

FTAs, Chinese Imports, and Employment in Developing Countries — Evidence from the China-Chile FTA

Hao Wei, Qiyangfan Feng*

Abstract: Expanding a global network of high-standard free trade agreements is an important measure for countries to promote high-level opening up. Taking the China-Chile FTA as a case, this paper systematically studies the impact of free trade agreements with China on employment in enterprises of developing countries by using firm-level data from Chile. The results of this paper show that the expansion of Chinese imports as a result of the implementation of the China-Chile FTA significantly increased employment in Chilean enterprises. The expansion of Chinese imports raised the employment scale of Chilean firms through mechanisms such as production scale effect, institutional cost effect, and industrial chain effect. Additionally, the mechanisms of the reduction in non-trade institutional cost and the industrial chain effect notably promoted the growth of employment in Chilean firms focused on domestic sales. The expansion of Chinese imports not only boosted employment in skilled labor, but also increased the proportion of female labor in Chilean firms. Furthermore, the reduction in non-tariff trade barriers induced by the China-Chile FTA significantly enhanced the employment scale of export-oriented Chilean enterprises. When considering both of the effects of China's export and import expansion, the China-Chile FTA also had a significant positive impact on employment in Chilean firms. This paper concludes that expanding China's free trade areas network is conducive to boosting global employment, and that active participation by developing countries in China's FTAs is a rational strategic choice.

Keywords: Free Trade Agreements (FTAs), Chinese Imports, Enterprise Employment, Non-tariff Trade Barriers, Trade Institutional Costs

I. INTRODUCTION

Currently, the global political landscape is volatile, geopolitical conflicts are

* Hao Wei, Professor, Business School, Beijing Normal University.

Qiyangfan Feng (Corresponding Author), PhD. Candidate, Business School, Beijing Normal University. Email: fengqyf@mail.bnu.edu.cn.

This paper is funded by the Major Project of National Social Science Foundation "Research on the Impact and Countermeasures of Actively Expanding Imports on Accelerating the Construction of a New Development Pattern" (23ZDA050).

The Chinese version of this paper was published on Issue 6, 2024 of the *Journal of International Trade*.

frequent and anti-globalization is on the rise, leading to a sharp increase in trade costs between countries and regions. Constrained by high institutional costs and export path dependence, many developing countries and low-income economies are at risk of large-scale unemployment and the potential return to poverty. However, China has consistently upheld the initiative of economic globalization, advocating for the liberalization and facilitation of trade and investment, and has already achieved remarkable progress in this regard. Against this backdrop, as the world's largest developing country and a responsible global power, whether and how China can “use opening-up to alleviate developmental challenges and pursue shared prosperity” is a pressing academic issue.

Expanding a global network of high-standard free trade agreements is a strategic measure for China to achieve high-standard opening-up. In recent years, bilateral or multilateral trade liberalization through FTAs has played a significant role in promoting regional economic cooperation and global trade. However, within the context of global regional economic cooperation, China's development of FTAs remains relatively lagging, which hinders its ability to engage in global governance reforms and the reshaping of international rules.¹ Accelerating FTA negotiations and promoting the high-quality development of FTAs have become important avenues for China to expand its international influence, boost domestic economic development, and contribute to global economic growth.

Different from existing studies, this paper focuses on the impact of signing FTAs with China on employment in developing countries. Firstly, the White Paper on China's International Development Cooperation in the New Era points out that “South-South Cooperation” is the basic orientation of China's international development cooperation. This paper reveals the key to whether China's high-level opening-up can achieve win-win cooperation among South-South countries. Secondly, employment is the most critical issue for people's livelihoods. The importance of employment for developing countries is self-evident. Existing literature has confirmed that employment not only helps to

1 Yang Jiang, China's Pursuit of Free Trade Agreements: Is China Exceptional? *Review of International Political Economy*, No. 2, 2010, pp. 238-261; Xuefeng Qian and Lianmei Gong, Trade Policy Uncertainty, Regional Trade Agreements and China's Exports of Manufacturing Industry, *China Industrial Economics*, No. 10, 2017, pp. 81-98; Jian Han and Yayun Xu, RCEP and the Integration of Asia-Pacific Regional Trade Agreements — A Quantitative Study on the Agreement Texts, *China Industrial Economics*, No. 7, 2021, pp. 81-99.

alleviate poverty and promote economic growth, but also plays a crucial role in stabilizing the political situation in developing countries.² Thirdly, humanity's fate is interconnected. Without the development of developing countries, global stability and prosperity cannot be achieved. Developing countries account for about 82.6% of the world's population, and the improvement in human living standards largely depends on raising the living standards of people in these countries.

In terms of sample selection, this paper takes the representative China-Chile Free Trade Agreement (hereinafter referred to as China-Chile FTA) as the research object, and selects Chilean enterprises as the research sample. The reason is that the China-Chile FTA is an early FTA signed by China, and it is also one of the FTAs signed by China with a higher level of liberalization of trade in goods, which is an important milestone in promoting China's high-level opening-up to the outside world. The China-Chile FTA was signed on November 18, 2005, and officially implemented on October 1, 2006, mainly covering areas such as goods trade and economic and technical cooperation. The ultimate goal of the China-Chile FTA is to achieve mutual benefits and win-win outcomes for both countries. To further promote trade liberalization and create a new chapter in mutual benefits, China and Chile signed the China-Chile Free Trade Area Service Trade Agreement on April 13, 2008, and later signed the upgraded version of the Free Trade Agreement Protocol on November 11, 2017. Benefiting from the China-Chile FTA, Chile's exports to China rapidly grew from \$1.909 billion in 2003 to \$18.078 billion in 2012, with an increase of 846.99%, and further rose to \$38.433 billion in 2022. In terms of export share, in 2003, Chile's exports of goods to China accounted for about 9% of its total exports, but by 2009, this figure quickly increased to 23%. Since then, China has consistently remained Chile's largest export destination. After that, Chile's exports to China continued to grow, and the share increased steadily, reaching approximately 39% by 2022. In light of this, this paper selects the key objective of the China-Chile FTA, which is employment generation, as the focus of the research, and conducts the study from a multi-dimensional perspective.

² Edgar O. Edwards, *Employment in Developing Countries*, *World Development*, Vol. 2, No. 7, 1974, pp. 1-27.

II. LITERATURE REVIEW

The literature relevant to this paper falls into two branches. One branch explores the potential economic benefits of participating in FTAs. Based on *ex-ante* research, this literature mainly uses reset models with iceberg trade costs to simulate or predict the potential impacts of FTA implementation. Some scholars have utilized the global model, Global Trade Analysis Project (GTAP), such as the Computable General Equilibrium (CGE), to simulate the economic benefits of FTAs for members.³ Other scholars have used gravity model to predict the trade creation effect of joining FTAs.⁴ However, due to the limitation of research paradigm, while *ex-ante* studies can “reasonably” predict the impacts of FTAs on different economic indicators, they still lack micro-level foundations and mechanism analysis. Existing *ex-post* studies, using country-level, industry-level, or product-level data, explore the impacts and transmission channels of FTAs, complementing the *ex-ante* research. For instance, Trefler (2004), using the US-Canada FTA as the background for his study, found that FTAs have heterogeneous effects on employment in industries with varying degrees of tariff reductions.⁵ Cadot et al. (2011) studied the Republic of Korea and Chile, showing that FTAs promote members’ export diversification, which in turn drives economic growth.⁶ Bown et al. (2014) found that FTAs could offset the negative trade impacts of the Great Recession, strengthening trade cooperation among members.⁷ FTAs stimulate exports

3 Richard E. Baldwin and Anthony J. Venables, Regional Economic Integration, *Handbook of International Economics*, Vol. 3, 1995, pp. 1597–1644; Shudong Zhou et al., Dynamic Analysis of the Impact of the Establishment of the China-ASEAN Free Trade Area on Regional Agricultural Trade, *Journal of Management World*, No. 10, 2006, pp. 14–21; Zhongmin Li, Research on China’s Regional Trade Liberalization Strategy, *The Journal of World Economy*, No. 8, 2007, pp. 46–51.

4 Scott L. Baier and Jeffrey H. Bergstrand, Do Free Trade Agreements Actually Increase Members’ International Trade? *Journal of International Economics*, Vol. 71, No. 1, 2007, pp. 72–95; Nianli Zhou, Can Concluding “Regional Trade Arrangements” Effectively Promote Service Exports of Developing Economies? *The Journal of World Economy*, No. 11, 2012, pp. 88–111.

5 Daniel Trefler, The Long and Short of the Canada-US Free Trade Agreement, *American Economic Review*, Vol. 94, No. 4, 2004, pp. 870–895.

6 O. Cadot, J. Demelo and Alberto Portugal-Pérez, Understanding the Barriers to Entry Effects of Rules of Origin in Preferential Trading Arrangements with an Application to Asian FTAs, *International Handbook on the Economics of Integration: General Issues and Regional Groups*, No. 1, 2011, p. 187.

7 Chad P. Bown and Mark Wu, Safeguards and the Perils of Preferential Trade Agreements: Dominican Republic – *Safeguard Measures*, *World Trade Review*, Vol. 13, No. 2, 2014, pp. 179–227.

directly through cost channels, and the increase in export demand can also raise the market prices of products. Therefore, countries participating in FTAs will increase exports to partner countries, which in turn stimulates employment growth. Against the backdrop of the US withdrawal from the Trans-Pacific Partnership (TPP), Xuefeng Qian and Lianmei Gong (2017) used product-level data to explore the impact of China's active participation in the Regional Comprehensive Economic Partnership (RCEP) and China's passive response to the TPP on Chinese exports.⁸ Unfortunately, there is almost no literature that explores this topic in depth based on the micro perspective of enterprises.

Another branch of literature focuses on the impact of China's trade openness on the global economy. Foreign studies have discussed the consequences of China's trade expansion from various perspectives. Some studies on developed countries argue that China's trade expansion has not only brought additional benefits to the world economy, but has also caused negative effects, such as rising unemployment, declining wages and welfare levels, and thus view China's development as a competitive "threat".⁹ These studies primarily focus on China's export expansion and fail to thoroughly discuss China's large-scale processing trade, while selectively "ignoring" the rapidly growing scale of China's import trade. On the other hand, some studies support China's contribution to the world economy. From a trade development perspective, since the reform and opening-up, China has gradually increased its market openness to other countries, and its broad demand market has driven global economic growth.¹⁰ Some resource-based countries and neighboring countries have maintained a high degree of export dependence on China. China's export upgrading has suppressed the average price of technological products, improving trade conditions for many low-income economies.¹¹

⁸ *Supra* n. 1.

⁹ David H. Autor, David Dorn and Gordon H. Hanson, The China Syndrome: Local Labor Market Effects of Import Competition in the United States, *American Economic Review*, Vol. 103, No. 6, 2013, pp. 2121–2168; Daron Acemoglu et al., Import Competition and the Great US Employment Sag of the 2000s, *Journal of Labor Economics*, Vol. 34, No. S1, 2016, pp. S141–S198; Justin R. Pierce and Peter K. Schott, The Surprisingly Swift Decline of US Manufacturing Employment, *American Economic Review*, Vol. 106, No. 7, 2016, pp. 1632–1662.

¹⁰ Wolfgang Keller, Ben Li and Carol H. Shiue, China's Foreign Trade: Perspectives from the Past 150 Years, *The World Economy*, Vol. 34, No. 6, 2011, pp. 853–892; Gordon H. Hanson, The Rise of Middle Kingdoms: Emerging Economies in Global Trade, *Journal of Economic Perspectives*, Vol. 26, No. 2, 2012, pp. 41–64.

¹¹ Xingye Jin, David Daokui Li and Shuyu Wu, How Will China Shape the World Economy? *China Economic Review*, Vol. 40, 2016, pp. 272–280.

From the perspective of domestic research, only a few studies have focused on how China's trade expansion drives global economic growth. For example, Changyuan Luo and Jun Zhang (2012) examined the impact of China's exports on innovation in Thai enterprises;¹² Jingjun Liu et al. (2020) explored, from an import perspective, the contribution of China's trade openness to promoting foreign direct investment;¹³ Hao Wei et al. (2021) used country-level data to investigate, from multiple dimensions, the impact of China's imports on global economic growth.¹⁴

Compared to existing literature, the marginal contributions of this paper are as follows. First, existing domestic literature mostly focuses on the study of China's export trade and its impact on the world economy. In contrast to these studies, this paper shifts the focus to examining the impact of China's imports on the economies of its trade partners. This provides a new perspective on the international influence of China's foreign trade, offering an important supplement and extension to the existing body of research. Second, this paper uses the implementation of the China-Chile FTA as an exogenous shock event, utilizing firm-level data from Chile to systematically study the impact of China's import expansion induced by FTA participation on employment in Chilean enterprises. The paper not only distinguishes between export-oriented and domestic-sales-oriented firms in Chile, but also reveals the path and mechanism through which Chinese imports affect employment in Chilean firms, including production scale effect, productivity effect, institutional cost effect, and industrial chain effect. This paper deepens the understanding of the effects of FTAs on the contracting parties and provides new evidence from the firm-level perspective for related studies. Third, this paper not only analyzes the impact of reductions in China's import tariffs and non-tariff barriers on employment in Chilean firms due to the China-Chile FTA, but also quantifies the total impact on employment in Chilean firms, considering both China's import and export expansions. This study is useful for China's trade partners

12 Changyuan Luo and Jun Zhang, The Innovation Spill-over Effects of China's Export Expansion: The Example of Thailand, *Social Sciences in China*, No. 11, 2012, pp. 57-80 & 204-205.

13 Jingjun Liu, Xiaodong Lu and Jian Zhang, Chinses Imports and Global Economic Growth: International Evidence from Corporate Investment, *Economic Research Journal*, No. 8, 2020, pp. 73-88.

14 Hao Wei, Ye Guo and Jun Wu, China's Market, Import Trade and World Economic Growth, *Forum of World Economics & Politics*, No. 3, 2021, pp. 26-53.

to gain a scientific understanding of the economic benefits of signing FTAs with China and contributes to China's ongoing policies and strategies, such as actively expanding imports, and constructing and expanding a global network of high-standard free trade areas.

III. THEORETICAL ANALYSIS AND RESEARCH HYPOTHESES

This paper proposes possible mechanisms of action from four perspectives: production scale effect, institutional cost effect, productivity effect, and industrial chain effect.

A. The Production Scale Effect Mechanism

The expansion in production scale is an inevitable result of a country's export growth. Signing an FTA with China will undoubtedly promote bilateral trade exchanges and encourage partner countries to increase their exports to China. The reason behind this is that China has enormous market and diversified product demand, and the decline of bilateral trade barriers will further lower China's import costs and increase domestic demand for imported goods by nationals and domestic enterprises. Therefore, theoretically, the market access liberalization induced by China's participation in FTAs will stimulate foreign enterprises to expand production through the production incentive effect and promote employment through the production scale effect. On the one hand, China's import expansion incentivizes export-oriented firms in FTA partner countries to hire more labor to increase output. On the other hand, the signing of the China-Chile FTA reduces the export uncertainty for Chilean export-oriented firms, encouraging them to increase fixed asset investment. According to the "capital-labor complementarity" theory, firms will hire more labor.¹⁵ Additionally, to more quickly and stably capture new markets, firms may introduce new machinery and advanced technologies to improve productivity and competitiveness. This implies that firms' production activities will require more skilled labor, which can increase employment through the capital-

¹⁵ Andrea Linarello, Direct and Indirect Effects of Trade Liberalization: Evidence from Chile, *Journal of Development Economics*, Vol. 134, 2018, pp. 160–175.

skill labor complementarity channel. Based on the above analysis, this paper proposes the following hypothesis.

Hypothesis 1: China's participation in FTAs will increase employment in export-oriented firms in FTA partner countries through the production scale effect mechanism.

B. The Institutional Cost Effect Mechanism

High institutional costs are one of the main factors hindering the effective allocation of resources in developing countries.¹⁶ This paper argues that participation in FTAs helps FTA partner countries reduce institutional costs, thereby promoting business development and increasing employment. The establishment of an FTA creates a closer economic network between the contracting countries, and the stable demand from the Chinese market significantly reduces trade uncertainty faced by Chile, which helps to secure national fiscal revenue sources. Under the export incentives, the governments of the partner countries are motivated to optimize institutional rules and regulations, thereby lowering institutional costs for businesses and improving operational efficiency, which, in turn, affects employment in firms. Furthermore, given that export-oriented and domestic-sales-oriented firms face different institutional constraints, this paper analyzes the institutional cost channels from both trade and non-trade institutional aspects.

Firstly, existing research has shown that external demand shocks can incentivize governments to promote trade facilitation, improve export customs clearance efficiency, and reduce inefficient regulations.¹⁷ On the one hand, under the influence of China's import expansion, for export-oriented firms in FTA partner countries, improvements in trade institutions help reduce export-related costs and encourage these firms to allocate more funds toward production, thus pushing them closer to the production possibility frontier. On the other hand, benefiting from reductions in transportation and customs

16 Chunmiao Shen and Jianghuai Zheng, Domestic Demand-based Economic Globalization and Inclusive Growth from an Open Perspective, *The Journal of World Economy*, No. 5, 2020, pp. 170–192.

17 Michael A. Houghton and Rémi Desmeules, Recent Reforms in Customs Administrations, *The International Journal of Logistics Management*, Vol. 12, No. 1, 2001, pp. 65–82; Shujie Zhang and Shilu Zhao, The Implication of Customs Modernization on Export Competitiveness in China, In: Ravi Ratnayake (Eds.), *Impact of Trade Facilitation on Export Competitiveness: A Regional Perspective*, United Nations Press, 2009, pp. 121–131.

clearance costs, export-oriented firms are better positioned to engage in direct exports, rather than relying on intermediaries for indirect exports. Direct exports lead to informational and learning effects, which enhance firms' market competitiveness and incentivize them to expand production and increase labor employment.¹⁸ Under the effect of these mechanisms, export-oriented firms are able to hire more labor to achieve the efficient allocation of labor resources within the firm.

Secondly, the expansion of China's imports resulting from the signing of an FTA affects the employment of Chilean firms through changes in the non-trade institutional costs faced by the partner country. The increase in Chinese imports due to FTA implementation lowers export costs for firms in the partner country, expands their export markets, and alleviates the financing constraints and economic uncertainty risks faced by firms in the partner country. As a result, the partner country's government can secure stable foreign exchange income and a favorable political environment. To maintain political stability and further promote economic development, the partner country's government is incentivized to increase public investment in infrastructure development and ensure socio-economic security. Improvements of transportation and reduction of security costs not only benefit the development of export-oriented firms in the partner country, but also allow domestic-sales-oriented firms to access more timely and widespread demand information, enabling them to sell within a larger domestic market. This, in turn, facilitates the expansion of production and labor employment. Based on the above analysis, this paper proposes the following hypothesis.

Hypothesis 2: China's participation in FTAs will increase employment in both export-oriented and domestic sales-oriented firms in the partner country through the institutional cost effect mechanism.

C. The Productivity Effect Mechanism

According to the theory of market access and learning by exporting, external demand shocks will motivate export-oriented firms in the host country to increase their R&D investments and improve production efficiency, which in

18 Jie Zhang, Fan Zhang and Zhiyuan Chen, A Re-examination of the Relationship between Export and Productivity: New Micro Evidence from China, *The Journal of World Economy*, No. 6, 2016, pp. 54-76.

turn affects firm-level employment.¹⁹ Signing an FTA with China will influence employment levels in the partner country through the productivity effect mechanism. Theoretically, the productivity effect impacts a firm's employment scale in two ways. On the one hand, under the influence of incentives, export-oriented firms may introduce new technologies to improve their competitiveness, and they may increase productivity while maintaining or even reducing the number of labor. In this case, China's import expansion could have a negative impact on the employment scale of Chilean firms. On the other hand, when facing increased Chinese import demand, if Chilean export-oriented firms cannot meet the expansion of exports through technological upgrades alone, they may choose to further expand their labor force to increase production scale and efficiency.²⁰ The actual impact of the productivity effect induced by the China-Chile FTA on employment in the partner country will depend on the relative strength of these two opposing forces. Based on the above analysis, this paper proposes the following hypothesis.

Hypothesis 3: China's participation in FTAs will affect employment in export-oriented firms in the partner country through the productivity effect mechanism.

D. The Industrial Chain Effect Mechanism

Theoretically, external shocks to specific industries can affect the economic performance of upstream and downstream industries through input-output relationships.²¹ This suggests that external demand shocks triggered by China's participation in FTAs may influence employment levels in the upstream and downstream industries of the partner country through industrial chain effect. On the one hand, a positive external demand shock to a specific industry will motivate firms in that industry to expand their production scale, leading to increased demand for domestic intermediate inputs, which in turn benefits

19 Bee Yan Aw, Mark J. Roberts and Daniel Yi Xu, R&D Investment, Exporting and Productivity Dynamics, *American Economic Review*, Vol. 101, No. 4, 2011, pp. 1312-1344.

20 Chris Milner and Peter Wright, Modelling Labor Market Adjustment to Trade Liberalization in an Industrializing Economy, *The Economic Journal*, Vol. 108, No. 447, 1998, pp. 509-528; Huixin Yu and Jingxiao Xue, Effect of China's Trade Liberalization on Employment in the Industrial Sector, *The Journal of World Economy*, No. 10, 2002, pp. 10-13.

21 *Supra* n. 15.

production activities in upstream industries. Therefore, China's import expansion will not only increase employment in firms in the partner country through scale effects, but also boost employment in upstream industries by increasing demand for local intermediate goods. On the other hand, external demand shocks to a specific industry may also influence employment in downstream industries. The positive external demand shock induced by China's participation in FTAs will encourage firms in a specific industry to improve production technologies, increase product technical content, and enhance the overall competitiveness and quality of the industry's products. The improvement in product quality can be transmitted to downstream industries through industrial chain, thereby increasing the competitiveness of downstream industries and expanding the employment in those sectors. Based on the above analysis, this paper proposes the following hypothesis:

Hypothesis 4: China's participation in FTAs will promote employment in both upstream and downstream industries of export sectors in the partner country through the industrial chain mechanism.

IV. ECONOMETRIC MODEL, VARIABLE DESCRIPTION, AND DATA PROCESSING

A. Construction of the Econometric Model

The China-Chile FTA officially came into effect on October 1, 2006. To examine the impact of signing an FTA with China on employment in Chilean firms, and following the approach of Qilin Mao and Jiayun Xu (2016),²² this paper constructs the following econometric model:

$$Employment_{ijt} = \alpha + \beta_1 TariffCut_{j, 2005} + \rho Controls_{ijt} + \vartheta_j \times \mu_t + \varepsilon_{ijt} \quad (1)$$

where $Employment_{ijt}$ represents the log of the number of employees in firm i in industry j in year t . $TariffCut_{j, 2005}$ refers to the initial tariff rate on industry j 's exports to China in 2005, which is used to measure the degree of trade liberalization under the China-Chile FTA for industry j (i.e., the level of China's import expansion). β_1 is the main parameter of estimation in this paper. The posi-

²² Qilin Mao and Jiayun Xu, Input Trade Liberalization and Manufacturing Job Dynamics, *Economic Research Journal*, No. 1, 2016, pp. 69–83.

tive, negative and magnitude of β_1 reflect the direction and extent of the impact of trade liberalization in Chile's industry j on employment in firm i within that industry. To control for time-varying unobserved industry-specific factors that may influence the results, the model includes year-industry fixed effects $\vartheta_j \times \mu_t$, where ϑ_j represents the fixed effects for the industry at the 2 digit-HS (Harmonized System) code level, $\rho Controls_{ijt}$ represents a set of control variables and their corresponding coefficient matrix, and ε_{ijt} represents the error term. In all estimated models, clustered robust standard errors at the 2 digit-HS industry level are used to mitigate heteroscedasticity and intra-group correlation issues.

B. Variable Description

1. *Dependent Variable*

The dependent variable in this paper is the employment scale of Chilean firms. This paper describes the dynamic changes in the Chilean labor market from multiple perspectives. The main focus is on the scale of employment in firms, as employment is one of the most critical livelihood issue of concern to governments. Compared to indicators such as income or expenditure, changes in employment are more likely to lead to significant variations in residents' welfare.²³ Therefore, this paper measures the employment scale of firms using the logarithm of the number of employees. In addition, this paper also examines the skill composition of employment within firms by calculating the share of skilled labor in the total workforce, as well as the gender composition by measuring the proportion of female labor in the firm's total labor force.

2. *Main Independent Variable*

The main independent variable in this paper is the extent of China's import expansion from Chile, which was induced by the implementation of the China-Chile FTA. Given that the China-Chile FTA primarily facilitated bilateral trade liberalization through tariff reductions, this paper takes tariffs as the main measure to capture the extent of China's import expansion. Consistent with most existing studies, the import tariff level is used as the primary indicator of

²³ *Supra* n. 9.

China's import expansion.²⁴ To alleviate the endogeneity problem, this paper follows the approach of Lu and Yu (2015) and uses China's Most-favored-nation (MFN) tariff (hereinafter referred to as the initial tariff) before the signing of the China-Chile FTA (i.e., 2005) as the measure for the initial tariff level.²⁵ The theoretical basis for this approach is that, under the FTA's goal of zero tariffs, industries (or products) with higher initial tariffs will face greater tariff reductions, and consequently, will have higher levels of import expansion in the future.

3. Control Variables

To further alleviate the omitted variable problem, this paper incorporates the following control variables in the econometric model, based on existing literature. These control variables include: (i) China's Export Expansion. In this paper, the initial tariff of Chile's 4 digit-HS industry codes in 2005 is used as a proxy for China's export expansion shock after the implementation of the China-Chile FTA. (ii) Total Factor Productivity (TFP). Following the approach of Levinsohn and Petrin (2003),²⁶ this paper estimates the TFP at the enterprise level.²⁷ (iii) Foreign Capital Technology Use. This variable is used to measure the use of foreign capital technology, with the presence of foreign technology in a firm being the proxy indicator. (iv) Capacity Utilization Rate. This is measured by the ratio of a firm's actual output to its production capacity. (v) Average Operating Time. The average weekly operating hours of a firm in the previous fiscal year are used as a measure of operating time. (vi) Firm Ownership Structure. This is measured by the proportion of foreign ownership in a firm, which serves as an indicator of the firm's ownership structure. (vii)

24 Loren Brandt et al., WTO Accession and Performance of Chinese Manufacturing Firms, *American Economic Review*, Vol. 107, No. 9, 2017, pp. 2784–2820.

25 Yi Lu and Linhui Yu, Trade Liberalization and Markup Dispersion: Evidence from China's WTO Accession, *American Economic Journal: Applied Economics*, Vol. 7, No. 4, 2015, pp. 221–253.

26 James Levinsohn and Amil Petrin, Estimating Production Functions Using Inputs to Control for Unobservables, *Review of Economic Studies*, Vol. 70, 2003, pp. 317–341.

27 In this paper, skilled labor and unskilled labor are measured by the number of skilled and unskilled labor, respectively. Due to data availability limitations, annual sales revenue of enterprises is used as a proxy for output value. The output, intermediate inputs, and capital values are deflated using the Chilean CPI index (with 2010 as the base year).

Intermediate Input Costs. This is measured by the logarithm of the costs of variable production materials and intermediate inputs. (viii) Firm Digitization Level. A binary variable is used to indicate whether the firm owns a website as a measure of its digitalization level. (ix) Parent-subsidiary Company Status. A binary variable indicating whether a firm is a subsidiary is used to capture the potential effects related to the firm's organizational structure.

4. Data Processing and Descriptive Statistics

The data used in this paper primarily comes from three databases: the World Bank's Microenterprise Survey (MES), the China Free Trade Area Service website, and the WTO Trade Concerns Database (STC). Data from the above databases are hand-collected and organized in this paper to construct an unbalanced panel dataset at the time-industry-firm level for the window periods of 2005 and 2009. To overcome the challenge of inconsistent industry classification, the International Standard Industrial Classification (ISIC) system was first converted to the CIC (China Industry Classification Standard). Then, based on the industry conversion table provided by Brandt et al. (2017), the CIC was matched with the 4 digit-HS codes from the 2002 version, allowing the tariff and non-tariff trade barrier information for 4 digit-HS industry codes to be matched with Chilean firms.²⁸ Considering the representativeness of the sample, only manufacturing firms are retained in this paper. Furthermore, the following data are cleaned as follows: samples with missing key variables were excluded; samples with mismatched industry codes and primary product codes were removed; firms with employee fewer than one were deleted; and any variables with values less than zero were treated as missing data.

V. EMPIRICAL RESULTS AND ANALYSIS

A. Baseline Estimation Results

Table 1 presents the baseline estimation results. Column (1) of Table 1 shows that, after the implementation of the China-Chile FTA, one-unit reduction in

²⁸ *Supra* n. 24.

China's import tariff leads to an average increase of 1.1% in the employment of Chilean firms. Since the impact of China's import expansion may differ between firms that export more to China and those that export less (or do not export), this paper conducts subgroup analyses in columns (2) and (3) of Table 1 to examine whether the effect of China's import expansion varies across these two types of firms. Specifically, in this paper, firms with an export-to-sales ratio greater than 50% are classified as export-oriented firms, while those with a lower ratio are defined as domestic-sales-oriented firms. As expected, column (2) shows that China's import expansion significantly increases the employment at Chilean export-oriented firms, indicating that the incentive effects driven by external demand shocks are present under the impact of the China-Chile FTA. Column (3) shows that the employment of Chilean domestic-sales-oriented firms also expands with the reduction in China's import tariffs. To ensure robustness, we reclassify firms with zero exports as domestic-sales-oriented firms and re-test this in column (5), with the results remaining consistent.

Table 1: The Impact of China's Import Expansion on Employment of Chilean Firms

Variable	(1) Full Sample	(2) Export-oriented	(3) Nonexport-oriented	(4) Full Sample	(5) Nonexport
<i>ChinaImport</i>	0.001*** (0.003)	0.023*** (0.008)	0.010*** (0.003)		0.007* (0.004)
<i>ChinaImport</i> × <i>Exporter</i>				0.034*** (0.003)	
<i>Controls</i>	Y	Y	Y	Y	Y
<i>Industry</i> × <i>YearFE</i>	Y	Y	Y	Y	Y
Observations	3313	490	2797	3313	1675
R-squared	0.726	0.785	0.775	0.798	0.752

Note: * and *** represent the statistical significance at the 10% and 1% levels respectively.

This paper also compares the marginal impact of China's import expansion on the two types of enterprises. In column (4) of Table 1, the main explanatory variable, *ChinaImport*×*Exporter*, is an interaction term constructed by multiplying the China import expansion variable (*ChinaImport*) with a dummy variable for export-oriented enterprises (*Exporter*). The estimated coefficient of

this interaction term is 0.034, which is statistically significant at the 1% level. This suggests that, compared to domestic-sales-oriented enterprises, Chilean export-oriented enterprises experience a larger increase in employment due to China's import expansion.

B. Robustness Test

This paper conducts three robustness tests: The first is replacing the measure of the main dependent variable, which is directly replacing the main dependent variable with the extent of China's tariff cuts to measure the effect of China's import expansion in the China-Chile FTA; The second is identifying and controlling for the impact of the Chile-Japan FTA. During the window period, Chile also signed a free trade agreement with Japan. This paper obtains the MFN average tariff for Japan in 2004 (before signing the Chile-Japan FTA) from the World Integrated Trade Solution (WITS) database, and includes this as an instrumental variable for Japan's import expansion in the estimation model; the last is excluding the copper and copper product industries. As most of Chile's exports to China are predominantly concentrated in the copper products sector, the concentration of exports in this industry could obscure the benefits and losses experienced by other industries under the FTA.²⁹ Therefore, this paper excludes the copper and copper product industries from the sample. The results from all three robustness tests indicate that the conclusions from the baseline estimates remain robust.³⁰

VI. TESTING OF EFFECT MECHANISM

A. Production Scale Effect Mechanism

Firstly, this paper tests the impact of China's import expansion on the production scale of Chilean enterprises in columns (1) and (2) of Table 2.³¹ The results show that for every unit reduction in China's import tariffs, the

²⁹ *Supra* n. 15.

³⁰ Due to space limitations, the results are not presented here. They can be accessed and downloaded from the "Supplementary Data Inquiry" section on the academic journal website of the University of International Business and Economics.

³¹ Due to data availability limitations, this paper uses enterprise sales scale as a proxy for output scale.

production scale of Chilean export-sales-oriented enterprises increases by an average of 0.4%. However, the impact on domestic-sales-oriented enterprises is not statistically significant. This finding indicates that export-oriented enterprises are incentivized to expand their production scale in response to the relaxation of market access in China. Next, using the present value of firms' fixed assets as the mechanism variable, columns (3) and (4) of Table 2 show that China's import expansion increases the fixed asset investment of Chilean export enterprises, which in turn boosts their employment scale.

Secondly, to further explore whether this mechanism operates through the capital-skill complementarity channel, this paper separately measures skilled and unskilled labor by the number of skilled and unskilled labor, and verifies them in columns (5) and (6) in turn. The results show that capital expansion has a positive effect on the scale of skilled labor, but not on unskilled labor, which suggests that the capital-skill complementarity effect plays an active role. This paper further investigates whether this capital-skill complementarity mechanism operates in nonexport-oriented enterprises in column (7) of Table 2. The results show that China's import expansion does not significantly affect the investment decisions of Chilean domestic-sales-oriented enterprises, confirming that Hypothesis 1 is supported.

Table 2: Test Results of the Production Scale Effect Mechanism

Variable	Outputs				Capital-labor Complementarity		
	(1) <i>Sales</i>	(2) <i>Sales</i>	(3) <i>Capital</i>	(4) <i>Employment</i>	(5) <i>SkilledLabor</i>	(6) <i>UnskilledLabor</i>	(7) <i>Capital</i>
<i>ChinaImport</i>	0.004*** (0.001)	0.002 (0.002)	0.012* (0.006)	0.006* (0.003)	0.009** (0.004)	0.008 (0.006)	-0.020 (0.015)
<i>Capital</i>				0.167*** (0.013)	0.182*** (0.016)	0.078*** (0.025)	
<i>Controls</i>	Y	Y	Y	Y	Y	Y	Y
<i>Industry×YearFE</i>	Y	Y	Y	Y	Y	Y	Y
Observations	461	2795	455	2781	490	490	2795
R-squared	0.986	0.983	0.813	0.918	0.858	0.679	0.694

Note: * and *** represent the statistical significance at the 10% and 1% levels respectively.

B. Institutional Cost Effect Mechanism

1. Trade Institutional Costs

As developing countries often face institutional constraints that limit the export capacity of their enterprises, firms are better able to adopt direct export strategies to reduce costs when institutional costs decline. To empirically verify the validity of the trade institutional cost mechanism, this paper selects three variables to measure trade institutional costs, which are the degree of customs regulations obstruction, export clearance days, and the proportion of direct exports to total exports. The third indicator, the proportion of direct exports, is used as a proxy variable for the trade institutional costs faced by firms, as suggested by Feng et al. (2022).³²

Table 3: Test Results of the Trade Institutional Cost Effect Mechanism

Variable	Customs Regulations		Export Clearance		Direct Export	
	(1)	(2)	(3)	(4)	(5)	(6)
	<i>CustomsRegulation Employment</i>		<i>ExportClearance Employment</i>		<i>Employment Employment</i>	
<i>ChinaImport</i>	-0.019** (0.010)	0.015** (0.007)	-0.008** (0.004)	0.020** (0.009)	0.423*** (0.161)	0.003 (0.008)
<i>Customs</i>		-0.403*** (0.034)				
<i>ExportClearance</i>				-0.067*** (0.012)		
<i>DirectExport</i>						0.011*** (0.003)
<i>Controls</i>	Y	Y	Y	Y	Y	Y
<i>Industry×YearFE</i>	Y	Y	Y	Y	Y	Y
Observations	490	490	212	212	434	434
R-squared	0.9303	0.9774	0.5141	0.9519	0.9908	0.9862

Note: ** and *** represent the statistical significance at the 5% and 1% levels respectively.

The results in columns (1) and (2) of Table 3 show that the estimated coefficients of the main variables are significantly negative. This indicates that Chile's customs regulations have hindered the expansion of enterprise employment, and that the import expansion induced by China's participation

32 Xiao Feng, Yongjin Wang and Laixun Zhao, Export Capacity Constraints and Distortions, *Journal of Development Economics*, Vol. 157, 2022, No. 102889.

in FTAs has alleviated these customs barriers, thereby promoting employment growth. The estimated results in columns (3) and (4) show that export clearance days have suppressed employment scale, but China's import expansion has reduced the number of export clearance days at Chilean customs, improving clearance efficiency and facilitating the expansion of employment. The results in columns (5) and (6) indicate that direct exports have a significantly positive effect on employment, and that China's import expansion has significantly increased the proportion of direct exports by Chilean export-oriented firms, thus stimulating employment in these firms. This suggests that China's import expansion can reduce trade institutional costs, thereby increasing employment in Chile's export-oriented firms.

2. Non-trade Institutional Costs

This paper selects three variables to measure Chile's non-trade institutional costs, namely, electricity supply barriers, political instability, and enterprise security costs, in order to test the existence of a non-trade institutional cost effect mechanism. Table 4 presents the estimation results based on domestic-sales-oriented enterprises. Columns (1) and (2) show that the estimated coefficients indicate that the expansion of Chinese imports significantly reduced Chile's electricity supply barriers, thereby benefiting domestic-sales-oriented enterprises in expanding their employment scale. Columns (3) and (4) show that Chinese import expansion can reduce political uncertainty, thus improving enterprise employment levels. Columns (5) and (6) show that Chinese import expansion significantly reduced the security costs faced by Chile's domestic-sales-oriented enterprises, further encouraging enterprises to increase employment. These results suggest that the import expansion triggered by China's participation in the FTA can reduce the non-trade institutional costs faced by Chilean enterprises, thereby expanding employment in Chile's domestic-sales-oriented enterprises. This paper also tests export-oriented enterprises. The results show that Chinese import expansion significantly reduced Chile's electricity supply barriers, which in turn benefited export-oriented enterprises in expanding their employment scale. These results confirm the validity of Hypothesis 2 proposed in this paper.³³

³³ *Supra* n. 30.

Table 4: Test Results of the Non-trade Institutional Cost Effect Mechanism (Domestic-sales-oriented Firms)

Variable	Electricity Supply		Political Instability		Security Costs	
	(1)	(2)	(3)	(4)	(5)	(6)
	<i>ElectricitySupply</i>	<i>Employment</i>	<i>PoliticalInstability</i>	<i>Employment</i>	<i>SecurityCosts</i>	<i>Employment</i>
<i>ChinaImport</i>	-0.013** (0.006)	0.003*** (0.001)	-0.009* (0.005)	0.010*** (0.003)	-0.001* (0.001)	0.002 (0.002)
<i>ElectricitySupply</i>		-0.031*** (0.010)				
<i>PoliticalInstability</i>				-0.071*** (0.011)		
<i>SecurityCosts</i>						-8.442*** (1.533)
<i>Controls</i>	Y	Y	Y	Y	Y	Y
<i>Industry×YearFE</i>	Y	Y	Y	Y	Y	Y
Observations	3083	3048	3074	3074	1556	1542
R-squared	0.441	0.735	0.627	0.756	0.661	0.930

Note: *, **, and *** represent the statistical significance at the 10%, 5% and 1% levels respectively.

C. Productivity Effect Mechanism

Theoretical analysis in this paper suggests that Chinese import expansion may increase employment in Chilean firms through productivity effects, but it could also have a suppressive impact. To facilitate comparison, Total Factor Productivity (TFP) is used as an intermediary variable, and this paper examines the impact of Chinese import expansion on both export-oriented and domestic-sales-oriented Chilean firms. The coefficient estimates in columns (1) and (2) of Table 5 show that Chinese import expansion increased the TFP of Chilean export-oriented firms. However, the improvement in TFP significantly reduced their employment scale. This result indicates that the productivity-enhancing effect played a negative role in the employment of export-oriented firms. The results in column (4) show that an increase in TFP for Chilean domestic-sales-oriented firms led to an expansion in employment. However, the results in column (3) indicate that Chinese import expansion did not significantly affect the TFP of domestic-sales-oriented firms. This suggests that domestic-sales-oriented firms in Chile did not improve their productivity as a result of Chinese import expansion, thus confirming that Hypothesis 3 does not hold.

Table 5: Empirical Estimation Results of the Productivity Effect Mechanism

Variable	Export-oriented Firms		Nonexport-oriented Firms	
	(1) <i>TFP</i>	(2) <i>Employment</i>	(3) <i>TFP</i>	(4) <i>Employment</i>
<i>ChinaImport</i>	0.010** (0.004)	-0.007 (0.008)	0.004 (0.003)	-0.001 (0.003)
<i>TFP</i>		-0.183** (0.085)		0.308*** (0.022)
<i>Controls</i>	Y	Y	Y	Y
<i>Industry×YearFE</i>	Y	Y	Y	Y
Observations	461	2795	455	2781
R-squared	0.927	0.970	0.419	0.765

Note: ** and *** represent the statistical significance at the 5% and 1% levels respectively.

D. Industrial Chain Effect Mechanism

To test the existence of the industrial chain effect, this paper constructs an industrial linkage index based on input-output relationships and employs it as an explanatory variable for empirical estimation. Firstly, obtains the Chile's input-output table for 2002 from the Central Bank of Chile; Secondly, it refers to the study of Linarello (2018) to convert Chile's CPC industry classification into the HS classification;³⁴ Thirdly, it calculates the level of Chinese export expansion faced by upstream and downstream industries of Chilean export firms with the following formula:

$$Upstream_{ht} = MarketAC_{ht} \times \sum_k (outputyear_{h \rightarrow d} - 1_{h \rightarrow d}) \quad (2)$$

$$Downstream_{ht} = MarketAC_{ht} \times \sum_k (inputyear_{u \rightarrow h} - 1_{h \rightarrow u}) \quad (3)$$

Where $\sum_k (outputyear_{h \rightarrow d} - 1_{h \rightarrow d})$ represents the correlation between industry h and its downstream industry d , reflecting the share of output from industry h used as input by industry d per unit of production. Similarly, $\sum_k (inputyear_{u \rightarrow h} - 1_{h \rightarrow u})$ indicates the correlation between industry h and its upstream industry u , reflecting the share of intermediate input from industry u used in the production of industry h . $1_{h \rightarrow d}$ is an indicator function, which equals 1 if $h=d$, and 0 otherwise. Thus, $Upstream_{ht}$ represents the impact on industry h resulting from export expansion in its downstream industry d , while $Downstream_{ht}$ reflects the influence of export expansion in industry h on its upstream industry u . The above two variables are used as dependent variables in empirical tests on

³⁴ *Supra* n. 15.

samples of Chilean export-oriented firms and domestic-sales-oriented firms respectively.

Table 6 presents the corresponding empirical results. The findings in columns (1) and (2) indicate that the import expansion driven by China's participation in FTAs significantly increases the employment scale of Chilean upstream domestic-sales-oriented firms, but has no significant impact on upstream export-oriented firms. The estimated coefficients in columns (3) and (4) suggest that China's import expansion has no significant effect on the employment levels of downstream domestic-sales-oriented or export-oriented firms.

Overall, the results demonstrate that China's import expansion can enhance the employment of Chilean domestic-sales-oriented firms through the industrial chain effect, supporting Hypothesis 4 of this paper.

Table 6: Empirical Results of the Industrial Chain Effect Mechanism

Variable	Upstream		Downstream	
	(1) Export-oriented	(2) Nonexport-oriented	(3) Export-oriented	(4) Nonexport-oriented
<i>Upstream</i>	0.008 (0.008)	0.041** (0.020)		
<i>Downstream</i>			0.013 (0.010)	0.007 (0.009)
<i>Controls</i>	Y	Y	Y	Y
<i>Industry×YearFE</i>	Y	Y	Y	Y
Observations	461	2795	455	2781
R-squared	0.927	0.970	0.419	0.765

Note: *** represents the statistical significance at the 1% level.

VII. FURTHER EXPLORATORY ANALYSIS

A. Analysis Based on Labor Heterogeneity

Considering that different types of employment may be affected differently during China's import expansion, this paper further examines the heterogeneous impacts of the China-Chile FTA on firm-level employment.

Firstly, this paper explores the effect of the China-Chile FTA on skilled labor employment in Chilean firms. Skilled labor employment is measured

as the proportion of skilled labor in total employment. By segmenting the sample and constructing interaction terms, the analysis investigates the employment differences between Chilean export-oriented and domestic-sales-oriented firms. The results show that,³⁵ on average, China's import expansion increased the proportion of skilled labor in export-oriented firms by 0.5%, but had no significant impact on domestic-sales-oriented firms. Additionally, an interaction term $ChinaImport \times Export$, formed by multiplying the China tariff variable $ChinaImport$ with the export-oriented firm dummy variable $Export$, was included in the estimation model. The results indicate that the coefficient of the interaction term is significantly positive, suggesting that export-oriented firms in Chile benefit more from the China-Chile FTA than domestic-sales-oriented firms. In summary, China's import expansion significantly increased the proportion of skilled employment in export-oriented Chilean firms, thereby optimizing the labor market structure. A possible explanation is that as the quality of China's economic development and the standard of living continue to improve, the demand for high-quality imported products has risen. To meet China's consumption and industrial upgrading needs, Chilean firms have increasingly enhanced their technological capabilities, leading to a greater demand for skilled labor.

Secondly, this paper examines the impact of China's import expansion on gender-specific employment in Chile. Gender inequality is widespread in developing countries, and the impact of international trade on gender gaps is a key issue currently under focus.³⁶ Therefore, it is necessary to discuss gendered labor employment issues. Female employment is measured as the proportion of female productive labor in total productive labor. By segmenting the sample, empirical tests are conducted separately for export-oriented and domestic-sales-oriented firms in Chile. The results show that China's import expansion does not have a significant impact on female employment in domestic-sales-oriented firms. However, it significantly increases female employment in export-oriented firms, thus improving the allocation of gendered labor resources in

³⁵ *Supra* n. 30.

³⁶ Hani Mansour, Pamela Medina and Andrea Velásquez, Import Competition and Gender Differences in Labor Reallocation, *Labour Economics*, Vol. 76, 2022, No. 102149; Feicheng Wang, Krisztina Kis-Katos and Minghai Zhou, Import Competition and the Gender Employment Gap in China, *Journal of Human Resources*, Vol. 59, No. 6, 2024, pp. 1830-1864.

Chile. A possible explanation is that China's import expansion increases the labor demand in Chilean firms, leading them to hire more employees. As firms are able to hire female labor at a relatively lower cost, the share of female employment tends to rise.

B. Impact of the Reduction in Non-tariff Trade Barriers from the China-Chile FTA on Employment in Chilean Firms

In recent years, non-tariff trade barriers have gradually replaced tariffs as the main obstacle to trade restrictions.³⁷ The China-Chile FTA not only provides for the reduction of bilateral tariffs, but has also makes substantial progress in weakening bilateral non-tariff trade barriers.³⁸ Text searches reveal that the China-Chile FTA proposed various solutions for non-tariff barriers such as rules of origin (RO), sanitary and phytosanitary measures (SPS), and technical barriers to trade (TBT), significantly reducing bilateral trade costs between China and Chile. Therefore, it is essential to examine the impact of the reduction in non-tariff trade barriers brought about by the China-Chile FTA on employment in Chilean firms.

This paper primarily focuses on the SPS and the TBT. These are considered the most significant non-tariff barriers globally. Since the SPS and the TBT vary by countries and products, they are more difficult to quantify than tariffs and have become a major area of concern for nations. Data for this analysis was obtained from the WTO Trade Concerns Database (STC). If exporters believe their products face widespread trade barriers, the WTO Trade Concerns Database (STC) labels their products as regulation-intensive.

This paper follows the study of Lee et al. (2023) to define whether a firm has experienced a reduction in non-tariff trade barriers based on whether the products it produces are classified as regulation-intensive products.³⁹ The

37 Kyle Handley, Exporting under Trade Policy Uncertainty: Theory and Evidence, *Journal of International Economics*, Vol. 94, No. 1, 2014, pp. 50–66.

38 These measures have made significant contributions to addressing internationally recognized SPS (Sanitary and Phytosanitary) and TBT (Technical Barriers to Trade). Additionally, the “China-Chile FTA” provides mechanisms for resolving bilateral trade disputes (Chapter 10), specifically including “consultations, mediation, conciliation, arbitration”, among others, thus complementing the WTO's dispute resolution mechanism to some extent.

39 Woori Lee, Alen Mulabdic and Michele Ruta, Third-country Effects of Regional Trade Agreements: A Firm-level Analysis, *Journal of International Economics*, Vol. 140, 2023, No. 103688.

construction of variables is based on the data characteristics, as follows:

$$STC_{jt} = \text{Max}(\text{Dummy}_{2009} \times STC_j)$$

Where STC_{jt} indicates whether industry j in year t has experienced a reduction in China's non-tariff trade barriers. If industry j is recorded as a trade concern in the WTO and is within the observation period of 2009, it is assigned a value of 1; otherwise, it is 0. To empirically analyze the additional impact of non-tariff trade barrier reduction on firm-level employment, and test the differences between the samples that experienced non-tariff trade barrier reduction and those that did not, the following econometric model is constructed:

$$\text{Employment}_{ijt} = \alpha + \beta_3(\text{ChinaImport}_{jt} \times \text{Non_tariff}_{jt}) + STC_{jt} + \rho \text{Controls}_{ijt} + \theta_j \times \mu_t + \varepsilon_{ijt} \quad (4)$$

Where $\text{ChinaImport}_{jt} \times \text{Non_tariff}_{jt}$ is the interaction term between the main explanatory variable and the non-tariff trade barrier reduction variable, and the coefficient β_3 is the estimator this paper concerns about primary estimate of interest. The meaning of this coefficient is that, compared to firms that did not experience a reduction in non-tariff trade barriers, the relative direction and extent of the effect of tariff reduction on firms that did experience a reduction in non-tariff trade barriers.

Columns (1) and (2) of Table 7 test the additional impact of non-tariff trade barrier reduction on employment in Chilean export-oriented and domestic-sales-oriented firms. The results show that the interaction term is significantly positive only in column (1), indicating that the reduction in non-tariff trade barriers promotes the employment scale of export-oriented firms but has no significant effect on domestic-sales-oriented firms. In column (3), a three-way interaction term $\text{ChinaImport} \times \text{Non} \times \text{Tariff} \times \text{Export}$ is constructed, and the results show that the coefficient of this three-way interaction term is significantly positive, suggesting that, compared to domestic-sales-oriented firms, the reduction in non-tariff trade barriers has a significant positive effect on employment in export-oriented firms.

To explore the underlying mechanism, empirical tests are conducted in columns (3) and (4) using export-oriented firms as the sample, with direct export share and safety costs as dependent variables. The results show that the reduction in non-tariff trade barriers significantly promotes the direct

export share of Chilean export-oriented firms, but has no significant impact on non-trade institutional costs measured by safety costs. This suggests that the reduction in non-tariff trade barriers resulting from the China-Chile FTA enhances the employment scale of Chilean export-oriented firms by reducing institutional costs.

Table 7: Estimation Results of the Impact of the Reduction in Non-tariff Trade Barriers Induced by the China-Chile FTA

Variable	Employment			Institutional Costs	
	(1) Export-oriented	(2) Nonexport-oriented	(3) Full Sample	(4) Direct Export	(5) Security Cost
<i>ChinaImport</i> × <i>Non-tariff</i>	0.033*** (0.010)	0.001 (0.003)	0.002 (0.004)	0.643*** (0.209)	-0.004 (0.003)
<i>ChinaImport</i> × <i>Non-tariff</i> × <i>Export</i>			0.068*** (0.015)		
<i>Non-tariff</i>	-0.194** (0.077)	-0.085** (0.035)	-0.215 (0.068)	-3.397** (1.691)	0.011 (0.020)
<i>Controls</i>	Y	Y	Y	Y	Y
<i>Industry</i> × <i>YearFE</i>	Y	Y	Y	Y	Y
Observations	514	3064	3259	514	445
R-squared	0.703	0.750	0.766	0.971	0.844

Note: ** and *** represent the statistical significance at the 5% and 1% levels respectively.

C. Total Effect of China's Exports and Imports

This paper further examines the total effect of the China-Chile FTA on employment in Chilean firms. Specifically, it quantifies the overall impact of the China-Chile FTA on Chilean employment by simultaneously considering both China's imports and exports. The estimation model is as follows:

$$Employment_{ijt} = \alpha + \beta_1(ChinaImport_{jt} + ChileImport_{jt}) + \rho Controls_{ijt} + \varepsilon_{ijt} \quad (5)$$

Where *ChileImport_{jt}* represents the initial tariff values before Chile's participation in the FTA, used to measure the extent of China's export expansion to Chile. Before the implementation of the China-Chile FTA, most tariffs in Chile were fixed at 7%. Yearly fixed effects were included to somewhat control for the export shock from China to Chile. Thus, fixed effects are gradually added in the model. Additionally, considering the non-comparability of the marginal adjustments in Chinese and Chilean import tariffs, both variables are

centered before being included in the estimation model. To quantify the total effect, the analysis focuses on the overall sample.

The results show that the estimated coefficient range for the main explanatory variables is [0.23, 0.47], meaning that for every 1% reduction in bilateral tariffs between China and Chile, the average employment scale of Chilean firms increases by 0.23% to 0.47%. These results indicate that even after considering China's export expansion to Chile, the positive impact of the China-Chile FTA on Chilean employment remains significant.⁴⁰

VIII. CONCLUSIONS AND IMPLICATIONS

A. Research Conclusions

Taking the implementation of the China-Chile FTA as an opportunity, This paper empirically investigates the impact of import expansion induced by China's free trade agreements on employment in the contracting countries' enterprises. The research conclusions are summarized as follows:

Firstly, the import expansion induced by the China-Chile FTA significantly increased employment in Chilean manufacturing enterprises, and this effect exists in both export-oriented and nonexport-oriented enterprises. This indicates that the expansion of Chinese imports generated a broad and positive international employment effect. In terms of marginal effects, the impact on export-oriented enterprises was greater than that on domestic-sales-oriented enterprises. After replacing the measurement of China's trade liberalization index, controlling for the impact of the Chile-Japan FTA, and excluding the copper industry, the main conclusions of this paper remain robust.

Secondly, the channels through which China's import expansion promotes employment growth in Chilean enterprises differ between export-oriented and domestic-sales-oriented enterprises. China's import expansion drives the employment growth in export-oriented enterprises through the mechanisms of production scale effect and institutional cost effect. The mechanisms of non-trade institutional cost effect and industrial chain effect are the primary channels for promoting employment growth in domestic-sales-oriented enterprises.

⁴⁰ *Supra* n. 30.

Meanwhile, China's import expansion does not promote employment growth in Chilean enterprises through productivity effects.

Thirdly, the import expansion induced by the China-Chile FTA has other economic effects. The China-Chile FTA improved the allocation of Chilean labor resources and optimized the structure of Chile's labor market. China's import expansion not only increased the employment of skilled labor in Chile, but also raised the proportion of female employment. Additionally, the reduction in non-tariff trade barriers brought about by the China-Chile FTA has a significant impact on increasing employment in export-oriented enterprises in Chile. When considering the combined effects of both China's exports and imports, the China-Chile FTA has a significant positive impact on Chilean enterprise employment.

B. Policy Implications

The findings of this paper suggest that by establishing FTAs with China, enhancing the facilitation and liberalization of exports to China, and increasing exports to China, the employment levels of partner countries can be significantly improved. Based on the current global economic situation, China's national conditions, and the conclusions of this paper, the following policy recommendations are proposed.

Firstly, China should proactively push to expand, improve, and enhance the effectiveness of its free trade area network. At first, China should actively advance the negotiation process of FTAs, promoting negotiations on new topics such as the digital economy, environmental protection, government procurement, and e-commerce, to enhance the quality and depth of FTAs, gradually upgrading commitments and regulatory standards. By combining the strategies of "upgrading old agreements, signing new agreements, and participating in large agreements", China can enhance its central position within the global FTA network. Then, China should accelerate the establishment of domestic rules and institutional systems aligned with high-standard FTA regulations, preventing risks of "regulatory decoupling" and being "marginalized", and further optimize its business environment. China should create a market-driven, rule-based, and internationalized market atmosphere, improve its initiative, autonomy, and influence in global economic and trade

rule governance, and strengthen its ability to provide institutional public goods to the outside world. Lastly, China should strengthen communication with relevant departments in partner countries, increase the frequency of bilateral and multilateral trade data and information exchanges, accurately identify the characteristics and needs of partner countries, provide trade information and infrastructure support to underdeveloped countries in FTAs, and jointly build a more resilient and sustainable network of mutually beneficial and win-win FTAs.

Secondly, developing countries should adopt a rational view, scientifically assess the positive impacts of signing FTAs with China, and actively participate in and promote the Free Trade Area negotiation process with China. Based on the principle of mutual benefit, developing countries should accelerate bilateral or multilateral trade development, thereby promoting domestic economic growth. First of all, relevant departments in developing countries should carry out promotional and training activities on the construction of Free Trade Areas, encouraging domestic foreign trade enterprises to better understand the Chinese market and actively mobilizing domestic enterprises to engage in FTAs with China. Then, governments of developing countries should proactively strengthen economic and trade ties with China, promote information sharing, and actively study the feasibility of establishing FTAs with China. For existing free trade areas, efforts should be made to accelerate their upgrading, promoting their development towards higher quality and efficiency. At last, while significantly reducing import tariffs with China, developing countries should also actively promote the reduction of bilateral non-tariff trade barriers, continue to expand the scope of free trade areas negotiations, and extend the areas of openness to include services trade and digital trade.