

**NATIONAL TECHNICAL UNIVERSITY OF UKRAINE
"IGOR SIKORSKY KYIV POLYTECHNIC INSTITUTE"
FACULTY OF MANAGEMENT AND MARKETING
DEPARTMENT OF INTERNATIONAL ECONOMY**

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December “____” 2023 p.

**MASTER THESIS
for a master's degree according
to the educational program
"International Economics"
specialty 051 "Economics"**

**on the theme: "IMPROVING THE BILATERAL COOPERATION
BETWEEN UKRAINE AND THE PEOPLE'S REPUBLIC OF CHINA"**

Completed:

student of the 2nd year, group US-23mp

Wang Yutong

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Reviewer:

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the Department of Economic Cybernetics,
Katerina BOYARINOVA

I certify that in this
master's thesis there are no
borrowings from the works
of other authors without
corresponding references

Student Wang Yutong

Kyiv - 2023

**НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ УКРАЇНИ
"КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ ІГОРЯ СІКОРСЬКОГО"
ФАКУЛЬТЕТ МЕНЕДЖМЕНТУ ТА МАРКЕТИНГУ
КАФЕДРА МІЖНАРОДНОЇ ЕКОНОМІКИ**

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До захисту допущено
Завідувач кафедри

УДК 339.92

_____ Сергій ВОЙТКО
Грудень "____" 2023р.

**МАГІСТЕРСЬКА ДИСЕРТАЦІЯ
на здобуття ступеня магістра
за освітньо-професійною програмою
«Міжнародна економіка»
спеціальності 051 "Економіка"**

**на тему: «УДОСКОНАЛЕННЯ ДВОСТОРОННЬОГО
СПІВРОБІТНИЦТВА МІЖ УКРАЇНОЮ ТА КИТАЙСЬКОЮ
НАРОДНОЮ РЕСПУБЛІКОЮ»**

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Specialty - 051 "Economics"

Educational and professional program "International Economics"

APPROVED

Head of the Department

_____ Serhii VOITKO

November "18" 2023

OBJECTIVE

for a master's thesis of a student

Wang Yutong

1. The theme is "Improving the bilateral cooperation between Ukraine and the People's Republic of China", scientific supervisor – Korohodova Olena Oleksandrivna, Associate Professor of Department of International Economics, Ph.D. in Economics, Associate Professor, approved by the order of the University from November 09, 2023, No 5212-c.
2. The deadline for students to submit a dissertation is December 18, 2023.
3. The Objective of the research is to improve the theoretical provisions and to provide reasonable suggestions for improving bilateral cooperation between Ukraine and China.

4. Initial data: CEPII database, journals and professional publications, Ukrainian legal framework, international scientific conference materials, United Nations UN Comtrade database, World Bank WDI database.

5. List of tasks to be developed:

Theory and methodology section:

1. The economic nature and basic principles of cooperation between the two parties;
2. The content and principles of cooperation between the two parties;
3. The tools and methods of assessment of bilateral cooperation;

Research and analysis section:

1. Ukraine-China economic and trade integration and potential analysis;
2. Assessing bilateral cooperation between Ukraine and China in the field of activities of multinational companies;
3. Analysis of Ukraine-China bilateral cooperation, focusing on the impact of technology transfer and migration processes;

Recommendation section:

1. Forecast of bilateral cooperation prospects between Ukraine and China;
 2. Analysis of the causes of Ukraine-China bilateral economic and trade development problems
 3. Recommendations for improving bilateral cooperation between Ukraine and China;
6. Approximate list of graphic (illustrative) material: not less than 20 tables and not less than 9 figures.
7. Approximate list of publications: 79 publications
8. Dissertation section consultants *

Section	Surname, initials and position consultant	Signature, date
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		task issued	task accepted

9. Date of issuance of the task: November 01 2023

Calendar plan

№	Name of stages	Term of implementation	Note
1	Selection of topics for master's theses (with supervisors) and their approval at the meeting of the department	October 20, 2023	done
2	Issuance of the task	November 01 2023	done
3	Development of the content (plan) of the master's dissertation	November 10, 2023	done
4	Selection of literature on the research topic and its analysis	November 10, 2023	done
5	Preparation of the theoretical chapter and coordination of its content with the supervisor	November 20, 2023	done
6	General research on the chosen topic of scientific research	November 27, 2023	done
7	Carrying out a comprehensive analysis of the practical component of scientific research	December 01, 2023	done
8	Final completion of the second chapter of the master's thesis;	December 04, 2023	done
9	Preparing the materials of the third chapter	December 09, 2023	done
10	Generalization of the received scientific results, use the materials of world published data and experience for further analysis and preparation of the general conclusions;	December 11, 2023	done
11	Registration of the master's dissertation and its submission for check to the scientific supervisor	December 12, 2023	done
12	Elimination of the shortcomings revealed by the head and the reviewer, preparation of a report and visual materials for defense	December 14, 2023	done
13	Checking the master's thesis for text overlaps and plagiarism	December 16, 2023	done
14	Submission of a master's thesis for review by a reviewer	December 18, 2023	done
15	Defense of the master's dissertation before the State Examination Commission according to the approved schedule.	December 23, 2023	

Student _____

Wang Yutong

Supervisor _____

Olena KOROHODOVA

ABSTRACT

Pages 98	Drawings 9	Tables 20	Applications
Research by example:	national economies and interconnections between countries		
The aim of the study:	to scrutinize the bilateral economic and trade relations between China and Ukraine, and to assess prevailing trade and investment conditions and offer reference suggestions for both enterprises and governments		
Objectives of the study	<ul style="list-style-type: none"> – Reveal the origin and nature of bilateral cooperation; – Study the operating mechanism of bilateral cooperation; –Analyze the actual situation of bilateral trade development between Ukraine and China; –Analyzed the scale and structural characteristics of Ukraine-China bilateral trade from two aspects: the scale and trend of bilateral trade between Ukraine and China, and the structural characteristics of imported and exported commodities; –Calculated the degree of trade integration between Ukraine and China, and studied the development potential of bilateral trade between Ukraine and China by constructing a gravity model; –Analyze problems existing in the development of bilateral trade between Ukraine and China and their causes; –Analyze current trade and investment conditions and provide some reference recommendations for businesses and governments; 		
Subject of study:	The study deals with the intricate relations between Ukraine and People's Republic of China, and identifies the conditions of their cooperation.		

Object of study:	is the process of improving bilateral cooperation between Ukraine and China
Scientific novelty	The research contributes scientific novelty by advancing and further developing the methodological foundations for the enhancement of international scientific and technical cooperation, foreign direct investment, migration process and international trade between countries on a bilateral basis. The study also adapted the existing methodics of international trade research by building a gravity model to determine the one of prospects of bilateral cooperation between Ukraine and China.

Keywords: international cooperation, Ukraine, China, People's Republic of China, developing country, bilateral cooperation, trade integration, sustainable development.

РЕФЕРАТ

Сторінки 98	Рисунки 9	Таблиці 20	Додатки
Дослідження на прикладі:	національних економік та взаємозв'язків між країнами		
Мета дослідження:	Метою дослідження є ретельне дослідження двосторонніх економічних та торговельних відносин між Китаєм та Україною, аналізування провідних умов торгівлі та інвестування, а також рекомендації та пропозиції як для підприємств, так і для урядів		
Завдання дослідження	<ul style="list-style-type: none"> – розкрити походження та характер двостороннього співробітництва; – вивчити механізм функціонування двостороннього співробітництва; – проаналізувати реальний стан розвитку двосторонньої торгівлі між Україною та Китаєм; – проаналізувати масштаби та структурні характеристики двосторонньої торгівлі між Україною та Китаєм з двох аспектів: масштаби та тенденції двосторонньої торгівлі між Україною та Китаєм та структурні характеристики імпорتنих та експортних товарів; – розрахувати ступінь торговельної інтеграції між Україною та Китаєм та дослідити потенціал розвитку двосторонньої торгівлі між Україною та Китаєм шляхом побудови гравітаційної моделі; – проаналізувати проблеми, що існують у розвитку двосторонньої торгівлі між Україною та Китаєм, та виявити їхні причини; – окреслити поточні торговельні та інвестиційні умови білатерального співробітництва і надати рекомендації для бізнесу та урядів країн 		

Предмет дослідження:	у дослідженні розглядаються складні відносини між Україною та Китайською Народною Республікою, визначаються умови їхнього співробітництва.
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Об'єкт дослідження:	процес удосконалення двостороннього співробітництва між Україною та Китаєм
Наукова новизна:	Подальший розвиток отримали методологічні основи для покращення міжнародного науково-технічного співробітництва, збільшення прямих іноземних інвестицій, регулювання міграційного процесу та міжнародної торгівлі між країнами на двосторонній основі. У роботі також адаптовано наявну методичку дослідження міжнародної торгівлі шляхом побудови гравітаційної моделі для визначення однієї з перспектив двостороннього співробітництва між Україною та Китаєм.

Ключові слова: міжнародне співробітництво, Україна, Китай, Китайська Народна Республіка; країна, що розвивається, двостороннє співробітництво, торгова інтеграція, сталий розвиток.

ANNOTATION

The master's thesis on the topic: "IMPROVING THE BILATERAL COOPERATION BETWEEN UKRAINE AND THE PEOPLE'S REPUBLIC OF CHINA". The thesis consists of 96 pages of printed text, including 20 tables and 9 figures.

The purpose of this study. The purpose of this study is to scrutinize the bilateral economic and trade relations between China and Ukraine, and to assess prevailing trade and investment conditions and offer reference suggestions for both enterprises and governments.

We use the analysis results of this thesis, combined with the current trade and investment conditions, to provide some reference suggestions for enterprises and governments. In this study, we will try to identify and evaluate the main areas of cooperation between China and Ukraine; determine the main directions and forms of cooperation between Ukraine and China; analyze the development of political relations between Ukraine and China at the government level; and understand the current situation of economic cooperation between Ukraine and China. main issues and prospects. In accordance with the set goal, the following **tasks were defined and solved in the dissertation:** to analysis of the content and principles of bilateral cooperation; to tools and methods of evaluating bilateral cooperation; to analysis of economic and trade integration and potential between Ukraine and China; to evaluation of Ukrainian-Chinese bilateral cooperation in the field of multinational corporate activities; to analysis of Ukraine - bilateral cooperation with China, focusing on the impact of technology transfer and immigration processes; to forecast of the prospects of bilateral cooperation between Ukraine and China; Analysis of the causes of bilateral economic and trade development problems between Ukraine and China; to suggestions for improving bilateral cooperation between Ukraine and China;

The object of the study is the process of improving bilateral cooperation between Ukraine and China.

Subject of study: The study deals with the intricate relations between Ukraine and People's Republic of China, and identifies the conditions of their cooperation.

Scientific novelty. The research contributes scientific novelty by advancing and further developing the methodological foundations for the enhancement of international scientific and technical cooperation, foreign direct investment, migration process and international trade between countries on a bilateral basis. The study also adapted the existing methodics of international trade research by building a gravity model to determine the one of prospects of bilateral cooperation between Ukraine and China.

Keywords: international cooperation, Ukraine, China, People's Republic of China, developing country, bilateral cooperation, trade integration, sustainable development.

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INTRODUCTION

Actuality of theme. In the current context, the escalation of globalization and inter-country competition imposes limitations on autonomous economic and social progress. Consequently, there is a global trend toward reforming bilateral and multilateral cooperation. A comprehensive examination of the intricacies of bilateral cooperation in international trade is of interest, offering a holistic approach to understanding the nuances of the Ukraine-China economic relationship.

The purpose of this study. The purpose of this study is to scrutinize the bilateral economic and trade relations between China and Ukraine, and to assess prevailing trade and investment conditions and offer reference suggestions for both enterprises and governments.

We use the analysis results of this thesis, combined with the current trade and investment conditions, to provide some reference suggestions for enterprises and governments. In this study, we will try to identify and evaluate the main areas of cooperation between China and Ukraine; determine the main directions and forms of cooperation between Ukraine and China; analyze the development of political relations between Ukraine and China at the government level; and understand the current situation of economic cooperation between Ukraine and China. main issues and prospects. In accordance with the set goal, the following **tasks were defined and solved in the dissertation:** to analysis of the content and principles of bilateral cooperation; to tools and methods of evaluating bilateral cooperation; to analysis of economic and trade integration and potential between Ukraine and China; to evaluation of Ukrainian-Chinese bilateral cooperation in the field of multinational corporate activities; to analysis of Ukraine - bilateral cooperation with China, focusing on the impact of technology transfer and immigration processes; to forecast of the prospects of bilateral cooperation between Ukraine and China; Analysis of the causes of bilateral economic and trade development problems between Ukraine and China; to suggestions for improving bilateral cooperation between Ukraine and China;

The object of the study is the process of improving bilateral cooperation between Ukraine and China.

Subject of study: The study deals with the intricate relations between Ukraine and People's Republic of China, and identifies the conditions of their cooperation.

Research methods. The study adopts a comprehensive approach, including a thorough literature review, a comparative analysis of the economic and trade dynamics between Ukraine and China, together with other relevant countries (Romania, Moldova, Poland, Slovakia, Hungary) and the application of trade integration exponential and gravity models.

Scientific novelty. The research contributes scientific novelty by advancing and further developing the methodological foundations for the enhancement of international scientific and technical cooperation, foreign direct investment, migration process and international trade between countries on a bilateral basis. The study also adapted the existing methodics of international trade research by building a gravity model to determine the one of prospects of bilateral cooperation between Ukraine and China.

Practical significance of the obtained results. Based on the analysis and construction of the model, this study offers recommendations for enhancing bilateral cooperation between Ukraine and China, which can serve as valuable guidelines for international companies and state governments, fostering the strengthening of international economic relations.

Thesis structure. The book consists of an introduction, a table of contents, an introduction, three chapters, a conclusion, and a list of the literature used. The book consists of 96 pages of printed text, including 20 tables and 9 figures.

Essay published. The master's thesis was approved. The results of the work were made public at the XIX Scientific and Practical Conference of Students, Graduate Students and Young Scientists "Efficiency and Automation of Engineering Solutions in Instrumentation", which took place in December 2023 at Igor Sikorsky KPI, and published in the form of an abstract:

- Wang Yutong, Olena Korohodova. THE ROLE OF FOREIGN DIRECT INVESTMENT FOR BILATERAL COOPERATION IN THE ERA OF INDUSTRY 4.0. Zbiornik prats XIXh Vseukrainskoi naukovo-praktychnoi konferentsii studentiv, aspirantiv ta molodykh vchenykh "Efektyvnist ta avtomatyzatsiia inzhenernykh rishen u prykladobuduvanni", 20-21 hrudnia 2023 r. K.: PBF, KPI im. Ihoria Sikorskoho. - 2023.
- An article was also published in the scientific journal. Publisher: Taras Shevchenko National University of Kyiv, Publishing center "Kyiv University". category B. Wang Y., Korohodova O., Moiseienko T., Chernenko N. INTERNATIONAL TRADE AS IMPORTANT ELEMENT OF BILATERAL COOPERATION BETWEEN UKRAINE AND CHINA Theoretical and applied issues of economics. Kyiv, 2023. No. 2(47). The journal is in the List of specialized scientific publications, which are to publish the main results of dissertations in Economic Sciences (Resolution of the Presidium of NAS of Ukraine № 1413 of 24.10.2017)

ВСТУП

Актуальність теми. У поточному контексті ескалація глобалізації та конкуренції між країнами накладає обмеження на автономний економічний і соціальний прогрес. Отже, у світі спостерігається тенденція до реформування двостороннього та багатостороннього співробітництва. Цікавим є комплексний розгляд тонкощів двостороннього співробітництва у сфері міжнародної торгівлі, що пропонує цілісний підхід до розуміння нюансів українсько-китайських економічних відносин.

Мета даного дослідження. Метою цього дослідження є детальне вивчення двосторонніх економічних і торговельних відносин між Китаєм і Україною, а також оцінка переважаючих умов торгівлі та інвестицій і надання довідкових пропозицій як для підприємств, так і для урядів.

Ми використовуємо результати аналізу цієї дисертації в поєднанні з поточними умовами торгівлі та інвестицій, щоб надати деякі довідкові пропозиції для підприємств та урядів. У цьому дослідженні ми спробуємо визначити та оцінити основні напрями співпраці між Китаєм та Україною; визначити основні напрями та форми співробітництва між Україною та Китаєм; аналізувати розвиток політичних відносин між Україною та Китаєм на урядовому рівні; та зрозуміти поточний стан економічного співробітництва між Україною та Китаєм. основні проблеми та перспективи. Відповідно до поставленої мети наступне **у дисертації були визначені та вирішені завдання:** до аналізу змісту та принципів двостороннього співробітництва; інструментам і методам оцінки двостороннього співробітництва; аналізу економічної та торговельної інтеграції та потенціалу між Україною та Китаєм; оцінці українсько-китайського двостороннього співробітництва у сфері транснаціональної корпоративної діяльності; до аналізу України – двостороннього співробітництва з Китаєм, акцентуючи увагу на впливі трансферу технологій та імміграційних процесів; спрогнозувати перспективи двостороннього співробітництва між Україною та Китаєм; Аналіз причин двосторонніх проблем розвитку економіки та торгівлі між Україною та Китаєм; на

пропозиції щодо вдосконалення двостороннього співробітництва між Україною та Китаєм;

Об'єкт дослідження є процес удосконалення двостороннього співробітництва між Україною та Китаєм.

Предмет дослідження: У дослідженні розглядаються складні відносини між Україною та Китайською Народною Республікою, визначаються умови їхнього співробітництва.

Методи дослідження. Дослідження використовує комплексний підхід, включаючи ретельний огляд літератури, порівняльний аналіз динаміки економіки та торгівлі між Україною та Китаєм разом з іншими відповідними країнами (Румунія, Молдова, Польща, Словаччина, Угорщина) та застосування експоненціального показника торгової інтеграції. і моделі гравітації.

Наукова новизна. Дослідження вносить наукову новизну шляхом просування та подальшого розвитку методологічних основ для посилення міжнародного науково-технічного співробітництва, прямих іноземних інвестицій, міграційного процесу та міжнародної торгівлі між країнами на двосторонній основі. У дослідженні також адаптовано існуючу методику дослідження міжнародної торгівлі шляхом побудови гравітаційної моделі для визначення однієї з перспектив двостороннього співробітництва між Україною та Китаєм.

Практичне значення отриманих результатів. На основі аналізу та побудови моделі в цьому дослідженні пропонуються рекомендації щодо посилення двосторонньої співпраці між Україною та Китаєм, які можуть слугувати цінними орієнтирами для міжнародних компаній та урядів держав, сприяючи зміцненню міжнародних економічних відносин.

Структура дипломної роботи. Книга складається зі вступу, змісту, вступу, трьох розділів, висновку та списку використаної літератури. Книга складається з 96 сторінки друкованого тексту, у тому числі 20 таблиць і 9 рисунків.

Нарис опубліковано. Затверджено кандидатську роботу. Результати роботи оприлюднено на XIX науково-практичній конференції студентів, аспірантів і

молодих вчених «Ефективність та автоматизація інженерних рішень у приладобудуванні», яка відбулася у грудні 2023 року в КПІ імені Ігоря Сікорського, та опубліковано у формі реферату:

- Ван Ютонг, Олена Корогодова. РОЛЬ ПРЯМИХ ІНОЗЕМНИХ ІНВЕСТИЦІЙ ДЛЯ ДВОСТОРОННЬОГО СПІВРОБІТНИЦТВА В ЕПОХУ ІНДУСТРІЇ 4.0. Збірник праць XIX Всеукраїнської науково-практичної конференції студентів, аспірантів та молодих вчених "Ефективність та автоматизація інженерних рішень у підприємстві", 20-21 грудня 2023 р. / Зб. К.: ПБФ, КПІ ім. Ігоря Сікорського. - 2023 рік.
- Також була опублікована стаття в науковому журналі. Видавець: Київський національний університет імені Тараса Шевченка, Видавничий центр «Київський університет». категорія Б. Ван Ю., Корогодова О., Моїсеєнко Т., Черненко Н. МІЖНАРОДНА ТОРГІВЛЯ ЯК ВАЖЛИВИЙ ЕЛЕМЕНТ ДВОСТОРОННЬОГО СПІВРОБІТНИЦТВА УКРАЇНИ ТА КИТАЮ Теоретичні та прикладні питання економіки. Київ, 2023. № 2(47). Журнал входить до Переліку фахових наукових видань, у яких публікуються основні результати дисертаційних робіт з економічних наук (Постанова Президії НАН України № 1413 від 24.10.2017 р.)

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CHAPTER 1. THEORETICAL FOUNDATIONS OF INTERNATIONAL TRADE THEORY AND REGIONAL ECONOMIC AND TRADE COOPERATION

1.1. Economic essence and basic principles of international cooperation

International cooperation is a basic form of international interaction. International cooperation refers to the policy coordination behavior among international actors in certain issue areas based on the basic agreement or partial agreement of mutual interests. International cooperation is not only a mode and state of communication between countries and the international community, but also one of the basic principles followed by the international system. Seeking international cooperation is the instinct and way of existence of a country. For policymakers of any country, international cooperation is sought in order to maximize and optimize their national interests. Therefore, in essence, international cooperation is not only a means to realize its foreign strategy, but also the main body of national diplomacy. It should be noted that it is impossible to study all cooperation phenomena in international society. International relations has never been a perfect science. In order to keep the theoretical construction as "tight as possible", this study defines the concept of "international cooperation" as follows [1].

First, international cooperation is cooperation between international actors in political, economic, cultural, social, security, environmental and other aspects. It reflects the relationship between countries and between countries and the international community (including international systems, international mechanisms, international norms, international agreements, international platforms), and the interaction between different international systems. International organizations, international mechanisms, international norms, international agreements, and international platforms mainly refer to the composition or participation of sovereign states. States are always the main actors in international cooperative relations.

Second, international cooperation mainly manifests itself in a country's diplomatic behavior and foreign policy. The motivation, content, methods and results of international cooperation reflect the will of the country. Therefore, international cooperation is often reflected through diplomatic strategies, diplomatic behaviors, diplomatic content, diplomatic results, etc. However, compared with diplomacy in the traditional sense, international cooperation is a more three-dimensional, comprehensive and multi-system concept. In essence, international cooperation is not only a diplomatic process to achieve national interests and the common interests of mankind, but also the result of interactions between international actors.

Third, cooperation and conflict are an inseparable unity of opposites. Where there is cooperation, there is conflict. Cooperation is not a state without conflict. On the contrary, there is also cooperation in conflict, and avoiding conflict is also the motivation for cooperation. "Worldview", "capabilities", and "systems" are three relatively balanced variables that affect international cooperation. The results of the evolution of the three variables are different and will produce different states, namely, a state of peace and win-win, a state of competition and cooperation, and a state of conflict and war.

The effectiveness and sustainability of bilateral cooperation between nations extend beyond mere diplomatic agreements, necessitating a comprehensive analysis of multifaceted factors. This thesis seeks to explore the intricate dynamics of bilateral relations, with a particular focus on the impact of international trade, foreign direct investment (FDI), technology transfer initiatives, and migration processes [5].

1. International trade. International trade is crucial to international cooperation. International trade can expand the international division of labor and thereby expand the scope of cooperation. International trade provides opportunities to enter foreign markets, thereby promoting cooperation between businesses. When facing a depressed economic environment, international trade can provide enterprises and families with accurate external choices and provide guarantee for international cooperation. International trade provides countries with a vast market and enables companies to

expand sales and production scale. Through international trade, companies can obtain more resources and technology, improve production efficiency and product quality. In addition, international trade also promotes the optimization of global division of labor and resource allocation, allowing countries to focus on their own advantageous industries and achieve higher efficiency and competitiveness. International trade is not only the exchange of goods and services, but also an important mechanism to promote cooperation and understanding between countries. Through trade, countries establish connections and interdependence, and promote international political, economic and cultural exchanges. Trade also provides the basis for international organizations and multilateral cooperation. Resolve trade disputes and problems through consultation and cooperation and maintain global trade order and stability. Although international trade brings many benefits, it also faces some challenges. Issues such as trade protectionism, trade imbalance, and intellectual property protection still exist and may have a negative impact on international trade. However, with the deepening of globalization, more and more countries realize the importance of trade cooperation and strengthen cooperation and open markets through multilateral and bilateral agreements. In the future, international trade is expected to continue to provide new opportunities and challenges for global economic development and cooperation. International trade is an important engine for economic development and global cooperation. It provides a broad market and cooperation platform for the country to promote economic growth and innovation [2].

2. Foreign direct investment. The Organization for Economic Cooperation and Development and the United Nations Conference on Trade and Development define foreign direct investment as: an enterprise in one economy (called a parent company or foreign investor) invests in another economy for continued control and benefit rights or the establishment of a long-term relationship. Investments made by enterprises (called foreign subsidiaries or branches); the World Trade Organization defines foreign direct investment as: investments initiated by investors in one country in order to obtain the management rights of an asset in another country; China's Ministry of Commerce The

definition given is: Domestic investors invest in physical, cash or intangible. Based on traditional international trade theory, scholars earlier proposed the trade substitution theory of foreign direct investment, and most of the early empirical research conclusions supported this substitution relationship. The reason for the formation of the substitution theory was mainly affected by the investment type and export commodity structure at that time. On the one hand, it was because the early international division of labor was not obvious and horizontal investment was mostly in foreign direct investment. Part of the productivity of the home country could be transferred through foreign direct investment, thus replacing exports; On the other hand, because the early export commodity structure was dominated by final products, the added value of export products basically came from the home country.

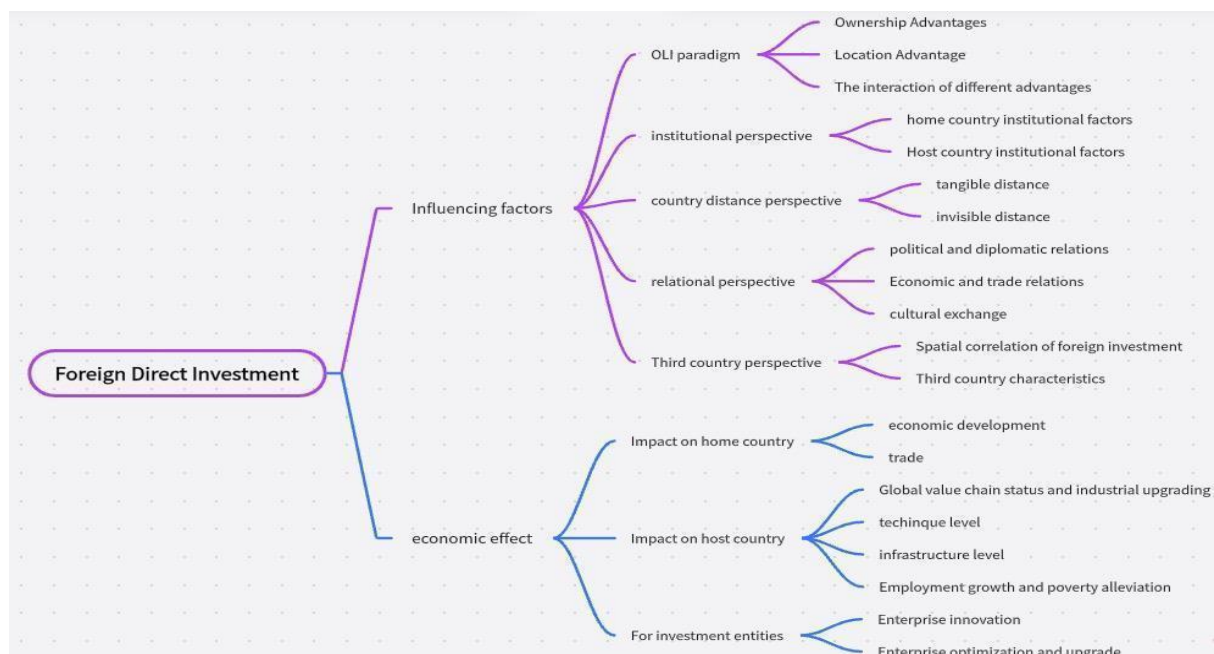


Figure 1.1 Theoretical analysis of foreign direct investment

Compiled by the author based on [78]

Foreign direct investment is active in developing countries and exhibits characteristics that are different from the investment behavior of developed countries. Some of the theoretical research areas involve the relationship between investment and trade. The representative theories are as follows:

1. Monopoly advantage theory. Hymer (1960) first proposed the foreign direct investment theory centered on enterprise advantages. This theory holds that the motivation for enterprises to conduct foreign direct investment comes from the fact that they have more monopoly advantages over similar enterprises in the host country and can produce in the host country to obtain more profits. Due to the incompleteness of the market, enterprises can maintain this monopoly advantage, which in turn becomes the decisive factor in foreign direct investment [18].

2. Internalization theory is based on Coase's enterprise theory. Buckley and Casson (1976) proposed internalization theory. This theory explains the problem of monopoly advantages being unable to exert itself. It is believed that enterprises in order to save transaction costs or protect knowledge The market for intermediate products is imperfect and production will be completed within the enterprise. If production needs to be carried out in other countries, multinational corporations will be established and establish internal markets through foreign direct investment. At this time, multinational corporations are a new organizational form of international production division of labor. Internalization theory can well explain the motivations of foreign direct investment. When the trade cost of intermediate goods is high, companies will integrate development, production and sales through foreign direct investment, thereby replacing the export of intermediate goods [19].

3. Dunning's (1977) eclectic theory of international production integrates the location advantage theory into the monopoly advantage theory and internalization theory. It is also called the "OIL paradigm". That is, if an enterprise has the three advantages of ownership, internalization and location at the same time, They are more willing to choose to use external direct [20].

Investment replaces export to participate in the international division of labor. When an enterprise only has ownership and internalization advantages, it is not enough to explain the enterprise's decision to set up abroad rather than produce and export domestically. Only when location advantages are introduced can it explain the enterprise's choice between foreign direct investment and exports. decision. It provides

a theoretical basis for all-round decision-making in the operation of multinational companies. Multinational companies can determine the form of participating in international economic activities based on their own ownership advantages, internalization advantages and location advantages [25].

3. Technology transfer is the next important factor of international cooperation. Technology transfer can promote technological innovation and progress and promote the development of global technology. Through technology transfer, advanced technologies and experiences from developed countries can be transferred to developing countries, helping them accelerate technological and industrial upgrading. At the same time, countries that accept technology transfer can also learn new technologies and management experience, injecting new impetus into the development of their own enterprises. Technology transfer can increase cooperation and exchanges in international trade. Through technology transfer, international companies can cooperate with each other, share technology and resources, and promote each other's development. Technology transfer not only enables companies to improve product quality and competitiveness, but also improves production efficiency, reduces costs, and expands market share. This will further promote the development of international trade and promote the economic prosperity of various countries. Technology transfer helps narrow the gap between developing and developed countries. Advanced technologies and management experience from developed countries can be transferred to developing countries through technology transfer, helping them speed up their development and improve their global competitiveness. Technology transfer also helps developing countries develop their own advantageous industries, reduce their dependence on imported technologies and products, and improve their independent innovation capabilities. Technology transfer can both promote international trade cooperation and intensify competition. Through technology transfer, companies can share technology and markets and promote cooperative development. But at the same

time, technology transfer may also lead to technological monopoly and intensified competition. Developed countries have mastered the core technology through technology transfer, while developing countries may be in a passive position of technology dependence. This may lead to imbalances caused by technology and further intensify the competitive relationship between countries [3].

4. The migration process is an important part of the international economy. Understanding the migration process is critical to the international economy because it directly affects the composition of the workforce, cultural exchange, and cross-border skills flows. Studying these dynamics is crucial for developing informed policies and promoting international cooperation, as effective migration management contributes to economic development, social integration and cooperative initiatives between countries. Faced with the surge of "anti-globalization" thoughts and the uncertainty of the international economy, it is very important to strengthen global economic cooperation by leveraging the power of international talents. To sum up, international migration has made a huge contribution to international cooperation [4].

1.2. Content and principles of bilateral cooperation

Since the establishment of diplomatic relations between the two countries in 1992, China-Ukraine relations have become increasingly close. The two countries established a strategic partnership in 2011. With the continuous promotion and development of economic and trade between the two sides, the bilateral trade volume exceeded US\$10 billion for three consecutive years from 2011 to 2013. By 2014, although bilateral economic growth and trade volume dropped by 23%, the Chinese market was irreplaceable for Ukraine and remained Ukraine's second largest trading partner.

As of 2019, China has become Ukraine's largest trading partner by trade volume. Since entering the new century, China has attached great importance to the reconstruction of the Silk Road Economic Belt, and Ukraine has also expressed strong support for China's reconstruction. This is an opportunity to develop a modern national

logistics infrastructure and attract Chinese investment. Ukraine's geographical location creates a unique business, transportation and logistics bridge between Europe and Asia. China and Ukraine have broad prospects for developing modern transportation corridors. The corridor passes through Ukraine and connects Germany, Austria, the Czech Republic, Slovakia, Hungary, Poland, Kazakhstan, Mongolia and China. It is also the shortest of all routes, reducing the cost and transportation of products from producing countries to demand countries. time, including the EU. The opening of such routes will not only benefit Ukraine and China, but also Asian countries. Regrettably, the current initiative is no longer a priority for Ukraine due to the aggressive actions of Russia, which has launched aggressive attacks on Ukraine, causing destruction to territories, ecosystems, loss of life, and damage to cultural values.

In recent years, Ukraine-China trade and investment have achieved constructive results. According to the review of relevant Ukrainian customs data, since 2013, Ukraine's second largest export market and import source has become China. The global financial crisis that broke out in 2009 also had an impact on bilateral trade. However, excluding 2009, 2002, 2003, etc. to 2018, bilateral trade has grown at an average annual rate of 28.2%

Bilateral cooperation pursues global trade liberalization and opposes various forms of trade obstacles, trade barriers and trade discrimination, laying an ideal foundation for fair trade exchanges, mutual benefit and global economic progress in international trade. After the WTO expanded the scope of the multilateral trading system, the principles of fairness and mutual benefit have deteriorated due to factors such as the wide disparity in economic strength among countries and the manipulation of the multilateral trade negotiation agenda by some developed countries. For this reason, analyzing the principle of mutual benefit is of essential significance for bilateral cooperation.

Further deepening bilateral trade between China and Ukraine holds both practical and theoretical significance. The study analyzes the ongoing development of economic and trade cooperation between the two nations, explores existing challenges, and provides recommendations for improvement based on the respective positions of China

and Ukraine. For example: Ukraine can reduce import and export tariffs on trade with China, improve the domestic foreign investment environment, etc.; China can increase agricultural technical support for Ukraine and encourage companies to invest in Ukraine. The most important thing is that both sides need to work together to continuously optimize the bilateral trade development environment and strive to realize bilateral trade liberalization and facilitation as soon as possible. Ukraine and China need to make full use of their respective inherent advantages. In particular, Ukraine should give full play to its location, language and other advantages to support enterprises in actively carrying out economic and trade cooperation. The government can also implement corresponding incentive policies to promote the development of bilateral trade and promote in-depth exchanges [6].

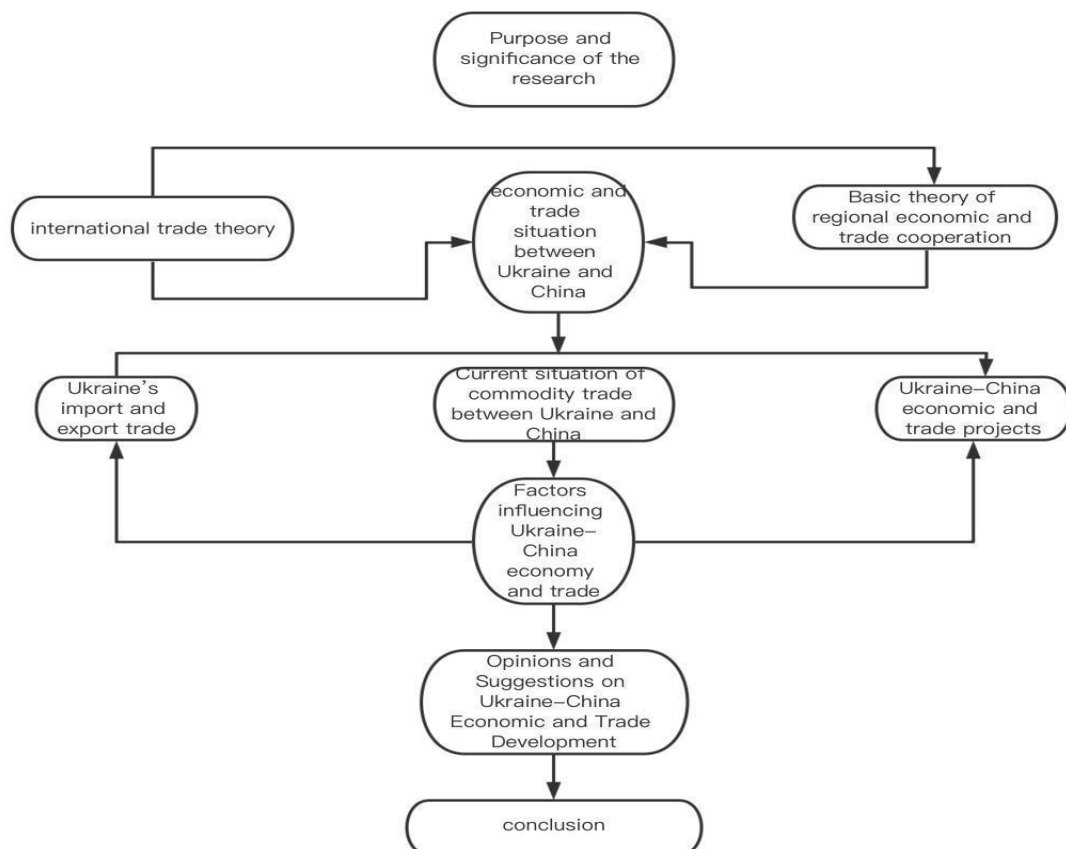


Figure 1.2 Basic framework for bilateral cooperation between Ukraine and China

Since the beginning of the 21st century, driven by the continuous deepening of China-Ukraine economic and trade cooperation, many scholars have conducted in-depth

research on the development of Ukraine-China bilateral trade [7]. The research focus is mainly on the current situation, characteristics and development potential of trade between the two countries [21].

Specifically, it mainly includes:

1. Litvin (academician of the National Academy of Sciences of Ukraine) pointed out through research in 2004 that China is currently a trade partner that Ukraine cannot ignore. In recent years, Ukraine has achieved considerable social and economic development through bilateral trade with China. Moreover, the current development trend of bilateral trade between the two countries shows that Ukraine's dependence on investment from China will continue to increase in the future. In addition, the current exchanges and cooperation between the National Academy of Sciences of Ukraine and the Chinese Academy of Sciences are getting closer and closer, and the two parties will reach more cooperation treaties in the future. The areas of cooperation have extended to more fields such as electric fields, superhard materials, geological exploration, space technology, and medical care. , and the two sides have carried out increasingly in-depth cooperation and exchanges in the field of military technology [8].

2. When Renfei (2004) studied the situation of foreign direct investment in Ukraine, he not only conducted evaluation and analysis, summarized the current situation and characteristics of the utilization of foreign direct investment in Ukraine, and finally predicted Ukraine's potential to attract and utilize foreign direct investment. In addition, Renfei also pointed out that the Ukrainian capital market has developed slowly since 1991 and its scale is relatively small, resulting in a serious shortage of domestic capital resources and thus hindering social and economic development. Therefore, an important way to promote the development of international trade is to improve the ability to attract foreign investment [9].

3. Zhu Jiang (2005) believes that within more than ten years since the establishment of diplomatic relations between Ukraine and China in 1992, the economic and trade cooperation between the two countries has generally experienced three different development stages: highs, lows, and prosperity. Then he systematically

analyzed the macroeconomic situation and the characteristics of economic and trade relations between China and Ukraine and pointed out that there are amazing development opportunities for bilateral trade between the two countries [10].

4. Ha Xinghua (2011) pointed out that the current Ukraine-China bilateral trade has developed to a new level, and has successfully realized the transformation from simple commodity trade to in-depth cooperation in the fields of production and investment. Not only is the trade structure becoming more and more reasonable, Moreover, the scale of bilateral trade continues to expand. However, the bilateral trade between the two countries is affected by their respective economic aggregates and market sizes, and has now entered a development bottleneck. He further put forward scientific suggestions, including divergent thinking and continuous optimization of the investment environment. The environment and building a platform for cooperation between enterprises of the two countries have greatly attracted Chinese enterprises to invest in Ukraine [11].

5. Wang Qingping and Hou Tiejian (2014) believe that China and Ukraine should focus on the quantity and structure of economic and trade cooperation, encourage domestic enterprises to actively participate in bilateral trade, and create micro-level basic conditions for the sustainable and stable development of bilateral trade. At the same time, the two governments should give full play to the institutional supply function, provide reliable institutional guarantees for enterprises to participate in bilateral trade, and help them achieve expected business goals; make overall plans for economic and trade cooperation projects from an overall perspective, and lay a solid institutional foundation. The degree and economic foundation have promoted the continuous deepening and broadening of economic and trade cooperation between the two countries. In addition, they also pointed out that China-Ukraine economic and trade cooperation has obvious shortcomings such as the small scale, low level and small quantity of mutual investment. At present, trade in goods between the two countries still dominates, and the proportion of mutual direct investment is still relatively low. The main reason for this phenomenon is that the development level gap between China and

Ukraine is too large, and both countries lack the ability to export capital on a large scale. At the same time, both countries are highly competitive in terms of direct investment and economic and social development. However, from an objective perspective, large-scale direct investment or mutual capital flows between the two countries are also very possible, because the market will promote the development of mutual investment when optimizing the allocation of production factors in the two countries. The flow of capital is ultimately formed by a comprehensive weighing of profits and risks, as well as capital's constant pursuit of maximum profits and minimum risks. This directly results in differences in investment environments in different countries, specifically in economic environments such as infrastructure and labor levels, system operating efficiency, There will be significant differences in aspects such as government policies and socio-political stability. Therefore, the policy systems and economic environment of China and Ukraine will have a greater impact on mutual direct investment opportunities [12].

6. Mi Jun and Huang Xuanwen (2016) published the article "Analysis of the Current Economic Situation and Influence Factors in Ukraine — It's Also About Sino-Ukrainian Economic and Trade Cooperation," which systematically analyzed China's current economic status and development potential. and Ukraine. Economic and trade cooperation with Ukraine has again raised key issues in the development of bilateral trade. Disadvantages and disadvantages. They believe that bilateral trade between the two countries is more complementary than competitive. However, the development process of bilateral trade between Ukraine and China has revealed many problems, such as small scale, instability, insufficient depth, low mutual investment and low degree of standardization. For China, only by continuously deepening and strengthening its investment in Ukraine. It can promote the entry of Chinese enterprises to the global level and promote the healthy development of bilateral trade between China and Ukraine. Only by constantly studying the Ukrainian market and increasing direct investment in Ukraine can Chinese enterprises transfer surplus domestic funds. Therefore, in the current conditions, Chinese enterprises are intensifying the analysis of

the Ukrainian market, and the government directs the constant optimization of investment cooperation mechanisms, which will contribute to the transformation of the economic structure of China and the acceleration of the exit of enterprises to the global level [13].

7. Long Yunfei (2017) studied the current situation of Ukraine's economic development and pointed out that Ukraine has entered a bottleneck in economic development. The main reasons are the irrational economic structure and defects in the policy system. Ukraine's domestic political situation has been turbulent in recent years, and its political relations with Europe, the United States, and Russia are unstable and harmonious. Long Yunfei also pointed out that if Ukraine wants to accelerate its economic transformation and development, it needs to pay attention to attracting external funds. Although Ukraine has implemented a series of policies to attract foreign direct investment, the actual results are not very satisfactory. The main reasons for this situation are: too conservative investment policies, relatively high investment risks, and lack of a good investment environment. Many high-quality foreign capital have withdrawn due to this [14].

8. Li Chunbo (2018) published "Strategic Ideas to Create a New Situation in China-Ukraine Economic and Trade Cooperation" and pointed out that developing bilateral trade between China and Ukraine is not a unilateral need of China or Ukraine but an urgent requirement for the social and economic development of both countries. Therefore, China and Ukraine 's deepening of economic and trade cooperation is two-way, and its essence is to achieve mutual win-win and mutual assistance [15].

9. Xu Linshi and Fomichova (2019) believe that both China and Ukraine are indispensable participants in the world community. Whether it is to effectively integrate into the international development environment or to establish a good strategic partnership, they need Attention should be paid to discussing and timely solving existing problems in the development of bilateral trade between the two countries, providing theoretical guidance for stabilizing the cooperative partnership between China and Ukraine, and making the strategic positioning of economic and trade cooperation

between the two countries clearer. At the same time, by exploring the development potential of economic and trade cooperation between the two countries in regional economic integration, the strategic cooperative relationship between the two countries will be strengthened, thereby further deepening the economic and trade cooperation between the two countries. Finally, they also pointed out that more and more Chinese funds are now entering Ukraine to invest and set up factories, which shows that the economic and trade cooperation between the two countries is deepening and the confidence of Chinese companies in investing in Ukraine has increased significantly [16].

10. Taras Kachka (2021) noted that deepening the strategic partnership with China is one of the priorities of Ukraine's foreign economic policy. Agricultural products account for more than 50% of the total export structure of Ukraine to China. Today, Ukraine is China's main supplier of corn and sunflower oil (accounting for 60-80% of China's imports in recent years). At the same time, Ukraine continues to increase oilseed meal exports (since opening the market in 2017). The Ukrainian government intends to further increase trade with China and diversify Ukraine's exports to China. Currently, Ukraine adopts comprehensive measures to allow domestic products to enter the Chinese market, including animal products (fish and fish products, poultry meat, pet feed, livestock compound feed) and plant products (wheat flour, wheat, rapeseed, sorghum, beans, Soybean meal, apples, blueberries, sweet cherries). Obviously, Ukraine and China have long-term stable relations and broad prospects for cooperation. The final summary proposed a constructive dialogue with China on issues related to the implementation of economic, trade and investment projects [17].

Taken together, existing relevant research has not yet conducted an in-depth discussion on the relationship between China-Ukraine's international direct investment and trade. This thesis will not be limited to just studying mutual investment or bilateral trade issues between China and Ukraine, but will also conduct a systematic study combining the two.

1.3. Tools and methods for assessing bilateral cooperation

In 2014, the World Bank Group developed a new approach to cooperation among countries. The goal is to achieve poverty eradication and common development with the concept of sustainability. The theoretical basis for international bilateral cooperation has been strengthened. This new approach consists of four main components. It takes the Country Partnership Framework (CPF) as the core, and other parts play a supporting role in country cooperation [72].

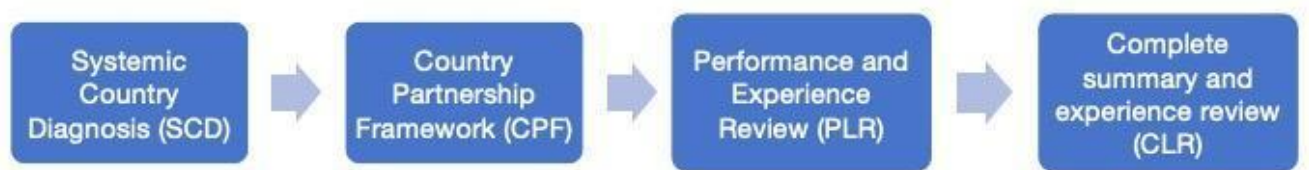


Figure 1.3 New approaches to international bilateral cooperation

*Compiled by the author based on [73]

1. SCD is the preliminary work for formulating a national partnership framework. It conducts concentrated analysis on key areas, conducts consultations with government departments, multinational companies, etc., and accelerates the process of bilateral cooperation. Similarly, SCD analysis will lead to different situations due to differences in sympathy. Countries with a large amount of data will make cooperation more in-depth, and countries with fragile information will use existing data to help countries with SCD to identify major areas of cooperation [72].

2. The Country Partnership Framework (CPF) serves as the main tool for cooperation between countries. Identify excellent partners through SCD analysis. At the same time, it is flexible and stable. For highly developed countries, it can make priority judgments on national clearance analysis and make modifications on previous data analysis. For relatively fragile countries, the CPF can provide modifications based on past experience, thus reflecting its flexibility. It can provide a good guarantee for bilateral cooperation [72].

3. A Performance and Experience Review (PLR) is conducted every two years. As the simple part, it mainly makes simple modifications to the plan and records the progress and performance of the project. Thus summing up experiences and lessons learned. At the same time, as a component, PLR will also supervise the CPF and find the key parts to solve the problem in the process [72].

4. When a country's CPF expires, countries collaborate to conduct a self-assessment and issue a Completion and Lesson Review (CLR) report. Expands and replenishes sources of information and approaches to improving development performance [72].

Table 1.1

Methods for assessing FDI levels, international trade levels, immigration levels, and ISTC levels

FDI level	Min's multi-factor evaluation method, factor evaluation classification method, investment obstacle analysis method, and sampling evaluation method. Weighted rank analysis method.
International Trade Level	Cost analysis method, grade scale method, hot and cold comparative analysis method, qualitative analysis method, quantitative analysis method,
Immigration Level	Key methods for assessing immigration level, points assessment, independent application, etc. Foreign talents who apply to work in the country are divided into high-end foreign talents (Category A), foreign professional talents (Category B), and other foreign personnel (Category C), and corresponding foreign work permits are issued. Through this standard, we can determine whether we can attract people and retain them.
ISTC level	Peer review method, Delphi method, analytic hierarchy process, statistical analysis, questionnaire survey, case study, case study, interviews.

*Source: Effective methods for bilateral cooperation [73]

Through the above analysis, it is believed that the assessment of bilateral trade and the gravity model are the most important in this case. The gravity model has stability and practical significance, and it can predict trade flows between countries with certainty.

The main idea of the trade gravity model is that the export volume of one country to another country is directly proportional to the economic scale of the two countries

(because it is the economic scale of the two countries that determines the supply and demand of exports), and inversely proportional to the distance between the two countries. (Because the farther apart the partners are, the higher the cost of trading goods will be). According to the theory described by the gravity model, the GDP of an exporting country reflects its production capacity, while the GDP of an importing country reflects its market capacity. Generally speaking, these two variables are directly proportional to trade volume [26]. Many scientists have improved the practical application of gravity models (Anderson, Keller, Helpman, Krugman, McCarron, Redding, Ross, etc.) [70]. However, the limitations of the model application are related to the scale of the research object (generally speaking, scientists use trade balance and international trade to study the use and composition of country and information data. This thesis will establish import and import data of imports and international trade). The export flow model between Ukraine and China, in order to simplify the gravity model, uses the total actual GDP of the country as an indicator of the economic size and the distance between the two capitals as an indicator of the distance between the two capitals. The use of the gravity model to analyze international economic relations is based on the assumption that trade flows have a positive dependence on the GDP of two countries, that is, the GDP coefficient obtained from regression analysis should be positive, and the distance between countries affects potential transportation costs. The negative correlation is, the greater the distance between the research objects. The larger the country, the higher the transportation costs and the less bilateral trade. Therefore, the distance coefficient between the two countries is approximately negative [27].

The main method is to analyze the evolution of China-Ukrainian economic and trade cooperation potential, the current situation of Sino-Ukrainian commodity circulation, and conduct research based on the results obtained, with a view to providing help for the economic cooperation between China and Ukrainian. Improve commodity circulation structure and increase commodity circulation volume. To achieve this goal, China-Ukrainian economic and trade cooperation should be comprehensively analyzed and studied [28].

Table 1.2

Treaty of Friendship between the People's Republic of China and Ukraine

	China	Ukraine
1	The contracting parties mutually respect each other's political, economic, social and cultural development path chosen based on their own national conditions, ensure the long-term and stable development of bilateral relations, implement the agreements reached by the two countries, and constantly inject new specific content into the relations between the two countries.	
2	The contracting parties will consolidate the strategic partnership by utilizing and improving regular meeting mechanisms at high-level and at all levels, and exchange views in a timely manner on bilateral relations and major issues of common concern to both parties.	
3	The contracting parties will expand and deepen cooperation in economy and trade, agriculture, mining, energy, transportation, infrastructure, aerospace, finance, investment, science and technology, communications and other areas of interest to both parties on the basis of equality and mutual benefit.	
4	The contracting parties will cooperate within the framework of the international financial system, economic organizations and forums.	
5	The contracting parties will ensure the protection of intellectual property rights, including patent rights, trademark rights, copyrights and related rights, in accordance with their domestic laws and international treaties to which they are both parties.	
6	The Contracting Parties actively encourage coordination and cooperation in culture, education, science, tourism, medical and health, journalism, social security, sports, environmental protection and other areas of interest to both parties.	
7	The contracting parties shall create necessary conditions in accordance with their respective laws to promote friendly exchanges and mutually beneficial cooperation between provinces, states and sister cities of the two countries.	
8	The contracting parties will vigorously promote the expansion of exchanges between the two countries' personnel, government and civil organizations, trade unions, business circles, social groups, educational, cultural and scientific research institutions, media, youth and sports organizations.	
9	The Contracting Parties will cooperate in promoting the realization of fundamental freedoms and human rights in accordance with their respective international obligations and domestic laws.	
10	In order to implement this treaty, the contracting parties will actively promote the signing of relevant agreements in specific areas of interest to both parties.	
11	The relevant departments of both Contracting Parties will investigate and resolve problems and disputes arising from the cooperation and operation of legal and natural	

persons of one Contracting Party in the territory of the other Contracting Party in accordance with their respective national laws.

Source: China.mfa.gov.ua. Ministry of [63]

Fei examined the state of foreign direct investment in Ukraine and highlighted the sluggish development of the Ukrainian capital market since 1991, with a relatively small scale leading to a shortage of domestic capital resources, hindering social and economic development. Consequently, he emphasized that enhancing the capacity to attract foreign investment is imperative for promoting international trade and overall economic development [14]. Jiang asserted that over the more than ten years following the establishment of diplomatic relations between Ukraine and China in 1992, the economic and trade cooperation between the two nations underwent distinct developmental stages, encompassing highs, lows, and periods of prosperity. He systematically analyzed the macroeconomic landscape and the features of economic and trade relations between China and Ukraine, highlighting opportunities for the bilateral trade development [10].

Conclusions to section 1

As the connection between foreign direct investment and international trade becomes increasingly close, the research on the relationship between the two can basically be summarized as the theory of substitution relationship or the theory of complementary relationship. In addition, the proposal of uncertainty relationship theory further expands the theoretical space of the relationship between foreign direct investment and international trade, and explores the complex dynamic relationship between the two.

This section aims to summarize the emergence and determination of trade structure through a systematic review of foreign direct investment theory and a detailed review of international trade theory, reflecting that the focus of trade research is the shift from inter-industry to intra-industry.

By analyzing the content and principles of bilateral cooperation, the principle of equality and win-win was established as the basic principle of bilateral cooperation. The practical significance is to realize resource complementarity and economic complementarity between Ukraine and China, promote policy communication and facility connectivity, and promote high-level trade exchanges. Specifically analyze the impact of FDI levels, international trade levels, immigration levels, international scientific and technological cooperation levels and other factors on bilateral cooperation. and determine how to accurately assess FDI levels, international trade levels, immigration levels, ISTC levels. Among them, the level of FDI is highly integrated with Industry 4.0, especially now that counter-globalization has led to the reorganization of supply chains. This does not change long-term cooperation, but plays an important role in the sustainable growth and fair distribution of bilateral cooperation. Through the release of the IMF's 2023 annual report, it was found that the global economic recovery is still slow, regional differences are growing, and the scope for mistakes in bilateral cooperation is very small. Global economic growth has dropped from 3.5% in 2022 to 3.0% in 2023, far from Lower than the historical average. The

development of bilateral cooperation can effectively alleviate the current situation. During this critical period, the analysis found that the most important thing is to establish a gravity model based on bilateral trade assessment, and through the reasonable use of data tools, accurately discover the bilateral trade relations between Ukraine and China, and propose key areas of cooperation to promote and develop the Ukrainian economy and achieve mutual prosperity for both parties.

CHAPTER 2. ANALYSIS OF UKRAINE-CHINA ECONOMIC AND TRADE INTEGRATION AND COOPERATION DEVELOPMENT POTENTIAL

2.1 Analysis of Ukraine-China economic and trade integration and potential

1. Overall economic conditions in Ukraine. After Ukraine's industrial growth in the past few decades, the ancient "Kievan Rus Park" originated here. Like China, Ukraine has become a country with a long history and civilization. Ukraine is also a young state, having been independent for more than 20 years. Since then, Ukraine has continued to explore a development path that suits itself. During the former Soviet Union, Ukraine established a strong industrial and agricultural foundation, and had a glorious history of producing tons of steel, tons of grain, and three tons of coal per capita per year. Ukraine's major industrial sectors such as aerospace and machinery manufacturing make its military technological strength not to be underestimated, accounting for basically 25% of the former Soviet Union. In particular, agriculture has developed well and is suitable for the growth and development of grains, making it the "Granary of Europe." From 2001 to 2007, Ukraine's GDP showed steady growth for eight consecutive years. It was not until the U.S. financial crisis broke out in 2008 that it affected the whole world, causing Ukraine's economy to decline sharply in 2008 and 2009. It was not until 2010 and 2011 that there was recovery growth. But starting in 2012, there were five consecutive months of economic recession, leaving the national economy with zero income growth in 2012 and 2013. The period after 2013 is characterized by Russia's military invasion of Ukraine and the occupation of part of the territory. The real national economic income in 2014 fell by 6.8%, and the real national economic income in 2015 down 9.9%. It was not until 2016 that there was a slight increase. In 2018, Ukraine's real GDP grew by 3.2%. The total foreign trade growth rate was as high as double digits, reaching 12%, and the total trade volume reached 44.4 billion US dollars. In 2022, Ukraine's GDP will decline by 29.1%, slightly better than the forecast of 30% [29].

Table 2.1

Comparison of GDP between Ukraine and China

Years	China (\$Trillion)	Word(%)	Ukraine(100.Million Us.Dollars)	Word (%)
2022	17.96	18.77	1605.12	0.15
2021	16.86	18.51	1988.21	0.2
2020	15.36	17.32	1566.5	0.18
2019	14.34	15.96	1539.21	0.17
2018	13.61	15.84	1308.32	0.15
2017	12.14	15.00	1121.9	0.14
2016	11.14	14.62	933.56	0.12
2015	11.02	14.68	910.31	0.12
2014	10.44	13.16	1335.03	0.17
2013	9.57	12.39	1833.1	0.24
2012	8.53	11.36	1757.81	0.23

Source:World Development Indicators Database (WDI)[22]

2.Ukraine's legal system related to trade and investment. Ukraine is located in eastern Europe. Its territory ranks second after France, and it has the reputation of "Europe's granary". It is strategically located to the north of the Black Sea and the Sea of Azov, adjacent to Romania and Moldova to the south, and close to Russia in the northeast. It has convenient transportation and many seaports around the Black Sea. Its unique geographical location provides it with a unique trade competitive advantage [30]. At the same time, in order to promote trade development and attract foreign investment, Ukraine formulated its first domestic law on foreign trade activities, the Law on Foreign Economic Activities, after declaring independence in 1992. The implementation of this law determined Ukraine's foreign trade management reform. The direction and development direction: implement foreign trade liberalization and integrate into the world trade system. In addition, it also stipulates that foreign trade operation rights must be registered. That is to say, enterprises in Ukraine that want to obtain foreign trade operation rights can apply to the Ministry of Economy. After the Ministry of Economy approves and completes the relevant procedures, they can obtain this right. However, this enterprise must be a legally registered enterprise in Ukraine to be valid. Currently, the "Customs Code of Ukraine" (promulgated and implemented in 2004) and the "Law on the Foreign Investment Regime" (promulgated and implemented

in 1996 and revised in 2000) are also specialized laws and regulations in the field of international trade and investment. In addition, the Law on Customs Rates of Ukraine, the Law on Unified Customs Rates of Ukraine, the Law on Processing of Incoming Materials in Foreign Economic Relations of Ukraine, the Law on Import and Clearance Procedures of Goods and Transport Vehicles of Ukraine, the Law on the Tax System of Ukraine, Laws and regulations such as the Ukrainian Value-Added Tax Law, the Land Market Law, the Ukrainian Special (Free) Economic Zone Law, the Ukrainian Customs Code and the Ukrainian Tax Code all regulate the economic activities of foreign enterprises in Ukraine. and protection [31].

Table 2.2

Ukraine's legal system related to international trade and investment

Number	Years	Legal Name
1	1992	«Foreign Economic Activities Law»
2	1992	«Law on the Tax System of Ukraine»
3	1992	«Law of Ukraine on Value Added Tax»
4	1992	«Budget Law of Ukraine»
5	1992	«Cadastral Act»
6	1992	«Land market law»
7	1992	«Customs Code of Ukraine»
8	1993	«Law on Customs Rates of Ukraine»
9	1993	«Law of Ukraine on Unified Customs Rates»
10	1993	«Tax Code of Ukraine»
11	1994	«Law on Processing of Incoming Materials in Foreign Economic Relations of Ukraine»
12	1996	«Foreign Investment Regime Act»
13	1996	«Tenancy Act»
14	1996	«Law on Special (Free) Economic Zones of Ukraine»
15	1997	«Ukrainian Law on Import and Customs Clearance Procedures for Goods and Transport Vehicles»
16	1998	«Law on Uniform Charges for Goods Passage at Border Stations of Ukraine»
17	2000	«Foreign Investment Regime Law» (Revised Edition)
18	2000	«Special Mortgage Law»
19	2004	«Customs Code of Ukraine»
20	2009	«N153»
21	2010	«N2155-VI»
22	2012	«N4496-VI»
23	2013	«N406-VII»
24	2016	«N1390-VIII»

20	2021	«Law on State Support for Major Investment Projects»
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Source: Ministry of Commerce of Ukraine [53]

The World Bank's business environment indicators are used to analyze Ukraine's business environment. The results show that its business environment is not particularly ideal, and the rankings of various scores are not very high. Although Ukraine's police reform and customs reform have achieved results, the level of corruption has declined [46]. With the development of global economic integration, the Ukrainian government has formulated many measures and methods to provide policy guarantees for investors, such as formulating investment promotion strategies, simplifying investment procedures, etc., especially the passage of the "Industrial Park Law", which has attracted More foreign investors[32]. In 2017 Ukraine managed to rise to 130th place in the Corruption Perception Index. Meanwhile, the World Bank's global Doing Business report shows that Ukraine moved up to the top 100 in 2017, at 76th place. An increase of 36 places compared with 2013 [43]. However, in the European Business Association's 2017 data release, it was found that Ukraine's investment attraction index fell for the first time, especially the proportion of people who expressed satisfaction dropped from 13% in the first half of the year to 11%. The main reason is that Ukraine's business environment has been impacted, with rapid changes in policies and laws; government bureaucracy; backward infrastructure, etc., all of which have greatly affected foreign investment [44]. However, it should be pointed out that Ukraine's ease of doing business score shows an increasing trend [45]. The DB 2020 ease of doing business score is higher than that of 2019, showing a positive trend [33]. The 2021 business environment ranking has improved by 10-20 places, and the Thirty indicators that may affect rankings were reformed and significant progress was made [71].

Ukraine Doing Business Index

Topic	Db2020 Ranking	Db2020 Ease Of Doing Business Score	Db 2019 Ease Of Doing Business Score	Changes In The Ease Of Doing Business Score (Percentage Points)
Total	64	70.2	69.1	1.1
Start Business	61	91.1	91.1	0
Get Electricity	128	62.5	59.2	3.3
Registerproperty	61	71.3	70	1.3
Get Credit	37	75	75	0
PROTECT MINORITY INVESTORS	45	68	66	2
PAY TAXES	65	78.1	79.4	1.3
CROSS-BORDER TRADE	74	80.1	77.6	2.5
EXECUTIONOF THE CONTRACT	63	63.6	63.6	0
GO BANKRUPT	146	31.4	31.7	0.3

Source: Ministry of Commerce of Ukraine [53]

3. The scale and development trend of Ukraine's export trade to China

Figure 2.4 below selects Ukraine's trade export volume and change range with China for 13 years from 2000 to 2012 [42]. Based on specific data, it is found that international trade is closely related to national politics. For example, due to the influence of the political environment, the export value in 2007 was the lowest, only US\$432 million, compared with the export data between 2000 and 2006. With the joint efforts of the two countries, relations have gradually recovered and normal trade has resumed. Since 2008, Ukraine's trade volume with China has generally shown an upward trend, and the trade surplus has increased. The following year, in 2009, exports to China reached US\$1.434 billion, reaching the largest increase of 161.68% in 13 years. At this time, the trade relationship between China and Ukraine was relatively stable. Until 2013, its export trade to China reached a peak of US\$2.727 billion. In the two years from 2014 to 2015, changes such as the Eastern War and the annexation of Crimea to Russia occurred, which affected Ukraine's domestic economic downturn [41]. Even so, exports to China in 2014 and 2015 were as high as 2.67 billion and 2.67 billion respectively. \$2.488 billion. In 2016 the Ukrainian economy recovered. In 2017,

according to Ukrainian customs statistics, although exports to China were only US\$1.919 billion that year, accounting for 4.6% of total exports and an increase of 9.9%, its total import and export trade volume with China was as high as US\$7.64 billion. As Ukraine's largest export target in 2019, China is very important to Ukraine's economy [34].

Table 2.4

The scale and changes of Ukraine's export trade to China

Years	Export Volume (Billion Us Dollars)	Range Of Change (%)
2018	19.19	9.91
2019	35.9	187%
2020	71.13	198%
2021	80	112%
2022	17	-470%

Source: CEPII database [23]

4. Structural characteristics of Ukraine's exports to China

It can be clearly seen from Table 2.5 that the main commodities exported by Ukraine to China include the following categories: 1. Mineral products; 2. Animal and vegetable oils and fats; 3. Plant products, such as grains, etc.; 4. Wood and wood products, such as charcoal; 5. Other base metals and their products; 6. Mechanical and electrical products, such as electrical, audio and video equipment, motors and parts; 7. Food, beverages, tobacco, etc.; 8. Live animals and animal products; 9. Plastics, rubber, etc.; 10. Clocks, optical and medical equipment, etc. In 2021, its main export commodities are mineral products, animal and vegetable oils and plant products, and the above three categories of commodities account for a total of 84.2% of Ukraine's export commodities [40]. Specifically, among Ukraine's main export commodities to China, mineral products accounted for the largest proportion, with an export value of US\$690 million, a year-on-year increase of 8.2%; animal and vegetable oils and fats accounted for 25.7%, with an export value of US\$510 million. It is worth noting that Ukraine's exports of live animals and animal products surged in 2021, rising from US\$02 million

in 2021 to US\$12 million, an increase of 448%; however, in terms of base metals and their products, such commodities Export demand weakened, falling by 37.3% [35].

Table 2.5

Composition of main commodities exported by Ukraine to China in 2021 (Unit: million US dollars)

Product Name	2021	2020	Proportion (%)	2021-2020 Growth (%)
Mineral Product	689	637	34.55	8.2
Animal And Vegetable Oils	512	527	25.68	-3
Plant Product	478	466	23.97	2.5
Electronics Product	201	65	10.08	210.6
Wooden Product	36	47	1.81	-24.3
Base Metal Products	19	31	0.95	-37.3
Food Beverage Tobacco	14	10	0.70	41.4
Optical Watches Medical Supplies	14	6	0.70	137.9
Animal Products	12	2	0.60	448
Cellulose Pulp Paper	5	3	0.25	84
Plastic Rubber	2	2	0.10	32.5
Chemical Products	2	2	0.10	32.1
Ceramic Glass	2	1	0.10	100
Textile Raw Materials	1	1	0.05	2683
Furniture Toys	1	1	0.05	45
Other Products	6	15	0.30	58.9
Total	1994	1814	100	9.9

Source: CEPII database [23]

Structural Characteristics of Ukraine's Export Commodities

- Exports of steel products fell significantly
- Growing mineral exports
- Cyclic changes in chemical exports
- Increased export demand for other products

Table 2.6

Composition of main commodities imported by Ukraine from China in 2021 (Unit: million US dollars)

Product Name	2021	2020	Proportion (%)	2021-2020 Growth (%)
Electronics Product	2574	1970	45.60	30.66
Base Metal Products	571	474	10.12	20.46
Chemical Products	502	444	8.89	13.06
Plastic Rubber	407	369	7.21	10.30
Textile Raw Materials	376	347	6.66	8.36
Furniture Toys	338	286	5.99	18.18
Transportation	176	123	3.12	43.09
Ceramic Glass	143	159	2.53	-10.06
Light Industrial Products	141	158	2.50	-10.76
Optics Watches Medical Equipment	137	96	2.43	42.71
Food Beverage Tobacco	61	51	1.08	19.61
Cellulose Pulp Paper	52	54	0.92	-3.70
Leather Products	52	48	0.92	8.33
Plant Products	37	34	0.66	8.82
Mineral Products	26	23	0.46	13.04
Other Products	52	41	0.92	26.83
Total	5645	4677	100	20.70

Source: CEPII database [23]

Through Table 2.6: In the import and export trade between China and Ukraine in 2021, the main commodities imported by Ukraine are chemical and mechanical and electrical products, base metals and related products, and raw materials such as rubber and plastics [38]. Among them, the trade volume of mechanical and electrical products was US\$257.4, accounting for 45.6% of the total trade volume, an increase of more than 30%, ranking first in the total trade volume; the second place was base metals and products, accounting for approximately 10.1%, totaling US\$5.71 billion, an increase of more than 20%; chemical products occupied the third place with US\$5.02 billion, an increase of 13.1%, reaching 8.9% of the total trade volume [39]. In addition to the above three categories of products, the trade volume of transportation equipment, optical and medical equipment, including watches and clocks has also increased significantly. However, due to the decline in demand, the trade volume of some light industrial products such as shoes and umbrellas, as well as ceramics and glass products, has decreased by 10% year-on-year. These data reflect from the side that Ukraine's economic and trade development level is not strong and unstable, and requires a huge economic volume to meet its development needs. With China's economic development and technological leaps, cooperation between Ukraine and China in the fields of energy, environmental protection, high technology and other fields is also constantly deepening. As China's investment and output in the field of scientific research are increasing, its influence on all aspects is also increasing, which makes China gradually develop into a big and powerful country in science and technology, thereby further deepening and promoting the economic and trade exchanges between China and Ukraine. cooperation in science and technology [37].

Looking at the import and export trade exchanges between China and Ukraine that have lasted for more than 20 years, we can find that the trade cooperation situation between the two sides has developed well and achieved good results. But at the same time, there are also differences and deficiencies on some subtle and specific issues. This requires both parties to actively search for the root causes of the problems, find out and fill in the gaps, promptly and effectively make up for the flaws in economic and trade

cooperation, resolve differences, and continuously deepen cooperation. This is important for the development of economic and trade relations between China and Ukraine is very important and is also the basis for maintaining prosperous trade. For a long time, the economic and trade cooperation between China and Ukraine has mainly focused on commodities and goods, while there has not been much exchange between the two parties in other related industries such as the tertiary industry. Since both countries have their own advantages in economic development and technological level, trade activities are mainly concentrated in their respective competitive industries and industries. In recent years, China's economic size has been increasing day by day, and its industrial structure and demand have been constantly adjusted. Ukraine's import trade demand has expanded rapidly. The two countries import from each other the production materials and technologies they lack to develop social production. Most of the goods exported from China to Ukraine belong to the light industry category, and the total volume is large, and the demand often changes greatly. This shows that the total volume of China's trade with Ukraine is affected by changes in Ukraine's domestic demand [36].

The impact is relatively obvious, and it seems that this impact will last for a long time at this stage. This is also a significant feature of the import and export trade between China and Ukraine. Therefore, to maintain the continued prosperity and mutual benefit of China-Ukraine import and export trade, a peaceful and stable external environment and close and friendly relations between the two countries are extremely important [37].

The commercial cooperation between China and Ukraine in the field of import and export mainly includes the two fields of steel and mechanical and electrical products. In the process of daily trade, we should pay full attention to the cooperation between the two countries in high and new technologies, so as to achieve mutual benefit and common development. In the process of national economic development, due to the influence of various factors, the problem of a single industrial structure has resulted. This requires increased policy support and capital investment in technology research

and development, and actively promotes the adjustment of industrial structure to achieve diversified and coordinated development [39].

In the commodity trade between China and Ukraine in recent years, Chinese mechanical and electrical products have occupied a major share. This has led to a number of local brands with great influence in China, such as Feixun and Konka, to rapidly expand the market in Ukraine and play an important role in the trade between the two countries. The electromechanical products in China's export trade to Ukraine include electronic audio and video equipment, electric and thermal energy equipment, mechanical equipment, nuclear reactors and other high-tech and related heavy industry facilities and equipment. The export proportion of light industrial products such as umbrellas and footwear, as well as raw materials such as plastics and rubber, has also increased year by year. For example, statistics on trade data between China and Ukraine in 2021 found that raw materials and light industrial products accounted for nearly 10% of export trade this year, totaling US\$6.48 billion [23].

2.2 Estimation of Ukraine-China bilateral cooperation in the field of TNC` activities

1. Trade integration index. Trade integration is a comprehensive indicator usually used to evaluate the closeness of trade relations between two countries. This indicator basically calculates the ratio between two ratios. The first ratio is exports from one country to another. The ratio of a country's products to its total exports, and the second ratio is the ratio of its imports from another country to its total world imports. Generally speaking, the smaller the value representing the degree of trade integration, the less close the trade relationship between the two countries. This thesis will explore the scale of trade between the two countries through the degree of trade integration between the two countries. The calculated value of the degree of trade integration can reflect the closeness of China-Ukraine trade in recent years. The specific calculation formula [48;49] is as follows:

$$TCDab = (Xab / Xa) / (Mb / Mw) \quad (2.1)$$

In the above formula, TCDab illustrates the degree of integration of country a with country b's trade, Xab illustrates the export volume of country a to country b, Xa refers to the export volume of country a, Mb refers to the import volume of country b, Mw represents world imports. Assuming that TCDab is greater than 1, it means that there is a close trade relationship between country a and country b; otherwise, TCDab is less than 1 it means that the trade ties between country a and b are not close enough.

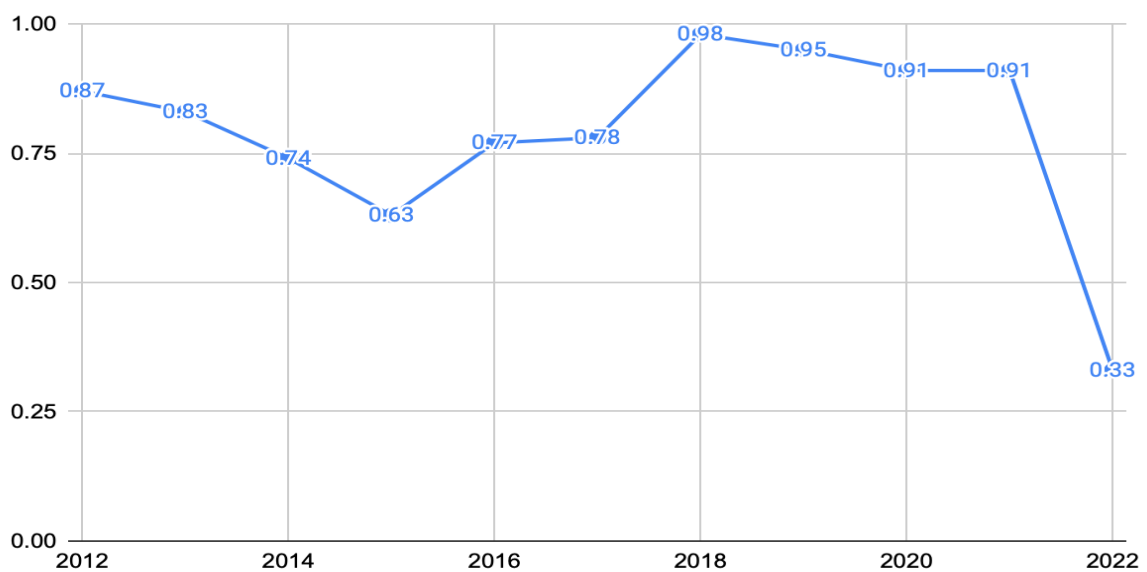


Figure 2.1 Trend of trade integration index between China and Ukraine

Source: Created by the authors based on Macro Trends data[50].

2. Construction of gravity model. Tinbergen (Tinbergen scholar, 1962) and Poyhomen (Poverman, 1963) integrated Newton's gravity with the trade flow between the two countries, and compared the relationship between the attraction, mass, and distance between two different objects to the relationship between the two countries. The relationship between trade flows and distance and economic scale. It can be concluded that for two countries [51].there is always a close relationship between trade flows as well as distance and economic size. The economic scale of both partners can promote trade between the two countries to a certain extent. The nature of distance and transportation costs are similar. When the distance is long and transportation costs are high, it will create certain obstacles to the trade between the two countries. In explaining the occurrence of two bilateral trades. To sum up, the following factors are summarized,

including population size, trade fortress, and social geographical location. Therefore, we use GDP, population, and geographical location as the three main factors to evaluate the factors affecting bilateral trade cooperation. The model is thus constructed as follows:

$$\ln Y_{ij} = \alpha_{ij} + \beta_1 \ln POP_{ij} + \beta_2 \ln DIST_{ij} + \beta_3 \ln GDP_{ij} + \varepsilon_{ij} \quad (2.7)$$

Y represents the bilateral trade volume with China, POP represents the population, DIST represents the distance between the capital of each country and the capital of China, GDP represents the gross national product, i represents the year, and j represents the country. β_1 , β_2 , β_3 is a pending index.

3. Sample selection and data

In order to better analyze the bilateral trade situation between Ukraine and China, we selected Slovakia, Hungary, Poland, Romania and Moldova, five countries adjacent to Ukraine and China for comparison (Table 1). We have used the World Bank WDI Database (population and GDP data) in Table 1, 2, CEPII Database (distance data between the countries' capitals and the capital of China) and United Nations UN Comtrade database (bilateral trade volume data with China) for the estimation in Table 2.7.

Table 2.7

Population data (millions)

	China	Slovakia	Hungary	Poland	Moldova	Romania	Ukraine
2012	1350.7	5.40008	9.97369	38.06316	2.86032	20.0580	45.5906
2013	1357.38	5.40737	9.92178	38.0402	2.85956	19.9837	45.4927
2014	1364.27	5.41409	9.89595	38.01174	2.85782	19.909	45.2752
2015	1371.22	5.41996	9.86767	37.98641	2.83598	19.8156	45.1517
2016	1378.67	5.42466	9.84366	37.97009	2.80319	19.7023	45.0022
2017	1386.4	5.42829	9.81732	37.97483	2.75519	19.5887	44.8332
2018	1392.73	5.43796	9.77374	37.97475	2.70720	19.474	44.624
2019	1408.45	5.45482	9.77128	37.96548	2.66422	19.3717	44.3913
2020	1411.67	5.45938	9.75574	37.89907	2.63513	19.2653	44.1398

2021	1412.87	5.44728	9.71351	37.74712	2.6152	19.1199	43.7919
2022	1411.75	5.43175	9.60472	37.5616	2.59248	18.9567	38.0000

Source: World Bank WDI database [22]

Table 2.8

Distance data between the capital and the capital of China(unit: kilometers)

	Slovakia	Hungary	Poland	moldova	Romania	Ukraine
distance	7422	6948	6640	6177	6476	10050

Source: CEPII database [23]

Table 2.9

GDP data (unit: billion US dollars)

	China	Slovakia	Hungary	Poland	moldova	Romania	Ukraine
2012	85300	944	1280	4952	87	1791	1760
2013	95700	987	1350	5157	94	1897	1830
2014	104000	1010	1410	5390	93	1997	1340
2015	110000	885	1250	4771	77	1778	910
2016	111000	896	1270	4700	79	1852	934
2017	121000	953	1420	5246	95	2101	1120
2018	136000	1060	1580	5887	112	2433	1310
2019	142800	1057	1640	5960	117	2510	1539
2020	146900	1067	1572	5994	115	2513	1566
2021	177300	1186	1818	6794	136	2854	1997
2022	181000	1154	1786	6881	144	3012	1605

Source: World Bank WDI database [22]

Table 2.10

Bilateral trade volume data with China (unit: billion US dollars)

	Slovakia	Hungary	Poland	moldova	Romania	Ukraine
2012	42.5478	61.8825	117.8909	1.4256	37.77	96.78
2013	46.7558	68.0028	148.1322	1.3122	40.3	106.3

2014	51.3821	74.7283	172.3631	1.4008	47.44	80.81
2015	56.4616	82.1191	170.943	1.2144	44.5728	75.21
2016	62.0457	90.2407	174.7154	1.0109	49.0427	64.19
2017	50.3178	80.7312	208.0682	1.3225	56.0221	75.59
2018	52.83369	84.7665	236.8116	1.4078	66.7579	79.56
2019	88.9112	74.1311	259.5617	1.7594	69.0023	127.59
2020	94.6263	116.8662	310.5118	2.0627	77.6481	148.79
2021	120.9254	157.1198	421.1970	2.8350	102.1575	189.7
2022	121.4547	155.2141	432.2276	2.9151	104.7184	76.56

Source: United Nations UN Comtrade database [24]

3. Gravity model regression results

Regression Analysis via Eviews 12. First, perform a stationarity test on the original sequence. The results are as shown in Table 3.1, $p > 0.05$, which cannot pass the stationarity test. Conduct a stationarity test on the first-order difference sequence and obtain Table 2.12, $p < 0.05$, indicating that the first-order difference sequence is subject to statistical analysis. Meaning. This is how a regression analysis can be carried out.

Table 2.11

Stationarity test of original sequence

method	statistics	Probability
ADF - Fisher Chi-square	32.8901	0.1075
ADF - Choi Z-stat	-0.95765	0.1691

Table 2.12

First-order difference stationarity test

method	statistics	Probability
ADF - Fisher Chi-square	52.9401	0.0000
ADF - Choi Z-stat	-4.77535	0.0000

The regression analysis results are shown in Table 2.13. $P(\text{POP}) < 0.05$, $P(\text{DIST}) < 0.05$ and $P(\text{GDP}) < 0.05$, indicating a significant relationship. The coefficient corresponding to $\ln\text{POP}$ is 0.319932, the coefficient corresponding to $\ln\text{GDP}$ is 0.249843, and the coefficient corresponding to $\ln\text{DIST}$ is -0.941091. It shows that the logarithm of bilateral trade volume is directly proportional to the logarithm of POP and the logarithm of GDP, and inversely proportional to the logarithm of distance. The results show that the larger the population, the more conducive to bilateral trade with China; the larger the GDP, the more conducive to bilateral trade with China; the further away from China, the less conducive it is to bilateral trade with China.

Table 2.13

Regression results

Variable	coefficient	Std. Error	t-statistic	possibility
C	28.72915	12.474415	3.98817	0.0497
GDP	0.747442	0.294138	1.897451	0.0405
POP	0.917132	0.264813	3.026575	0.0482
DIST	-0.941091	0.822409	-2.744311	0.0293

*Source: Created by the authors via Eviews 12

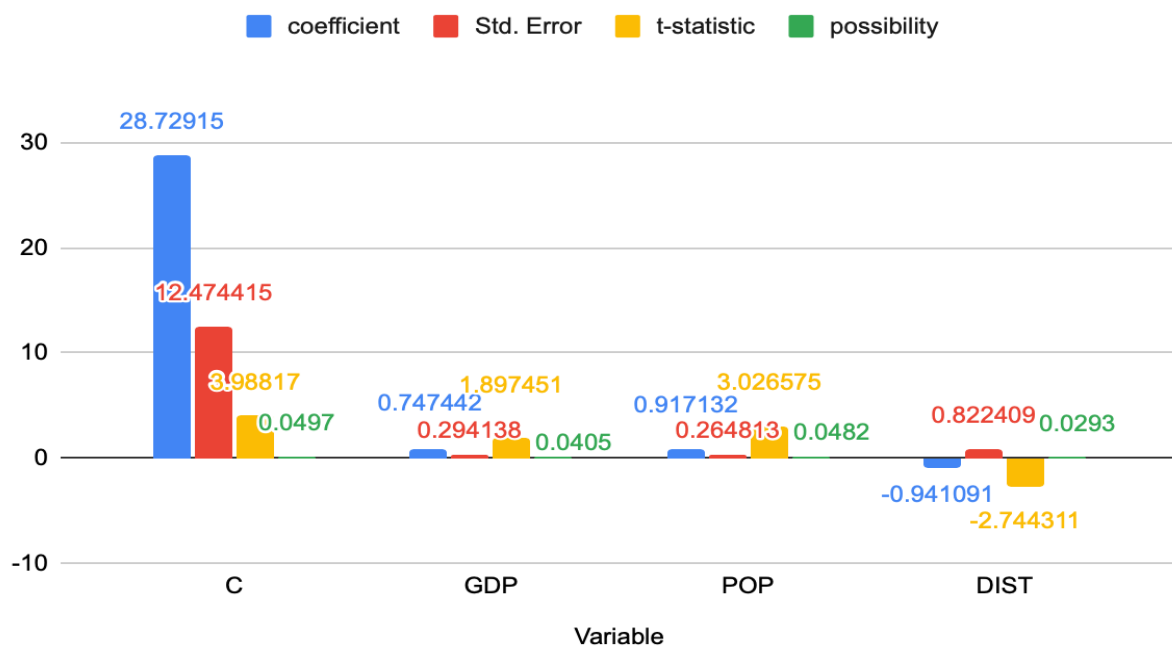


Figure 2.2. Regression results

*Source: Created by the authors via Eviews 12

4. Ukraine-China Trade Potential Estimation

On this basis, a trade gravity model is constructed through the following three important gravity models. In order to examine the impact of population, geography, economy and other factors on bilateral trade between China and six countries, the following gravity model was constructed:

$$\ln Y_{ij} = \alpha_j + \beta_1 \ln(\text{POP}_i + \text{POP}_j) + \beta_2 \ln(\text{GDP}_i + \text{GDP}_j) + \beta_3 \ln \text{DIST}_{ij} + \varepsilon_{ij} \quad (2.14)$$

In the formula, $i=1$ represents China; $j=1, 2, 3, 4, 5,$ and 6 represent six countries respectively. The dependent variable represents the bilateral trade volume between China and these three countries (unit: 100 million US dollars); the independent variables GDP_i and GDP_j represent GDP. The independent variables POP_i and POP_j represent the population size respectively; the independent variable DIST_{ij} represents the distance, and ε_{ij} is the random disturbance term. α_j is a constant term.

Use the regression equation of the gravity model to calculate the simulated trade volume between China and the three countries in 2021, and then compare this data with the actual value. If the actual value is higher than the simulated value, it means that there are certain problems in the trade process between the two parties. That is the phenomenon of excessive trade. On the contrary, there will be a lack of trade. The following table shows the test results.

Table 2.14

Estimation of bilateral trade potential between China and three countries in 2021

Country	actual value	simulation	actual value/simulation
Ukraine	1897687	1675473	1.13
Hungary	1571198	1128437	1.37
Slovakia	1209254	981378	1.23
Poland	4211970	4305178	0.97
moldova	28350	29365	0.96

Romania	1021575	963281	1.06
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*Source: Created by the authors via Eviews 12

Calculated by using 0.8 and 1.20 as data boundary calculations, it is estimated that the actual value and scale value of China, as a potential country, with these six countries are greater than 0.8. Countries with development potential have ratios between 1.0 and 1.20, while countries with ultimate reinvention potential have ratios ≥ 1.20 . Due to objective factors, Ukraine is not conducive to the development of bilateral trade with China at this stage. However, the Ukrainian government has provided policy assistance to these potential first-mover countries. These favorable factors have greatly facilitated trade between China and Ukraine. The Chinese market continues to open up to the outside world and has entered the global development speed. Ukraine has gradually become China's gateway to the European market.

Table 2.15

Estimated bilateral trade potential between China and six countries in 2021 and 2022

Country	Actual value		Simulation		Actual value/Simulation	
	2021	2022	2021	2022	2021	2022
Ukraine	1897687	765612	1675473	961837	1.13	0.79
Hungary	1571198	1552768	1128437	1492384	1.37	1.04
Slovakia	1209254	1215635	981378	1209782	1.23	1.00
Poland	4211970	4322276	4305178	4319799	0.97	1.00
Moldova	28350	29151	29365	27832	0.96	1.04
Romania	1021575	1047184	963281	976384	1.06	1.07

Source: United Nations UN Comtrade database [23]

For 2021 calculated by using 0.8 and 1.20 as data boundary calculations, it is estimated that the actual value and scale value of China, as a potential country, with these six countries are greater than 0.8. Countries with development potential have ratios between 1.0 and 1.20, while countries with ultimate reinvention potential have ratios ≥ 1.20 . As seen at Table 2.15, in 2021, the estimated bilateral trade potential between China and Ukraine was the highest among the six countries. Both sides actively

developed mutually beneficial bilateral trade and economic cooperation, with China expanding its import of high-quality products from Ukraine and Ukraine expanding its export of agricultural products to China. In 2022, the bilateral trade potential between China and Ukraine was expected to continue growing, with efforts made to promote sustainable development of economic and trade relations between the two sides. However, the state of martial law in Ukraine has changed the situation significantly. The estimated bilateral trade potential between China and the other five countries (Hungary, Slovakia, Poland, Moldova, and Romania) in 2021 and 2022 varied based on their individual trade relations with China. However, in 2021 and 2022, Ukraine remained the most attractive of these six countries for China in terms of bilateral trade potential. For 2022 calculated by using 0.8 and 1.20 as data boundaries, the actual value and scale of China's trade with the six potential countries is 0.8, that is, less than 0.8. Countries with development potential have a ratio between 0.8 and 1.20, while countries with ultimate reinvention potential have a ratio ≥ 1.20 . Since 2019, China has been Ukraine's largest trading partner. There are close economic exchanges between the governments of China and Ukraine. In 2021, Ukraine was the most attractive of these six countries for China. Both sides actively developed mutually beneficial bilateral trade and economic cooperation. China expanded its import of high-quality products from Ukraine and contributed to trade liberalization. Ukraine expanded its export of agricultural products to China and strengthened the protection of Chinese companies in Ukraine. By 2022, there was an improvement in the business environment, and efforts were made to promote sustainable development of economic and trade relations between the two sides. However, after February 24, 2022, the situation changed due to the state of martial law in Ukraine, logistical problems arose, and there was an occupation of southern Ukrainian territories that provided agricultural exports to China.

2.3 Analysis of Ukraine-China bilateral cooperation with focus on the impact of technology transfer and migration processes

The evolution of Ukraine's immigration laws began after the collapse of the Soviet Union, when it began to build its own immigration legal system. The difference is that after entering the 21st century, Ukraine actively seeks cooperation with the EU and NATO countries. The more special ones are the facilitation of visas and the labor immigration system between Ukraine and the EU. In 2008, the Visa Facilitation Agreement and the Readmission Agreement signed between Ukraine and the EU came into effect [56]. In 2012, Ukraine and the EU adopted additional provisions to simplify visas. This agreement first simplified the visa application process for Ukrainian citizens. Regarding the visa procedures to EU countries, the EU has opened multiple visas to Ukrainian citizens, such as students, journalists, delegation members, retirees and truck drivers. This is also one of the results of Ukraine's reforms to comply with EU membership. The long-term political corruption and sluggish economic development in Ukraine have caused a significant increase in the number of Ukrainian working-age workers going to the EU [57]. In the early years, Ukraine had formulated population restriction policies in response to the massive loss of the working population. However, due to the EU member states' restrictions on population freedom, the degree of mobility requirements is relatively high, so Ukraine has adjusted its domestic laws on restricting population mobility in order to meet the standards for joining the EU [58]. Ukraine has also launched cooperation projects with EU countries in the control of illegal immigration.

At this stage, the Ukrainian visa system is divided into transit visas, business, cultural and sports visas, personal visas, tourist visas, medical visas, study visas, labor visas, family reunion visas and visas for scientific, educational, cultural and health activities, among which short-term visas are valid for 5-90 days, which can be divided into single, double and multiple times. The transit visa is valid for 5 days, and the long-term visa is valid for no more than 5 years. Foreigners who stay in Ukraine for a short period of time have no right to change their visa type and residence status during their stay, and do not have the right to apply for permanent residence in Ukraine.

Chinese citizens holding diplomatic and service passports can enter Ukraine without a visa and the stay period is 90 days [59].

At this stage, the relationship between Ukraine and China is experiencing certain tests. Since Ukraine's independence, these relations have continued to develop and reached their peak in 2013. At that time, the two governments signed a number of treaties on friendship and cooperation. Based on this, the trend of bilateral cooperation between Ukraine and China will gradually increase.

Currently, Ukraine and China are conducting cooperation in two aspects: scientific and technological cooperation and military-technical cooperation. Cooperation in these two areas can become the basis for each other and promote the emergence of new cooperation. China is currently the world's second largest arms exporter (\$100 billion) [40] and is actively looking for new technology partners. Compared with other countries that do not have sufficient development funds in applied science, Ukraine is fully capable of becoming a partner of China with its military-industrial complex. Ukraine can provide China with stable technical support.

Firstly, it is because many experts from the Soviet Union who assisted China were Ukrainians. Secondly, in the 1980s, our country introduced military equipment from Western countries. However, after 1989, the United States and Europe closed the door to military and technical cooperation, forcing my country to find another way. In 1991, Ukraine had about 1,800 defense-related enterprises and research institutions, and Ukraine also inherited about 1,700 nuclear warheads and 130 nuclear warheads. UR-100N intercontinental ballistic missiles, 46 RT-23 intercontinental ballistic missiles, 33 strategic bombers, and conventional military equipment including tens of thousands of tanks. Therefore, after the disintegration of the Soviet Union, our country actively established diplomatic relations with Ukraine, and at the same time mobilized party, government and military personnel who had contacts with Ukrainian experts to go to Ukraine to discuss cooperation. And there is real progress [60].

- Vagrian aircraft carrier and technology
- European Bison hovercraft and technology

- IL-76 strategic transport aircraft and technology
- Aerial refueling technology
- UGT-2500 gas turbine technology
- 40,000-ton large supply ship technology
- Helicopter and tank engine technology
- Cruise missile and air-to-air missile technology
- Aerospace and intercontinental ballistic missile technology

The purchase of the Varyag hull fulfills China's aircraft carrier dream, and it will develop carrier-based aircraft and landing equipment with reference to Uzbek technology. In the military cooperation between China and Ukraine, the most talked-about thing among military fans is the introduction of the "Varyag" aircraft carrier hull. After that, my country successfully built it into the country's first aircraft carrier through the hands of Dalian Shipyard. Liaoning" ship. In 1999, China's Macau Chuanglu Company signed an agreement with Ukraine to spend US\$20 million to tow the "Varyag" to China in the name of purchasing scrap iron. Although the United States instigated Turkey to obstruct it, the "Varyag" hull successfully arrived at the Dalian Shipyard in March 2002 [61]. During the same period, our country also used its personal relationships with relevant parties in Ukraine to invite a large number of Ukrainian experts to China with technical information.

China's agricultural investment in Ukraine has developed rapidly, and a full industrial chain of planting and breeding has been formed through technology transfer. COFCO's comprehensive agricultural investment in Ukrainian has made it one of the top three grain merchants in Ukrainian. Its subsidiary, "COFCO Agriculture" completed the acquisition of all shares of the Ukrainian Noble Group from 2014 to 2015, and took over the group's global agricultural product procurement, processing, storage and marketing businesses, including Mariupol LeeTeuk Sunflower Seed Crushing Plant. "COFCO Agriculture" became the second largest vegetable oil exporter in Ukraine, with an annual operating volume of 300,000 tons. In 2016, COFCO Agriculture invested US\$75 million to build the Nikolayev grain and oil transfer station, with an annual sales

volume of 2.5 million tons of grain, exported to China, Iran, North Africa, the Mediterranean, Southeast Asia, and Europe [77].

Ukraine and China have a stable scientific and technological cooperation relationship. The international exchange of modern science and technology marks the overall level of the new partnership established between countries. It includes the generation and research and development, development and exchange of new knowledge and technology and their application in different ways. In today's conditions, scientific and technological relations between Ukraine and China have reached their peak [62].

Table 2.16

Conference on scientific and technological cooperation between Ukraine and China

Year	Meeting
July.2012	Within the framework of the meeting, a scientific and technical cooperation plan for 2013-2014 was signed.
17.June.2016	The two sides discussed the current status and prospects of Ukrainian-Chinese scientific and technological cooperation and approved the list of joint projects that will be included in the Ukrainian-Chinese cooperation plan for 2017-2018.
23.June.2016	The conference "Cooperation between Ukraine and China in the field of science and technology" was held.
21.November.2017	The Ukrainian delegation participated in the first Ukraine-China science and innovation conference and signed a scientific and technological cooperation agreement.
6.June.2018	With the assistance of the embassy, more than 80 Chinese institutions and companies participated in the Ukraine-China Innovation Exhibition at the Kyiv International Exhibition Center.
13.October.2018	The 2019-2020 science and technology cooperation plan was approved.

24.October.2018	The 2nd Harbin Ukraine-China Science and Innovation Conference was held.
April.2019	The scientific and technological cooperation plan between Ukraine and the People's Republic of China for 2019-2020 was approved, with a total of 32 joint projects.
January-February.2021	The Subcommittee met for the fourth time and signed the next program of scientific and technological cooperation between Ukraine and the People's Republic of China.

Source: Embassy of Ukraine in the People's Republic of China [63]

Scientific and technological ties between the National Academy of Sciences of Ukraine and Chinese academic and industrial organizations have been significantly strengthened. The scientific and technological cooperation between Ukraine and China has made the actual pace of common development proceed quite smoothly. It provides a guarantee for the stability of bilateral cooperation. Become an effective direct contact for bilateral cooperation between Ukraine and China. has a positive meaning [64].

International exchanges of modern science and technology mark the establishment of new partnerships between countries. The overall level includes the generation and research, development, exchange and application of new knowledge and new technologies in different ways. Under today's conditions, these international exchanges are a necessary means of bilateral cooperation. One of the obvious examples is the friendly exchange and cooperation between the Igor Sikorsky Kyiv Polytechnic Institute and Chinese educational institutions.

Table 2.17

Academic cooperation between Igor Sikorsky Kyiv Polytechnic Institute and Chinese universities

University Name	LOGO	Agreement/Memorandum
Chinese Academy of Sciences (CAS)		In 2012, a strategic partnership agreement was signed, and the technology was improved

Dalian University of Technology (DUT)	 大连理工大学 Dalian University Of Technology	Agreement on academic exchange 2020-2025
University of science and technology Beijing (USTB)	 北京科技大学 University of Science and Technology Beijing	Memorandum of Understanding 2019-2024
North University of China (NUC)		Memorandum of understanding 2018-2024
Northwestern Polytechnical University (NPU)		Memorandum of understanding 2020-2025
Ningbo University (NBU)	 宁波大学 NINGBO UNIVERSITY	Memorandum of understanding 2019-2022
Jiaxing University	 嘉兴学院 JIAXING UNIVERSITY	Memorandum of understanding 2021-2026
Shenyang University of Technology (SUT)		Memorandum of understanding 2021-2026
Nanchang University (NCU)		Memorandum of understanding 2019-2022

Source:Igor Sikorsky Kyiv Polytechnic Institute [74]

Based on the academic characteristics of China and Ukraine, and based on the principles of mutual benefit and win-win cooperation, the two parties have expanded cooperation in all fields in an all-round way; they are committed to developing a comprehensive strategic partnership of equality, trust, and mutual support to promote cooperation between the two parties to a new level and achieve cooperation. new achievements and promote common development of both parties.

In 2018, the Guangzhou International Sister Cities Universities Alliance (GISU) was established in Guangzhou. The alliance has greatly promoted bilateral cooperation. Promote academic and cultural exchanges among universities. Based on the principle of mutual benefit, respect for equal exchanges. It is a platform to promote the development of bilateral cooperation between universities [75].

On December 2, 2020, Igor Sikorsky Kyiv Polytechnic Institute officially joined the alliance, and the two parties introduced and discussed the Digital Academy. A number of platform corporations have been carried out to draw on the superior disciplines of both parties to improve quality, especially the discipline of traditional Chinese medicine, which is of positive significance from a humanistic perspective. The Faculty of Management and Marketing actively contributes to the enhancement of international scientific and educational cooperation. Organizing international lectures under the auspices of the Alliance, the faculty aims to disseminate innovative methodological approaches to economic disciplines globally. These initiatives serve as a successful illustration of the vibrant international exchange of scientific and educational expertise, furthering the improvement of bilateral cooperation between Ukraine and China.

Conclusions to section 2

This chapter analyzes the integration of Ukraine-China economic and trade cooperation, mainly including Ukraine's economic foundation, legal systems related to trade and investment, and Ukraine's business environment.

1. Judging from the analysis results, Ukraine's economic foundation is not particularly good, but it has made great progress. However, the legal system was in part improved. At the same time, judging from the World Bank's business environment evaluation, Ukraine's business environment ranks low, but it is showing an upward trend. It also has certain comparative advantages. But now Ukraine is under the challenges of Russian aggression.

2. Then it introduces the measurement method of trade integration and the changing trend of trade integration between Ukraine and China. Secondly, a comparative analysis of the economic and trade dynamics between Ukraine and China is carried out together with other relevant countries (Romania, Moldova, Poland, Slovakia, Hungary) and applying trade integration index and gravity model, the study lags from 2012 to 2022. To construct the model, statistical data from various sources were utilized. Population and GDP data come from the World Bank's WDI database, and data on the distances between capitals and China come from the CEPII database. The prediction for the prospects of Ukraine-China trade is that inter-industry trade will still be the main body of Sino-Ukraine trade and Sino-Ukraine trade products. The structure continues to be optimized, and agricultural products will continue to become an important growth point for China-Ukraine trade. Although there will be certain resistance in the short term, in the long term, the economic globalization environment and open policies will become a strong driving force for the development of Ukraine-China trade. Secondly, it analyzes the impact of bilateral cooperation on technology transfer and immigration, and finds that China and Ukraine generally show a positive trend in the field of international scientific and technological cooperation, and the cooperation between the two parties has achieved mutual benefit and win-win

results. In 2012, the Eighth Institute of Electronics Technology of China signed a strategic cooperation agreement with the Igor Sikorsky Kyiv Polytechnic Institute to promote joint technological progress. Take the third Guangzhou International Sister University Alliance (GISU) "Urban Innovation University Student Entrepreneurship Competition" finals as an example, which will be held on November 15, 2022 at the University of Padua, Italy. The competition is hosted by the Secretariat of the Guangzhou International Sister Cities Universities Alliance and hosted by the University of Padua. This competition is supported by the Guangzhou Municipal People's Government and initiated by members of the Guangzhou International Sister City University Alliance. The theme of the competition is "Promoting Sustainable Development of Sister Cities through Scientific and Technological Innovation". The competition is centered around the United Nations Sustainable Development Goals, with special attention to concepts such as innovation, multi-discipline, and entrepreneurship and innovation. Furthermore, by observing the gravity model estimation results, we find that there is huge potential for development in Ukraine's trade relations with China. On this basis, the prospects for the development of bilateral trade between Ukraine and China are predicted and rationalized suggestions are given.

CHAPTER 3. SUGGESTIONS ON IMPROVING PROBLEMS AND CAUSES OF BILATERAL COOPERATION BETWEEN UKRAINE AND CHINA

3.1.Forecast of Ukraine-China Bilateral cooperation prospects.

At the policy level, the presidents of China and Ukraine had a phone call on April 26, 2023 [55]. The core issue is bilateral cooperation between the two countries and the exchange of views on the Ukraine crisis. The core position is to resolve issues through peaceful negotiation. Faced with the unstable situation in today's world, China promotes bilateral cooperation with Ukraine with the utmost sincerity. It also released "China's Position on the Political Solution to the Ukraine Crisis"[78], calling on countries around the world to pay attention, and was recognized by more than 80 countries around the world.

1. Inter-industry trade is still the main body of trade between China and Ukraine. Although economic and trade cooperation between China and Ukraine has been deepening in recent years, it is still dominated by inter-industry trade based on the differences in natural endowments between the two countries. Ukraine's exports to China are mainly agricultural products, steel products, etc,while China's exports to Ukraine are mainly electronic machinery products. In the future, the two countries will still focus on inter-industry trade and promote its continuous expansion and development by expanding the complementarity of bilateral trade [31].

2. The product structure of China-Ukraine trade will continue to be optimized. On the one hand, Ukraine's exports to China have added more than 200 new export products in the past two years, including boiler auxiliary equipment, steam turbines, ship propulsion systems, electric engines and generators, while reducing base metals. and exports of its products; on the other hand, regarding Ukraine's imports from China, the amount of transportation equipment imported from China increased significantly, while the import amount of light industrial products such as shoes, umbrellas, etc. decreased significantly. It can be seen that the product trade structure of the two countries is being continuously optimized by combining the resources, technology, production processes and other advantages of the two countries.

3. Agricultural products will remain an important growth point for China-Ukraine trade. Ukraine's biggest advantage is its agricultural natural resources, while China has comparative advantages in labor, capital, logistics and agricultural product processing technology. At the same time, China is the world's largest agricultural product market, so agricultural products have been the focus of China-Ukraine trade for many years. In addition, with the continued development of China-Ukraine agricultural product trade and the strengthening of bilateral technical exchanges and cooperation, the added value of Ukraine's agricultural products exported to China is expected to increase [32].

Examples of negative cooperation experiences from Ukraine: On May 25, 2012, Ukraine and China signed an agreement on cooperation in the agricultural sector. The contractors are the Export-Import Bank of China, the Ministry of Finance of Ukraine, the Chinese State Company CCEC, the State Grain and Grain Company of Ukraine (SFGCU). Volume traded was 69.5 million tonnes. However, Ukraine violated the agreement in the first year. According to China's letter of appeal to Ukraine, SFGCU delivered to SECCU (1) 530,000 tons in 2013 (4 million tons under the contract) (2) 1.48 million tons in 2014 (4.25 million tons under the contract) (3) 770,000 tons from January to June 2015 (5.17 million tons according to the contract). However, SFGCU bypasses CCEC to achieve maximum profits by delivering grains to third countries: -1.47 million tons in 2013, more than 700,000 tons in 2014 and 380,000 tons in the first half of 2015. In addition, China incurred additional costs of demurrage (simple vessel) of over \$1.6 million due to delivery time violations. The peaceful settlement failed because Ukraine failed to respond to demands and letters, so China was forced to appeal to the London Court of Arbitration to demand repayment of the \$3 billion loan. Now, the Chinese company intends to participate in the privatization of SFGCU, which was announced in March 2017 [38].

1 China's investment activities in Ukraine are low. International trade and capital flows are closely linked, and the activity of investment activities often affects trade. China has huge investment potential, but in Ukraine its usage is less than 1%. Ukraine's share in the Chinese investment structure is 0.004%, however, the amount of

investments is growing every year. So why is Chinese investment activity in Ukraine low? First, there are negative experiences of Chinese public and private companies cooperating with Ukrainian companies, especially in the agricultural sector [37].

It can be seen that there are many factors that hinder Chinese investment in the Ukrainian economy, one of the main factors is corruption and inflation. If the country solves the corruption problem a little by arresting corrupt politicians and revealing corruption schemes, then inflation will make the situation worse and more complex. In fact, Ukraine hopes to improve inflation and stabilize the Ukrainian currency by injecting foreign capital into its economy. Regarding other factors such as tax legislation and tax levels, the Ukrainian government is already formulating new tax regulations to make it easier for residents and non-residents to do business and the investment environment has become more favorable.

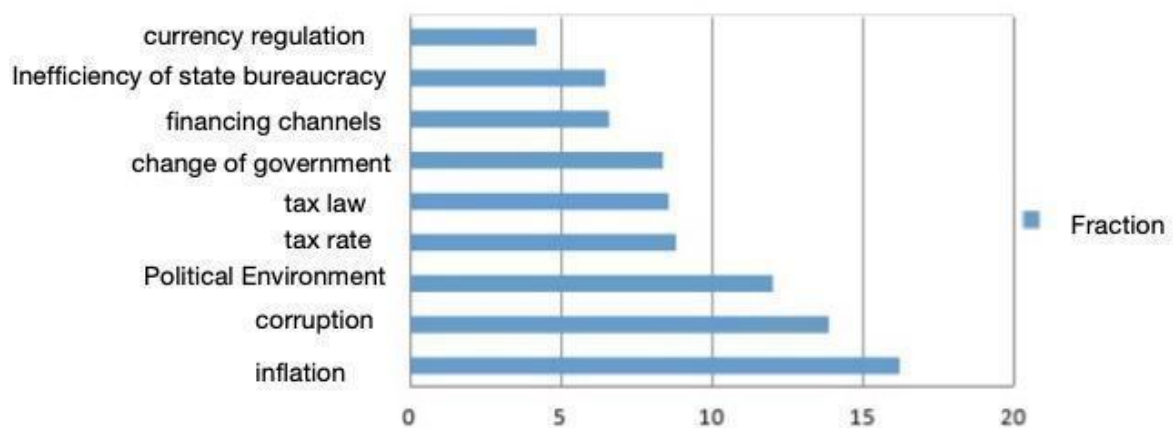


Figure 3.1 Factors hindering investment

*Compiles by the author on the basis [54]

2. Ukraine and China have a high degree of trade integration but a small scale of development. Analyzing the specific situation of China Foreign export trade, and comprehensively analyzing Ukraine's proportion, we found that from 2012 to 2015, Chinaforeign exports continued to rise. At the same time, the proportion of Ukraine's exports to my country is basically 0.1%. From 2017 to 2018, China's export trade volume to Ukraine continued to grow. Starting in 2019, the proportion of Ukraine's exports to my country began to increase significantly. During the same period, my

country also continued to increase exports to the country. In 2019, China Exports to the country and the country's exports to my country were US\$4.51 billion and US\$7.4 billion respectively. In 2020, China's exports to Ukraine reached a record high of US\$8.47 billion and increased steadily. After 2021, there will be a decrease due to force majeure factors. To sum up, Chinaexport trade with this country has broad prospects for development. If the two countries can strengthen cooperation, they can give full play to their respective advantages and effectively integrate resources. Ukraine's main advantage lies in agriculture. At the same time, the country has a large number of labor and production talents. China Advantages are mainly reflected in the light industry and electromechanical industry. Therefore, the two countries can learn from each other's strengths and jointly leverage their respective advantages. In addition to developing original industries, our country can also use Ukraine's advantages to further promote the development of various industries. Ukraine can make full use of its own advantages, strengthen encouragement and support for talents, and ultimately improve the country's market competitiveness.

Table 3.1

Development status of China's foreign export trade and Ukraine's proportion

years	China's foreign trade export volume (billion US dollars)	China's exports to Ukraine (100 million U.S. dollars)	Ukraine's share (%)
2012	12699	73.2	0.05
2013	13020	78.4	0.06
2014	13461	54.1	0.04
2015	13617	50.32	0.03
2016	13918	46.73	0.03
2017	15407	56.4	0.03
2018	17658	76.1	0.04
2019	19564	74.1	0.03
2020	19357	84.7	0.04
2021	25435	35.9	0.01

2022	28522	33.1	0.01
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Source: United Nations UN Comtrade database [23]

Observing Table 3.1, we can see that Ukraine's export proportion to my country has always been relatively low. By analyzing the table, it is found that in 2013, Ukraine's export share to our country reached 0.06%, which is the largest proportion from 2012 to 2022. Since 2014, the export trade with China has become more and more stable. The main reason for this phenomenon is that the two countries have begun to develop foreign relations. In other words, the development of foreign relations can play a large role in the development of foreign relations. Increase economic trade between the two countries and ultimately promote the country's economic development [65].

3.2 Analysis of the causes of Ukraine-China bilateral economic and trade development problems

1. Internal and external environment both countries is not conducive to speed development of investment and trade between Ukraine and China

The stability of the internal and external environments in both countries varies significantly.

Within the Asian region, China stands as a significant and influential state. Amidst its ongoing development, the country is fostering a dynamic internal environment while promoting market relations. This approach is conducive to attracting foreign investors to engage in China's burgeoning market. Unfortunately, Ukraine faces challenges in both its internal and external environments, raising apprehensions among potential Chinese investors. A primary source of concern hindering increased foreign direct investment from China into Ukraine is the ongoing Russian aggression and the persistent bombing of Ukrainian cities. Beyond the human toll, the destruction of industrial facilities intensifies investor worries about safeguarding their capital amid elevated risks and uncertainties. This geopolitical context poses a notable obstacle to fostering stronger economic ties between China and Ukraine.

At this stage, the internal environment in Ukraine depends on many other factors. The processes of building democracy in Ukraine are quite complex. Due to this, there is a certain political instability. On the one hand, the reforms that are being carried out have a positive impact and are taking place under the influence of international organizations. On the other hand, constant reforming of the economy has negative consequences.

“Russia’s invasion continues to have a devastating economic and social impact on Ukraine. Gross domestic product contracted by around 30 percent in 2022, civilian casualties are mounting and more than a third of the population has been displaced, while a large swathe of the country’s infrastructure has been destroyed. Despite policymaking by the authorities to maintain overall economic and financial stability, public debt has soared, and the fiscal deficit ballooned to accommodate additional defense and security spending” [66]. Specialists of Statysta have an optimistic forecast for Ukraine's GDP [67]. The projected values have an upward trend (\$173.4 billion in 2023, \$186.26 billion in 2024, \$196.05 billion in 2025, \$206.63 billion in 2026, \$214.75 billion in 2026, \$223.51 billion dollars in 2027). Of course, the improvement of trade and other types of bilateral cooperation with China should have a positive effect on increasing the level of economic activity. Predictive values are quite likely, but everything will depend on the duration of hostilities.

2. Flaws of the political and economic system

For many years, trade cooperation between Ukraine and China has become a key object of research by the international academic community. From this level of importance, Ukraine and China should optimize and improve their respective political and economic systems and establish the most acceptable one. The economic development model fully reveals the potential of economic and trade cooperation between Ukraine and China. Although the deficit of the trade balance between the two sides shows a growing trend in recent years, we cannot ignore the huge space for the development of high technologies in Ukraine and its huge potential. So, despite the war, the number of start-up projects continues to grow in Ukraine. The number and quality of

international academic exchanges is also increasing. The main constraints to cooperation include the prevalence of bureaucracy, which affects the process of bilateral trade and investment cooperation.

3. Ukraine's domestic trade environment is unstable

The constrained economic and trade environment in Ukraine serves as a limiting factor for the development of trade between Ukraine and China. The internal trade environment within the state remains marked by instability, caused by the significant impact of the war. Previously advantageous logistics channels, which conferred competitive benefits to Ukraine, have faced disruption due to the occupation of territories and imposed restrictions, particularly affecting air transport. Consequently, the trade process with distant countries like China has encountered heightened complexities. The restoration of these trade opportunities hinges on international support, a prompt cessation of hostilities, and the reinstatement of Ukraine's territorial integrity to pre-2014 levels. Numerous projects in Ukraine are actively addressing economic recovery in the post-war period.

4. Unbalanced industrial development leads to the inability to give full play to comparative advantages

In 2021, Ukraine's main export products to China included animal and vegetable oils, mineral products, and plant products. Mineral products accounted for the largest share, reaching 34.6%, totaling 6.89 billion U.S. dollars, a year-on-year increase of 8.2%. Plant products totaled US\$4.66 billion, accounting for approximately 24%, a year-on-year increase of 2.5%. Animal and vegetable fats and oils totaled US\$5.27 billion, accounting for about 25.7%, a decrease of 3% year-on-year. It can be seen from this that the main types of products exported by Ukraine to China in 2021 were animal and vegetable oils, mineral products and plant products. During the Soviet period, Ukraine's steel industry and military industry developed rapidly. It was one of the most important industrial bases. It was relatively advanced in technology and the heavy industry industry chain was also very complete. Nowadays, Ukraine's economic development is very slow because of war, and regardless of this, the protection of

advantageous industries is not perfect enough. Although Western countries have provided assistance, the economic crisis has had a serious impact on Ukraine. Different degrees of constraints have been imposed, which has a greater impact on the development of advantageous industries.

3.3 Recommendations for improving Ukraine-China bilateral cooperation

1. Cooperation between Ukraine and China

At present, there are deficiencies in the commodity structure of Ukraine-China trade. In cooperation, Ukrainian enterprises still mainly rely on natural resources to promote the development of trade relations. The emerging economic and trade demands have a smaller growth rate, especially the low development level of service trade, which has restricted the economy and trade between Ukraine and China. Further development, but because natural endowment economic and trade products will have high demands on the country's natural resources, it will only promote Ukraine's economy to a certain extent. However, this situation can be gradually changed through economic and trade cooperation with China, because China's industrial development is well balanced.

The expeditious cessation of hostilities in Ukraine and the restoration of territorial integrity are pivotal for the comprehensive revitalization and renewal of Ukraine's industrial development. Presently, industrial advancement is recognized globally as a key driver for prosperity and enhanced competitiveness among nations. Many countries have initiated reindustrialization processes to bolster their economic landscapes, a paradigm that holds significant relevance for Ukraine in its quest for revitalization within a new contextual framework. International aid plays a crucial role in fostering these endeavors. The collaborative efforts between nations, especially with contributions from China, can significantly expedite and amplify Ukraine's reindustrialization processes in the aftermath of territorial restoration.



Figure 3.3 Total value of imports and exports of goods between China and Ukraine from 2015 to 2022 [68]

Promote the market-based liberalization of Ukraine-China trade. In order to promote the market liberalization of trade between Ukraine and China, we should cooperate with China to establish a free trade area. Drawing on the experience of trade liberalization in Ukraine and the CIS countries, we must establish a common free trade area for both parties to tap out. Regarding the potential of Ukraine-China economic and trade development, Ukraine and China have close cooperation in many aspects, which can make up for the shortcomings of Ukraine's insufficient industrial development. Continue to promote trade liberalization between Ukraine and China, including the implementation of a relatively flexible Ukrainian tax mechanism system to promote the construction of infrastructure investment, mainly by providing relative preferential strength, guidelines and trade liberalization policies for raw materials, agricultural technology and investment in Ukrainian industries imported from China [41].

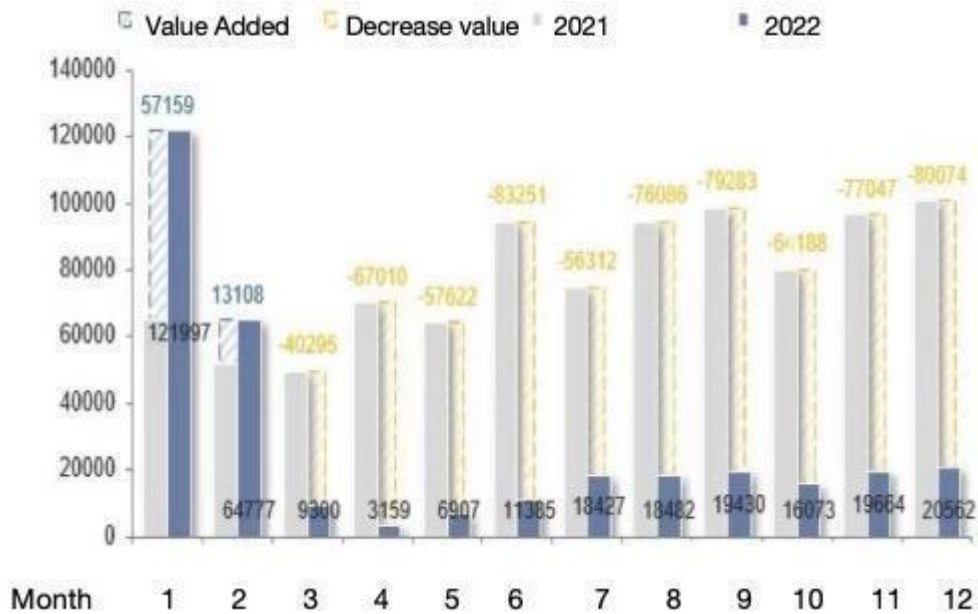


Figure 3.4 The total value of monthly exports of goods between China and Ukraine in 2021-2022 [68]

Data from the Huajing Industrial Research Institute shows that from January to August 2023, the bilateral import and export volume of goods between China and Ukraine was US\$4,861,827,800, a decrease of US\$1,166,150,500 compared with the same period in 2022, and a year-on-year decrease of 19.5% [68].

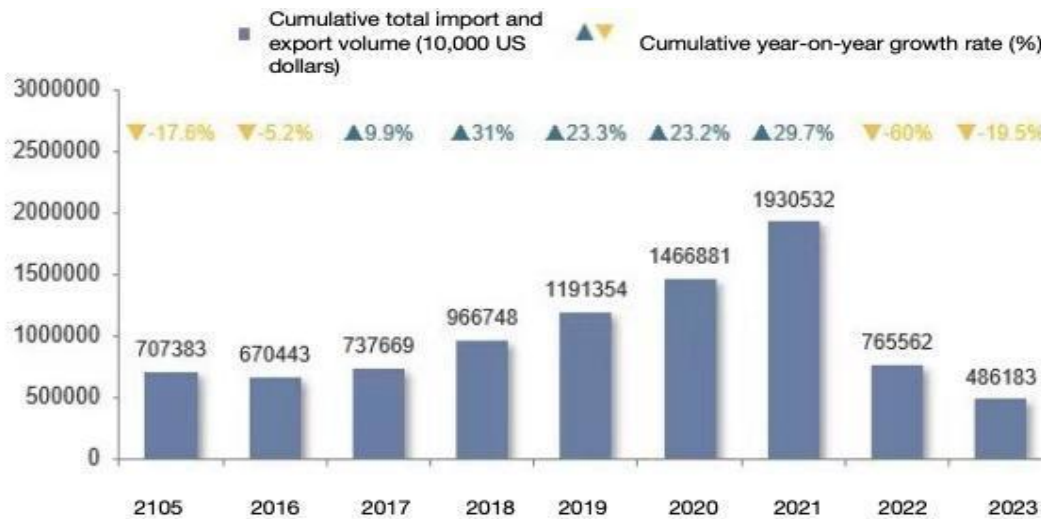


Figure 3.5 The total value of monthly exports of goods between China and Ukraine in 2015-2023 [68]

2. China's suggestions. Actively expand capital investment in Ukraine, develop economic and trade cooperation between China and Ukraine, expand trade and

investment in Ukraine, and introduce raw materials and military technology from China. The current political situation in Ukraine is unstable, which will affect Ukraine's domestic investment environment to a certain extent, thereby affecting trade. However, there is still a large investment space in Ukraine, and Ukraine's current economic situation is not very good. Ukraine has The preferential foreign investment policy of 2005 has been reactivated, which allows China's direct investment in Ukraine to enjoy great discounts. Ukrainian laws clearly stipulate that at least 10% of the registered capital of foreign-funded enterprises must come from foreign investment. That is, foreign companies that set up companies in Ukraine can enjoy preferential policies for foreign investment by only paying 10% of the capital. In the world of taxation, foreign-invested enterprises enjoy the same treatment as domestic enterprises. Among them, Ukraine pays more attention to industry encouragement policies, which mainly include agricultural products, food processing, machinery manufacturing, etc. in China's investment industries. These industries are the most important industries for China's investment in Ukraine. China must increase direct investment in these industries. investment, thereby strengthening Ukraine-China trade relations [42].

Increase financial and agricultural technical support to Ukraine. China has gradually increased financial support to Ukraine and increased agricultural technical support to Ukraine. On the one hand, Ukraine's agricultural development has great potential, and increasing financial support for agriculture can further promote Ukraine's agricultural development will also be of great help to China's import of Ukrainian agricultural products. On the other hand, Ukraine's introduction of China's agricultural production technology into the country can help Ukraine's agricultural technology upgrade and transform. International trade enables both parties to benefit and promotes the development of economic and trade relations in a better direction. China continues to help Ukraine upgrade and transform its agricultural technology, change its backward development methods, improve the level of agricultural production, and further gradually improve the efficiency of Ukraine's agricultural production. Based on this, China must also take seriously the rewards it gets from exporting agricultural

technology to Ukraine. In its economic and trade cooperation with Ukraine, China pays more attention to the export of agricultural technology, especially the output of production technology and mechanical processing technology, which can make up for the loss of Ukrainian agriculture. Due to the shortage of technology, it can increase the output per unit area of agricultural products, increase China's food imports, help change Ukraine's status of low agricultural production technology, and further form its own agricultural industry advantages. Both Ukraine and China will enjoy the benefits of improved agricultural technology [43].

3. Ukrainian suggestions. Optimizing Ukraine's trade industrial structure. Ukraine will further optimize its trade industrial structure, change the current trade model, grasp the economic and trade development relationship between Ukraine and China, promote economic and trade cooperation between the two countries, improve Ukraine's trade status, reduce the trade deficit, and promote further development of the Ukrainian economy. Ukraine inherited the Soviet Union's superior industries after the disintegration of the Soviet Union. With the development of Ukraine's energy technology industry and military industry, this has also made Ukraine's industrial development unbalanced to a certain extent. Ukraine's economic foundation is energy-intensive industries.

However, Yang Fan noted that Ukraine's energy self-sufficiency rate is less than 20% [69]. The main energy importer for Ukraine was previously Russia, which had a significantly negative impact on the country, even in earlier periods. Energy security brings hidden dangers. The higher industrial output value in Ukraine is heavy industry and high energy-consuming industries. The development of light industry is relatively low, and its output value is lower than that of heavy industry. The government does not pay much attention to its development. The development of the light industry has been subject to many restrictions. Ukraine deepens its cooperation with China to change the status quo of a single structure. China's industrial structure has a relatively balanced development. Ukraine can conduct economic and trade cooperation with China to learn from China's experience in industrial transformation, and can also conduct trade

cooperation in light industry to make up for its own lack of industrial development, thereby promoting Ukraine's industrial upgrading [69]. Direct foreign investment from China, especially in industrial enterprises, is important for solving this problem.

4. Ukrainian and Chinese proposals. China and Ukraine also need to discuss promoting cross-border e-commerce, financial services, tourism, local cooperation, etc. development in various fields and enhance the level of cooperation in various fields. Personnel exchanges are an important condition for communication and cooperation between the two parties. In October 2016, Ukraine opened visas on arrival to Chinese citizens, which greatly promoted personnel exchanges between the two countries. Currently, Ukraine only implements a visa-free policy for Chinese diplomatic and official passports, while ordinary official passports still require a visa. In the future, both parties can explore further simplifying visa procedures. Ukraine can study the implementation of visa exemption for a certain period of time for ordinary official passports to promote exchanges and cooperation between government agencies and enterprises. Ukraine is rich in tourism resources and China-Ukraine tourism cooperation has great potential. Ukraine needs to continue to increase its tourism promotion efforts, comprehensively introduce Ukraine's natural scenery, history, culture, ethnic customs and other resources to the Chinese people, refine the content of tourism cooperation, and launch more abundant and distinctive tourism products for Chinese tourists. . At present, investment and trade cooperation between China and Ukraine is mainly concentrated in Kiev and some areas in southern and eastern Ukraine. There are still relatively few Chinese companies investing in western and northern Ukraine. In the future, the two sides can explore local cooperation in a wider geographical scope [43].

Pay attention to the role of educational institutions, enhance mutual understanding, and cultivate talents for China-Ukraine cooperation. Cultivate corresponding talents for the long-term development of bilateral economic and trade cooperation. At present, the use of Ukrainian in Ukraine is becoming more and more common, especially in official occasions, but there are not many talents who are proficient in Ukrainian in China. With the encouragement of the Chinese Ministry of Education, some foreign language

colleges and universities have successively opened Ukrainian language teaching in recent years, but talent training requires conditions and time. Ukrainian studies in China are an endangered discipline, and the development of Ukrainian research centers established by the Chinese Academy of Social Sciences and some universities are facing problems such as talent shortages. Not many people in Ukraine who understand Chinese are willing to engage in research on China issues, and research institutions have very limited influence on government decision-making. Under this circumstance, China needs to increase its support for the dissemination of information about China in Ukraine and research institutions on China issues, so that Ukrainian society can have a relatively objective and comprehensive understanding of China, and push the Ukrainian government to make diplomatic decisions towards China that are in the interests of both parties. decision. Paying attention to media communication channels, China's Xinhua News Agency, CCTV and other media have branches in Ukraine and stationed reporters. Chinese audiences can often receive direct reports from Ukraine. It is necessary for the Ukrainian government to support Ukrainian language teaching and Ukrainian research in China, as well as media dissemination. Cultivate and reserve corresponding talents for the long-term development of economic and trade cooperation and strategic partnership between Ukraine and China.

Conclusions to section 3

This chapter mainly analyzes the shortcomings and reasons of bilateral trade between Ukraine and China. Start with data, summarize experience, and make suggestions for improving bilateral cooperation between Ukraine and China.

1. Inter-industry trade is still the main body of trade between Ukraine and China. Both sides should actively expand cooperation in light industrial products, attract investment and build factories in China's light industry, and give full play to China's construction advantages. Continuously optimize structured products combined with resources. Actively expand China COFCO Group's direct investment in Ukraine, actively promote the construction of industrial facilities in Ukraine and provide technical support to Ukraine based on its early investment in advanced local terminals in Ukraine. Continue to promote the development of the agricultural field, continuously optimize and subdivide agricultural products for reprocessing, improve product quality, and enhance international competitiveness.

2. The main problems in Ukraine-China economic and trade relations are: the low degree of trade integration and the ever-expanding trade deficit between Ukraine and China, which affects Ukraine's per capita income level. The reason is that Ukraine's domestic trade environment is unstable and its industrial development is unbalanced, which hinders its advantages from being fully utilized. The analysis shows that war factors have greatly restricted the development of trade between Ukraine and China. Due to the impact of the war, infrastructure was damaged, resulting in inconvenient transportation and hindering direct investment by potential Chinese investors. Swelling public debt and an unstable internal environment have led to the erosion of advantages. Growing bureaucracies constrained the progress of collaboration.

3. The whole world should work together to play the positive role of international assistance. Stop the destruction of Ukraine. Make every effort to restore Ukraine's infrastructure construction. Ukraine is rich in natural resources. Ukraine and China can actively cooperate in the agricultural and energy fields to develop resources, which is of

positive significance for reviving the Ukrainian economy. China should actively expand direct investment in Ukraine. China's infrastructure level is world-class and it can actively cooperate with Ukraine. On the economic front. Both sides should establish a stable and efficient free trade area and promote bilateral cooperation between Ukraine and China. Ukraine should actively cooperate with China's light industry to make up for its shortcomings. The intensity of preferential treatment should be expanded within a reasonable range. In response to the current unstable environment, Ukraine should exert its great power spirit, contact and promote the establishment of policies, and provide a strong force for bilateral trade protection.

CONCLUSIONS

The political relations between Ukraine and China are increasingly close, and Ukraine is one of China's strategic partners. Based on this, China should take its friendly cooperative relations with Ukraine seriously, and Ukraine should make full use of its good cooperative relations with China to intensify economic and trade cooperation, further bringing long-term benefits to the country's economic growth. Deepening economic and trade cooperation with China can, on the one hand, drive sustained economic growth in Ukraine and promote the transformation of the country's industrial structure. On the other hand, it can also establish a long-lasting trade cooperation relationship, gradually make China pay more attention to Ukraine's national political situation, and conduct political mediation around the world, using China's power to help Ukraine maintain a more stable economic situation. This thesis mainly studies the development trends and industrial structure of bilateral economic and trade cooperation between Ukraine and China, analyzes the factors affecting the development of Ukraine through close cooperation between the two countries, and identifies and improves problems that arise in the process. All this made it possible concluded the following points:

1. Current status of economic and trade development between Ukraine and China: First, starting from service trade, to the scale and trade structure of economic and trade cooperation between Ukraine and China, the current achievements of Ukraine-China trade cooperation are mainly to find ways to be consistent with their own trade development paths. At the same time, China must continue to improve its scientific and technological innovation capabilities and vigorously develop independent intellectual property rights. Only in this way can we transform from a manufacturing power to a technological innovation power. This shift is based on the experience of developing economic and trade relations with Ukraine.

2. The impact of Ukrainian-Chinese economic and trade relations on the Ukrainian economy has been carefully studied and analyzed in a number of factors influencing Ukrainian-Chinese economic and trade relations, such as the increase of Ukrainian

GDP, various economic incomes, etc. Based on the results of correlation analysis and trade integration analysis it is shown that there will be some problems in the economic and trade process between Ukraine and China, such as insufficient trade stickiness, the impact of the continued increase of Ukraine's trade deficit, etc. Then, after further analyzing the causes of the problems, we came to the conclusion that since Ukraine and China can play a certain role in economic and trade cooperation, a certain level of reduction of advantages led to an economic and trade deficit between Ukraine and China. The Russian invasion has seriously affected Ukraine, which in turn has affected Ukraine's current economy. So on a deeper level, China should make reasonable use of its own influence to help Ukraine resolve the crisis reasonably. This will have a positive impact on the in-depth development of Ukraine-China economic and trade to a large extent, and will ultimately form a beautiful vision for the development of cooperative economy between China and Ukraine.

3. Ukraine-China economic and trade cooperation can promote the sustainable development of Ukraine's national economy, especially in aspects such as national economic development, government revenue, and the transformation of industrial institutions. Therefore, the most important economic reform strategy currently implemented by Ukraine is to deepen Ukraine-China economic and trade relations. Due to the limited available data, the impact model established in this thesis still has shortcomings, and it is hoped that it can be improved in future research.

4. Ukraine's trade advantage with China is not very obvious, and it can benefit a lot from economic exchanges with China. If Ukraine wants to develop its economy, it must establish close economic and trade relations with China. Due to the current low international competitiveness of Ukraine caused by Russia's invasion and the sharp decline in total international trade, deepening cooperation with China will not harm its own economy, and China will also protect Ukraine's vital interests.

5. Gradually deepening Ukraine-China economic and trade relations can increase Ukraine's per capita income, GDP and other related data. Since this relationship has greatly promoted the development of Ukraine's national economy, cooperation between

Ukraine and China is particularly necessary. Increase more cooperation opportunities. Finally, identify the problems that have arisen in the current cooperation and put forward scientific and reasonable suggestions for improving Ukraine-China economic and trade relations, as follows:

- Actively expand capital investment in Ukraine;
- Increase financial and agricultural technology support for Ukraine;
- Optimize Ukraine's trade industrial structure;
- Make full use of Ukraine's geographical advantages;
- Ukraine treats foreign investors fairly in terms of policy;

6. When Ukraine and China carry out economic and trade cooperation, they must make full use of Ukraine's geographical and language advantages. In terms of geographical advantages, Ukraine is in the core area of the CIS countries and the eastern part of the European Union. It is also a very important country for EU integration. At the same time, Ukraine is in These countries which also have innate language advantages and have very stable trade relations with many countries. These two advantages of Ukraine are conducive to attracting cooperation between China and itself. China hopes to conduct trade with more CIS countries and establish relatively stable economic and trade relations, and further strengthen trade cooperation with the eastern region of the EU. Moreover, Ukraine has also become a logistics distribution center for the CIS countries and the eastern part of the European Union. Ukraine should give full play to its trade geographical advantages and establish a more stable and long-term trade market relationship with China to further achieve the goal of trade liberalization in order to Establish close trade relations with China, the eastern part of the EU and the CIS countries. The formation of multilateral trade relations centered on Ukraine will promote Ukraine's economy.

7. China starts from Ukraine's own interests, and its core is to promote peace negotiations through diplomatic means and ultimately stop the war. Comply with the basic norms of international relations, respect the territorial integrity of Ukraine, and all standards should be based on equality, rather than doing one thing in front of others and

another behind the scenes. China and Ukraine respect each other's territorial integrity. Ukraine respects the one-China principle, and China respects Ukraine's territorial integrity.

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