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Intra-Industry Trade Specialization in Türkiye's Agricultural Sector*

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Abstract

This study examines Türkiye's agricultural trade between 2002 and 2022, focusing on the 20-year period following the 2001 economic and political crisis. Intra-industry trade theory was employed as the research method, with the Grubel-Lloyd index used for measurement. The study highlights that, under neo-liberal policies, developed economies allocate the smallest share of GDP to the agricultural sector, with industrialization and the service sector being prioritized as the foundations of wealth and development. Türkiye adopted a similar approach, shifting its focus away from agricultural growth after 1980 to prioritize investments in industry and services. However, the findings indicate that the countries deriving the most value from agricultural trade—such as the USA, the Netherlands, France, and Germany—are among the most developed. The study also reveals that Türkiye lacks a comparative advantage in the international agricultural market, having opened the sector to competition. Nonetheless, with technological advancements and branding, Türkiye could create added more value in agriculture, potentially increasing its agricultural revenues to levels closer to those of the most developed countries.

Keywords: *Intra-Industry Trade, Agricultural Economics, Trade Theories*

JEL Kodu: F10, F11, F13

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Türkiye Tarım Sektöründe Endüstri İçi Ticarette Uzmanlaşma

Öz

Bu çalışma Türkiye'nin 2002-2022 yılları arasındaki tarım sektörü ticaretini incelemektedir. Türkiye'de yaşanan 2001 ekonomik ve politik krizinden sonraki 20 yıllık tarım sektörü periyodunu inceleyen bu çalışmada araştırma yöntemi olarak endüstri içi ticaret teorisi kullanılmıştır. Ölçüm metodu ise Glubell-Lloyd endeksidir. Neo-Liberal politikalar sonrası gelişmiş ekonomiler GSYH içerisindeki sektör paylarında en az payı tarım sektörüne vermektedir. Zenginleşmenin ve kalkınmanın temeli sanayileşme ve devamında hizmet sektörü olarak formüle edilmiştir. Türkiye de bu politikayı benimsemiş, 1980 sonrası tarımsal büyümeden vazgeçip sanayi ve hizmet sektörü yatırımlarına öncelik vermiştir. Ancak araştırma sonucunda görülmektedir ki, tarımsal ürün ticaretinden en fazla değeri kazanan ülkeler yine bu gelişmiş ülkelerdir. Bu ülkelerin başında ABD, Hollanda, Fransa ve Almanya gelmektedir. Araştırma sonucunda Türkiye'nin tarım sektöründe uluslararası piyasada karşılaştırmalı üstünlüğe sahip olmadığı, tarım sektörünü rekabete açtığı belirlenmiştir. Teknoloji ve markalaşma ile tarım sektöründen daha fazla katma değer yaratılabileceği ve en kalkınmış ülkelerin elde ettiği tarımsal ürün gelirlerine yaklaşılabileceği düşünülmektedir.

Anahtar Kelimeler: *Endüstri İçi Ticaret, Tarım Ekonomisi, Ticaret Teorileri*

Introduction

Türkiye's agricultural potential is enriched by its unique geographical location, varied climate, and vast land structure. Acting as a bridge between Europe and Asia, this transcontinental positioning fosters a rich diversity of agricultural products, ranging from staple grains to globally prized exports like hazelnuts and olives. As a critical player in global agriculture, Türkiye not only meets domestic needs but also significantly contributes to international markets, cementing its role as a vital producer and exporter of agricultural goods.

Recent studies offer valuable insights into Türkiye's agricultural sector. Kuşlu's (2020) analysis of the rural structure highlights the concentration of agricultural enterprises within the 20–49 declares range, which also boasts the highest level of mechanization. Ownership patterns reveal that two to five parcels are most commonly held within this group, followed by those with six to nine parcels. Notably, enterprises under 50 declares constitute 64.8% of all agricultural enterprises but occupy only 21.34% of the total agricultural area. Furthermore, 1.6% of Türkiye's arable agricultural land remains uncultivated, underscoring potential inefficiencies in land utilization. Özçatalbaş and Imran (2018) examined family farming, which dominates Türkiye's agricultural landscape, comprising 88% of all enterprises. Despite their critical role in sustaining agriculture and supplying raw materials to agriculture-based industries and exports, family farms face numerous challenges. These include limited access to microcredit, inadequate cooperative support, reliance on intermediaries for marketing, and the informal nature of women's labor. Additionally, poor institutional coordination exacerbates these issues, threatening the long-term sustainability of family farms.

Sönmez (2023) conducted a comprehensive study on the structural dynamics of land ownership, land use, and the evolving social classes of farmers and non-farmer landowners. His research also measured the wealth disparities between these groups and assessed the influence of family structure on income and wealth. The findings reveal that Turkish agricultural structures have undergone profound changes over the past quarter century, with persistent and significant income and wealth inequalities observed both between farmers and non-farmer landowner households and at the national level.

Abdullah and Arısoy (2022) provide an in-depth evaluation of agricultural support policies in Türkiye, situating them within the context of global agricultural policies and incentives. Their study highlights notable transformations in Türkiye's agricultural policies, reflecting global trends, yet reveals that expected improvements in budget allocations for these policies have not been fully realized. Specifically, while the support budget increased 3.45 times in nominal terms, the real increase was only 2.15 times, with the overall rise in current values amounting to 8.05%. Agriculture's contribution to gross production value was found to be approximately 13% in Türkiye, comparable to 12% in the USA and 19% in the EU. The analysis of 2018 agricultural support data further showed that livestock supports accounted for 27% of the total, followed by difference payment supports (26%), field-based supports (25%), and compensatory payments and agricultural insurance, each comprising 8%, with rural development supports representing 7%. Additionally, the 2021 Producer Support Estimate (PSE) for Türkiye indicates that agricultural policies contributed approximately 15.1% to the gross production value, with the highest PSE level recorded in 2010, underscoring that Turkish farmer receive one of the highest levels of protection internationally. These findings emphasize the necessity of ongoing evaluation and restructuring of agricultural policies to enhance their efficiency, coverage, and impact on the agricultural sector.

Türkiye's agricultural production is distinguished by both its capacity and product diversity, with hazelnuts being the most notable example. The country is the largest producer and exporter of hazelnuts globally, contributing 62% of the world's total production. Türkiye also ranks first in cherry production, with 627,000 tons produced in 2018, according to FAO data. It maintains global leadership in both fresh and dried fig production, with an output of 308,000 tons. However, Türkiye has fallen to third place in lentil production, following Canada and India. Additionally, it ranks third in tomato production worldwide, producing 12.75 million tons in 2018, with China and India occupying the top two positions.

Türkiye continues to lead in fresh apricot production, with 985,000 tons recorded in 2018, and ranks third in apple production behind China and the United States. Pistachios are another key product for Türkiye, though the biennial nature of pistachio yields causes its global rank to fluctuate between second and third. Türkiye ranks sixth in grape production, leads in table olive production, and ranks fifth in olive oil production, following Spain, Italy, Greece, and Tunisia. In addition, the country holds second place in global melon and watermelon production, trailing only China. Türkiye is also among the top global producers of several other crops, including spinach, sugar beet, cucumber, quince, chestnut, cherry, and green beans (Yıldırım, 2022: 312–315).

According to The Turkish Statistical Institute (TUIK) data, Türkiye's GDP in 2022 was approximately 905 billion USD, with expectations for 2023 projecting it to exceed 1 trillion USD. Data from the Turkish Ministry of Agriculture and Forestry indicate that, as of the end of 2022, the agricultural sector contributed 6.5% to the country's GDP. The table below illustrates the trend in the share of the agricultural sector in GDP from 2017 to 2022.

World Bank data reveal that Türkiye's agricultural sector contributes significantly less to GDP compared to the industrial and service sectors, which collectively account for 94% of the total. Since 2017, agriculture's share of GDP has remained steady at around 6%, a pattern consistent with the past two decades. During this time, the service sector has consistently held the largest share in Türkiye's GDP.

Table 1

Share of the Agricultural Sector in GDP in Türkiye (2017-2022)

Years	AGRICULTURE, FORESTRY AND FISHING			Exchange Rate	TÜRKIYE	
	Million TL	Million $	GDP Share (%)		Million TL	Million $
2017	189.233	51.875	6	3,648	3.133.704	859.055
2018	217.107	46.048	5,8	4,715	3.758.774	797.221
2019	276.325	48.729	6,4	5,671	4.311.733	760.355
2020	336.623	47.817	6,7	7,04	5.048.220	717.092
2021	401.806	44.739	5,5	8,891	7.248.789	807.106
2022	969494	58.500	6,5	16,573	15.006.574	905.501

Source: TUIK (https://data.tuik.gov.tr/Bulten/Index?p=Quarterly-Gross-Domestic-Product-Quarter-IV: -October-December, -2022-49664&dil=2)

TUIK reports that, according to the production method, the manufacturing sector had the largest share in Türkiye's GDP as of the end of 2022, making up 22%. This was followed by Wholesale and Retail Trade, contributing 13%, and Transportation and Storage, accounting for 10%. The Agriculture, Forestry, and Fisheries sector ranked fourth, with a 6.5% share, reflecting a 1% increase from its share in 2021.

Agricultural Foreign Trade in Türkiye After the Transition to Liberal Economy

The shift from a mixed economy to a free market economy in Türkiye began with the economic reforms introduced on January 24, 1980, representing a watershed moment in the country's economic evolution. Further steps toward liberalization included Türkiye's accession to the World Trade Organization in 1995 and its inclusion in the European Union Customs Union. Global events such as the 2001 Turkish economic crisis, the 2008 global financial crisis, and the 2019 COVID-19 pandemic have had profound impacts on both Türkiye's economy and the broader global economic landscape.

Following the January 24 decisions, Türkiye entered a neo-liberal economic period. The most notable consequence of this transition for the agricultural sector has been the rapid decline in its contribution to the Gross Domestic Product (GDP). In 1980, the agricultural sector comprised 26% of GDP; by 2022, this share had fallen to 6%. To better understand Türkiye's transition to a neoliberal economy, it is essential to examine its core principles, summarized by Cahill and Konings (2019) as follows:

- Government intervention in the market should be avoided, public expenditures should be curtailed, and fiscal discipline should be reinforced.
- Taxes should be reduced to mitigate the impact of externalities on both private individuals and legal entities.
- Financial markets should undergo liberalization, supported by appropriate regulatory and supervisory mechanisms.
- A flexible and floating exchange rate system should be instituted.
- Trade on the international level should be liberalized.
- State-owned enterprises should be privatized.
- Policies should be designed to promote both direct and indirect foreign investments.

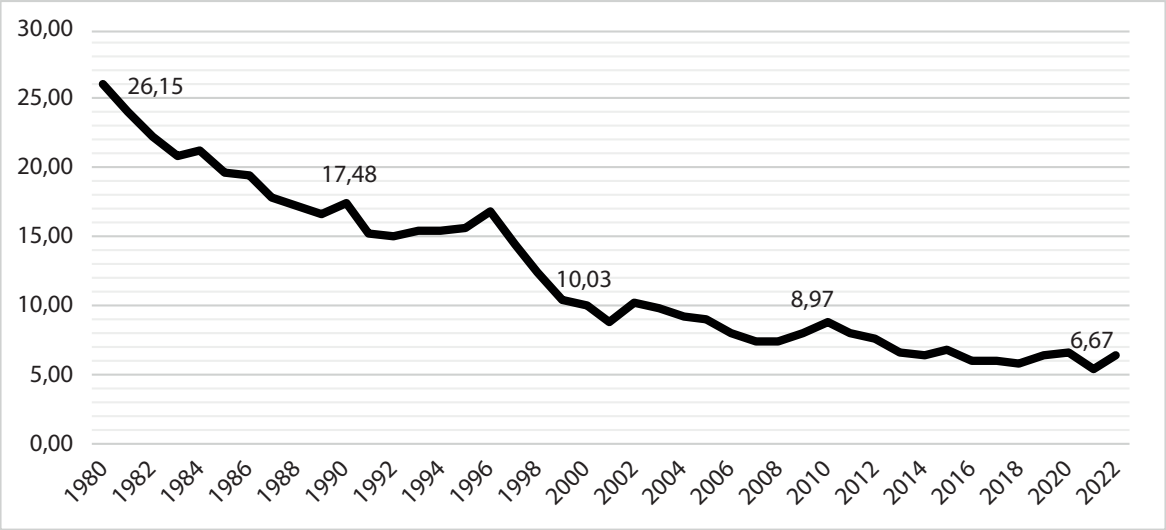

Figure 1. Türkiye's agricultural sector's share in GDP (1980-2022)

The January 24, 1980, decisions—commonly referred to as the January 24 Decisions—opened the Turkish economy to international markets and initiated its liberalization. These decisions had significant implications for the agricultural sector. Since the 1980s, Türkiye has made substantial progress toward embracing a free market economy. The economic measures implemented during this period have played a pivotal role in reshaping the country's economic landscape. In particular, the inflation-control measures enacted during this time affected various sectors, with agriculture being the most impacted. Policies aimed at "setting fuel prices, base prices for agricultural products, and VAT at inflation-preventive levels" laid the foundation for future agricultural strategies, highlighting the profound effects of these decisions on the sector. It was determined that subsidies for agricultural inputs led to persistently high agricultural product prices, while low-interest agricultural loans contributed to inflationary pressures. In line with these decisions, the goal was to boost exports by imposing restrictions on domestic consumption and maintaining low product prices to encourage foreign buyers. Consequently, agricultural incomes, wages, and the base prices of agricultural products remained suppressed (Bakırcı, 2007: 166).

The agricultural sector in Türkiye experienced a significant deceleration in production growth after the liberalization reforms of the 1980s. During the 1980–1989 period, the annual average increase in agricultural value-added

was only 0.66%, and although it rose slightly to 1.64% in the post-1990 period, this rate remained below the levels observed in the earlier planned economy era (Kepenek & Yentürk, 2003). Furthermore, growth rates in the sector displayed increased volatility, reflecting structural fragility. In parallel, liberalization of the trade regime led to a notable increase in agricultural imports. The substantial reduction of tariffs and fees on food products in 1984, for instance, triggered a surge in imports—especially of meat and livestock—contributing to the decline of domestic animal husbandry (Eşiyok, 2004). While agriculture constituted over 80% of total exports in the 1960s and over 60% in the 1970s, its share declined sharply with the end of the import substitution model. By the late 1970s, the share of exports in national income had fallen below 3%. Following the economic opening in 1980, manufactured goods rapidly replaced agricultural products as the main drivers of export growth.

In the aftermath of the January 24 Economic Decisions, Türkiye's agricultural sector failed to realize the anticipated expansion in production and exports. This period was characterized by persistent inflation and a marked depreciation of the Turkish Lira. Although inflation temporarily declined in the early 2000s, renewed global and domestic economic pressures contributed to its resurgence by 2008. Policies formulated under the influence of international institutions, particularly the IMF and the World Bank, were designed to stimulate economic development; however, they disproportionately affected rural populations and undermined the sustainability of domestic agricultural production (Öztürk, Nas & İçgöz, 2008). Once self-sufficient and a net exporter in agricultural goods, Türkiye has undergone a significant structural transformation and is now increasingly dependent on food imports.

Agricultural foreign trade in Türkiye after the World Trade Organization

Türkiye officially joined the World Trade Organization (WTO) on February 25, 1995, following the publication of the Official Gazette. As one of the founding members, Türkiye fulfils all commitments and reconciliations arising from WTO agreements and diligently meets its notification obligations. Furthermore, it enforces legal regulations mandated by the various agreements within the WTO framework. Consequently, Türkiye's foreign trade legislation is shaped by the commitments and obligations arising from its WTO membership.

The World Trade Organization's Agreement on Agriculture (AoA) was introduced as a significant regulatory initiative aimed at reducing trade barriers and fostering a liberalized global agricultural market. However, the agreement has largely failed to establish an equitable and genuinely open trading environment. One of the primary reasons is that the liberalization commitments of developed countries have remained mostly rhetorical, while the provisions intended to support developing countries have proven insufficient. Moreover, the Framework Decision within the AoA offers only limited benefits for developing economies, revealing that the WTO has fallen short of its stated goals of promoting fairness in agricultural trade (Ay & Yapar, 2005: 21). In alignment with this broader liberalization agenda, Türkiye undertook a series of agricultural reforms under its commitments to both the IMF and the WTO. These reforms, grounded in the view that "agriculture has no place in an industrializing country," led to a significant reduction in protective mechanisms for the agricultural sector, further deepening its structural vulnerabilities (Ay & Yapar, 2005: 21).

Following the implementation of the WTO Agreement on Agriculture in 1995, there was a widespread expectation of a significant increase in global agricultural trade. While the overall expansion in trade volume was lower than anticipated, agricultural exports still grew by an average of 4%, supporting the notion that the agreement facilitated some level of trade liberalization. However, despite this moderate increase, the relative share of agricultural products in Türkiye's total exports has declined dramatically. Whereas agricultural goods accounted for nearly 40% of total exports during the 1950s and 1960s, their share fell to 9% in the early 2000s, and further dropped to only 3.2% by 2017. This long-term downward trend highlights a structural transformation in Türkiye's trade composition and underscores the marginalization of agriculture within the broader export economy (Yılmaz, 2016).

Agricultural foreign trade in Türkiye after the 2008 global financial crisis

In 2007, the deceleration in growth rates across four key sectors of the U.S. economy—namely finance and insurance, real estate, construction, and mining—contributed to a broader economic slowdown. These sectors were directly impacted by the mortgage crisis. Changes in interest rates exerted a contractionary effect on the credit market, while investors' pursuit of risk-free returns, coupled with easy access to low-cost credit, led to excessive borrowing and uncontrolled credit expansion among consumers. This situation heightened the fragility of the financial system. The crisis, initially triggered by the inability of subprime borrowers in the U.S. to meet their payment obligations, intensified due to these vulnerabilities and escalated into a global financial crisis.

During the 2008–2009 global financial crisis, Türkiye experienced a significant overall economic contraction; however, its agricultural sector continued to grow, challenging the common perception that agriculture is highly vulnerable to global economic downturns. Despite this resilience, Türkiye's agricultural trade exhibited structural imbalances. For instance, in 2008, exchange rate fluctuations led to a near doubling of agricultural imports compared to exports. While this cannot be directly linked to the crisis itself, it points to underlying weaknesses in the agricultural trade structure. Moreover, the share of agricultural and livestock products in total exports declined from 6% in 2000 to 3% in 2008, before slightly recovering to 4% in 2009, whereas their share in total imports remained relatively stable throughout the period (Erçakar, 2010).

In addition to structural trade imbalances, Türkiye's agricultural sector has been increasingly exposed to input cost volatility, particularly in the context of the 2007–2008 global food crisis. During this period, the rising prices of key agricultural inputs such as fertilizers and diesel significantly outpaced the increase in product prices, squeezing farmers' profit margins. Although a partial price stabilization was observed after 2009, fluctuations in exchange rates and the continued rise in input prices remained a burden for producers until at least 2013. Moreover, Türkiye's dependency on imported agricultural inputs—especially in sectors with domestic supply shortages, such as vegetable oils—exacerbated cost-related vulnerabilities (Cengiz & İlhan, 2016).

Agricultural foreign trade in Türkiye after the covid-19 pandemic

COVID-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020. A pandemic refers to an epidemic that spreads across multiple countries and continents, affecting a vast geographical area. According to WHO data, the COVID-19 pandemic resulted in the loss of 2.21 million lives, with 275 million people diagnosed with the virus. (World Bank) During this period, the restrictions and measures imposed to contain the pandemic had a detrimental impact on working life. Disruptions in logistics and agricultural production led to global challenges in food supply chains.

The COVID-19 pandemic has brought food security and sustainability issues to the forefront of the agricultural sector's agenda. A critical component of ensuring food security is the economic accessibility of food, which can be evaluated through variables such as disposable income levels, food prices, and the poverty rate. In this context, high food prices or low disposable incomes are key factors that hinder efforts to achieve food security (Eştürk & Ören, 2014).

One of the significant challenges Türkiye faced during the COVID-19 pandemic was its inability to curb rising food prices. While global food prices generally trended downward, food prices in Türkiye entered an upward trajectory. Both the food consumer price index and the agricultural products producer price index exhibited continuous increases. This indicates that food costs became a substantial economic issue during the pandemic. An examination of food price changes in Türkiye between January 2020 and June 2020, based on the consumer price index, reveals increases of 1.95% in March, 2.53% in April, and 0.24% in May. In contrast, the agricultural products producer price index rose by 2.5% in February, 1.8% in March, and 0.8% in May, following a 0.5% decrease in April. These figures suggest that increases in the food consumer price index outpaced those in the agricultural products producer price index, indicating that consumer food prices were rising more rapidly than the prices producers received (Aydın & Güner, 2020: 13).

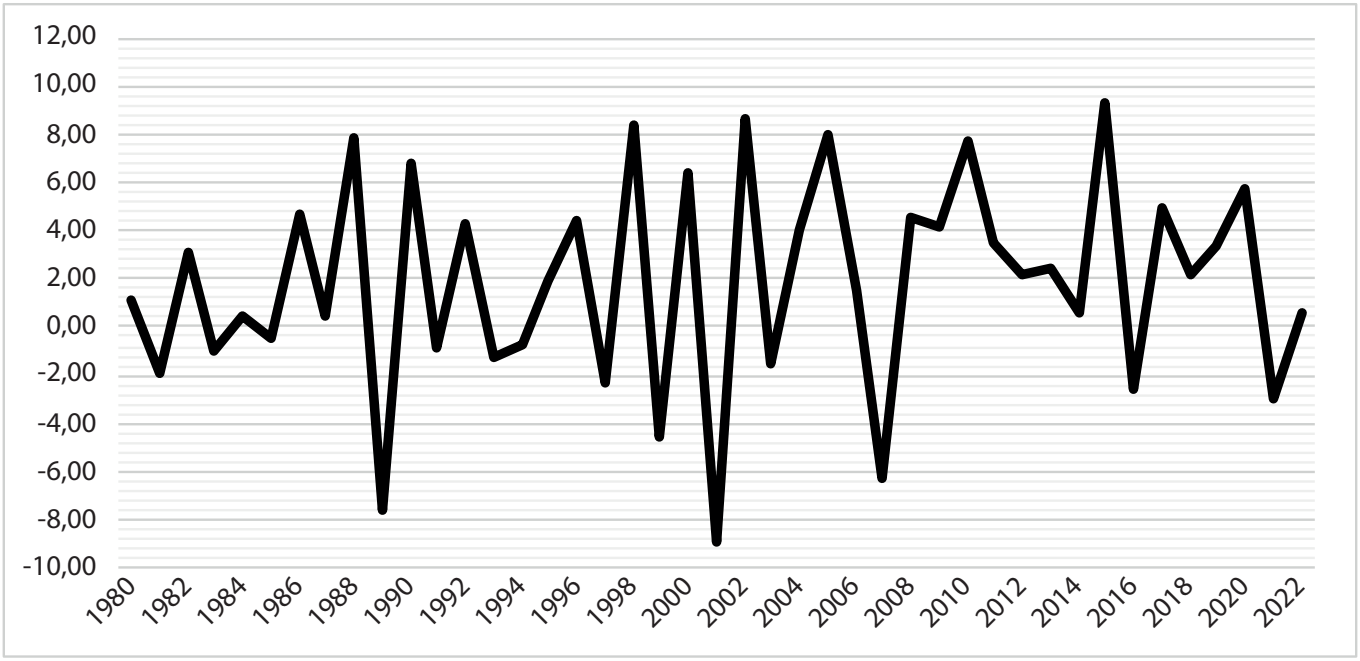

Figure 2. Türkiye's agricultural sector growth rate by years % (1980-2022)

The agricultural sector in Türkiye has been persistently impacted by developments following 1980, owing to its susceptibility to both economic and geographical factors. In the post-1980 era, the sector experienced periods of negative growth, specifically in 1989, 2001, 2007, 2016, and 2021. Over the past four decades, Türkiye has been unable to maintain stable and sustained growth in its agricultural sector.

With the January 24 decisions marking the beginning of a new era in Türkiye, the agricultural sector has witnessed both positive and negative effects of the neo-liberal period. Efforts have been made to boost productivity and production through various regulations and policies. Although neo-liberal ideals aimed for development and progress, the success of these efforts is debatable. Globally, challenges such as population growth, pandemics, the global climate crisis, and food security have become increasingly critical in agriculture. While developed countries have successfully industrialized and simultaneously advanced their agricultural sectors, Türkiye, despite its significant agricultural production potential, has yet to achieve stability or emerge as a global actor in the sector.

Studies of Intra-Industry Trade in Different Economies and Türkiye

To analyze intra-industry trade specialization in Türkiye's agricultural sector, it is crucial to consider research conducted in both developing and developed economies. Banerjee and Bhattacharyya (2004) investigated the role of economic development as a driver of intra-industry trade (IIT) in India from 1971 to 2000, concluding that development enhances IIT through complex economic forces. Veeramani (2002, 2009) observed that India experienced higher IIT with developed nations, and that liberalization policies and foreign competition accelerated IIT growth. Shahbaz, Leitao, and Butt (2012) found in Pakistan that GDP differences positively affect IIT, while Lee and Sohn (2004) emphasized the roles of consumer preferences and geographic proximity in South Korea. Bhattacharyya (2005) and Xing (2007) added that vertical IIT often dominated, shaped by communication with foreign partners and FDI flows. Sawyer et al. (2010) and Türkcan and Ateş (2011) expanded on these determinants, highlighting the importance of R&D, trade orientation, and infrastructure.

Cole and Elliot (2003) added a regulatory dimension by showing how environmental policy disparities influence IIT levels. Varma and Ramakrishnan (2014) and Banik and Das (2014) contributed sector-specific insights, especially for processed food trade in ASEAN and the Mekong region. Fertő and Hubbard (2001), Hazners and Jirgena (2013), and Şahbudak and Şahin (2016) provided comparative evidence from Hungary, Latvia, China, and Brazil pointing to the prevalence or absence of IIT in agricultural trade across emerging and transitioning economies.

A growing number of empirical studies focus directly on Türkiye. Eşiyok (2005) and Erün (2010) found high levels of IIT between Türkiye and EU countries in food products such as beverages, oils, oilseeds, and fruits, often characterized by vertical differentiation. Şahin (2015) and Şahin & Şahbudak (2016) confirmed these results using SITC Rev.3 classifications and unit value methods, noting consistent vertical IIT patterns with EU-15 countries. Mangır and Fidan (2017) identified strong IIT in processed foods but weak performance in raw agricultural materials, suggesting sectoral competitiveness asymmetries. Kalaycı (2013) extended the analysis to Türkiye–Russia relations, identifying inter-industry trade dominance but emerging IIT signals in animal and food products.

More recent contributions have examined Türkiye's broader structural trade shifts. Yılmaz (2018) observed that despite modest growth in agricultural exports following the WTO Agreement on Agriculture, their share in total exports has declined steeply—from 40% in the 1950s to just 3.2% in 2017. Cengiz and İlhan (2016) analyzed the effects of the 2007–2008 global food crisis on Türkiye's input costs and price volatility, revealing structural fragility in the country's agricultural supply system. These structural constraints—combined with cost pressures, import dependence, and sectoral trade imbalances—limit Türkiye's ability to benefit fully from agricultural trade liberalization.

Current Research

Measuring intra-industry trade

In the context of the Factor Endowment Theory, the trade between labor-intensive and capital-intensive countries is highlighted. Industrial countries are typically associated with an abundance of capital, while underdeveloped or developing economies are linked to an abundance of labor. Although the Factor Endowment Theory explains the trade between labor-intensive and capital-intensive countries, it falls short in explaining trade between nations with similar levels of development. In contrast, Linder's thesis suggests that trade between countries with comparable levels of development is also significant (Linder, 1961: 69).

International trade is often conducted between countries with similar levels of development. In such trade, rather than specializing in specific product groups, countries simultaneously act as both exporters and importers within the same product categories. This phenomenon, where a country exports and imports goods or product groups within the same industry, is known as Intra-Industry Trade (Yılmaz, 2016: 250). In other words, Intra-Industry Trade refers to the exchange of goods that share similar demand and supply structures between countries.

Although Edward Leamer called for the development of a new foreign trade theory in response to the doubts raised by the Leontief paradox, his proposal was not widely accepted by economists (Yılmaz, 2016: 251). Intra-Industry Trade, often regarded as a statistical anomaly, was identified by Richard Promfret in his 1987 study as a key factor behind the expansion of market size, the increasing levels of production specialization among countries, and the diversification of goods and services. According to Promfret, the primary driver of intra-industry trade growth is market expansion. As countries develop, the division of labor intensifies, and economic development, coupled with technological advancements, enlarges market size. The removal of trade barriers further accelerates specialization (Promfret, 1987: 57).

David Greenaway and Chris Milner assert that intra-industry trade is an undeniable aspect of international trade. They offer two primary explanations for this. First, international trade is shaped by more than just factor endowments; other critical factors play a role. Second, if the expansion of international trade occurs predominantly through intra-industry trade, it allows countries to adapt more easily to trade growth (Greenaway & Milner, 1981: 761).

Grubel and Lloyd's 1971 study aimed to measure intra-industry trade, and their index is still widely recognized in academic discourse. In their analysis, they focused on the intra-industry trade dynamics of nine industrialized countries along with Austria. According to Grubel and Lloyd, the intensity of intra-industry trade is determined by subtracting the net import or net export value from a country's overall foreign trade.

Formula

In the calculation below, X represents the country's export value in that commodity group in terms of money, and M represents the import value of that country in the relevant commodity group, also in terms of money.

$$B_i = 1 - \frac{|Xi - Mi|}{Xi + Mi} \tag{1}$$

The calculated result takes a value between 0 and 1. If the result is 0, there is full inter-industry trade. If the result is 1, there is full intra-industry trade. If it is 0, there is either full export or full import (Grubel & Lloyd, 1971:497).

In Grubel and Lloyd's original calculation, intra-industry and inter-industry trade were measured interdependently. However, believing that intra-industry trade could be independent of inter-industry trade, they revised their methodology in 1975. The new formula was developed to minimize the influence of total foreign trade, addressing a limitation of their initial model.

$$Ci = \frac{\sum_{i=1}^{n}\left(X_i + M_i\right) - \sum_{i=1}^{n}\left|X_i - M_i\right|}{\sum_{i=1}^{n}\left(X_i + M_i\right) - \left|\sum_{i=1}^{n} X_i - \sum_{i=1}^{n} M_i\right|} \tag{2}$$

The revised formula, known as the developed or adapted formula, was designed by Grubel and Lloyd to address potential deviations in the measurement of countries with substantial trade deficits or surpluses. This new approach includes these foreign trade imbalances. In calculations using the adapted formula, intra-industry trade levels tend to be higher.

Codes

HS (Harmonized System) codes are internationally recognized numerical codes developed by the World Trade Organization (WTO) for the classification of traded goods. These codes are employed worldwide to streamline the identification, categorization, and regulation of products in global trade. The system assists countries in imposing tariffs, tracking trade statistics, and ensuring adherence to trade regulations.

Findings

Table 2 presents the HS codes classified as agricultural products, according to the World Trade Organization. The intra-industry trade ratio for the period between 2002 and 2022 has been calculated by the author.

The intra-industry trade ratio was calculated annually for the period between 2002 and 2022 in this study. Nevertheless, Table 2 presents the data at four-year intervals.

Table 2

Grubel-Lloyd (GL) Index in Türkiye's Agricultural Trade (HS Codes)

HS	INDUSTRY	2002	2007	2012	2017	2022	Total
01	Live animals	0,674	0,456	0,018	0,055	0,832	0,119
02	Meat and edible meat offal	0,007	0,004	0,308	0,418	0,218	0,442
03	Fish and crustaceans, mollusks, and other aquatic invertebrates	0,307	0,522	0,598	0,444	0,328	0,416
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	0,760	0,792	0,352	0,339	0,242	0,417
05	Products of animal origin, not elsewhere specified or included	0,828	0,970	0,941	0,967	0,889	0,913
06	Live trees and other plants; bulbs, roots, and the like; cut flowers and ornamental foliage	0,710	0,941	0,912	0,982	0,511	0,861
07	Edible vegetables and certain roots and tubers	0,278	0,250	0,449	0,541	0,612	0,579
08	Edible fruit and nuts; peel of citrus fruit or melons	0,103	0,172	0,214	0,374	0,356	0,270
09	Coffee, tea, maté and spices	0,506	0,836	0,931	0,874	0,699	0,922
10	Cereals	0,352	0,128	0,202	0,370	0,227	0,242
11	Products of the milling industry; malt; starches; inulin; wheat gluten	0,219	0,079	0,144	0,204	0,262	0,169
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruits; industrial or medicinal plants; straw and fodder	0,319	0,225	0,249	0,347	0,349	0,313
13	Lac; gums, resins and other vegetable saps and extracts	0,117	0,405	0,360	0,423	0,729	0,426
14	Vegetable plaiting materials: vegetable products not elsewhere specified or included	0,294	0,336	0,415	0,792	0,599	0,605
15	Animal or vegetable fats and oils and their cleavage products prepared edible fats; animal or vegetable waxes	0,559	0,670	0,783	0,842	0,925	0,819
16	Preparations of meat, of fish or of crustaceans, mollusks, or other aquatic invertebrates	0,047	0,091	0,106	0,156	0,165	0,165
17	Sugars and sugar confectionery	0,230	0,316	0,323	0,574	0,737	0,446
18	Cocoa and cocoa preparations	0,984	0,786	0,916	0,932	0,814	0,958
19	Preparations of cereals, flour, starch, or milk; bakers' wares	0,326	0,360	0,267	0,248	0,193	0,257
20	Preparations of vegetables, fruit, nuts, or other parts of plants	0,064	0,110	0,085	0,123	0,149	0,114
21	Miscellaneous edible preparations	0,984	0,912	0,788	0,963	0,866	0,894
22	Beverages, spirits, and vinegar	0,394	0,693	0,856	0,985	0,831	0,981
23	Residues and waste from the food industries; prepared animal feed	0,155	0,039	0,180	0,329	0,636	0,347
24	Tobacco and manufactured tobacco substitutes	0,700	0,638	0,733	0,838	0,944	0,821
29	Organic chemicals	0,160	0,171	0,226	0,211	0,175	0,182
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	0,508	0,647	0,753	0,746	0,922	0,765
35	Albuminoidal substances; modified starches; glues; enzymes	0,207	0,289	0,540	0,625	0,919	0,559
41	Raw hides and skins (other than fur skins) and leather	0,195	0,329	0,381	0,914	0,898	0,531
43	Fur skins and artificial fur; manufactures there of	0,195	0,329	0,568	0,433	0,562	0,722
50	Silk	0,348	0,153	0,158	0,144	0,122	0,208
51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	0,624	0,652	0,654	0,619	0,418	0,607
52	Cotton	0,770	0,725	0,857	0,731	0,637	0,758
53	Other vegetable textile fibers; paper yarn and woven fabric of paper yarn	0,145	0,284	0,158	0,178	0,293	0,222

Note: *Prepared by the author.*

Table 3

Grubel-Lloyd (GL) Index and Trade Volume of Türkiye's Total Agricultural Trade

Year	Export ($)	Import ($)	Total Trade ($)	Net Trade ($)	GL Index
2002	8.196.428.326	5.560.235.082	13.756.663.408	2.636.193.244	0,808
2003	10.561.606.789	7.734.372.209	18.295.978.998	2.827.234.580	0,845
2004	13.105.259.011	8.895.813.747	22.001.072.758	4.209.445.264	0,809
2005	16.677.859.708	9.436.787.444	26.114.647.152	7.241.072.264	0,723
2006	17.240.312.391	9.899.100.655	27.139.413.046	7.341.211.736	0,729
2007	19.629.401.412	14.052.825.920	33.682.227.332	5.576.575.492	0,834
2008	21.303.228.062	20.215.981.907	41.519.209.969	1.087.246.155	0,974
2009	22.077.671.663	14.996.017.424	37.073.689.087	7.081.654.239	0,809
2010	24.863.299.141	18.534.532.907	43.397.832.048	6.328.766.234	0,854
2011	29.687.780.875	24.420.207.590	54.107.988.465	5.267.573.285	0,903
2012	30.952.808.620	23.264.156.720	54.216.965.340	7.688.651.900	0,858
2013	36.740.780.941	32.123.447.338	68.864.228.279	4.617.333.603	0,933
2014	39.519.910.985	32.594.152.953	72.114.063.938	6.925.758.032	0,904
2015	36.954.572.536	27.505.618.153	64.460.190.689	9.448.954.383	0,853
2016	36.078.690.714	26.894.985.236	62.973.675.950	9.183.705.478	0,854
2017	36.984.603.382	30.708.857.167	67.693.460.549	6.275.746.215	0,907
2018	38.224.541.128	29.607.173.598	67.831.714.726	8.617.367.530	0,873
2019	38.882.568.663	31.446.758.173	70.329.326.836	7.435.810.490	0,894
2020	40.645.738.095	32.711.673.137	73.357.411.232	7.934.064.958	0,892
2021	49.185.938.770	39.123.164.280	88.309.103.050	10.062.774.490	0,886
2022	57.766.663.633	51.646.059.810	109.412.723.443	6.120.603.823	0,944
Total	625.279.664.845	491.371.921.450	1.116.651.586.295	133.907.743.395	0,880

Note: *Prepared by the author.*

Between 2002 and 2022, Türkiye's total agricultural product exports exceeded 625 billion USD, while imports during the same period amounted to approximately 491 billion USD. This resulted in a trade surplus in the agricultural sector, with the difference between exports and imports being around 134 billion USD.

In the study examining Türkiye's agricultural sector, a detailed analysis was conducted on live animals, fruits and vegetables, other plant products, vegetable and animal oils, food products, organic chemical products, and agricultural inputs used in the textile industry. Aside from Türkiye's fruit and vegetable exports and cereal products exported under the domestic processing regime, the majority of these products are imported.

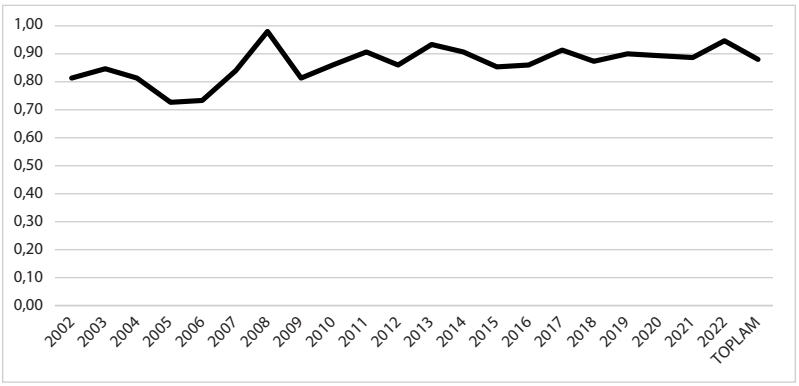

Figure 3. Grubel-Lloyd (GL) index in Türkiye's total agricultural trade

In this analysis, the Intra-Industry Trade (IIT) rate for Türkiye's agricultural sector was 0.88, as measured by the Grubel-Lloyd (GL) index. Over the 20-year period, IIT showed steady growth, with the highest rate of 0.94 observed in 2008. That year, Türkiye's agricultural exports exceeded imports by roughly 1 billion USD. The study also calculated a trade surplus of 89.134 billion USD across 33 agricultural product groups, classified using HS codes.

Türkiye's agricultural sector operates according to the classification of agricultural products defined by the World Trade Organization (WTO). This study explores the trade of all agricultural products within this classification. The findings are thoroughly examined in the results and discussion section. Interestingly, Türkiye, despite being one of the largest global traders of agricultural products, faces a trade deficit. In addition to its production capacity, globalization significantly influences Türkiye's agricultural trade dynamics.

Results and Discussion

The intra-industry trade theory attempts to explain trade between countries with similar supply and demand structures. Country-specific, product-specific, and market-specific factors contribute to the formation of intra-industry trade. The first findings in this study explore the emergence of intra-industry trade in Türkiye's agricultural sector. Between 2002 and 2022, Türkiye's agricultural trade index was calculated at 0.89, a level approaching full intra-industry trade. The development levels, geographical proximity, and factor endowments of Türkiye's trade partners are consistent with intra-industry trade theory and resemble the trade structures of developed, industrialized nations.

Six of the top ten countries to which Türkiye exports agricultural products are high-income, industrialized nations. Among its import partners, five are high-income countries, and five are classified as upper-middle-income, a group similar to Türkiye. Since 1980, the contribution of agriculture to Türkiye's GDP has declined consistently each year.

Another significant result and discussion arising from this study involves Türkiye's agricultural sector, specifically analyzed by product categories. The research investigated agricultural products, live animals, fresh fruits and vegetables, other plants, vegetable and animal oils, food products, beverages, tobacco products, organic chemical products, furs, textiles, ready-made clothing, and home textile products, each examined individually.

Türkiye's live animal trade has seen major changes between 2002 and 2022. Initially characterized by an intra-industry trade structure in the early 2000s, it shifted to inter-industry trade after 2009. Trade policies in this product group have resulted in a trade deficit for Türkiye. However, meat, fish and crustaceans, dairy products, and poultry have shown a trade surplus within this group. Overall, an intra-industry trade structure remains prevalent in this product category.

Türkiye holds an international comparative advantage in the trade of edible vegetables and fruits, with the trade structure characterized as inter-industry trade. Additionally, Türkiye exports grain-based products to international markets. However, grain trade represents the product group with the largest trade deficit within this sector.

Between 2002 and 2022, Türkiye's agricultural trade exhibited an index of 0.89, indicating a trade structure close to full intra-industry trade. This average was consistently maintained throughout the 20-year period, with no significant deviations observed. Following its transition to a liberal economy, Türkiye's agricultural sector has experienced processes similar to those in the global economy. However, during this period, Türkiye did not hold a comparative international advantage in the agricultural sector.

Globalization is a key concept for understanding the current economic order and plays a central role in the growth and development of international trade. The removal of trade barriers has reshaped the wealth distribution among nations and altered the structure of global trade. Since Adam Smith laid the foundations of international trade, the nature of trade has changed significantly. Smith posited that international trade would bring mutual development and benefit to countries, but 250 years have passed since his theory was first introduced. Over this period, the Industrial Revolution sparked a surge in production, leading to a growing demand for raw materials and a search for new markets. By the early 20th century, nations that had endured two world wars embraced globalization and sought prosperity through international cooperation. The acceptance of the Bretton Woods system in 1945 established institutions with global authority, such as the IMF, the World Bank, and the GATT, as key decision-making bodies in the global economy.

In addition to political developments, the rapid progress in science and technology has led to a re-examination and transformation of the theories and policies that explain international trade. When analyzing the commercial structure of the past 80 years, advancements in science, technology, and politics have allowed for the investigation of topics that classical foreign trade theories could not fully address. Key among these new theories are those concerning skilled labor, monopolistic competition, technological deficits, product cycles, economies of scale, and preference similarity, alongside intra-industry trade theory, which forms the central subject of this study.

This study examines Türkiye's agricultural trade from 2002 to 2022. It is the first to analyzed the agricultural sector over the 20-year period following the economic and political crisis that Türkiye faced in 2001–2002. This period was marked by significant developments in the global economy. The study investigates the aftermath of crises experienced by developing economies during their transition to neo-liberalism and the expansion of globalization. These crises include the Asian financial crisis of the 1990s, the Mexican and Argentine crises, the Russian financial crisis, and Türkiye's 2001 crisis. Additionally, Türkiye has had to contend with the challenges of transitioning from a mixed economy model to a free market economy.

The 2008 global financial crisis is another important factor. Recovery from the crisis was driven by monetary expansion and state intervention, which ushered in a new era for the global economy. However, the rapid recovery brought new challenges linked to monetary expansion. Following this, the COVID-19 pandemic significantly impacted the global economy, drawing attention to the agricultural sector. The pandemic sparked renewed debates on food security, sustainability, agricultural productivity, and the global climate crisis. While the effects of COVID-19 on agriculture are still emerging, global developments in 2022 continue to influence the sector. The 2022 Ukraine-Russia war, natural disasters in Africa in 2023, and the earthquake in Türkiye have prolonged these critical discussions within the agricultural sector.

The findings of the study indicate that, following the January 24, 1980 decisions, Türkiye shifted away from its policy of international comparative advantage in agriculture, opening its agricultural sector to global competition. This strategic shift mirrors the approach taken by the world's most developed nations, where the share of agriculture in GDP lags significantly behind the service and industrial sectors. However, the wealthiest countries, despite this, generate the highest export revenues from agricultural products. In this context, Türkiye has the potential to join these nations by investing in technology and building strong agricultural brands. Since the neo-liberal period, Türkiye has pursued a national policy focused on industrialization and the expansion of the service sector. On a global scale, comparative advantage in agriculture remains characteristic of underdeveloped and developing countries.

The final result and discussion of this study should be framed within the context of global trade. It is noteworthy that the countries earning the highest export revenues in the agricultural sector are the developed and industrialized nations. This success can largely be attributed to advanced technology and a highly skilled labor force, aspects that warrant further investigation and discussion. After transitioning to neo-liberal policies, Türkiye also abandoned its planned agricultural strategies, opening its market to international competition. However, given the critical role of agricultural products in both sustaining human life and providing essential raw materials for industry, agricultural policies must be redefined. Globally, the share of the service sector in GDP is rising among developed economies. These nations, while shifting industrial investments to developing and underdeveloped countries through their powerful multinational corporations, continue to achieve high profitability. Although Türkiye lacks such a strong industrial base, it is worth noting that its most robust sector is the service sector. In this context, while the diminishing role of agriculture in Türkiye's GDP aligns with its development objectives, the long-term importance of agriculture should not be overlooked, especially in building resilience to political and economic crises. Addressing the decline in agricultural employment and removing other barriers to production are critical steps that need support. Rapid growth in the service sector may be premature for Türkiye.

Conclusion

This study has demonstrated that the factors leading to the introduction of intra-industry trade theory remain valid. Türkiye's agricultural potential has been evaluated, and the solution to enhancing its global competitiveness has been identified in technological advancements and branding. The findings also highlight the success of the wealthiest countries in agricultural trade, driven by factors such as increased productivity and a skilled labor force, while emphasizing the challenges faced by developing countries in implementing effective agricultural support and incentive policies.

References

Abdullahi, A.A., & Arısoy, H. (2022). Evaluation of Türkiye's agricultural support policies in terms of world trends. *Selçuk Journal of Agriculture and Food Sciences, 36*(4), 72–78. doi:10.15316/SJAFS.2022.081

Ay, A., & Yapar, S. (2005). Dünya Ticaret Örgütü Tarım Anlaşması ve Türkiye. *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 13,* 57-80.

Aydın, A., & Güner, A. (2020). Covıd-19 salgınının tarım sektörü ve gıda güvenliği üzerine etkisi: Türkiye üzerine bir değerlendirme. *Artuklu Kaime Uluslararası* İktisadi *ve* İdari *Araştırmalar Dergisi, 3*(2), 155-171.

Bakırcı, M. (2007). *Türkiye'de kırsal kalkınma: Kavramlar-politikalar-uygulamalar.* İstanbul: Nobel Yayın Dağıtım.

Banik, N., & Das, K. C. (2014). The location substitution effect: Does it apply for China? *Global Business Review, 15*(1), 59-75. doi:10.1177/0972150913515595

Bhattacharyya, M., & Banerjee, A. (2004). Integration of global capital market: An empirical exploration. *International Journal of Theoretical and Applied Finance, 7,* 385-405. doi:10.1142/S0219024904002529

Bhattacharyya, R. (2005). Economic development and intra-industry trade in the Republic of Korea. *Journal of Economic Integration, 20*(4), 809–831.

Botric, V. (2013). Determinants of intra-industry trade between Western Balkans and EU-15: Evidence from bilateral data. *International Journal of Business and Economic Sciences Applied Research (IJBESAR), 6*(2), 7-23.

Cahill, D., & Konings, M. (2019*). Neoliberalizm.* (Çev. Orhangazi, O). Ankara: Ütopya Yayınevi.

Cengiz, V., & İlhan, E. (2016). 2008 dünya gıda krizi ve Türkiye'de etkisi. Ziraat Mühendisliği, (363), 17–23.

Cole, M. A., & Elliott, R. J. R. (2003). Determining the trade–environment composition effect: The role of capital, labor and environmental regulations. *Journal of Environmental Economics and Management, 46*(3), 363-383. doi:10.1016/S0095-0696(03)00021-4.

ComTrade. (2023). *Detailed global trade data.* Erişim adresi: https://comtradeplus.un.org/

Erçakar, M. E. (2010). Küresel kriz öncesi ve sonrasında tarım kesimine bakış. *Journal of Management and Economics Research, 8*(14), 93-104.

Erün, G. (2010). Türkiye ile AB, gıda ve canlı hayvan sektörü dış ticaretinde endüstri-içi ticaret analizi. Ekonomi Bilimleri Dergisi, 2(1), 71–78.

Eşiyok B.A.(2004), Kalkınma Sürecinde Tarım Sektörü: Gelişmeler, Sorunlar, Tespitler ve Tarımsal Politika Önerler, Cilt II, Türkiye Kalkınma Bankası A.S. Genel Araştırmalar

Eşiyok, B. A. (2005). Tarımsal ürünlerde Türkiye-AB arasında dış ticaretin analizi: Endüstri-içi ticaret ve rekabet gücü. Ankara: Türkiye Kalkınma Bankası Yayınları.

Eştürk, Ö., & Ören, M. N. (2014). Türkiye'de tarım politikaları ve gıda güvencesi. *Yuzuncu Yıl University Journal of Agricultural Sciences, 24*(2), 193-200. doi:10.29133/Yyutbd.235933

Fertő, I., & Hubbard, L. J. (2001, August 5–8). Intra-industry trade in agrifood products between Hungary and the EU [Conference presentation]. American Agricultural Economics Association Annual Meeting, Chicago, IL, United States.

Greenaway, D., & Milner, C. (1981). Trade imbalance effects in the measurement of intra-industry trade. *Weltwirtschaftliches Archiv, 117*(4), 756–762.

Grubel, H. G., & Lloyd, P. J. (1971). The empirical measurement of intra-industry trade. *Economic Record, 47,* 494-517. doi:10.1111/j.1475-4932.1971.tb00772.x

Grubel, H. G., & Lloyd, P. J. (1975). *Intra-industry trade: The theory and measurement of international trade in differentiated products.* London: Macmillan Press.

Hazners, J., & Jirgena, H. (2013, July 16–19). Intra-industry trade in Latvian agricultural commodities and food products [Conference presentation]. International Conference on Economics and Business Administration, Greece.

Kalaycı, C. (2013). Rusya Federasyonu ile ticarette Türkiye'nin açmazları. Eskişehir Osmangazi Üniversitesi İİBF Dergisi, 8(1), 37–57.

Kepenek, Y.,Yentürk, N.(2003), Türkiye Ekonomisi, Remzi Kitabevi İstanbul.

Kuşlu, Y. (2020). The study on components of the rural structure in Türkiye. *Journal of Agricultural Economics and Rural Development, 6*(3), 899-906.

Lee, H-H., & Sohn, C-H. (2004). South Korea's marginal intra-industry trade and the choice of preferential partners. *Asian Economic Papers, 3*(3), 94–116. doi:10.1162/1535351054825265

Linder, S. B. (1961). *An essay on trade and transformation*. New York: John Wiley.

Mangır, F., & Fidan, A. (2017). Grubel-Lloyd endeksi ile endüstri-içi ticaret analizi: Tarım sektörü Türkiye örneği. KMÜ Sosyal ve Ekonomik Araştırmalar Dergisi, 19(33), 45–51.

Özçatalbaş, O., & Imran, M. (2017). Current situation and importance of the family farming in agriculture of Türkiye. *Modern Agricultural Science and Technology, 3*(3-4), 1-9. doi:10.15341/mast(2375-9402)/02.03.2017/001

Öztürk, Ş., Nas, F., & İçgöz, E. (2008). 24 Ocak kararları, neo-liberal politikalar ve Türkiye tarımı. *Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 1*(2), 15-32.

Promfret, R. (1987). On the division of labour and international trade: or Adam Smith's explanation of intra-industry trade. *Journal of Economic Studies, 13*(4), 55-62. doi: 10.1108/eb002633

Ramakrishnan, A., & Varma, P. (2014). Do free trade agreements promote intra-industry trade? The case of India and its FTAs. *International Journal of Trade and Global Markets, 7,* 129-144. doi:10.1504/IJTGM.2014.062855

Şahbudak, E., & Şahin, D. (2016). Measurement of vertical and horizontal intra-industry trade in agricultural food products: The case of China and Brazil. The Journal of Academic Social Science Studies, 42(3), 145–154.

Şahin, D. (2015). Türkiye'nin tarımsal gıda ürünlerinin endüstri-içi ticaretinin analizi: AB-15 ülkeleri ile karşılaştırmalı analiz. Uluslararası Hakemli Ekonomi Yönetimi Araştırmaları Dergisi, 4, 171–193.

Sawyer, W.C., Sprinkle, R.L., & Tochkov, K. (2010). Patterns and determinants of intra-industry trade in Asia. *Journal of Asian Economics, 21*(5), 485-493. doi:10.1016/j.asieco.2010.04.001

Shahbaz, M., Leitao, N. C., & Butt, M. S. (2012). Pakistan intra-industry trade: A panel data approach. *International Journal of Economics and Financial Issues, 2*(2), 225-232.

Sönmez, A. (2023). Class, family, income and wealth: farming and non-farming landowners in the occupational and social class orders in Türkiye. İnsan *ve Toplum, 13*(2), 84-159. doi:10.12658/M0694

Türkcan, K., & Ateş, A. (2011). Vertical intra-industry trade and fragmentation: An empirical examination of the US auto-parts industry. *The World Economy, 34,* 154-172. doi:10.1111/j.1467-9701.2010.01316.x

Türkiye İstatistik Kurumu. (2022). *Dönemsel gayrisafi yurt içi hasıla, IV.* Çeyrek*: Ekim - Aralık, 2022.* (TÜİK 49664). Erişim adresi: https://data.tuik.gov.tr/Bulten/Index?p=Donemsel-Gayrisafi-Yurt-Ici-Hasila-IV.-Ceyrek:-Ekim---Aralik,-2022-49664#:~:text=%C3%9Cretim%20y%C3%B6ntemiyle%20Gayrisafi%20Yurt%20%C4%B0%C3%A7i,milyar%20717%20milyon%20TL%20oldu

Veeramani, C. (2002). Intra-industry trade of India: trends and country-specific factors. *Weltwirtschaftliches Archiv, 138*(3), 509-533. doi:10.1007/BF02707952

Veeramani, C. (2009). Trade barriers, multinational involvement and intra-industry trade: Panel data evidence from India. *Applied Economics, 41*(20), 2541-2553. doi:10.1080/00036840701235688

WorldBank. (2023). *GDP per capita (current US$).* Erişim adresi: https://data.worldbank.org/indicator/NY.GDP.PCAP.CD

Xing, Y.Q. (2007). Foreign direct investment and China's bilateral intra-industry trade with Japan and the US. *Journal of Asian Economics, 18*, 685-700. doi:10.1016/j.asieco.2007.03.011

Yıldırım, A. E. (2022). Üretme*, tüket.* İthalat-siyaset- *rant kıskacında tarım.* İstanbul: Sia Yayınevi.

Yılmaz, H. (2018). Dünya Ticaret Örgütü'nün tarım politikaları ve Türkiye'ye etkileri (Yayımlanmamış yüksek lisans tezi). İstanbul Üniversitesi, Sosyal Bilimler Enstitüsü, İstanbul.

Yılmaz, Ş. E. (2016). *Dış ticaret kuramlarının evrimi* (4. Baskı). Ankara: Efil Yayınevi.

Genişletilmiş Özet

Amaç: Bu çalışmanın amacı, Türkiye'nin 2002-2022 yılları arasındaki tarım sektörü ticaretinde endüstri içi ticaret yapısını incelemektir. Çalışma, Türkiye'nin bu sektörde uluslararası rekabet avantajı elde edip edemediğini ve gelişmiş ülkelerin tarımsal ticarette nasıl bir konuma sahip olduğunu analiz etmektedir. Bu inceleme, Türkiye'nin tarım sektörünü diğer sektörlerle kıyaslayarak büyüme stratejilerini nasıl geliştirebileceğine yönelik bir çerçeve sunmaktadır. Tarım sektörünün küresel ticarette giderek artan önemine rağmen, Türkiye'nin bu alanda karşılaştığı yapısal sorunlar ve fırsatlar çalışmanın temel sorularını oluşturmaktadır. Çalışma, Türkiye'nin rekabet gücünü artırabilecek teknoloji ve markalaşma stratejilerini vurgularken, tarım sektörü gelirlerinin en yüksek olduğu gelişmiş ülkelerin deneyimlerinden çıkarımlar yapmayı amaçlamaktadır.

Tasarım ve Yöntem: Bu çalışma, Türkiye'nin tarım sektörü ticaretinin endüstri içi ticaret yapısını analiz etmek amacıyla uygulamalı bir araştırma olarak tasarlanmıştır. Araştırma, Türkiye'nin 2002-2022 yılları arasındaki tarım ürünleri ticaretinde endüstri içi ticaret düzeyini ölçmeye odaklanmaktadır. Betimsel bir yaklaşım benimsenmiş olup, uluslararası ticaret literatüründe yaygın olarak kullanılan Grubel-Lloyd Endeksi hesaplama yöntemi ile Türkiye'nin tarım ticaretinde endüstri içi ve endüstriler arası ticaret oranları ölçülmüştür. Endüstri içi ticaret yapısı, Türkiye'nin tarım sektörünün uluslararası rekabet gücünü ve gelişmiş ülkelerle kıyaslanabilir bir ticaret profiline sahip olup olmadığını incelemek için önemli bir ölçüt olarak ele alınmıştır.

Veri toplama aşamasında, Türkiye'nin tarım sektörü ticaret verileri Birleşmiş Milletlere bağlı Comtrade veri tabanından elde edilmiştir. Bu veri tabanı, ülkelerin ithalat ve ihracat verilerini yıllık bazda güncelleyerek detaylı bir ticaret analizi yapılmasını olanaklı kılmaktadır. Veriler, 2002-2022 yıllarını kapsayan 20 yıllık dönemde her yıl için tarımsal ürün bazında alınmıştır. Tarım ürünlerinin tanımlanması ve sınıflandırılması için Dünya Ticaret Örgütü'nün belirlediği HS (Harmonized System) kodları kullanılarak tarım ürünleri kategorize edilmiştir. Bu sınıflandırma, çalışmanın uluslararası kabul görmüş bir veri standardıyla uyumlu olmasını sağlamış ve tarımsal ürünlerin ticaret analizine odaklanmayı mümkün kılmıştır. HS kodları, ürünlerin ticaretine ilişkin detaylı bilgi sunarak tarım sektörü ürünlerinin kapsamını belirlemede önemli bir rol oynamaktadır.

Çalışmada endüstri içi ticaret oranlarının yıllık olarak hesaplanması amacıyla Grubel-Lloyd Endeksi kullanılmıştır. Bu endeks, Türkiye'nin her bir tarım ürünü bazında ihracat ve ithalat değerleri üzerinden hesaplanarak endüstri içi ticaret seviyesini belirlemektedir. Endeks değeri, iki sektör arasındaki ticaretin ne kadarının endüstri içi ticaret olarak değerlendirilebileceğini göstermektedir. Çalışmanın veri analizi sürecinde kullanılan Grubel-Lloyd Endeksi ile Türkiye'nin tarımsal ticaret yapısının farklı yıllar boyunca nasıl değiştiği karşılaştırmalı olarak analiz edilmiştir. Bu yöntemsel yaklaşım, Türkiye'nin tarımsal ürün ticaretindeki yapısal değişimleri ve rekabet gücünü ortaya koymada etkili olmuştur.

Bulgular: Bu çalışmada, Türkiye'nin 2002-2022 yılları arasındaki tarımsal ticareti analiz edilerek endüstri içi ticaret yapısı ve uluslararası rekabet durumu detaylı bir şekilde incelenmiştir. Grubel-Lloyd Endeksi kullanılarak hesaplanan endüstri içi ticaret oranları, Türkiye'nin tarımsal ticaretinde yüksek bir seviyeye ulaştığını göstermektedir. Ortalama endeks değeri 0,88 olan bu oran, Türkiye'nin tarım sektöründe birçok ürün grubunda hem ithalat hem de ihracat gerçekleştirdiğini ve bu ürünlerin aynı endüstri kapsamında ticaretinin yapıldığını ortaya koymaktadır. Özellikle 2008 yılında endüstri içi ticaret oranının zirveye ulaşması, o dönemde Türkiye'nin tarımsal ihracat ve ithalat dengesinin iyileştiğini ve ticaret yapısında önemli bir artış kaydedildiğini göstermektedir.

Araştırmada, Türkiye'nin başlıca tarımsal ticaret ortaklarının çoğunlukla gelişmiş ve yüksek gelirli ülkeler olduğu tespit edilmiştir. ABD, Almanya, Hollanda ve Fransa gibi ülkeler, Türkiye'nin tarım ticaretinde en fazla değer kazandığı ticaret ortakları arasında yer almakta ve bu ülkeler, tarımsal ürün ticaretinde güçlü bir rekabet avantajına sahiptir. Bulgular, Türkiye'nin uluslararası tarımsal piyasalarda rekabet gücünün sınırlı olduğunu ancak teknoloji ve markalaşma gibi faktörlerle tarım sektöründe katma değer yaratma potansiyeline sahip olduğunu göstermektedir. Bu bağlamda, Türkiye'nin gelişmiş ülkelerle rekabet edebilmesi için tarım ürünleri ihracatında kaliteye dayalı stratejik bir yaklaşımı benimsemesi gerektiği vurgulanmaktadır.

Çalışmada ayrıca, Türkiye'nin bazı ürün kategorilerinde endüstri içi ticaret yapısına sahip olduğu belirlenmiştir. Örneğin, sebze ve meyve gibi ürünlerde Türkiye ihracat hacmini artırırken, tahıl gibi diğer ürünlerde ithalat daha baskın bir durumdadır. Bu durum, Türkiye'nin sebze ve meyve ticaretinde rekabet avantajına sahip olduğunu ve bu ürünlerin uluslararası piyasalarda daha güçlü bir konumda olduğunu ortaya koymaktadır. Bununla birlikte tahıl ürünlerinde ithalatın yüksek olması, Türkiye'nin tarımsal ticarette bazı ürün gruplarında kendi kendine yeterliliğinin düşük olduğunu göstermektedir. Araştırma bulguları, Türkiye'nin tarım sektörü gelirlerini artırmak ve gelişmiş ülkelerle rekabet gücünü yükseltmek için markalaşma ve teknolojiye yatırım yapmasının önemini vurgulamakta olup, uzun vadeli stratejiler geliştirilmesi gerektiğine işaret etmektedir.

Sınırlılıklar: Bu araştırmanın sınırlılıkları, kullanılan veri kaynakları ve analiz kapsamıyla ilgilidir. Veriler Birleşmiş Milletler Comtrade veri tabanından elde edilmiştir; ancak, bu veri tabanının güncellenme sıklığı ve veri girişlerindeki olası eksiklikler analiz sonuçlarını etkileyebilir. Ayrıca, tarımsal ürünlerin tanımlanması için Dünya Ticaret Örgütü'nün HS kodları kullanılmıştır, ancak bazı ürünlerin tarım ürünü olup olmadığı konusunda ülkeler arasında farklılıklar bulunabilir, bu da sonuçların tutarlılığını sınırlayabilir. Çalışma, yalnızca 2002-2022 yıllarını kapsamakta olup, küresel krizler, pandemiler ve politik değişikliklerin tarım ticaretindeki etkisi sınırlı bir perspektifte ele alınmıştır. Bu durum, sonuçların yorumlanmasında dikkate alınması gereken önemli bir kısıtlama oluşturmaktadır.

Öneriler: Bu araştırma, Türkiye'nin tarım sektöründe endüstri içi ticaret yapısını analiz ederek teorik, uygulamaya yönelik ve sosyal açılardan önemli çıkarımlar sunmaktadır. Teorik olarak, çalışma Türkiye'nin tarımsal ticaret yapısını Grubel-Lloyd Endeksi ile inceleyerek endüstri içi ticaret teorisine katkı sağlamaktadır. Bu analiz, gelişmekte olan ülkelerin, özellikle de tarım sektöründe rekabet gücüne sahip olmayanların, katma değer yaratma stratejileriyle gelir düzeylerini artırabileceğini göstermektedir. Araştırmacılar, bu modeli diğer gelişmekte olan ülkelerin tarım sektörü için de uygulayarak sonuçları karşılaştırabilir ve tarımsal ticaret literatürüne yeni açılımlar getirebilir.

Uygulama açısından, araştırma Türkiye'nin tarım sektöründe rekabet avantajı sağlamak için teknoloji ve markalaşma gibi stratejik yatırımlara odaklanması gerektiğini vurgulamaktadır. Tarım sektörü ihracatını artırmak için, tarımsal ürünlerin kalite standartlarını yükseltmek, ürün çeşitliliğini artırmak ve özellikle ihracatta ürün değerini artıracak markalaşma çalışmaları yapmak önerilmektedir. Bunun yanı sıra, tarımsal araştırma-geliştirme faaliyetlerinin artırılması, yeni tohum teknolojileri, sürdürülebilir üretim yöntemleri ve verimlilik artışı açısından büyük önem taşımaktadır. Tedarik zincirlerinin güçlendirilmesi, özellikle soğuk zincir altyapısı, lojistik ve depolama sistemlerinin geliştirilmesi yoluyla ürün kayıplarını azaltarak dış pazarlara erişimi kolaylaştırabilir. Bu bağlamda, politika yapıcılar tarım sektörüne yönelik destek programlarını bu stratejiler doğrultusunda güncelleyebilir ve tarımsal inovasyonlara yatırım yaparak sektörün küresel rekabet gücünü artırabilir.

Özgün Değer: Bu çalışma, Türkiye'nin tarım sektöründe endüstri içi ticaret yapısını uzun dönemli bir perspektifle inceleyen ilk araştırmalardan biri olarak özgün bir katkı sunmaktadır. 2002-2022 yıllarını kapsayan bu analiz, Türkiye'nin tarımsal ticaretteki rekabet gücünü ve uluslararası piyasalardaki konumunu değerlendirmek üzere Grubel-Lloyd Endeksi'ni kullanarak yapılmıştır. Çalışma, tarım sektörünün gelişmiş ülkelerdeki önemi ve Türkiye'nin bu ülkelerle kıyaslandığında karşılaştığı zorluklara dikkat çekmekte; böylece tarımsal ticaret ve politika alanında yeni bir bakış açısı sunmaktadır.

Ayrıca, araştırma bulguları, tarım sektörünün teknoloji ve markalaşma yoluyla katma değer yaratma potansiyeline vurgu yaparak, gelişmekte olan ülkelerin tarımsal ticarette rekabet avantajı elde etmeleri için stratejik bir yol haritası sunmaktadır. Bu bağlamda, çalışma gerek akademik alanda gerekse politika yapıcılar ve tarım sektörü aktörleri için uygulanabilir stratejiler önererek tarımsal ticaret literatürüne katkıda bulunmaktadır.