that have signed the New York Convention agree to recognize and enforce arbitral awards on their territory, thereby ensuring that the award can be enforced.

The ruling of the international arbitration Court are based on international law, and the compliance and respect of international law is crucial to maintaining the international order. Shared trust among countries in the international rule of law helps to ensure that arbitral awards can be implemented globally. International arbitration courts usually work closely with the multilateral trading system (such as the World Trade Organization). Coordination with these agencies helps to ensure that the rulings are consistent with international trade rules, thus enhancing their enforcement.

When handling trade disputes, international arbitration courts often need to cooperate with national governments, international organizations, and trade agreements. Through international cooperation, the courts can obtain more information, have a more comprehensive understanding of the background and details of the disputes, and help to make more objective and comprehensive decisions. Trade disputes often involve the interests and disputes between many countries. International arbitration courts need to use international cooperation to ensure that all parties are treated equally and fairly in the process of dispute settlement, and to promote multinational cooperation and coordination.

The International Arbitration Court cooperates with other international arbitration institutions to jointly formulate and promote the development of international arbitration rules. This helps to establish a unified arbitration standard and improve the consistency between different arbitration awards, thus promoting the stable and sustainable development of international trade.

5. Impact on the Predictability and Stability of International Trade Relations

The role of the international arbitration court in dealing with trade disputes has an important impact on improving the predictability and stability of international trade relations. By establishing unified standards for the application of law, maintaining legal order and effectively resolving disputes, the courts help to reduce trade frictions and uncertainties, and promote the sustainable development and stability of international trade relations. However, courts may have some negative effects in handling trade disputes, which, although relatively few, still deserve attention and discussion.

5.1. Fairness and efficiency of dispute settlement

International commercial arbitration, with its high efficiency different from foreign-related litigation, attracts cross-border commercial subjects to submit their disputes to the arbitration tribunal, and wins the trust of the arbitration parties with its core value of pursuing justice. However, there is a natural conflict between justice and efficiency. On the one hand, in order to pursue justice, the arbitral tribunal must use the rules of evidence to determine the facts of the case; on the other hand, for the efficiency of the arbitration, the tribunal should decide as quickly as possible, and determine the evidence as efficiently and quickly as possible to determine the dispute. Therefore, the evidence rules of international commercial arbitration have to face the game and balance between efficiency and justice.

Efficiency, the rules of evidence law under the premise of given the basic framework, let the parties can according to their most urgent need to flexible design of arbitration procedure, meet the specific case of the parties to the needs of different values, can avoid the parties malicious delay the arbitration procedure, as the parties discuss the case evidence rules of the starting point, in order to shorten the consultation time, the purpose of progress, objectively promote the efficiency of the arbitration procedure. In terms of fairness, under the conflict of interest and legal culture between the parties to international commercial arbitration, it is easy for the parties to arouse the suspicion of the

fairness of the procedure, whether at the discretion of the evidence law or at the discretion of the arbitration tribunal. Therefore, the evidence soft evidence law not only emphasizes the characteristics of ensuring the efficiency and convenience of international commercial arbitration, but also pays attention to further strengthening the fairness of international commercial arbitration. The soft evidence law of international commercial arbitration highlights its guarantee of efficiency and convenience in the following aspects. For example, article 9, paragraph 2 of the IBA Forensics Rules exclevidence under certain circumstances or evidence with certain characteristics from the arbitration tribunal. It can be seen accordingly that the IBA Forensics Rules stipulate the specific reasons for the parties to refuse to submit evidence, which is a positive attempt to improve the efficiency of the arbitration procedure. For another example, the Notes on the Arrangement of Arbitration Procedures suggest that the arbitration tribunal take into consideration the decision on whether to hold a hearing, the oral arguments between the parties and whether the witnesses should have a general time limit. Many of the Provisions on the Arrangement of Arbitration Procedures and the IBA Evidence Collection Rules can be regarded as institutional guarantees to ensure that the arbitration tribunal improves the efficiency of the procedure under the premise of making a fair award.

The fairness and efficiency of dispute settlement help to avoid the expansion of disputes and reduce the uncertainty and risks caused by disputes. By resolving disputes in a timely manner, international arbitration courts can help stabilize trade relations and prevent disputes from having negative effects on trust and cooperation among trading partners. It also helps to strengthen the legal environment in the field of international trade. When trade participants are aware that disputes can be resolved in a short period of time and the ruling can be carried out effectively, they are more motivated to comply with international trade regulations, thus promoting the stability of trade relations.

5.2. Conformity and transparency of the rules

The consistency and transparency of the rules of the international arbitration courts in handling trade disputes can help to improve the predictability and stability of international trade relations, and provide a fair, transparent and reliable dispute settlement mechanism for trade participants. It will help to enhance the international business environment and promote economic cooperation and development.

By setting consistent rules and procedures, the international arbitration courts provide a more stable and predictable dispute settlement environment for trade participants. Rules of consistency ensure the consistent treatment of similar disputes, reducing legal uncertainty, and making it easier for trade players to predict the outcome of dispute settlement.

The rule of consistency helps to ensure impartiality in the treatment of the parties in different disputes. Such consistency helps to prevent different decisions on similar situations, thereby enhancing fairness and a sense of justice in international trade relations. The rulemaking and procedures of the International Court of Arbitration are often transparent, which means that the process of dispute resolution is clearly visible to all parties. Transparency helps to ensure that trade participants understand the entire process of dispute resolution, including evidence collection, hearing and adjudication, thereby increasing the credibility and reliability of dispute resolution.

Rules of consistency and transparency help reduce the risk of disputes. Trade participants' understanding the rules and procedures of international arbitration courts can better circumvent potential disputes, thus reducing the negative impact of disputes on trade relations. It will help to make trade players more compliant. Because the parties understand the standards and procedures for dispute settlement, they are more motivated to follow the rules in trade activities, thus reducing the occurrence of disputes and establishing the credibility of the international arbitration court. When trade participants believe that the dispute settlement mechanism is fair, consistent and transparent, they prefer to settle disputes through arbitration, thus enhancing the reliability and stability of the international trading system.

5.3. Respect for the diverse legal system

The respect of the international arbitration court for the diverse legal system helps to uphold the rule of law and promote cooperation in the settlement of international trade disputes, improve the effectiveness and predictability of dispute settlement, and thus make positive contributions to the stability of international trade relations.

Multiple legal systems mean that different countries have unique legal systems and cultural traditions. By re-

specting this diversity, the international arbitration Court ensures that national legal systems and cultural differences are fully taken into account in resolving trade disputes, which helps to safeguard national sovereignty and promote inclusiveness in international law. International arbitration courts respect diverse legal systems to promote mutual recognition of laws in different countries. By considering the characteristics of the national legal systems, arbitral awards are more likely to be recognized and implemented by various countries, thus improving the effectiveness of dispute settlement.

Respecting multiple legal systems can reduce the uncertainty caused by conflicts of law. By considering multiple legal systems in its rules and rulings, the international arbitration court helps to establish a more unified and coordinated legal framework and reduce the legal risks faced by trade entities when they operate between different countries. It has also played a huge role in upholding the rule of law in international trade. By fully respecting the legal systems of various countries, the arbitration mechanism can better ensure that the settlement of trade disputes complies with international law, thus maintaining the legal nature of the entire international trading system.

Respect for diverse legal systems facilitates a cooperative and consultative approach in resolving disputes. The respectful attitude of the international arbitration court encourages trade participants to be more open and cooperative in the dispute settlement process, thus helping to build a relationship of mutual trust and promote the adaptability of international law to enable them to better meet the legal needs of different countries and regions. This helps to establish a more flexible and adaptable international legal framework, which is conducive to the development and stability of international trade relations.

5.4. Improve the investment environment and business confidence

The improvement of the investment environment and business confidence in the handling of trade disputes has a positive impact on the predictability and stability of international trade relations. It will not only help attract more investment, improve the investment environment and reduce business risks, but also promote cooperation and sustainable development among countries, thus enhancing the stability and predictability of the international trading system.

As an independent and neutral dispute settlement body, the international Arbitration Court can provide investors with a fair and efficient dispute settlement mechanism. When investors know that they can rely on international arbitration courts to defend their rights in international trade disputes, they are more willing to make cross-border investments, which helps to enhance investors' confidence in international trade relations. A stable and predictable international trade dispute settlement mechanism can help improve the international investment environment. Investors will be more willing to invest in countries with a sound rule of law and an arbitration system, because they know that they can rely on international arbitration courts to resolve disputes without fear of political or other uncertainties.

The existence and effectiveness of international arbitration courts reduce the commercial risk of cross-border trade and investment. When carrying out international trade activities, enterprises will face various risks, including contract performance risks, and political risks. There is a reliable arbitration mechanism that can help enterprises to reduce these risks and increase their enthusiasm to explore and invest in the international market. The existence of the international arbitration court encourages all parties to adopt a cooperative attitude to resolving trade disputes rather than through hostile means. This will help to establish a long-term and stable trade relationship and promote the cooperation and sustainable development among various countries.

The effective operation of the international arbitration court helps to strengthen the stability of the international trading system. When trade disputes are resolved in a fair and timely manner, it is easier for all parties to reach consensus, maintain the authority and credibility of international trade rules, and thus promote the stability and development of the international trade system.

5.5. New disputes and the risk of politicization

The new forms of disputes and the risk of politicization pose new challenges to the effectiveness and impartiality of international arbitration courts in handling trade disputes, which may affect the predictability and stability of international trade relations. Therefore, the international community needs to strive to strengthening the adaptability of the international arbitration courts and maintaining their independence and neutrality so as to ensure the effective settlement of trade disputes and promote the stability and predictability of the international trading system.

When new forms of disputes emerge or disputes are complex, international arbitration courts may face greater uncertainty. Emerging business models, technological changes, or transnational legal and business issues may lead the courts to face unprecedented cases, which may be more difficult to resolve, thus affecting the predictability of international trade relations. Some international trade disputes may be affected by politicization, where national governments may incorporate political considerations into the decision-making process in international disputes. This may lead to the international arbitration court facing pressure between political wrangling and national interests, making its judgment no longer based on jurisprudence, but may be subject to political intervention, damaging the neutrality and impartiality of dispute settlement.

New forms of controversy and risks of politicization may lead to challenges in cooperation among participants in international trade. If the parties question the neutrality and resolving ability of the international arbitration court, they may be more inclined to adopt a unilateral approach to resolve disputes rather than through a cooperative international arbitration mechanism, which may aggravate the disputes and weaken the stability of international trade relations. Faced with new forms of dispute, ICC may need to adapt to new legal and business practices to ensure the effectiveness of the solution. However, the lag of the law and the insufficient innovation capacity of the institutions may lead to the emergence of legal loopholes and defects, which may make the international trade relations more unstable.

When the dispute settlement process is affected by the risk of politicization, investors may question the effectiveness and impartiality of the international arbitration court. This could lead to lower investor confidence in the international trading environment, slowing down cross-border investment and affecting the stability of international trade.

6. Conclusions

This paper discusses the role of international arbitration courts in resolving trade disputes from five levels. In order to better promote the practice of international commercial arbitration, the author gives several suggestions: First, the ADR (Alternative Dispute Resolution) clause in the contract should be actively promoted, and the parties should be encouraged to adopt arbitration method to solve disputes in the contract. In this way, the cost and time of dispute settlement can be effectively reduced, and the smooth progress of international commercial transactions can be promoted. Second, we should pay attention to the efficiency and fairness of the arbitration procedures. In the arbitration procedure, it should be ensured that the procedure is concise, efficient and fast, and the fair treatment of the parties should be guaranteed, and the improper behavior such as discrimination should be avoided. Third, we should pay attention to the effectiveness and public nature of the arbitration judgment. In the arbitration judgment, the rationality and fairness of the judgment should be ensured, and the uncertainty of the judgment result should be avoided, so as to enhance the credibility of the arbitration institutions and promote the development of the arbitration system. The three-point proposal aims to promote the development of international commercial arbitration practice, provide a more fair, efficient and reliable dispute settlement mechanism for the parties, and give better play to the positive role of international arbitration courts in resolving trade disputes, so as to promote the prosperity and development of international commercial transactions.

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The Potential of Blockchain Technology in Facilitating International Trade

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Abstract

This paper investigates the potential application of blockchain technology in international trade. It provides an overview of blockchain technology, its application in global trade and includes successful use cases. The article analyzes the impact of blockchain technology on supply chain transparency and efficiency, regulatory obstacles and relevant factors. In addition, it investigates how blockchain technology can transform international trade, explores current trends, and addresses scalability and interoperability challenges. In conclusion, this article conducts a comprehensive analysis of blockchain's potential in global trade and ends with recommendations for future research and practical application.

Keywords: blockchain technology, global trade, transparency, efficiency.

1. Introduction

1.1. Blockchain technology and its relevance to international trade

Blockchain is a distributed ledger technology that connects transaction records in blocks and deploys cryptographic algorithms to guarantee the security and immutability of data. The fundamental concept behind blockchain is decentralization and de-trust, where transaction authentication and recording rely on a consensus mechanism among network participants, eliminating the need for a central authority.

Each block stores a set of transaction records and includes a hash value that points to the previous block, creating an immutable chain structure for the data stored on the blockchain. By following this design, the data on the blockchain is kept secure and reliable due to the creation of an immutable chain structure. New transactions are verified through a consensus algorithm by network participants who add them to a new blockchain block.

Blockchain technology is extensively and significantly used in international trade. It has transformed supply chain management, facilitating real-time traceability and transparency through smart contracts and distributed ledger technology. This helps supply chains operate more efficiently, decreasing delays and storage costs.

Blockchain technology can help resolve trust issues in international trade. Blockchain records transaction data and shares it, providing highly secure and tamper-proof transaction records. This allows participants to verify the origin, authenticity and quality of goods. The trustworthy information provided helps to combat the circulation of substandard goods, reinforcing consumer trust and enhancing brand reputation.

In terms of payments, blockchain technology provides quick, secure and low-cost solutions for cross-border transactions. Cross-border payments can become more efficient, transparent and reduce transaction costs through the automated execution of smart contracts and the lack of intermediaries. This solution can be particularly helpful for SMEs by reducing trade costs and enhancing competitiveness.

Furthermore, the use of smart contracts with blockchain technology can help simplify the process of trade contract management and execution. By encoding contract terms in the blockchain, contract participants can automate enforcement, ensuring contract compliance and accuracy. This automated system reduces the risk of contractual disputes and enhances transactional efficiency and reliability.

The application of blockchain technology in international trade enhances supply chain management, trust, cross-border payments, and simplifies trade contract management. These applications drive the development and innovation of international trade by improving efficiency, credibility, and competitiveness of commercial entities.

1.2. Analysis of problems that may be encountered in the application of blockchain technology in international trade

Blockchain technology has shown diverse applications in international trade, although several challenges still need to be addressed. Standardisation and interoperability are key challenges for blockchain technology due to the absence of consistent standards for current systems. Achieving seamless data interaction between different systems is challenging because of this. The issue of scalability is also a challenge that necessitates attention, mainly when handling large-scale transactions and data. Blockchain technology risks facing a performance bottleneck. Another significant consideration is privacy and data protection. While confidentiality of commercial data is crucial in international trade, the transparency of blockchain technology may pose privacy issues. Furthermore, the discrepancies present in the legal and regulatory environment can create obstacles for the utilisation of blockchain technology in international trade applications. For blockchain technology to be compliant with international trade regulations, it necessitates cooperation and coordination across borders.

To conquer these challenges, advancements in technology, collaboration, and policy backing are essential to warrant standardisation, scalability, confidentiality, pragmatic and feasible legal, and regulatory frameworks. Thus, the promotion of blockchain technology in international trade could be enhanced. This article analyses the aforementioned issues and proposes corresponding recommendations.

1.3. Outline the specific objectives and goals of the research paper

This paper aims to investigate the potential role of blockchain technology in international trade. It also strives to analyze the future potential of the technology in facilitating international trade and provide relevant recommendations in this regard.

2. Overview of Blockchain Technology and its Potential Applications

2.1. A comprehensive definition of blockchain technology and explain its core characteristics

Blockchain, being a decentralised distributed ledger technology, offers numerous applications in businesses. Blockchain's main characteristics comprise distributed ledger, immutability, transparency, decentralisation, anonymity, and authentication.

To begin with, distributed ledger permits storing transactions and data records on various nodes within the network in a decentralised manner, which enhances data reliability and security. On the contrary to traditional centralised institutions where there is a risk of a single point of failure, the decentralised nature of the blockchain eliminates this potential issue.

Secondly, the integrity and trustworthiness of transactions and data is ensured by the ability to prevent tampering with the blockchain. After the data is written to the blockchain and confirmed sufficiently, it cannot be modified or removed arbitrarily. Cryptographic algorithms and consensus mechanisms guarantee the security and reliability of data through blockchain technology.

Another important feature of blockchain technology is transparency. Data records and transactions on the blockchain are publicly visible and open for verification by anyone. This transparency increases the trustworthiness of transactions and reduces information asymmetry.

In addition, the decentralised nature of blockchain reduces the number of trust links by eliminating intermediaries in traditional business models. This improves the security and reliability of transactions.

Furthermore, blockchain technology offers the dual characteristics of anonymity and authentication. Users have the option to employ anonymous addresses when performing transactions to safeguard their anonymity. Nevertheless, there are situations where identity verification becomes necessary, especially to comply with regulatory requirements.

As a new type of digital technology based on cryptographic algorithms, consensus mechanisms and smart contracts, blockchain technology is able to effectively enhance social consensus and trust and reduce the cost of social governance, and has thus become a new means and tool for the modernisation of social governance. However, in order for blockchain technology to effectively play its role as the underlying technology of social governance modernisation, it needs to be demanded, selected, evaluated and regulated by society in order to achieve efficient and convenient governance. Blockchain technology is not formed and developed independently, but has to rely on social factors since its birth, and its development depends on the degree of meeting social needs, and its application depends on the existence of social support conditions. Therefore, the formation and development of blockchain technology cannot be separated from the participation of social actors and social shaping¹⁹.

2.2. Various potential applications of blockchain in the context of international trade

Blockchain is a sophisticated computer application that functions as a shared data platform. The security and reliability of data on the blockchain are ensured by storing it on multiple nodes in a network that utilize cryptographic algorithms and consensus mechanisms. Blockchain's decentralized nature supports decentralized data storage, thereby avoiding the risks of single points of failure and data tampering.

Blockchain's complete transparency ensures that all transactions and data records are publicly visible for all participants to view and verify, thus enhancing transparency and trust in transactions. All participants can view and verify this data, enhancing transparency and trust in transactions. The blockchain platform's untraceability also ensures data integrity and trustworthiness by making it challenging to manipulate or erase recorded data. This attribute guarantees the integrity and trustworthiness of transactions.

The consensus mechanism is also a critical blockchain attribute that enables co-maintainability. The overall security and stability of the blockchain is ensured as participants negotiate and reach consensus to validate transactions.

The inherent immutability of transactions and data records in blockchain enables participants to collaborate without worrying about information asymmetry or issues of trust. This transparency and trustworthiness contribute towards forming a secure foundation for partnerships across various fields, thereby facilitating their establishment and development.

Numerous technology and innovation firms across the globe are presently engaged in developing and implementing groundbreaking blockchain applications in the financial sector. Currently, the use of blockchain technology in the financial sector presents a wide range of possibilities.

19. Gad, A. G., Mosa, D. T., Abualigah, L., & Abohany, A. A. (2022). Emerging trends in blockchain technology and applications: A review and outlook. *Journal of King Saud University-Computer and Information Sciences*, 34(9), 6719-6742.

Decentralized Finance (DeFi) represents the primary breakthrough in blockchain technology within the financial sector. DeFi applications enable financial transactions without the involvement of third-party intermediaries through the use of smart contracts, such as lending and borrowing, decentralized exchanges, and liquidity mining. Traditional financial transactions necessitate verification and clearance by several intermediaries. The decentralised nature of blockchain facilitates direct peer-to-peer transactions, which lowers transaction costs by eliminating intermediary links. Blockchain technology allows for permanent recording of transaction records on the blockchain network ensuring both.

Transparency and traceability of transactions. This decentralised financial framework provides unprecedented prospects for implementing transparent, efficient and open financial services.

Secondly, blockchain technology has played a significant role in shaping the digital currency and payments sector. Blockchain offers a range of novel options for conducting global financial transactions, through digital currencies such as Bitcoin, Ethereum, stablecoins and others. The traditional method of international payment often includes intermediation via multiple banks and clearing houses, leading to high costs and time consumption. Blockchain technology enables real-time peer-to-peer payments for cross-border trade and personal remittances, with the potential to offer faster and more cost-effective transactions while increasing payment security. The decentralised nature of blockchain technology makes cross-border payments and real-time settlements more convenient, cost-effective, and secure.

Another significant area where blockchain technology can be applied is in the financial sector of the supply chain. The use of blockchain technology can improve the efficiency and reliability of financial services provided in the supply chain. Creating a traceable supply chain network that allows for information sharing and automated transaction financing enhances the transparency and speed of capital flow in the supply chain.

Moreover, blockchain technology has a considerable influence on digital security management and asset handling. The decentralized ledger and smart contracts of this technology permit digital securities' automated management, trading and issuance. As a consequence, the transactions' transparency and efficiency are improved, and intermediaries' participation costs are reduced.

Finally, blockchain technology offers innovative techniques for managing risks and complying with regulations. The unchangeable nature of blockchain combined with its ability to monitor transactions in real-time can enhance risk assessment and monitoring systems, and reduce fraud and non-compliance.

2.3. Inherent challenges and limitations associated with blockchain technology

2.3.1. Technical aspects

Regarding scalability, current public blockchains like Bitcoin and Ether usually face hindrances in performance while processing voluminous transactions. As blockchains are distributed in nature, each node has to reproduce and authenticate every transaction, which restricts the processing power and throughput of transactions. To alleviate this issue, it is necessary to investigate further solutions like enhancing consensus algorithms, implementing sharding techniques, and introducing sidechains and lightning networks.

Traditional blockchains have been designed to be transparent and open in terms of privacy and confidentiality, displaying all transaction information on their chains. In some cases, it is essential to safeguard users' privacy and sensitive data. Presently, privacy-preserving methods involve the use of techniques such as zero-knowledge proofs, ring signatures, and cryptographic algorithms that enable anonymity and data privacy.

Blockchain technology poses another significant challenge that concerns security. Consensus algorithms and cryptographic mechanisms are the key factors that determine the security of blockchain. Despite this, new security vulnerabilities and attacks continue to emerge, such as the 51% attack, double-flower attack, and smart contract vulnerability. To preserve blockchain security, it's crucial to continuously analyze vulnerabilities and enhance security measures, as well as strengthen node authentication and network defence mechanisms.

Similarly, the "Prism Gate" incident also reflects that there are many data leaks in reality, and the security of storage is a pain point for the general audience. Therefore, in "blockchain + cross-border payment", firstly, it is necessary to reduce the risk of passwords being deciphered, such as setting up a certain level of protected access rights for public and private keys, which is also the first condition for economic entities to accept the application

of blockchain technology in cross-border payment, i.e., security guarantee. Second, strengthen the construction of firewalls. Because of the decentralisation feature of blockchain technology, it is an open system, and nodes can share information after logging in, while the database of blockchain is often open and transparent, which provides a sense of security for users, but also provides opportunities for intrusion of lawless elements, so in order to maintain security under the premise of guaranteeing the transparency of information, the technological upgrade and construction of firewalls is the most important thing. Therefore, the technical upgrading and construction of firewalls is a top priority in order to maintain security while ensuring information transparency²⁰.

2.3.2. Legal regulatory level

The decentralised nature of blockchain technology makes it challenging to apply traditional compliance and regulatory models to blockchain applications, especially those that cross borders. As a result, it is necessary to develop regulations and regulatory frameworks that ensure blockchain applications conform to legal requirements and prevent illegal activities, such as money laundering and other financial flows.

Regarding data privacy and protection, the transparent and open nature of the blockchain may infringe on the legal requirements for personal data protection. To resolve this matter, it is necessary to define how sensitive information is to be protected and handled in order to respect personal data privacy and comply with regulations.

Moreover, although smart contracts are a fundamental application of blockchain technology and allow for automated and tamper-proof contract execution, the legal responsibilities and dispute resolution mechanisms require clearer definition. To ensure that smart contracts are compliant with legal requirements and provide appropriate remedies for the parties, there is a need for further research and development of the relevant legal framework.

At this stage, 86 per cent of the world's central banks are accelerating their research and development of digital currencies, and the accompanying ecological alliances such as the construction of legal frameworks are also following suit, with China's research and development in this area already ahead of other major economies. China is already ahead of other major economies in this area, which is why China's legal and regulatory research needs to develop at a rapid pace.

The decentralized and cross-border nature of blockchain is increasingly challenging traditional compliance and regulatory models. Regulators must establish suitable regulations and regulatory frameworks to ensure compliance with blockchain applications and prevent illicit activities. For example, regulatory bodies must enforce national and regional regulations to govern digital currency exchanges' operations, including real-name requirements and anti-money laundering measures.

Secondly, blockchain's open and transparent nature may contradict legal obligations for personal data protection. Governments and regulatory bodies must balance data privacy and compliance. The EU's General Data Protection Regulation (GDPR) demands stringent security of personal data, but information on a publicly available blockchain may raise issues of personal privacy. To protect personal data in blockchain applications, especially those involving medical records or identity verification, technical measures such as anonymisation, encryption, and decentralised control are necessary.

Besides, smart contracts face legal constraints. Smart contracts, as one of the primary features of blockchain technology, can enforce contract terms automatically. Nevertheless, legal responsibilities and dispute resolution avenues require further clarity in case of errors or disputes. For instance, there must be a clear definition of legal liabilities and remedies when a smart contract loophole or mistake prevents contract fulfilment or results in losses. Legal disputes regarding vulnerabilities in smart contracts like the hacking of Decentralised Autonomous Organisations (DAOs) have already arisen. One way to solve this problem is to clarify the legal limitations of smart contracts, dispute resolution mechanisms, and contract cancellation conditions within the legal framework.

It is essential to prioritize cross-border compliance and regulatory cooperation. The cross-border nature of blockchain technology makes it necessary for countries and regions to cooperate to achieve effective regulation and compliance. For instance, cross-border blockchain projects may entail several jurisdictions with varying compliance and regulatory requirements. Thus, international cooperation and the establishment of common regulatory

20. Böhmecke-Schwafert, M. (2024). The role of blockchain for trade in global value chains: A systematic literature review and guidance for future research. *Telecommunications Policy*, 102835.

standards are crucial in addressing cross-border regulatory concerns. Certain countries have collaborated to generate international standards for compliance, such as the Financial Action Task Force (FATF) guidelines for Virtual Asset Service Providers (VASPs).

3. The Impact of Blockchain Technology on Supply Chain Transparency and Efficiency

The utilization of blockchain technology holds significant potential in addressing trade financing challenges, enhancing transparency within supply chains, streamlining the export process, and facilitating MSMEs' engagement in government procurement. Employing blockchain technology enables MSMEs to effectively resolve trade financing issues, bolster visibility throughout the supply chain, optimize export operations, and enable seamless participation in government procurement, thus augmenting their prospects in international trade.

Nevertheless, it is worth noting that MSMEs currently encounter numerous obstacles when adopting blockchain solutions. To ensure widespread implementation of blockchain technology, industry experts suggest adopting an inclusive approach that encompasses both larger enterprises and smaller MSMEs. Governments play a vital role in fostering an inclusive environment for blockchain promotion and integration. By formulating policies and allocating resources, governments can provide vital support to ensure the inclusivity and accessibility of blockchain development.

In conclusion, the integration of blockchain technology offers considerable advantages for MSMEs, such as the resolution of trade financing challenges, heightened supply chain transparency, streamlined export processes, and improved access to government procurement opportunities. While MSMEs face obstacles in adopting blockchain, an inclusive approach that involves government support and collaboration between larger enterprises and MSMEs can pave the way for successful blockchain implementation and overall advancement in the realm of international trade.

3.1. Significance of transparency in international trade and its relationship to supply chains.

Transparency assumes a pivotal role in international trade, serving as a crucial component of effective supply chain management. It encompasses the visibility and openness of information, enabling participants to access accurate, real-time data through the sharing of transactional and supply chain information. Extensive research supports the significant role of transparency in establishing trust, improving operational efficiency, reducing costs, and promoting sustainable development.

Trust forms the bedrock of business transactions, and transparency plays a vital role in cultivating a trustworthy relationship between transactional parties. By facilitating the transparent sharing of specific and clear data, it effectively mitigates uncertainties and risks, providing participants with valuable insights into the behavior and circumstances of other stakeholders. This transparency fosters cooperation in the supply chain, eliminating information asymmetries and enhancing transactional reliability and stability.

The adoption of blockchain technology is an indispensable solution if we want to accelerate the pace of the integration of production and financing in international trade. The decentralisation, full trace-keeping and open and transparent institutional mechanism of blockchain technology can bring a shared industrial chain system to all trading subjects in international trade, further enable the free and accurate flow of currency, commodities and funds, so that market trading subjects can clearly grasp the flow of goods and whether funds are in possession, and form an automated and transparent green industrial chain platform. The platform will form an automated and transparent green industrial chain²¹.

Furthermore, transparency plays a pivotal role in enhancing trade efficiency. Real-time information sharing

21. Deepa, N., Pham, Q. V., Nguyen, D. C., Bhattacharya, S., Prabadevi, B., Gadekallu, T. R., ... & Pathirana, P. N. (2022). A survey on blockchain for big data: Approaches, opportunities, and future directions. *Future Generation Computer Systems*, 131, 209-226.

empowers participants to track and verify data during transactions and logistics, thereby minimizing errors and delays and optimizing overall trade processes. Supply chain managers can proactively identify and address potential problems, allowing for timely resolution and avoidance of additional costs and time wastage.

Moreover, transparency significantly contributes to reducing trade-related expenses. By promoting information transparency, it mitigates the risks of theft, fraud, and illicit activities, thereby reducing trade losses and related costs. A comprehensive understanding of the various entities and processes within the supply chain enables the avoidance of unnecessary risks and financial losses, ultimately enhancing trade efficiency and economic viability.

Finally, transparency is closely intertwined with sustainable development initiatives. It facilitates the establishment and regulation of sustainable supply chains by ensuring product traceability and compliance with environmental and social responsibility standards. Transparent data tracking empowers regulatory bodies to monitor the origins, production practices, quality standards, and conformity to sustainable principles, promoting the pursuit of sustainable development goals.

3.2. How blockchain enhances supply chain visibility, traceability, and overall efficiency

The integration of blockchain technology into supply chain management improves visibility, traceability, and overall efficiency. The distributed and shared ledger mechanism of blockchain allows supply chain participants to access transaction and logistics data in real-time, thus enhancing the visibility of the supply chain. Through transparent data logging and visualization dashboards, supply chain managers can obtain up-to-date information about inventory levels and product flow status.

The blockchain's tamper-proof structure ensures high traceability within the supply chain. Each logistics and transaction node is recorded in a secure block, enabling participants to trace product origin, manufacturing processes, and transport routes. In cases of quality issues or recalls, the affected batch or product can be swiftly identified, reducing potential risks and losses. This traceability enhances supply chain reliability and fosters consumer trust.

Furthermore, blockchain technology enhances supply chain efficiency through the use of smart contracts. Smart contracts automate the execution of eligible transactions and payments, eliminating the bureaucratic procedures and time delays associated with traditional supply chain management. By sharing data and receiving real-time updates, participants improve logistics, transportation, and payment efficiency, reducing information asymmetry. The removal of intermediaries and streamlining of processes in blockchain technology reduce complexity, resulting in improved operational efficiency and transport within the supply chain.

The integrated framework also provides heightened security to the blockchain. The decentralized structure and encryption algorithms of blockchain ensure data security and integrity. Transactions recorded in tamper-proof blocks prevent data tampering and fraudulent activities, enhancing the stability and protection of the supply chain.

In conclusion, the integration of blockchain technology in supply chain management offers improved visibility, traceability, efficiency, and security. The ability to access real-time data, track product information, and automate transactions contributes to the effective management of the supply chain. However, it is worth noting that there are technical, regulatory, and collaborative challenges associated with implementing blockchain technology. As technology progresses and adoption rates increase, blockchain has the potential to play a significant role in the field of supply chain management.

Combining theory and practice, supply chain visibility is believed to enhance diverse capabilities in addressing problems and challenges arising in the supply chain system, which result in improved economic and sustainable performance²². Previous research has examined the "triple bottom line" performance of businesses and revealed that enhanced supply chain visibility can substantially enhance the companies' social, environmental, and economic performance²³.

22. Jiang Yishe. (2021). The Impact of Big Data Analysis Capability and Supply Chain Visibility on Mass Customisation Capability (Master's thesis, Harbin Institute of Technology). <https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202201&filename=1021903761.nh>

23. Dubey, R., Gunasekaran, A., Childe, S. J., et al. (2020). Upstream supply chain visibility and complexity effect on focal company's sustainable performance: Indian manufacturers' perspective. *Annals of Operations Research*, 290(1-2), 343-367.

3.3. Specific case studies and research demonstrating the positive impact of blockchain on supply chain processes

A related study published in the journal *Annals of Operations Research* examines the impact and relationship of supply chain visibility on various aspects of firm performance. The study analysed an empirical data of a manufacturing firm. The study's findings reveal a positive association between increased supply chain visibility and firm performance. To be specific, increased visibility contributes to reduced operational risk, improved collaboration, lower inventory costs, and better delivery on-time performance.

Moreover, the study highlights the importance of collaboration and trust in supply chain relationships which significantly influence the relationship between supply chain visibility and firm performance. Enhanced supply chain collaboration and trust contribute to better communication and information sharing, and thereby, further improve the positive impact of supply chain visibility on firm performance.

This study has important implications for companies and professionals in the supply chain industry. It emphasizes the vital role that supply chain visibility plays in enhancing operational efficiency, reducing costs, and increasing customer satisfaction. Therefore, companies must prioritize and implement actions to improve supply chain visibility. This will help to optimize operational efficiency, reduce costs, and increase customer satisfaction.

Secondly, let us analyze the collaboration between IBM and Huadi Electric.

The collaboration seeks to leverage blockchain technology to enhance supply chain processes and improve product sourcing and quality tracking. By utilizing the distributed ledger and smart contract capabilities of blockchain technology, IBM and Huadi Electric have succeeded in achieving supply chain transparency and traceability. This systematic tracking mechanism reduces the risk of counterfeit and poor-quality products entering the supply chain, improving product credibility, and sustainability.

The third case is a collaborative study conducted by Maersk and IBM. The study's aim is to enhance global trade supply chain processes by using blockchain technology. They enabled the tracking and verification of goods by developing a blockchain-based global trade platform. The study demonstrated that blockchain technology reduces manual processes and paper documents while improving delivery efficiency and data accuracy. This enhances supply chain visibility, collaboration, and efficiency.

Next, I examine the example of Walmart's utilization of the Food Trust platform. Walmart collaborated with IBM to construct the Food Trust platform by utilizing blockchain technology to trace food products' origin, production, and shipping process. This platform improves consumer confidence in food products' quality, safety, and sustainability while increasing the transparency and dependability of the food supply chain. By utilizing blockchain's unchanging and decentralized nature, the Food Trust platform assures the security and integrity of supply chain data.

3.4. The role of trust, security, and information sharing in the context of blockchain - enabled supply chains

Trust is a crucial factor within blockchain supply chains. Traditional supply chains may encounter trust issues among participants; however, blockchain resolves this by fostering trust through its decentralised and transparent nature. The distributed ledger technology of blockchain captures every transaction and operation, with viewing and verifying capabilities for all participants. In turn, transparency and trustworthiness of transactions are enhanced.

Furthermore, blockchain ensures heightened security levels. Data and information are stored and transmitted in an encrypted form on the blockchain. This data is verified and recorded by multiple nodes in the network which reduces the risk of data tampering or loss. The consensus mechanism of the blockchain ensures that only verified and authorised transactions are added to the blockchain. As a result, the security of the supply chain network is further enhanced.

Moreover, blockchain promotes information sharing and transparency. Supply chain participants can share data and information in real-time, thus providing real-time visibility into the supply chain through the blockchain sharing mechanism. As a result, this enhances collaboration and responsiveness within the supply chain and allows participants to better coordinate and respond to supply chain activities.

4. Regulatory Challenges and Considerations for the Use of Blockchain

4.1. Provide an overview of the existing regulatory landscape and frameworks relevant to blockchain in international trade

Compatibility between blockchain technology and legal and regulatory frameworks at a national and regional level is a significant concern. The decentralized and traceable nature of blockchain can potentially conflict with regulatory compliance. Therefore, comprehensive research is essential to guarantee compliance with various international regulatory requirements regarding blockchain and to establish methods to encourage international cooperation and standardisation.

This would enable the resolution of practical issues concerning the current legal conflict.

Blockchain technology in international trade requires a highly self-controllable and anonymous smart contract system for smooth operation. The adjustments to traditional international trade laws primarily address creditworthiness issues which may arise during cross-border capital operations, creating some disharmony between existing financial laws and blockchain technology²⁴.

At present, the legal system lacks provisions for the taxation of blockchain, and digital currency transactions lie outside the scope of taxation. Moreover, there are no specific regulations regarding the payment of taxes for these transactions.

4.2. Privacy and data protection concerns related to cross-border transactions facilitated by blockchain technology

The transparency and immutability of the blockchain enable the storage of transaction data on the chain for extended periods. However, this also increases the risk of data leakage and violations of privacy.

Blockchain technology is a decentralised, public, shared ledger where data is stored and accessible to all users on the network level, directly removing information bottlenecks that may occur in the international trade supply chain. However, a significant amount of enterprises and affiliates' core content will unavoidably be kept on the blockchain, which could lower transaction costs but also potentially result in business information leakage or misuse. Moreover, financial recourse for international trade parties could become a significant challenge due to the misuse of blockchain technology.

These issues involve several aspects that require attention.

The first aspect to consider is the use of permission control and anonymisation techniques to safeguard data privacy. Access control mechanisms provide restricted data access, allowing authorised participants to access specific data, while others can only view anonymised data. This measure helps protect both commercially sensitive information and personal privacy to a certain extent.

The second aspect is that cross-border transactions typically involve multiple countries, each having its data protection laws and regulations. Researchers can investigate the development of compliance strategies that adapt to the data protection requirements of different countries. To meet data protection regulations and ensure data compliance and security, techniques such as data encryption and anonymisation are used to process and transmit data.

New solutions for cross-border transactions are provided by evolving privacy-preserving technologies. The legitimacy of transactions can be verified without exposing data details, through techniques such as zero-knowledge proof and homomorphic encryption. Research exploring the application of these technologies for personal data privacy protection and transaction compliance can be conducted.

Privacy and data protection can also be ensured by establishing compliance frameworks and industry standards. To ensure privacy and data protection in cross-border transactions, relevant stakeholders and regulators can collaborate to establish harmonised data protection standards that offer clear guidance to businesses and individuals.

24. Zhang, L. & Zhang, Z. A. (2023). Research on legal risk control of blockchain technology applied in international trade. *Business Economics* (03), 100-103. doi:10.19905/j.cnki.sjy1982.2023.03.029.

4.3. Strategies or recommendations to address the regulatory challenges and foster blockchain adoption.

Developing a clear regulatory framework is imperative for establishing effective regulation and compliance standards for blockchain technology. Collaboration with industry experts and practitioners is necessary to devise transparent and consistent regulations. Simultaneously, regulators should continuously educate themselves, undergo training, and share knowledge to better understand the advancements of blockchain technology.

For ensuring compliance within the blockchain technology realm, a well-defined regulatory framework is crucial. For example, the government could institute a specialized regulatory body for blockchain to formulate regulations and policies relevant to cryptocurrencies and smart contracts. The entity could cooperate with industry experts and practitioners to create transparent and consistent regulations, which would safeguard the interests of investors and ensure market stability. For instance, the Financial Action Task Force (FATF) in the United States is an exemplary successful initiative in this domain. The FATF has established international standards that focus on preventing money laundering and financing of terrorism. It collaborates with national regulators to promote the harmonization of blockchain regulations worldwide.

Industry organizations can collaborate with regulators to develop compliance standards and best practices. For instance, in the financial sector, cooperating with central banks can promote the compliant adoption of digital currencies. One noteworthy example is the pilot project carried out by the Chinese central bank, in collaboration with numerous commercial banks, which centres on the digital RMB. The aim of this project is to ensure compliance with regulatory requirements for digital currencies while also fostering innovation in fintech.

To regulate blockchain technology effectively, it is critical to establish a clear regulatory framework and compliance standards, alongside industry collaboration and continuous education and training for regulators. Regulators can enable responsible and secure implementation of blockchain technology, encouraging innovation and contributing to the development of the digital economy through the adoption of transparent and uniform regulations, protection of investor interests, and promotion of compliance. This will also promote a harmonious global environment for blockchain regulation, fostering a conducive regulatory environment for stakeholders in the field.

Additionally, considering the technical specifications and characteristics of blockchain, it is necessary to supplement and enhance the existing laws and regulations to address the issue of legal ambiguity. Furthermore, the legal framework should be upgraded in line with the technical features of blockchain technology, and the legal status of blockchain in international trade applications should be clarified elucidated. In view of the inherent characteristics of blockchain technology, it presents an arduous task to regulate and maintain control over the technology, hence the requirement for government departments to continuously revise and bolster regulations using professional technology. The banking and financial industry plays a pivotal role in international trade. It's regulatory department can take the first step by devising a preliminary framework for the regulation of blockchain technology, followed by the issuance of initial guidelines to local financial institutions for compliance. It can then base the creation of a specialised regulatory agency on the feedback received through regular reports.

Regulators could enhance their inspection and regulation of blockchain technology by emphasising cybersecurity, data privacy, and consumer protection. To illustrate, the European Union has boosted the safeguarding of personal data privacy by implementing the General Data Protection Regulation (GDPR). Moreover, regulators may motivate companies to create security audits and technical monitoring systems that can guarantee the secure and compliant operation of blockchain applications. An example of this approach is that bitcoin exchanges are obliged by regulators to furnish KYC (Know Your Customer) and AML (Anti-Money Laundering) compliance standards in order to ensure adherence and to safeguard the security of user-owned assets.

Promoting education and outreach is crucial for enhancing public and business awareness and acceptance of blockchain technology. Regulators can organise various activities, such as training courses and seminars, to improve the knowledge of blockchain technology among regulators and practitioners. Additionally, raising awareness about the potential and benefits of blockchain technology can aid public and business understanding and implementation of the technology. The Monetary Authority of Singapore (MAS) is a noteworthy example. It has advanced the awareness and usage of blockchain technology in the financial sector by conducting seminars and organizing a blockchain innovation challenge.

5. Future Prospects for Blockchain Technology in Transforming Global Trade

5.1. Emerging trends, innovations, and developments in the field of blockchain technology

In the blockchain technology field, emerging trends, innovations and developments continue to evolve dynamically.

Blockchain Features	Distributed storage of data, smart contracts, trustworthy, decentralised, information transparency, tamperproof
Classical blockchain composition	Data Layer, Network Layer, Consensus Layer, Incentive Layer, Contract Layer, Application Layer
Blockchain form	Public chain, private chain, alliance chain
Stages of blockchain development	Blockchain 1.0 Digital Currency Stage, Blockchain 2.0 Smart Contract Stage, Blockchain 3.0 Extended Application Stage
Scenario Applications of Blockchain in International Trade	Full-process collaborative services, paperless process operation, foreign trade logistics supervision, international settlement and digital finance, import and export commodity traceability

Figure 1: Characteristics of blockchain, scenario applications in the field of international trade
Source: Publicly available data on the web

Firstly, Decentralised Finance (DeFi) is currently a popular topic. It involves building financial systems that don't rely on intermediaries, through the use of smart contracts and distributed ledger technology. DeFi applications, including decentralised exchanges, lending platforms, stable coins and prediction markets, offer users more open, efficient and transparent financial services.

Secondly, privacy protection is now a significant concern in the field of blockchain technology. To address this issue, techniques such as zero-knowledge proof, homomorphic encryption and multi-party computation have been widely studied to protect users' personal information and transaction data, while still maintaining the tamperability and decentralised nature that are inherent in blockchain technology. The aim of these techniques is to protect users' personal information and transaction data, while retaining the tamperability and decentralised nature which are key advantages of blockchain technology.

Cross-chain technologies and interoperability have gained significant attention due to multiple blockchain networks' emergence, necessitating the transfer of data and assets across chains. Cross-chain technologies, including atomic swaps, side-chains, and relay chains, have been extensively researched and implemented to enhance interoperability within the blockchain ecosystem.

With the increasing concern over environmental problems resulting from energy consumption and carbon emissions, sustainable development has emerged as a significant area of innovation. Green blockchain projects and protocols have emerged with the purpose of decreasing blockchain energy consumption and promoting sustainable blockchain development through the adoption of clean energy, energy-efficient algorithms, and consensus mechanisms.

Additionally, there has been a proposal for centralised financial bridging technology that aims to connect traditional and blockchain-based finance. This technology aims to provide users with greater liquidity, lower transaction costs, and improved accessibility to financial services. This technology helps to create a bridge that encourages better cooperation between centralised and decentralised finance.

As a final point, enterprise-level blockchain solutions are becoming more prominent. In addition to cryptocurrencies and financial applications, blockchain technology is crucial in creating trustworthy and verifiable enterprise networks. Such solutions offer a secure, transparent, and efficient method to record and verify data, which can be applied in various domains like supply chain management, digital identity verification, and intellectual property protection.

5.2. Assess the scalability and interoperability challenges faced by blockchain in the context of global trade.

One of the significant obstacles for the utilization of blockchain in international trade is its limited scalability. Since each block in a blockchain must be verified by all nodes on the network, the system often bogs down when processing large numbers of transactions, leading to delays in transaction processing, which is a major problem in the operation of blockchain technology in the field of international trade²⁵.

For example, the challenges faced by the Bitcoin network in handling highly concurrent transactions result in long transaction confirmation times. To address this issue, projects such as the Lightning Network have been proposed as a second-tier solution for Bitcoin, aiming to improve Bitcoin's transaction scalability and expand its use in global trade.

Another challenge is interoperability between blockchain systems. Global trade involves multiple participants and multiple systems, such as supply chain management, cargo tracking, and payment systems, each using different standards and technologies. To enable interoperability between systems, the International Trade Digitalization Initiative (ITDI) is an initiative to promote standardisation and interoperability in global trade. The initiative aims to facilitate connectivity and data exchange between different blockchain systems by developing common interface specifications and promoting standardisation efforts. Another possible risk is the identification of significant inadequacies in the privacy framework, which may allow malicious players to exploit system vulnerabilities and engage in fraudulent or deceptive activities. Regarding the traceability of products, blockchain technology poses challenges when it comes to evaluating the role of potentially harmful nodes that may adversely affect food safety monitoring.

5.3. Insights and predictions on the long-term impact of blockchain on international trade practices and systems

Blockchain technology has a wide range of potential applications in international trade. First, blockchain's decentralised, untamperable and traceable features bring significant improvements to supply chain management. By recording and sharing transaction data on the blockchain, participants can achieve real-time and reliable logistics tracking and traceability, reducing the risk of information asymmetry and fraudulent behaviour. This transparency enhances trust and reliability of transactions.

In addition, blockchain can streamline and automate international trade processes, increasing efficiency and reducing costs. Smart contracts are automated contracts executed on the blockchain that enable real-time, transparent transactions and settlements between participants. Through smart contracts, not only can cumbersome paper processing be eliminated, but the number and involvement of intermediaries can also be reduced, resulting in lower transaction costs and shorter transaction cycles.

25. Shi Qin. (2023). Research on the application of blockchain technology in the field of digital trade - based on the perspective of the whole process of international trade. *China Business Journal* (01), 45-49. doi:10.19699/j.cnki.issn2096-0298.2023.01.045.

Blockchain also brings new business models and market opportunities for international trade. Taking decentralised finance (DeFi) as an example, blockchain technology enables investors across the globe to conduct cross-border transactions and investments directly, bypassing the restrictions of traditional financial institutions. This innovative financial model creates more opportunities for small and medium-sized enterprises (SMEs) to participate in global trade and contributes to the development of the global economy.

In international trade, blockchain can also improve supply chain sustainability and quality assurance. Through blockchain technology, the origin and transfer records of products can be traced and verified, ensuring compliance and quality reliability. This is important for promoting sustainable development and the provision of quality products, while also enhancing consumer trust and satisfaction with products.

Currently, the process of global trade is becoming increasingly computerized and faster. The use of blockchain and digital currency technology in international trade is already a clear trend. If a higher level of integration can be achieved, the security systems for the logistics, transfer, and transactional information of international trade will be greatly enhanced²⁶.

6. Conclusion

The analysis above leads to the conclusion that blockchain technology holds great potential and opportunities in the international trade field. The decentralised and tamper-proof nature of this technology considerably improves supply chain management by enhancing transparency, trust, and traceability. The application of blockchain technology has resulted in supply chain tracking and verification becoming more efficient and reliable while mitigating the risks of information asymmetry and fraud, and further improving the security and sustainability of trade.

Furthermore, blockchain technology has the ability to simplify and automate international trade processes, leading to real-time, transparent transactions and settlements through the usage of smart contracts. The above leads to lower costs, reduced intermediate links, faster transaction cycles, and increased efficiency. Blockchain technology offers more opportunities for small and medium-sized enterprises (SMEs) to engage in global trade, thus contributing to economic development and inclusive growth.

Nevertheless, the application of blockchain technology in international trade encounters several challenges and obstacles. More attention needs to be given to the absence of technical standards, scalability problems, privacy, and data security. Furthermore, legal and regulatory frameworks must be established to guarantee compliance and consumer protection.

To address these challenges, future research and practical applications should prioritize developing and promoting technical standards, improving the scalability and performance of blockchain, and enhancing privacy protection and data security. Moreover, it is essential to actively encourage international cooperation and reform of the legal and regulatory framework to facilitate the implementation of blockchain technology.

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