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İÇİNDEKİLER

THE ECONOMIC IMPACT OF TRUMP'S TARIFFS ON TÜRKİYE: AN INTERNATIONAL TRADE PERSPECTIVE

Cüneyt ÇATUK[1]

1. INTRODUCTION

The reelection of Donald Trump as President of the United States in 2024 represented a decisive turning point for global trade policy. On April 2, 2025, a date the Trump administration officially labelled as "Liberation Day", The United States rolled out a sweeping set of reciprocal tariffs aimed at imports coming in from over 180 countries. It was described as one of the biggest breaks from the rules based, multilateral trading system since the post war era (Dinh & Canuto, 2025).These measures, grounded in the International Emergency Economic Powers Act (IEEPA), set a starting point 10% tariff on all US imports, then added country specific increases that ran from 11% to 50%. The added rates were decided largely using bilateral trade deficit ratios, not the actual foreign tariff levels (NBER, 2025).

The macroeconomic consequences of this policy shift go well past the United States. For emerging and middle income economies that are deeply integrated into global value chains, these tariffs act like a structural shock, both direct and indirect at the same time. Türkiye occupies a particularly complex position in this new picture. On one hand Türkiye received a relatively moderate tariff rate, initially set at 10%, and later revised to 15% in August 2025, which makes its situation more favourable than

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many major competitors like China India and Vietnam (Interesse, 2025). On the other hand, Türkiye's deep linkage into the European Union supply chains through the 1996 Customs Union agreement means that the larger tariff burden imposed on the EU, initially 20%, indirectly pressures Turkish intermediate goods exporters who provide inputs to European manufacturers (CATS Network, 2025).

Turkey's side of bilateral trade with the United States hit about 32.6 billion dollars in 2024, and Turkish exports were roughly 1617 billion dollars, close to 6% of Türkiye's overall exports. Key export categories include vehicles and automotive parts, iron and steel products, textiles and apparel, machinery, and electrical equipment (Interesse, 2025). Each of these sectors faces distinct pressures, particularly given the additional sectoral tariffs on steel and aluminium (50%) and automotive products (25%) that apply independently of the reciprocal tariff framework.

Beyond the obvious direct trade effects, Türkiye is also exposed to the risk of trade diversion coming from China. If Chinese exports to the United States drop hard due to tariffs sitting above 100%, then Chinese producers might redirect large volumes of goods toward other destinations, including Türkiye and the wider European market, and that significantly intensifies competitive pressure on local Turkish industries (Bruegel, 2025; Novy, 2025). At the same time though, this shift in global supply chains presents Turkey with a strategic opportunity. From a strategic management perspective, firms operating in highly competitive and uncertain international environments tend to redesign their decision-making processes in response to external shocks and changing market conditions (Papatya & Uygur, 2019) Its geographic closeness to Europe, its already in place manufacturing base, and its comparatively lower tariff rate place it as a potential nearshoring location for multinational companies that want to limit their exposure to higher tariff jurisdictions

(Değirmenci, 2025. This is because the transportation route and the mode through which internationally traded goods are carried affect both businesses and states in many respects (Ekinler D. & Ekinler F., 2025).

Against this backdrop, this chapter provides a comprehensive assessment of the economic repercussions of Trump's reciprocal tariffs on Türkiye through an international trade lens, examining the theoretical foundations, the structural features of Türkiye–US trade relations, the direct and indirect sectoral effects, and the strategic opportunities and policy implications that arise from this new trade environment.

2. THEORETICAL FRAMEWORK

2.1. Tariff Economics: Trade Diversion and Trade Creaiton

The theoretical foundations that get used for analysing the economic effects of tariffs rest on a well-established body of international trade literature. At the very basic level, a tariff is a tax placed on imported goods, pushing up the domestic price, lowering import volumes, and bringing in some government revenue (Krugman et al., 2018), while its aggregate welfare effects depend on the interplay of production distortions, consumption distortions, terms-of-trade shifts, and income redistribution.

The ideas behind trade creation and trade diversion, which Viner (1950) introduced in the customs union theory context, provide a useful analytical starting point . Trade creation shows up when a tariff is imposed, or when it’s removed, and production moves away from a less efficient domestic supplier toward a more efficient foreign one, so aggregate welfare tends to rise. Trade diversion is different, it happens when commerce gets pointed

away from the most efficient global producer and toward a weaker partner, often because preferential tariff schedules or discriminatory trade policies are in place. With Trumps reciprocal tariffs, the big gap in the tariff levels placed on China, topping 100%, versus the rates used for other countries, around 10–15% , sets up strong incentives for trade diversion. In practice Chinese exporters look for other outlets and US importers also search for different sources (Chen, Novy and Solórzano, 2025; Bruegel, 2025).

Empirical evidence from the first US–China trade war (2018–2019) confirms these theoretical predictions. Amiti, Redding and Weinstein (2019) showed that the 2018 US tariffs were almost fully passed through to domestic importers and consumers, producing sizable welfare losses, while simultaneously generating measurable trade diversion effects for third countries — evidence directly relevant to understanding Türkiye's exposure in the current episode.

Chen, Novy and Solórzano (2025) add even more detail at the firm level . They demonstrate that when trade diversion from China to Mexico occurred, driven by US tariffs, Mexican exporters saw higher employment and wages , with impacts that are concentrated in technology and in skill intensive manufacturing industries. So, the evidence supports the expectation that Turkey, as a potential recipient of similar trade diversion mechanisms in the 2025 episode , may gain non trivial employment and productivity improvements in manufacturing if it manages to secure market share that Chinese exporters leave behind. Beyond tariff structures, institutional harmonization and internationally accepted accounting standards also play a facilitating role in international trade by increasing comparability and reducing transaction frictions between countries (Uzun & Uygur, 2022).

2.2. Terms of Trade and Welfare Effects

A second key theoretical dimension concerns terms-of-trade effects. While standard trade theory suggests large economies may improve their terms of trade through tariff imposition, Türkiye is effectively a price-taker in global commodity markets and cannot exercise this leverage (Dinh & Canuto, 2025). Instead, Türkiye is exposed to deteriorating terms of trade as the United States imposes tariffs, a point reinforced by the NBER (2025), which finds that under full retaliation scenarios world trade contracts by approximately 11% and global employment falls permanently by 1.1%.

For Turkey specifically, the welfare calculus is shaped by a few structural features that matter in practice. First , Turkey is not a large enough economy to push world prices around, so it is effectively a price taker in global commodity markets. Second, Turkey has deep integration into EU value chains via the Customs Union, so welfare effects do not move only through direct bilateral trade, but also through more roundabout supply chain linkages (Afşar, 2022; InstituDE, 2025). Third, there is an asymmetric structure in the Customs Union tie with the EU. Turkey has to harmonize its external tariffs with EU tariffs, but it does not get the same reciprocal market access when it comes to EU free trade agreements with third countries , this arrangement adds more vulnerabilities in the current trade environment (Afşar, 2022).

The Yale Budget Lab (2025) estimates that Trumps tariffs will raise US consumer prices by somewhere in the range of 0.9% to 1.2% in the short run, meaning there is an extra annual burden of roughly 1,257 to 1,671 dollars per household. Even though these figures are about the US economy, they still matter a lot for Turkish exporters: when Americans face higher prices, their real buying power goes down and import demand feels weaker, and

that adds on top of the direct price competitiveness pressure that tariffs create, all in the same direction. In a similar vein, the Tax Foundation (2026) projects that in the long run US GDP could contract by 0.2% to 0.3% under the present tariff setup, this points to a more lasting, systemic drop in US import demand that will spill over onto every partner, including Turkey.

Finally, the political economy dimension of tariff policy must be acknowledged: Çaylı and Babahanoğlu (2020) argue that the Trump administration's trade policies operate as a geopolitical instrument rather than a strictly economic one, and this structural uncertainty itself constitutes an additional welfare cost for partners like Türkiye (PIIE, 2025).

3. US RECIPROCAL TARIFF POLİCY (2025): AN OVERVIEW

3.1. Key Policy Measures and Timeline

The trade policy architecture rolled out by the Trump administration in 2025 represents the most sweeping restructuring of US import rules in almost a century. By invoking the International Emergency Economic Powers Act, IEEPA, President Trump announced a national economic emergency on April 2, 2025, and it was officially tagged as “Liberation Day” , while also describing the ongoing US trade deficit as an unusual and extraordinary threat to national security and economic stability (Dinh & Canuto, 2025). The executive order then put in place a two layer tariff setup: first, a universal baseline tariff at 10% on all US imports starting April 5, 2025, , and second, extra reciprocal tariffs that vary from 11% up to 50% for 57 specific countries. Those 57 were marked as using non reciprocal trading practices, with that higher set of duties scheduled to kick in on April 9, 2025 (Dinh & Canuto, 2025).

The top rates were applied disproportionately to lower-income, export-oriented manufacturing economies, a pattern that trade economists widely criticised given its weak theoretical foundation (PIIE, 2025; Dinh & Canuto, 2025). At the same time, the earlier sector-based tariffs were extended: steel and aluminium imports faced a 50% surcharge under Section 232 authority, while imported vehicles and automotive parts faced a 25% tariff regardless of origin (Bruegel, 2025).

However, within hours of the country-specific tariffs taking effect on April 9, the administration announced a 90-day pause for all countries except China, reverting to the 10% baseline. China remained on an escalating path, with tariffs eventually exceeding 100% before a bilateral truce was reached on May 12, 2025, temporarily reducing rates on both sides (Dinh & Canuto, 2025).

For the other countries, that 90- day break did not remain fixed. It was extended to August 1, 2025, and then revised country specific ta riff schedules were introduced. That is where Türkiye's rate went from 10% up to 15% (Turkish Minut e, 2025). The part about Türkiye, and this switch in August 2025, warrants closer examination. The evi dence available points to the adjustment not being driven by Türkiye in particular. Instead it seems it was embedded in a wider systemic re calibration by the Trump administration, they revised tariff sche dules for more than 67 countries at the same time, basically right as the initial 90day pause ran its cour se. The US administration also looked like it changed how it measured "reciprocity" . It shifted away f rom bilateral trade balance alone, and started weighing a wider bundle of elements, including non tarif f barriers and market access conditions. That methodological change, it then reduced the protective eff ect that Türkiye's earlier, balanced trade posture had provided. Taken together, this episode illustrates a fundamental risk for Türkiye's tariff approach: bilateral trade

balance can work as a decent defense in the immediate term, but it does not protect in the long run, because the Trump tariff regime is political, and it gets re calibrated again and again.

Orkunoğlu (2026) documents that the retaliatory spiral triggered by the tariff announcements — with Canada, the EU, and China introducing countermeasures across agriculture, automobiles, and industrial machinery — magnified the disruptive effects of the initial tariff shock far beyond what US unilateral measures alone would have produced. One year of empirical data confirms the regime's limited effectiveness: Lincicome, Carrillo Obregon and Smitson (2026) document that the US trade deficit reached an all-time high in real terms in 2025, manufacturing employment continued to decline, and tariff costs were passed through to American households at a rate as high as 96% — confirming that the welfare burden has fallen principally on US consumers rather than generating the economic rebalancing the administration promised.

4. TÜRKİYE–US TRADE RELATIONS: STRUCTURAL OVERVIEW

4.1. Bilateral Trade Volume and Main Export Categories

Türkiye's trade relationship with the United States, while not the country's most voluminous bilateral trade partnership, still shows up as a strategically significant economic link, and it has grown considerably in depth and complexity across recent decades. In 2024, total bilateral trade between Türkiye and the United States reached approximately 32.6 billion dollars, Turkish exports to the US were roughly 16–17 billion dollars, and US exports to Türkiye totaled an amount that looks similarly sized, so overall the relationship feels fairly balanced, and later that balance would prove rather useful in Türkiye's tariff talks with the

Trump administration (Interesse, 2025). The US accounts for about 6% of Türkiye's total export income, and it is placed as the ninth largest destination for Turkish goods, although it stays well behind the European Union, which consistently absorbed around 41–49% of Turkish exports between 2019 and 2023 and, by 2024, exceeded 108 billion dollars in annual Turkish exports (Brookings Institution, 2024; Şişman, 2025). Updated destination data further confirm that Germany appears as Türkiye's leading market at 17.6 billion dollars, and then comes the United States at 13.7 billion dollars, the United Kingdom at 11.2 billion, Italy at 10.6 billion, and Spain at 9.2 billion. So, in the end, European markets dominate Türkiye's export direction, and the US remains relatively smaller, yet it continues to rise in importance in a strategic way (TRENDS Research & Advisory, 2026).

The sectoral make up of Türkiye’s exports to the United States tends to follow the countrys broader industrial structure and its relative clout in mid tech manufacturing, metals, and labour intensive consumer goods. Based on figures that TurkStat reports and what various trade intelligence channels mention, Türkiye’s main export groups to the US in 2024 can be summarised as follows. The auto and related parts space brought in about 1.04 billion dollars in export receipts, and it includes both finished light commercial vehicles plus a broader mix of components, spare parts, and sub assemblies that back the US aftermarket as well as the original equipment manufacturer channels (Interesse, 2025). Iron and steel products were another big share, and Türkiye has often sat among the top twenty steel suppliers to the United States in the past, before Section 232 tariffs were introduced during Trumps first term, a step that trimmed market presence quite a lot (Brookings Institution, 2024). Textiles and apparel, which is a familiar pillar of Turkish production, generated around 2.68 billion dollars in exports to the US in 2024, and they also seemed to benefit from firmer demand

in the first months of 2025. For that stretch, year on year export growth jumped to 14% in the first quarter before the tariff impact, and it was felt quickly (Turkish Minute, 2025). Other visible categories include machinery and mechanical appliances, electrical equipment plus electronic components, carpets and textile floor coverings, mineral fuels together with petroleum products, and precious stones along with jewellery, a concentration that heightens exposure to tariff shifts targeting specific sectors (Interesse, 2025; TradeInt, 2025)

On the import side, Türkiye ’s purchases from the United States are mostly capital goods , advanced technology products , agricultural commodities and defence-related equipment. That shows Türkiye ’s structural reliance on US-sourced machinery, aircraft components and high technology inputs for its manufacturing and defence sectors. Because of this import set-up, bilateral trade has a certain kind of sectoral fit, Türkiye exporting relatively labour- and capital-intensive manufactured goods , while importing technology-intensive and knowledge-intensive products. So there is less direct head-on competition in bilateral trade, however it also narrows the room for fast import substitution if there is a supply disruption.

It is important to note that the near balance of Türkiye's bilateral trade with the United States, a rarity among the countries subjected to Trump's reciprocal tariffs , actually played a meaningful role in shaping the tariff treatment Türkiye received. Turkish officials explicitly highlighted this balanced trade relationship during negotiations with the US administration, and the relatively moderate tariff rates imposed on Türkiye (10% initially, revised to 15% in August 2025) were partly attributed to this near equilibrium trade position. That positioning put Türkiye on what Turkish officials described as the US “white list” of non threatening trade partners, (Turkish Minute, 2025).

4.2. Türkiye's Position within the EU Customs Union

A defining structural feature of Turkey's international trade situation and one that really influences how Trump's tariffs make their way into the Turkish economy is its EU-Turkey Customs Union membership. It started operating in 1996, and it covers industrial goods along with processed agricultural products. Through this setup Turkey ends up following the EU's tariff framework for industrial goods, meaning its external tariff schedule is tied to the EU's Common External Tariff, and Turkey also gives tariff-free entry to EU products. It also accepts obligations to bring in EU trade rules and standards for the sectors that fall under the agreement (Afşar, 2022). InstituDE (2025) puts a number on how lopsided this is: even though Turkey has 23 active FTAs with different partners, the EU has preferential arrangements with 76 countries, and Turkey must fit these outcomes into its own tariff structure without receiving comparable reciprocal openings for Turkish exports. This export orientation did not emerge spontaneously. It came from specific industrial and commercial policy decisions Turkey's deep automotive export position emerged largely through multinational investment decisions following the 1996 Customs Union, as firms valued Turkey's proximity to European markets and existing metalworking capacity (Taymaz & Yilmaz, 2017). They act as suppliers of intermediate goods, components, and semi finished products to European manufacturers (Brookings Institution, 2024). Turkey is also the EU fifth largest trade partner overall, a ranking that points to decades of supply chain integration that was enabled by the Customs Union framework. Kirişci and Bülbül (2025) add more texture to this trade reliance argument: foreign trade made up 55.2% of Turkey GDP in 2023, which is notably higher than the EU about 50% and also well above the United States 18.7%. These figures underscore how strongly Turkey is structurally exposed to global trade

disruptions, and why the EU relationship remains such an important stabilising anchor for the Turkish economy.

However, the Customs Union also puts serious structural limits on Turkey's trade policy autonomy, and it creates particular vulnerabilities in the current tariff setting. As Afşar (2022) documents in detail, the Customs Union's asymmetric setup means that when the EU signs a free trade agreement with some third country, Turkey is basically required to open its market to that third country's exports on equivalent terms, because its external tariffs largely track the EU's, without always getting any reciprocal preferential entry for Turkish exports into that third country's market. This "third country FTA asymmetry" has historically led to trade diversion against Turkey and it has also produced competitive disadvantages for Turkish exporters in places where the EU already gained preferential access. In the context of Trump's tariffs, the asymmetry manifests in a particularly problematic way: the high tariff burden applied to EU exports to the United States (started around 20%, then lowered to 10% during the pause period) ends up hitting the competitiveness of European producers who depend on Turkish intermediate inputs, so the tariff shock travels back upstream and reaches Turkish suppliers, even though Turkey itself is confronting a lower direct tariff rate.

The modernisation of the EUTurkey Customs Union has therefore emerged as a critical policy priority, in the context of the new global tariff environment, and well, it matters a lot. InstituDE (2025) estimates that a comprehensive modernisation of the Customs Union extending its coverage to services agriculture digital trade, and public procurement, plus dealing with the third-country FTA asymmetry could push Turkey's GDP by between 1.8% and 2.5% , bring net welfare gains of roughly 12.5 billion euros, and also draw in something like 25 to 35 billion euros in additional foreign direct investment across a decade. In

other words these numbers really point to how much economic upside is still sitting there, within the Turkey EU trade relationship and they also show why deepening the partnership is strategically important as a buffer against disruptions that come from US trade policy volatility.

As Brookings Institution (2024) argues Turkey's longer term trade policy objectives are served better by reinforcing its rules based economic relationship with the European Union, rather than trying to chase preferential bilateral arrangements with an unpredictable US administration, where tariff policies have already shown that they can damage Turkish export sectors, as seen in the 23% decline in Turkish steel exports to the United States after the Section 232 tariffs from Trump's first term.

5. EFFECTS OF TRUMP'S TARIFFS ON TÜRKİYE

5.1. Direct Effects: Steel, Automotive, and Textiles

The direct effects of Trump’s reciprocal tariff regime on Türkiye operate primarily through three key export sectors , steel and aluminium, automotive and parts, and textiles and apparel. each one faces a distinct mix of base reciprocal tariffs and sector-specific extra duties, which then compound overall competitive pressure on Turkish exporters, in a way that is hard to untangle.

The Turkish steel and aluminium sector represents perhaps the most severely affected part of Türkiye export economy under this new tariff rule. Türkiye is one of the world’s top steel producers, it sits among the top ten overall, and for years it kept a meaningful footprint in the US market for export sales. But with the new 50% surcharge placed on all steel and aluminium imports, under the Section 232 umbrella, this is applied separately from, and on top of the reciprocal base tariff,

so Turkish steel exports to the United States end up basically not working commercially for a lot of typical standard product groups (Interesse, 2025). It is not even a totally fresh problem though: in Trump's first term, Section 232 tariffs were set at 25% on Turkish steel in 2018, then later doubled to 50%. By 2023 that contributed to a 23% fall in Turkish steel exports to the United States, and Türkiye dropped from 13th to 19th biggest steel supplier to the US (Brookings Institution, 2024).

The reinstatement of these rates in 2025 therefore represents a continuation and even a deeper kind of structural displacement, that already had worn down Türkiye export position in the American market. And for Turkish steel derivative products, the burden becomes extra heavy: primary Turkish steel faces a 25% Section 232 tariff, but derivative steel goods that originate from Türkiye were first hit with a 50% rate, which is double the usual derivative product rate most other countries get (Neville Peterson LLP, 2025). Then a notice, dated April 2, 2026, rearranged the method: it replaced the 50% levy tied to metal content with a 25% tariff computed on the full customs value of the imported product (Brownstein Hyatt Farber Schreck, 2026). Even if the headline rate looks lower, the switch to full customs valuation means the real, effective tariff cost for most covered derivative products actually jumps up, and that piles on the competitive stress already facing Turkish steel exporters.

Türkiye also introduced its own anti dumping duties on hot rolled flat steel imports coming from China, Russia , India and Japan, with the intent to shield its domestic steel sector from Chinese export diversion pressure, this intensified as Chinese steel exports rose to multi year highs in 2024 and 2025, after a period of contraction in domestic Chinese demand (Dallas Fed, 2025).

The automotive sector is, by far, Türkiye's most valuable single export category to the United States, bringing in about 1.04 billion dollars in export revenues in 2024, across both finished vehicles and a broad range of parts plus sub assemblies (Interesse, 2025). More generally, total Turkish automotive exports climbed to 36.65 billion dollars in 2024, meaning 17.3% of Türkiye's overall exports, and it has been the leading export activity for almost two decades, with roughly 59% going to the EU , and Germany alone representing 13% (Aydın, 2025).

Türkiye was placed twelfth worldwide , and fourth in Europe, among passenger car producers in 2024. That strong EU alignment helps explain why the tariff load placed on European producers becomes a big indirect shock for Turkish automotive suppliers, a channel that runs quite independently of Türkiye's own direct bilateral tariff rate with the US. Looking at direct exposure , Türkiye's automotive exports to the United States were 1.2 billion dollars in 2024, mainly components and parts rather than completed cars, with the US as Türkiye's ninth largest automotive export market (bne IntelliNews, 2025). Meanwhile other key Turkish export categories to the US, like chemicals and chemical products 1.5 billion dollars, and ready to wear apparel 856 million dollars, face only the 10% baseline reciprocal tariff, which makes the automotive segment the most disproportionally hit group.

The added reality is, this 25% tariff on all imported vehicles and automotive parts, kicking in from late March 2025, and it is applied across the board no matter where the country comes from. In practice this means Turkish automotive exports to the United States are meeting an overall tariff burden around 40% (so 25% sectoral plus 15% reciprocal). At that level the price advantage of Turkish automotive exports gets seriously weakened, especially because automotive parts margins tend to be thin in the first place.

Industry observers expect that the 25% auto tariff will reduce US demand for imported vehicles, and in the process trigger supply chain disruptions that ripple outward, including all the way back to Turkish component manufacturers that sell straight to the US, and also indirectly feed European automotive assemblers (Turkish Minute, 2025) . The CATS Network (2025) adds that Türkiye's automotive supply chain depends a lot on imported inputs, particularly those coming from Germany, France, and other EU member states. So when European automotive output contracts because of tariff effects, that downturn tends to curb demand for Turkish automotive components upstream in the value stream too.

Turkey's textile and clothing sector stepped into the 2025 tariff landscape from a position of relative strength . Export volumes headed to the United States were growing robustly, and in early 2025, year on year growth was around 14% ,with US buyers trying to diversify away from Chinese suppliers as they looked ahead to higher tariffs developing over time (Turkish Minute, 2025). This competitive setting is also consistent with evidence from Türkiye's textile and apparel exports, where rival-country effects appear to shape export performance. In this respect, the price and market-share competition emerging after Trump's tariffs should not be read only through the US–Türkiye bilateral channel, but also through third-country competition involving China, Vietnam, Bangladesh, and other major suppliers (Özbaş, 2025). In a sense, this looks like part of a wider "China Plus One" procurement idea that big US retailers and brands have been leaning on. Under that approach, Türkiyethanks to its long standing manufacturing capability, its geographic convenience, and shorter lead timesended up being a fairly appealing alternative supplier.

Still, the situation has turned more complicated. The introduction of a 15% reciprocal tariff on Turkish textile and

apparel exports, together with the removal of the 800 dollar de minimis import cap in August 2025, has basically thinned out the competitive edge Turkish exporters were building up. Even though Türkiye's tariff rate is still notably lower than what major Asian textile exporters face, like Vietnam at 46%, Bangladesh, and Cambodia at 49%, the "gap" has tightened enough that margins get squeezed. As a result, Turkish goods can feel less price competitive compared to suppliers from countries that managed to secure preferential tariff access via bilateral talks with the United States (Interesse, 2025).

It should be noted, however, that the direct to consumer segment is only a limited slice of Türkiye's overall textile and apparel exports to the US. Most of the trade, rather goes through more classic bulk commercial freight arrangements tied to long term retail sourcing relationships.

5.2. Indirect Effects: EU Channel and Chinese Trade Diversion

Beyond the direct sectoral impacts described above, Türkiye's economy is exposed to two significant indirect transmission channels through which the effects of Trump's tariffs propagate: the EU supply chain channel and the Chinese trade diversion channel.

Turkey's deep integration into European manufacturing value chains through the Customs Union , creates a significant indirect transmission mechanism for the tariff shock. In the initial Liberation Day announcement, the EU was hit with a 20% reciprocal tariff, later brought down to 10% during the pause period , and that move basically lifted production costs for European manufacturers trying to compete in the US. At the same time it squeezed export earnings of EU firms with meaningful US market exposure which is not a small thing.

For Turkish suppliers of intermediate goods to those European manufacturers, the EUlevel tariff shock feeds through into reduced orders, stronger downward pricing pressure and in some cases, cancellation of supply contracts, since European assemblers tend to try to lower expenses across the whole value chain (CATS Network, 2025). The Bruegel (2025) analysis on regional employment exposure to US tariffs points to several EU member states , especially Germany, Italy, and some Central and Eastern European economies , as being rather exposed to the tariff shock via their manufacturing export segments. Germany's automotive industry — one of the key buyers for Turkish automotive components — is estimated to experience a GDP contraction of around 0.4% because of the tariff shock. That demand drop then ripples backward upstream toward Turkish component suppliers (Bruegel, 2025).

Darvas and Lappe (2026) also corroborate that EU exports to the US fell by roughly 10% in November 2025 versus the same month a year earlier. Yet overall EU exports kept rising, because alternative destinations — the UK, Norway, Switzerland, and Türkiye especially — took up part of the rerouted trade flows. This substitution pattern implies that Turkish intermediate goods suppliers may see less demand from European manufacturers tied to the US market , but the broader resilience in EU export performance does soften the magnitude of the upstream demand shock

The second indirect transmission channel operates through a potential diversion of Chinese exports away from the United States, where those goods meet tariffs above 100% , and toward alternative destinations, such as Türkiye. In other words, this trade diversion danger is pretty structurally similar to what we saw in the 20182019 USChina trade war. Back then , Chinese exporters pushed sizable volumes to thirdcountry markets, and that created competitive strain on local producers there (Novy,

2025). The magnitude of this risk is not just theoretical, either. Darvas and Lappe (2026) confirm it empirically, showing that China's overall exports kept expanding even though exports to the United States dropped 45% by November 2025, with exporters quickly rerouting shipments toward ASEAN countries, the EU, and other destinations.

Türkiye's "structural exposure" to this kind of pattern is especially strong because the trade link with China is deeply onesided. Şişman (2025) reports that China's share in Türkiye's total imports rose steadily from 9.1% in 2019 to 12.4% in 2023, while Türkiye's exports to China were basically close to nothing, around 1.31.5% of total exports. This imbalance also shows up in the bilateral trade numbers. Total TürkiyeChina trade exceeded 48 billion dollars in 2023, which is an 86.6% jump from 25.9 billion dollars in 2020, but Turkish imports coming from China were about 45 billion dollars, compared to exports of only 3.3 billion dollars (Manohar Parrikar IDSA, 2024).Then in the 2025 context, the possible rerouting effect could be even bigger since the tariff gap between China and the rest of the world is far more extreme. Türkiye is therefore exposed to Chinese trade diversion across several key manufacturing segments, including steel — with Chinese output already climbing to multiyear peaks — textiles and apparel, electrical machinery, furniture, and consumer goods (Dallas Fed, 2025).

Yet, the trade diversion risk is not only a danger, it also comes with strategic openings for Turkish policymakers and producers. As Değirmenci (2025) suggests, Türkiye's comparatively low tariff rate, together with China's effective exclusion from the US market, builds a kind of situation where Chinese manufacturers might decide to set up production facilities in Türkiye, using Turkish manufacturing capacity and the origin status, then shipping to the United States while paying that lower Turkish tariff rate. In other words, this tariffjumping

foreign direct investment logic, if it is actually attracted and then handled well, could inject capital, knowhow and jobs into Türkiye's manufacturing sector, while at the same time raising Türkiye's export ability to the US.

The Turkish Deputy Trade Minister also put it plainly in May 2025. He said Türkiye had already mapped out a certain roadmap, aimed at product groups linked to partner countries expected to shed US market share because of these tariffs (Turkish Minute, 2025). Still, turning this possibility into reality depends a lot on whether Türkiye can provide a competitive investment climate, and also on how well it can navigate the political and regulatory tangle connected with hosting Chinese manufacturing activity that is oriented, specifically towards the US market.

6. OPPORTUNITIES AND POLICY IMPLICATIONS

6.1. Türkiye's Competitive Positioning in the New Trade Landscape

Even with the major challenges described in the previous section, the reconfiguration of global trade routes that comes from Trump's reciprocal tariff regime also causes a kind of strategic opening for Türkiye, and if it is used properly, it could bring meaningful long term economic gains. Türkiye's ability to compete in this changing picture is basically formed by three connected advantages . First, its comparatively favourable tariff treatment next to many of the big Asian players. Second, its geographic nearness, plus logistical connectivity toward both Europe and the Middle East, which matters more than people assume . Third, it has a built up manufacturing base across multiple sectors, especially those that are going through a broad supply chain reshuffle.

The tariff differential between Türkiye and its main rivals in labourintensive manufacturing, represents the most immediately actionable competitive advantage With a reciprocal tariff rate of 15% Türkiye gets a real price edge over Chinese exporters, who are basically practically shut out of the US market when tariffs run over 100% , and also over Vietnamese (46%) , Cambodian (49%) and Bangladeshi producers who end up facing some of the highest rates in the reciprocal tariff schedule (Dinh & Canuto, 2025). This creates an opening for Turkish exporters for Turkish exporters in textiles and apparel , furniture, carpets , machinery components, and processed food items, to take share in the US that was previously sitting with competitors paying higher tariffs. Değirmenci (2025) frames it as a "tariff advantage", something that is temporary and depends on how US trade talks evolve, but for now it still gives Turkish companies a meaningful first-mover opportunity to build relationships with US buyers who want to diversify their supply base and mitigate exposure to supply chain risk.

Türkiye's geographic position further enhances it attractiveness as a manufacturing and logistics hub in the reorganised global trade architecture. Located at the crossroad of Europe, the Middle East, Central Asia, and North Africa, Türkiye gives multinational firms that want to restructure their supply chains a versatile base, combining rather low production costs with a large and skilled industrial workforce, and also port infrastructure that is fairly well developed. On top of that, there is preferential market access to the EU via the Customs Union (CATS Network, 2025), which really matters for firms looking at both stability and speed.

The Atlantic Council (2025) also points to Türkiye's active involvement in the main connectivity initiatives — including the Middle Corridor, a transCaspian transport route that links Europe and Asia. This is described as a structural strength

that places the country in a good position within the emerging setting of regionalised production networks. In other words, as global value chains fracture into more geographically focused regional clusters, Türkiye can function at the same time as a production platform for European, Middle Eastern, and potentially American markets. That capability becomes a lasting competitive advantage, and it does not simply fade after the immediate tariff conjuncture.

The nearshoring and friendshoring investment opportunity constitutes a third dimension of Türkiye's competitive positioning, not just the trade side, but more like the whole inflow angle. Multinational firms — especially those that were relying on Chinese manufacturing before — seem to want to cut down their exposure to geopolitical risk and tariff uncertainty , so they relocate production to places that are more politically steady and also more tariff friendly. In that picture Türkiye shows up as a credible candidate for serious inward foreign direct investment.

The Istanbul Chamber of Commerce and the Turkish Young Businessmen Association have both pointed, publicly, toward the idea that Chinese manufacturers could set up production facilities in Türkiye, basically to take advantage of Türkiye's lower tariff rate on exports to the United States (Euronews, 2025). If this actually happens at scale, that tariffjumping FDI behavior could generate big capital inflows, bring some technology transfers, and create employment within Türkiye's manufacturing sector, and those results would likely magnify the economic payoff from Türkiye's tariff positioning beyond the direct trade effects.

The automotive sector shows Türkiye's nearshoring potential in the most concrete way, really. Aydın (2025) notes that the Chinese electric vehicle producer BYD has agreed to set up a

production plant in Manisa, while Chery is talking about a comparable facility in Samsun. Importantly, the cars made in Türkiye get tarifffree access to the EU single market via the Customs Union, so that advantage is not just there, it's also something Chinese companies are clearly trying to use for their growth into Europe. In other words, this whole setup suggests that Türkiye's location and institutional setup can pull in tariffjumping FDI not only toward the US, but kind of at the same time for Europe, and that could boost the economic gains from those investments quite a lot.

There is also empirical support for the logic. Evidence from the 20182019 USChina trade war indicates that trade diversion can have real labormarket effects. Chen, Novy and Solórzano (2025) show at the firm level that diversion from China to Mexico, pushed by US tariffs increased employment and wages among Mexican exporters. They also find that the impact is stronger in technology and skill intensive manufacturing, like chemicals, rubber, plastics and automotive, not in random sectors. So, if Türkiye ends up as a similar destination in this kind of 2025 trade diversion episode, it could plausibly see employment and productivity improvements in manufacturing if it manages to capture the market share.

6.2. Policy Recommendations

Turning Turkey's structural edge into long-lasting economic benefits in the new tariff reality requires a policy approach that is more coherent and proactive than before, addressing the immediate challenges of tariff adjustment alongside longer-term priorities such as trade diversification, investment attraction, and institutional modernisation. The following recommendations derive from the analysis laid out in this chapter.

The single most consequential policy action Turkey can take in the current trade environment is accelerating the EU–Turkey Customs Union modernisation talks. As InstituDE (2025) shows, a broad modernisation that expands the Customs Union coverage to include services, agriculture, digital trade, and public procurement could lift Turkey's GDP by about 1.8% to 2.5%, create net welfare improvements of roughly 12.5 billion euros, and attract something like 25 to 35 billion euros in additional FDI across ten years. With Trump's tariffs in mind, this modernisation is even more urgent for two reasons. First, it would tackle the third-country FTA imbalance that now places Turkish exporters at a disadvantage compared with EU firms in places where the EU already has preferential entry. Second, it would further connect Turkey to EU value chains right when European manufacturers are trying to near-shore production and lock in sturdier regional sourcing links — an alignment of interests that the Brookings Institution (2024) flags as a strong reason for renewed momentum in EU–Turkey trade relations.

Turkey's export portfolio to the United States remains concentrated in a small group of sectors — automotive parts, steel, textiles, and carpets — many of which are under the sharpest tariff pressure. A deliberate diversification toward higher value-added, technology-driven, and less tariff-exposed products is therefore a necessary medium-term task. Turkish Deputy Trade Minister Murat Tuzcu said this very directly in May 2025, laying out a roadmap aimed at product categories from countries expected to lose US market share, and citing a bilateral trade goal of 100 billion dollars, services included, as a long-run strategic objective (Turkish Minute, 2025). Reaching that target will require sustained public support for export promotion, product certification, and market intelligence, alongside more targeted backing for Turkish companies entering new US segments such as defence components, digital services, pharmaceutical

ingredients, and advanced materials. Değirmenci (2025) also underlines that parallel alternative market strategies — strengthening ties with the UAE, revising FTAs with Pakistan and South Korea, and deepening BRICS engagement — are essential components of a resilient, less destination-dependent trade strategy.

Turkey should also develop a more nuanced, proactive policy framework to handle the twin risks and opportunities that come with Chinese trade diversion. On the risk side, Turkey needs to keep strengthening its anti-dumping and safeguard toolkit, in a way that stays aligned with WTO rules, so domestic producers in steel, textiles, electric vehicles, and solar components are not displaced by redirected Chinese exports. Turkey already has relevant measures in place — the 40% tariff on Chinese electric vehicles and anti-dumping duties on Chinese steel — and these should be systematically extended and more strictly enforced as diversion pressures increase (Atlantic Council, 2025). On the opportunity side, Turkey should introduce a clear regulatory and incentive framework to attract legitimate manufacturing FDI from companies of any nationality seeking to use Turkey's production capacity to serve the US market under the lower Turkish tariff rate. The FDI framework must remain open to investment while applying rigorous rules of origin, so that effective transshipment does not circumvent enforcement and invite US countermeasures, and it should prioritise projects that create real value addition, employment, and technology transfers inside Turkey.

In this context, it is crucial for Turkey to convert the temporary trade advantages arising from tariffs into permanent investments. However, low tariff advantages alone are not sufficient to achieve this. Macroeconomic stability and a climate of confidence must also be established. Studies on the E7 countries indicate that inflows of foreign direct investment are

significantly influenced by macroeconomic variables (Korkmaz, 2025).

Even though Turkey's bilateral trade with the United States has stayed close to balanced, the revision of Turkey's rate to 15% in August 2025 makes clear that this favourable positioning is not permanent. Turkey should therefore pursue a more proactive bilateral engagement with the United States — not a broad free trade agreement, which faces strong political resistance in Washington, but targeted sector-based tariff exemptions covering product lines of mutual interest, such as defence parts, advanced machinery, and pharmaceutical ingredients (CATS Network, 2025). These focused arrangements would give Turkish exporters greater tariff certainty for long-term investment commitments, while opening Turkey's sizable and strategically connected market more fully to US firms. The bilateral trade ambition of 100 billion dollars can serve as a useful framing for these discussions, and the current transatlantic friction between Washington and Brussels may open a narrow strategic window to advance them, particularly in machinery, defence industries, and advanced technology (TRENDS Research & Advisory, 2026).

Ultimately, realising these opportunities depends on preserving macroeconomic stability. Dinh and Canuto (2025) note that currency appreciation creates a double squeeze — exports become pricier in dollar terms while firms simultaneously face higher tariff barriers. Structural reduction of import dependency in critical inputs, particularly energy and fertilisers, is equally essential: without it, Turkey's nominal 15% tariff advantage over major Asian competitors may prove less durable than it appears.

7. CONCLUSION

The imposition of Trump's reciprocal tariff regime in 2025 represents a watershed moment for the post-war multilateral trading system, altering the fundamental conditions under which countries like Turkey engage with the global economy. As this chapter has shown, the welfare effects of tariffs are complex and multidimensional — manifesting as trade creation and diversion, terms-of-trade readjustments, and global value chain disruptions — and the empirical burden of tariff imposition tends to fall disproportionately on the imposing country's own consumers and on smaller, trade-integrated economies. That result gives the key theoretical backdrop needed to make sense of Türkiye's exposure to the 2025 tariff shock.

Turkey's position in this new landscape is formed by a distinctive mix of vulnerabilities and opportunities. Its bilateral trade with the United States stays relatively balanced, and thereby gained some protection from the harshest tariff rates, but because Turkey is deeply integrated into EU supply chains via the Customs Union, there is still serious indirect exposure. In practice, when European manufacturers trimmed orders to absorb their own tariff load, the stress traveled back upstream toward Turkish suppliers of intermediate goods, even if they were not the main target.

On the sector side, steel and aluminium face a 50% Section 232 surcharge that renders much of the US market commercially unviable, while automotive exporters confront a combined tariff burden of approximately 40% that erodes the price competitiveness of Turkish exports. Textiles, even with the recent growth trajectory, face narrowing margins and intensified competition. Beyond these direct impacts, Chinese export diversion adds a further layer of competitive pressure across multiple manufacturing segments while simultaneously creating

FDI and market-share opportunities that proactive policy can convert into economic gains.

Nevertheless, that same tariff environment also creates genuine strategic openings. Turkey's 15% tariff rate positions it as a credible nearshoring destination for firms restructuring supply chains away from higher-tariff jurisdictions, and the BYD investment deal along with broader interest from international manufacturers confirms that this is already translating into concrete economic interest, not just a theoretical promise. Realising these opportunities fully requires the coherent policy response outlined in Section 6 — accelerating Customs Union modernisation, diversifying the export portfolio, constructing robust FDI frameworks, and preserving the macroeconomic stability that underpins export competitiveness.

Some important limitations should be acknowledged: US trade policy continues to evolve rapidly, and the analysis necessarily abstracts from the broader complexity of Turkey's multilateral trade relationships and the geopolitical pressures shaping its economic trajectory. Future research should address these dimensions through granular econometric analysis of sector-level trade flows and dynamic general equilibrium modelling of Customs Union modernisation outcomes. Turkey's capacity to navigate this evolving environment will ultimately depend on the strength of its economic institutions, the ambition of its trade policy, and the adaptability of its private sector.

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GREEN WAREHOUSING PRACTICES[1]

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1. INRODUCTION

Today, growing environmental awareness is encouraging individuals to prefer recyclable products and prioritise energy efficiency, while also compelling businesses to adopt environmentally friendly policies. Particularly in energy-intensive sectors such as logistics and warehouse management, the implementation of sustainability-focused strategies has become inevitable (Kamarulzaman et al., 2012). Although warehousing activities were previously viewed merely as a physical storage function, they have now become one of the critical components that offer significant advantages and value to businesses as a strategic logistics function. The operational scope of warehousing activities continues to expand, and their functionality is increasing over time (Frazelle, 2002). In particular, in recent years, the growing prominence of operational excellence driven by advancements in warehouse management

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systems has placed companies under the responsibility of ensuring consistent inventory efficiency and customer-focused services (Ibrahim & Fernando, 2023).

Growing environmental concerns have made the impact of warehouse operations on the carbon footprint impossible to ignore, necessitating the more efficient use of natural resources such as energy, fuel, water, and land. In particular, the fact that logistics-related emissions account for 13% of global greenhouse gas emissions, together with new regulations and stakeholder pressure, makes compliance with sustainability standards critical (Perotti & Colicchia, 2023).

The implementation of green practices in warehouses plays a critical role in achieving energy savings and reducing carbon emissions and constitutes one of the fundamental elements of sustainable warehouse management (Kamarulzaman et al., 2012: 386). Although it was initially believed that sustainability practices would conflict with economic efficiency, it has been noted over time that logistics engineering has become aligned with environmental approaches and that these two elements complement one another (Żuchowski, 2015: 172). Green initiatives are shaped not only by environmental concerns but also in ways that attract public attention and provide firms with a competitive advantage (Xin et al., 2019).

The green warehousing approach, which serves as a strategic bridge between the sustainability goals of warehouse operations and the strengthening of their market positions within the logistics sector, is an important factor that goes beyond cost savings by providing both a marketing strategy and an environmentally friendly image (Lewczuk et al., 2021).

Green warehousing practices do not merely refer to the adoption of environmentally conscious practices; they also offer a comprehensive management approach encompassing

multifaceted environmental objectives such as improving energy efficiency, enhancing waste management, and reducing carbon emissions. These approaches support environmental sustainability through the efficient use of natural resources while also providing businesses with a long-term competitive advantage by reducing operational costs. At the same time, these concepts, which are aligned with corporate social responsibility principles, facilitate businesses' achievement of sustainable development goals and emerge as a strategic transformation tool that shapes their long-term vision (Castillo et al., 2022).

2. GREEN WAREHOUSING PRACTICES

Ensuring sustainability in businesses relies on managing the synergy among human, building, and technological capital components in a holistic and coordinated manner. To achieve sustainability goals in the warehousing sector, the human element must evolve from a simple operator role to that of a supervisor and strategic decision-maker, while the fact that individuals spend a significant portion of their time in buildings necessitates the collection of data from those buildings (Akhavan et al., 2025; Hokmabadi et al., 2024; Taherkhani & Aziminezhad, 2023). The transformation of warehousing systems into high-tech and costly facilities may also lead to an increase in emission sources (Bartolini et al., 2019). Scientists and environmentalists have introduced the concept of "go green" for green warehousing practices aimed at reducing greenhouse gas emissions through the management of the flow of goods, information, and services within warehouses in accordance with sustainability principles (Indrasiri & Rathnayake, 2015). Practices in the warehousing sector, when considered within the framework of the "green" concept, address the impact of buildings on human well-being and the environment, the relationship of technological investments to

both the quality of human capital and employees' perceptual adaptation, as well as human–machine collaboration. As shown in Figure 1, green warehousing practices are evaluated under three main headings: green human resource management practices, green building practices, and operational optimisation and green technology applications.

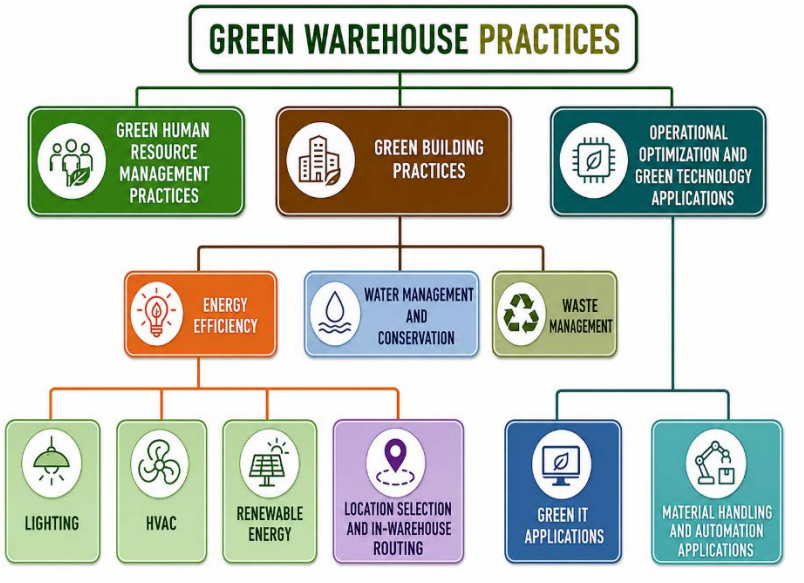

Figure 1. Green Warehousing Practices

The alignment of green warehousing practices with the 'triple bottom line' principle, which encompasses economic, environmental, and social dimensions, means that this approach offers not only an operational perspective but also a holistic perspective on sustainability (Indrasiri & Rathnayake, 2015).

For this reason, green warehousing practices contribute to multifaceted sustainability objectives, such as reducing environmental impacts, limiting resource consumption, and enhancing ecological value, while necessitating a reassessment of the environmental impacts of warehouse processes and the adoption of environmentally friendly operational approaches to

reduce carbon emissions in the logistics sector (Żuchowski, 2015).

Today, green warehousing practices are no longer confined to developed countries; rather, they have become a universal necessity, spreading globally as a result of increasing import and export activities (Wahab et al., 2019).

2.1. Human Resources Management Practices in Green Warehouse

Ensuring sustainability in warehouse management involves addressing the issue holistically—not merely focusing on reducing energy consumption and costs, but also encompassing multifaceted objectives such as occupational safety, environmental impact, and employee health—thereby ensuring the consistency of academic research and facilitating the development of more effective and sustainable strategies for organisations implementing such practices. Human resource management, one of the key elements supporting warehouse management, is an important tool in organisations' sustainability strategies. Aligning core human resource functions—such as recruitment and selection, training and development, performance management, compensation and reward systems, and employee participation with environmental management objectives contributes to the effective design and implementation of environmental management (Kesen & Öselmiş, 2021).

As any disruption in logistics activities within the supply chain leads to an increase in carbon emissions, managers' greater emphasis on green supply chain practices and their search for green alternatives in logistics activities positively affect the reduction of carbon emissions (Selamzade et al., 2025). Many warehouse managers make operational decisions primarily on the basis of their own experience, thereby hindering the development of systematic solutions through subjective judgements. For this

reason, the adoption of systematic and data-driven approaches in warehouses is of great importance (Chow et al., 2006). The failure to clarify managerial motivations and behaviours in critical areas such as energy efficiency, reducing environmental impact, and improving sustainability performance has created strategic gaps in policy development processes. It is critical for senior management personnel to adopt visionary approaches that support green practices, establish clear strategic objectives, and allocate the necessary resources (Wahab et al., 2019).

Another key factor enhancing the effectiveness of green warehousing practices in human resource management is employee participation. Although advanced technologies and automation systems make significant contributions to businesses, employees' voluntary involvement in environmental initiatives is critical to the success of these practices. Strategies such as targeted training programmes designed to increase employees' environmental awareness, paperless ordering systems, and prioritising the use of local materials are effective tools for achieving environmental sustainability goals (Indrasiri & Rathnayake, 2015). In today's organisations, employees are not merely individuals involved in production processes but also important stakeholders who contribute to corporate sustainability goals. Organisations are increasingly placing greater emphasis on employee satisfaction, job fulfilment, and the creation of an environmentally friendly corporate culture. Working in a green environment is not merely a choice but also an indicator of corporate reputation and a source of motivation for employees. In this regard, employees' active involvement in environmental matters facilitates the adoption of green practices at the organisational level and paves the way for organisational transformation (Wahab et al., 2019). Furthermore, the aim is to encourage environmentally conscious behaviour among

employees through awareness campaigns and incentive mechanisms.

Another important factor in the success of corporate sustainability initiatives is the support of business owners or shareholders. Although business owners do not generally participate directly in operational processes, they play a decisive role in determining the organisation's strategic direction and long-term objectives. Therefore, for green initiatives to be implemented successfully, business owners must provide both financial and moral support (Wahab et al., 2019).

Measures aimed at reducing employee stress, preventing occupational illnesses caused by hazardous working environments, and minimising environmental impacts; the use of safety equipment that does not harm the environment; and the provision of green offices and working environments that are physically suitable and compatible with the human body and psychological makeup are among the green practices that make human resource management more efficient and sustainable (Kesen & Öselmiş, 2021). In this context, green practices in human resource management play a significant role in developing human capital through employee training programmes and positively influence entrepreneurship, productivity, and employment (Castillo et al., 2022; Zhang et al., 2024).

2.2. Green Building Practices

To examine the environmental impact of the interaction between warehouse inventory and warehouse management, many researchers have investigated ways to reduce carbon emissions in warehouses through warehouse architecture, space utilisation, lighting systems, and heating facilities (Ren et al., 2023). Research indicates that designing energy-efficient buildings constitutes the most fundamental level of green warehousing practices and that the objective should be to optimise internal

factors such as lighting, heating, ventilation, and mechanical handling equipment within warehouses. Effective methods include adopting LED lighting systems to reduce energy consumption and designing warehouse roofs and windows to maximise the use of natural sunlight. In the next phase, promoting environmentally friendly energy use by prioritising renewable and green energy sources, such as solar and wind power, to minimise carbon emissions contributes to the development of green warehouses (Baker & Marchant, 2015).

Achieving carbon-neutral industrial warehouse buildings is the ultimate goal of green warehousing initiatives (Bartolini et al., 2019). Therefore, efforts to make industrial warehouse buildings carbon-neutral are of critical importance for building a sustainable future. The strong link between warehousing activities and global climate change highlights the urgency of reducing carbon emissions in this sector. To limit the adverse effects of climate change and achieve a more resilient economic structure, significant reductions must be achieved in both the direct carbon emissions arising from warehouse building materials and construction processes and the ongoing emissions associated with the operation of the warehouse building (Korra & Valaboju, 2024).

Operational factors such as facility size, space utilisation, lighting systems, and heating and ventilation technologies have a direct impact on energy consumption. From a structural perspective, roof insulation, wall thickness, and the characteristics of door systems play a decisive role in energy efficiency. These facilities consume energy continuously throughout their life cycle, from construction to demolition, and make intensive use of natural resources. Furthermore, the implementation of appropriate insulation materials and applications in the structural design of warehouse buildings is of

great importance for minimising energy losses (Ries et al., 2016; Bartolini et al., 2019).

2.2.1. Energy Efficiency Practices in Green Warehouse Building

In today's world, where global warming and environmental degradation are accelerating, reducing carbon emissions is a key priority for various industries (Mashud et al., 2022). The fact that warehousing activities, one of the components of logistics operations, account for 11% of the total greenhouse gas emissions produced by the global logistics sector (Ren et al., 2023) demonstrates that warehousing plays a critical role in supply chain-related emissions. As warehouses involve numerous energy-intensive activities, such as lighting, heating, cooling, and air-conditioning systems, as well as fixed and mobile material handling equipment, reducing the carbon footprint of warehouses presents various opportunities (Ries et al., 2016).

Among carbon reduction strategies, energy efficiency is one of the methods capable of delivering the quickest results in the short term. In particular, efficiency measures in the building, transport, and industrial sectors reduce current energy consumption or enable greater production with the same amount of energy, thereby directly reducing carbon emissions (Röder et al., 2021). For this reason, ensuring energy efficiency in warehouses plays a significant role in helping the logistics sector achieve its sustainability goals. Energy consumption directly increases greenhouse gas emissions, leading to an expansion of businesses' carbon footprints (Ries et al., 2016). Consequently, strategies aimed at improving energy efficiency are indispensable components of sustainable warehouse management. Fixed material handling equipment (FMHE) and mobile material handling equipment (MMHE), which account for a large proportion of energy consumption in warehouse operations, stand

out as the primary operational elements in which energy savings must be achieved (Bartolini et al., 2019). Systematic approaches to analysing warehouse energy consumption are of critical importance for achieving energy efficiency. In their comparative analysis, Freis and colleagues (2016) demonstrate that the energy requirements of manual, semi-automated, and fully automated warehouses vary significantly depending on the level of automation. Their findings reveal that, in manual warehouses, energy consumption stems largely from heating and cooling systems, whereas in semi-automated and fully automated warehouses, the highest energy consumption is attributable to material handling equipment. Consequently, energy efficiency strategies must be tailored by taking into account the level of warehouse automation and the types of equipment used (Freis et al., 2016).

The aim is to optimise key operational elements such as heating, lighting, ventilation, and mechanical handling systems through green warehousing practices focused on the design and operation of highly energy-efficient warehouse structures. Strategies centred on energy efficiency not only help to reduce operating costs but also support the fulfilment of environmental and social responsibilities. The use of clean energy technologies, the integration of renewable energy systems into warehouses, and the widespread adoption of LED based lighting solutions are among the key components of these strategies. Furthermore, designing warehouse roofs and windows to maximise the use of natural sunlight significantly contributes to overall energy efficiency by reducing heating and lighting requirements. These applications not only reduce energy consumption but also promote the use of environmentally friendly energy, thereby supporting the development of a green warehousing approach (Jakimovska & Vasileva, 2020).

2.2.1.1.Energy Efficiency in Lighting Systems for Green Warehouse Building

The modernisation of lighting systems and the integration of natural light in the logistics sector are strategic measures that provide both economic and environmental benefits in the long term. Today's fluorescent technologies, which have replaced traditional lighting systems, can reduce a facility's electricity consumption for lighting by up to 70 per cent. This transformation not only helps to reduce energy costs but also facilitates the achievement of environmental sustainability goals (Đukić et al., 2010). For this reason, the vast majority of logistics companies are transitioning to LED or induction lighting systems. Indeed, research indicates that 89% of logistics organisations have implemented this transition to achieve energy savings. Although LED technology involves high initial costs, its low heat output and long lifespan make it an ideal solution, particularly for cold storage areas (Indrasiri & Rathnayake, 2015). To improve energy efficiency, motion sensors are also widely used in warehouse areas. These sensors prevent unnecessary energy consumption by ensuring that lights are switched on only when required. Such automation applications deliver significant savings, particularly in large areas where continuous lighting is not required (Đukić et al., 2010). In this context, optimising lighting and heating systems is one of the primary measures for achieving energy savings (Bartolini et al., 2013).

With the growing body of research on the use of renewable energy applications in warehouses in recent years, the utilisation of natural daylight is now regarded as a key component of energy efficiency strategies in warehouses (Perotti & Colicchia, 2023). Businesses that use skylights can reduce their electricity consumption by maximising the use of natural daylight. In addition to energy savings, this approach provides a more ergonomic and healthy working environment for employees

(Indrasiri & Rathnayake, 2015). In newly constructed distribution centres, increasing natural lighting through large glass surfaces and skylights, together with investments aimed at utilising flat roof surfaces for solar panel installations, significantly reduces energy costs and carbon footprints (Đukić et al., 2010).

2.2.1.2.The Impact of HVAC Systems and Insulation on Energy Efficiency in Green Warehouse Building

A significant proportion of energy consumption in warehouses stems from heating, ventilation, and air-conditioning (HVAC) systems used during the operation of warehouse facilities and equipment (Xin et al., 2019). Ren and colleagues note that, after lighting, the largest share of energy consumed in warehouses is used for heating and that this accounts for a significant proportion of CO_2 emissions (Ren et al., 2023). These findings highlight the critical role of HVAC systems in warehouse operations with regard to energy efficiency and environmental sustainability.

HVAC systems are a key factor in determining the energy efficiency and environmental impact of warehouse operations. Effective management of these systems not only helps to reduce energy costs but also plays a significant role in minimising environmental impacts (Colicchia et al., 2013). Improvements to HVAC systems help reduce both warehouse-related emissions and operational costs through energy savings. Consequently, modernisation and integration initiatives aimed at improving the energy efficiency of HVAC systems are emerging as effective tools for reducing the environmental impact of warehouse operations.

To better assess the energy performance of HVAC systems, the scope and determinants of total HVAC energy consumption are becoming increasingly important. Total HVAC

energy consumption encompasses not only the direct energy use of heating, cooling, and ventilation systems but also the heat losses and energy inefficiencies arising from these processes. This represents the total energy demand required to maintain suitable climatic conditions within a warehouse. Heating energy requirements, however, vary depending on structural and environmental factors such as the level of wall and roof insulation, the number and physical condition of skylights and doors, and outdoor temperature (Fichtinger et al., 2015). Furthermore, passive design strategies implemented in warehouse buildings are among the effective means of reducing energy consumption and improving environmental performance. Elements such as natural ventilation and the thermal inertia of walls play a significant role in optimising the energy requirements of logistics facilities, and solutions such as the use of selective glazing are effective methods for enhancing energy efficiency. In particular, selective glazing reduces the need for cooling by minimising heat transfer, thereby achieving a significant reduction in energy consumption (Perotti & Colicchia, 2023).

2.2.1.3.The Use of Renewable Energy Systems in Green Warehouse Building

In energy policy and economic development processes, concerns regarding global climate change and sustainability have made the use of renewable energy systems a strategic element. Renewable energy sources such as solar, hydroelectric, wind, geothermal, and biomass energy constitute cleaner, safer, and more sustainable alternatives to fossil fuels. Owing to their carbon-free characteristics, renewable energy sources strengthen energy supply security and directly prevent carbon emissions (Raihan et al., 2022).

According to the International Energy Agency (IEA), in order to achieve the global carbon-neutrality target by 2050, the

share of renewable energy sources in energy production must be increased to 90% (IEA, 2023). Thanks to technological advancements, investments in renewable energy are becoming increasingly attractive from both environmental and economic perspectives (Kamarulzaman et al., 2012). In particular, improvements in the efficiency of solar energy technologies help reduce the energy dependence of logistics companies and lower their carbon footprints (Lewczuk et al., 2021). In this context, such investments aim not only to provide businesses with long-term operational efficiency and cost advantages but also to minimise the environmental impacts of emissions (Bhavani, 2023; Ibrahim & Fernando, 2023).

Modern warehouse buildings have the capacity to generate some or all of the energy they require on-site through the use of renewable energy sources. Solar panels installed on warehouse roofs not only significantly reduce electricity consumption but also decrease indirect carbon emissions arising from energy production processes (Boztepe & Çetin, 2020). However, the high capital requirements of renewable energy systems do not make on-site energy generation cost-effective in every situation. While solar panels typically have a payback period of approximately 15–20 years, wind turbines involve lower costs and can often recover their initial investment within five years. Therefore, managers must conduct a comprehensive payback analysis before making renewable energy investments. Investments in energy-efficient production technologies become particularly feasible for large-scale warehouses when supported by government incentives and a strengthened regulatory framework. Consequently, government policies play a critical role in the widespread adoption of green energy production (Jakimovska & Vasileva, 2020).

2.2.1.4.Site Selection and In-Warehouse Routing Strategies for Green Warehouse Buildings

In addition to requiring significant capital investment and labour costs, warehousing activities necessitate the minimisation of transport costs and transit times, which makes warehouse location selection a strategic decision (Gergin & Peker, 2019). Determining the location of storage facilities requires a multidimensional assessment that takes into account not only cost factors but also environmental and social criteria in line with the principle of sustainability (Parizi et al., 2024).

Inefficient site-selection decisions increase logistics costs and weaken businesses' competitiveness by limiting access to a skilled workforce. Therefore, sustainability-oriented location decisions reduce environmental impacts while increasing operational efficiency (Boztepe & Çetin, 2020). Considering the scale of large-volume warehouse structures and transport operations, the site-selection process must strike a balance between cost and environmental impact. For this reason, the impact of a warehouse's location on ecosystems and land use highlights the environmental sustainability dimension of site selection and is associated with SDG 15 (Life on Land) (Kumar & Adil, 2025). In addition, the correct choice of location can not only reduce environmental impacts but also lower transport costs, thereby generating savings across the logistics system (Jakimovska & Vasileva, 2020).

While location decisions in traditional warehouse management primarily focus on cost and operational efficiency, recent studies support the view that modern warehouse management should be expanded to include environmental sustainability (Accorsi et al., 2017). However, the simultaneous optimisation of multidimensional objectives such as reducing cycle times, lowering total costs, and decreasing the carbon

footprint may lead to conflicting design and operational outcomes due to trade-offs among these objectives. Therefore, the implementation of green warehouse strategies aimed at improving energy efficiency and reducing environmental impact helps reduce carbon emissions from operational systems and enhances the environmental performance of logistics facilities (Perotti & Colicchia, 2023).

In-warehouse routing is considered a key factor influencing CO_2 emissions, as it affects the distance travelled per order and, consequently, energy consumption (Ries et al., 2016). Accordingly, in modern logistics practices, routing has evolved from being merely a tool for operational efficiency into a strategic mechanism that supports economic sustainability and enables a management approach aligned with environmental objectives (Accorsi et al., 2017; Bartolini et al., 2019). In this context, one of the fundamental steps for small businesses with limited resources within the scope of smart and green logistics is the optimisation of collection routes in line with infrastructure constraints. Particularly in situations where error reduction and process standardisation are prioritised, applications that support the selection of the right product from the right shelf at the right time increase operational efficiency and strengthen sustainability goals by reducing error rates (Jakimovska & Vasileva, 2020).

2.2.2. Water Management and Conservation in Green Warehouse Buildings

Rising operating costs and the increasing risk of water scarcity have made effective water management one of the fundamental components of sustainable development, particularly in commercial buildings. Warehouse buildings represent an important commercial sector in terms of both operational scale and water consumption. Addressing water leaks in warehouse buildings is crucial for ensuring water-use

efficiency. A significant proportion of water losses that go unnoticed by users or are overlooked during routine operations stem from internal plumbing leaks. Because uncontrolled leaks directly increase operating costs, the problem becomes more visible in commercial facilities such as warehouses. In this context, the nature of technical interventions is decisive; the quality of technical maintenance, together with users' awareness and level of participation in reporting faults, contributes to reducing water losses in warehouse plumbing systems and consequently lowering water consumption costs (Knapik, 2025). Therefore, improvements to internal plumbing systems and measures aimed at controlling leaks constitute fundamental steps in reducing operational water losses.

The large roof areas of warehouse buildings enable the implementation of rainwater harvesting systems, adding a complementary dimension to water management. The storage of rainwater collected from roof surfaces promotes water recovery and contributes to sustainable water management. Rainwater harvesting stands out as a sustainable source of clean water because of its low cost, ease of maintenance, and accessibility. However, collection efficiency and the quality of harvested water vary depending on the effective roof area and the roofing material. Therefore, the selection of smoother, cleaner, and well-insulated roofing materials is important for achieving higher volumes of harvested water and better water quality (Abdulla & Al-Shareef, 2009).

In addition to being an important complementary measure for improving water efficiency in warehouse operations, rainwater harvesting should be considered alongside wastewater management, which is another critical factor requiring attention. The treatment and reuse of wastewater through appropriate technologies play a role in the implementation of a circular economy approach whose importance cannot be overlooked.

Wastewater generated in buildings is separated into blackwater and graywater. Blackwater can be further separated into yellow water and brown water through the use of urine-diverting toilets. Following this separation, the remaining graywater can be treated to a quality suitable for reuse through less energy-intensive methods (Baserba, 2024).

The reuse of graywater is regarded as a strong option for water demand management and resource conservation. It has been reported that graywater recovery can achieve water savings of up to 80–85% and reduce dependence on potable water (Al-Jayyousi, 2003; Baserba, 2024). In commercial facilities such as warehouse buildings, allocating graywater to appropriate applications including irrigation, landscaping, toilet flushing, and groundwater recharge supports the conservation of high-quality freshwater resources, contributes to the reduction of environmental pollutants, and can reduce overall water supply costs (Al-Jayyousi, 2003).

In the face of the global water crisis, implementing strategies in warehouse facilities that reduce potable water consumption, minimize operational water losses, and systematically incorporate alternative water sources represents a significant opportunity. Approaches such as the treatment and reuse of gray-water and blackwater, rainwater harvesting from warehouse roofs, and the reduction of plumbing-related water losses contribute to the conservation of water resources against the risk of water scarcity while also enhancing water efficiency. Water management practices developed in this direction for warehouse buildings strengthen operational efficiency and play a critical role in ensuring future water security by supporting environmental sustainability.

2.2.3. Waste Management in Green Warehouse Building

Among the environmental issues arising from warehousing operations, waste management is a critical component in reducing the environmental impacts of warehousing and logistics activities and developing sustainable operations. A comprehensive waste management and recycling system integrated into warehouse architecture, aligned with the 3R principles, and supported by digital technologies is a strategic sustainability element that extends beyond reducing storage and operational costs to provide balanced performance in controlling the carbon footprint, conserving natural resources, and increasing societal benefits (Bartolini et al., 2019; Indrasiri & Rathnayake, 2015; Xin et al., 2019).

Ensuring waste control in storage operations at green warehouse facilities enhances the effectiveness of packaging management in warehouses in terms of both operational efficiency and environmental sustainability. Since packaging use is one of the areas in which waste generation is most evident in storage processes, warehouse operators tend to reuse, improve, and recover packaging elements such as pallets, cardboard boxes, and similar materials as much as possible in order to keep costs under control and reduce the environmental burden (Indrasiri & Rathnayake, 2015). Green packaging practices are a significant factor influencing consumer perceptions and purchasing decisions through the use of environmentally friendly materials. Biodegradable, compostable, or reusable packaging materials are perceived positively by consumers and are often preferred despite their additional cost. Research indicates that consumers are willing to pay 10–15% more for products with green packaging from brands they recognize. From a corporate perspective, green packaging strategies not only help companies improve their environmental performance but also contribute to significant

gains in brand reputation and competitive advantage (Kuru & Boyraz, 2020). However, the lack of visible information regarding packaging reusability during the shopping process may diminish the impact of this preference (Yemez & Akca, 2024). In this context, deposit-based packaging systems, which are widely adopted in practice, facilitate the circular reuse of packaging, thereby extending its lifespan and offering opportunities for multiple uses through streamlined return processes. Consequently, waste generation within businesses is significantly reduced (Indrasiri & Rathnayake, 2015). Additionally, the use of lighter packaging materials reduces storage space requirements and decreases vehicle movements during transportation. While this offers significant cost advantages, it also results in a substantial reduction in carbon emissions. Furthermore, the use of paperless tracking systems digitizes documentation processes, eliminating unnecessary paper consumption and helping storage processes become simpler, faster, and more sustainable (Markley & Davis, 2007; McKinnon et al., 2015).

Another important factor of critical significance for waste management is digitalization and the advancement of information and communication technologies. Technologies such as sensors, data analytics tools, automated notification systems, and Geographic Information Systems (GIS) enable waste generation to be monitored more quickly and accurately (Gürcan & Açıksöz, 2023). In this context, applications referred to as “smart waste management” facilitate the automation of waste collection and monitoring processes. In addition, smart waste management enhances operational efficiency by saving time and reducing costs associated with collection and sorting activities. Furthermore, the Zero Waste Project, supported by digital tools, is a social initiative aimed at raising awareness of waste management by encouraging organizations and individuals to adopt a conscious approach to waste management (Tamkoç et al., 2024). Therefore,

waste management is not merely a technical process; consumer behavior and organizations' understanding of sustainability also play a significant role in shaping the process.

2.3. Operational Optimization and the Integration of Green Technologies in Green Warehousing

Technologies in Green Warehousing Rising global CO_2 emissions, which intensify the greenhouse gas effect, are increasing environmental pressures, particularly in supply chains where intensive logistics activities are carried out. Although studies on carbon emissions related to warehousing activities remain limited, the high energy consumption of stationary and mobile material-handling equipment used in warehouses is one of the factors hindering the achievement of sustainability goals (Ries et al., 2016). Therefore, the effective management of resources in the logistics sector is of critical importance for both ensuring sustained customer satisfaction and minimizing operational costs. In this context, the integration of automation and digital technologies into logistics processes offers significant opportunities for both sustainability and operational efficiency in today's supply chains (Minashkina & Happonen, 2020).

Smart management software and IoT-based monitoring technologies play a key role in the implementation of green warehousing practices. Through the digital infrastructure provided by these systems, warehouse operations become more sustainable, resulting in significant reductions in energy consumption and operational costs (Liu & Ma, 2022). Although the initial investment in these technologies may seem costly, the energy savings and increased efficiency achieved in the medium and long term offer businesses significant economic advantages. Additionally, the detailed datasets generated by these systems facilitate internal warehouse analysis processes and enable more

accurate strategic decision-making, thereby strengthening a sustainable management approach (Kamarulzaman et al., 2012).

2.3.1. Green IT Practices in Warehouse Operations

The lack of information systems that provide integrated and comprehensive resource data among logistics service providers significantly hinders effective resource allocation (Chow et al., 2006). This shortcoming has led to an increased need for information systems that support logistics processes.

In warehouse operations, decision support systems, such as transportation management, warehouse management, demand forecasting, and planning systems, strengthen businesses' logistics capabilities. In addition, timely access to data in businesses increases the efficiency of internal processes and improves response times to customers. Improvements in supplier and customer integration, together with enhanced logistics service quality, positively affect performance indicators and customer satisfaction, thereby making the decisive role of technological elements in logistics decision-making processes increasingly visible (Autry et al., 2005).

Among the concrete technological applications widely used in logistics processes, barcoding, electronic data interchange (EDI), and, in particular, radio-frequency identification (RFID) systems stand out. RFID technology increases operational efficiency and accuracy by enabling real-time resource tracking in warehouse management. Studies conducted in corporate firms show that RFID significantly increases labor productivity while markedly reducing document-related errors. In addition, RFID provides businesses with tangible gains, such as optimized inventory levels, reduced risks of stockouts, and increased operational accuracy. RFID-enabled forklifts and automated data collection systems reduce the need for manual checks, thereby accelerating operations and lowering error rates. The integration

of such data collection technologies with smart management software and IoT-based systems significantly increases the effectiveness of green warehousing practices. Through RFID-based resource planning, orders can be processed more quickly and accurately; by reducing the manual workload at loading docks and in field operations, such planning shortens order cycle times. All these improvements have a direct effect on reducing energy consumption and CO_2 emissions and also lead to significant reductions in costs associated with incorrect shipments and return processes (Chow et al., 2006).

The comprehensive data infrastructure provided by smart management software and IoT-based solutions, together with the effective use of logistics information management tools such as transportation management systems (TMS) and warehouse management systems (WMS) in warehouses, is among the important tools that increase efficiency.

WMS increases process efficiency in core operations such as order picking, packing, and inventory tracking (Autry et al., 2005; Wahyuni et al., 2024). In addition, by supporting paperless operations, WMS minimizes the environmental impacts of warehouse operations by enabling savings in energy and resource use (Đukić et al., 2010). When the process and data optimization achieved through warehouse management systems is integrated with enterprise resource planning (ERP) systems, the environmental performance of the supply chain is further strengthened. ERP structures supported by environmental management standards such as ISO 14000 make environmental management processes holistic by ensuring coordination in green procurement, green production, and green distribution activities (Rahayu et al., 2019). In this context, information technologies used in warehousing applications serve as strategic tools that support environmental sustainability in logistics operations,

reduce costs, and increase efficiency, thereby contributing to businesses' long-term competitive advantage.

2.3.2. Material Handling and Automation Applications

The digitization of warehousing processes and the use of sensor-based technologies are of great importance for enhancing environmental sustainability and improving energy efficiency. Smart warehousing technologies increase operational visibility and process accuracy by enabling real-time data exchange among inventory, personnel, and equipment through sensors, GPS tracking devices, and internet-connected systems. Sensor-based applications offer high accuracy in mapping warehouse areas, determining product locations, and conducting inventory analysis, thereby reducing unnecessary movements and contributing to a lower carbon footprint. Similarly, GPS-enabled tracking systems provide greater control and precision in in-warehouse transportation and storage activities, enabling the comprehensive management of logistics operations (Jakimovska & Vasileva, 2020).

Innovations in material handling technology are an integral part of sustainable warehouse management. Electric forklifts used for material handling in warehousing operations support the use of cleaner energy while also offering high energy efficiency (Đukić et al., 2010). The fact that electric forklifts produce no exhaust emissions helps maintain air quality in enclosed warehouse areas, while their low noise levels enhance worker comfort and support social harmony in warehouses located near residential areas (Payel, 2020).

In addition, smart warehouses, where full automation is implemented as a key outcome of technological transformation in warehousing, are becoming increasingly important. Automated storage and retrieval systems (AS/RS) maximize the utilization of storage areas, increasing availability by up to 95% and

significantly reducing energy consumption. Furthermore, structural improvements in the design of warehouse management systems, such as aisle layouts, rack-type selection, and optimized pallet placement, contribute to energy efficiency and support the achievement of green warehouse goals (Ries et al., 2016).

At the same time, autonomous mobile robots (AMRs) are gaining prominence among the evolving applications of warehouse automation. In their study, Zhen and Li (2022) note that, thanks to the environmental perception capabilities of AMR systems and sensor-based mapping methods, intralogistics routes can be dynamically evaluated and quickly adapted to changing warehouse conditions. Task planning synchronized with warehouse management systems (WMS) facilitates more efficient coordination of AMRs at the fleet level, contributing to the overall improvement of operational processes. In addition, because their structures do not require fixed tracks, rails, or magnetic strips, AMRs can move flexibly even in narrow aisles and enable more efficient use of storage areas (Zhen & Li, 2022).

In light of all these developments, automated electric material-handling equipment plays a significant role in enhancing both environmental and operational performance in sustainable warehouse management. By reducing reliance on human intervention, these systems minimize unnecessary movements, thereby lowering energy consumption and the carbon footprint while contributing to warehouse efficiency (Payel, 2020). Thus, the integration of material handling and warehouse automation technologies significantly contributes to reducing the environmental impacts of logistics operations, increasing efficiency, and fostering the adoption of sustainability goals at the corporate level.

Declaration of AI-assisted Language Editing

This book chapter was originally written by the authors in Turkish. DeepL AI and ChatGPT were used solely for translation from Turkish into English and for academic language editing. In addition, ChatGPT was used to generate the visual design of Figure 1 (“Green Warehousing Practices”) based on the authors’ conceptual framework and content. The conceptual framework, research design, arguments, interpretations, citations, and final content of the chapter belong entirely to the authors.

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ULUSLARARASI TİCARET PAZARLAMASINDA DIŞ TİCARET İSTİHBARATI KULLANILMASI VE ETİK İNCELEMESİ

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1. GİRİŞ

Ülkeler binlerce yıldır ticari faaliyetlerinde bulunmaktadır. Bu ticaret faaliyetleri günümüze kadar birçok değişiklik gösterse de temel amaç hep aynı kalmıştır. İhracat yapan kişi ve firmalar ticaretin bir sonucu olarak zenginleşecektir. Bu zenginleşme ülke halkına ve vergiler aracılığıyla da doğrudan devletlere yansımaktadır. Gerek dış bağımlılığı azaltmak gerekse de refah seviyesini yükseltmek için devletler ihracat yapılmasını isterler. Bu amaç doğrultusunda ihracat yapmak isteyen veya yapan firmaları destekler ve yardım ederler. Bu yardımlar maddi olarak yapıldığında Devlet teşvikleri olarak adlandırılır. Aynı zamanda maddi olmayan yardımlarda da bulunulmaktadır. Bu yardımlardan biride Dış Ticaret İstihbaratıdır. Dış Ticaret istihbaratında rakip olan firmaların çeşitli ticari bilgileri yer almaktadır. Bu bilgiler birçok ülkede ticari sır niteliği taşımasına rağmen dış ticaret istihbaratı çoğu ülkede yasal hatta bizzat devletin desteklediği bir faaliyettir.

Uluslararası Ticaret, uluslararası iktisadın uygulama alanıdır. Uluslararası İktisat hem mikro iktisadı hem de makro iktisadı etkileyen bir alandır. Ülkeler Uluslararası iktisat alanında güçlü olma çabası ihracata odaklanmalarına ve bu amaç

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doğrultusunda çalışmalar yapmaya itmiştir. Bu çalışmada ticari istihbarat faaliyetlerinin ticari etik durumuna değinirken aynı zamanda bu tür çalışmaların hem şirketler hem de ülkelerin yararına olduğunu incelemektedir.

2. KAVRAMLAR VE TANIMLAR

2.1. Dış Ticaret

Dış Ticaret, iki farklı ülkede faaliyette bulunan iki şirket veya kurum arasında gerçekleşen mal veya hizmet alışveriş sürecinin ve bu süreçten doğan finansal hareketliliğin genel ekonomik adıdır.

Ekonomik olarak dışarıya açık bir ülkenin başka dışarı açık ülkelerle yapmış olduğu ürün ve hizmet alım satım işlemine dış ticaret denmektedir (Melemen, 2017: 15).

Dış ticarette amaç özel şirketleri kazanımlarının yanı sıra ekonomik büyüme, ülkeye döviz girdisi sağlama, personel istihdam etme ve gerek ülkelerin gerekse şirketlerin uluslararası rekabete katılımını sağlama gibi birçok ekonomik faaliyeti barındırır. Ülkeler için dış ticaretin faydalarından biride dış rekabete ayak uydurmak isteyen firmaların üretim kapasitelerinin arttırma çabaları ve kaliteli ürün üretmesidir. Bu çalışmalar sonucunda hem dış pazarda ülke prestiji artmakta hem de bu firmalar yurt içi pazara da aynı ürün sattığı zaman ülke içi pazarda kalite artışı gözlemlenmektedir.

Devletler dış ticaretin sağladığı ekonomik faydaların farkında olduğundan dolayı bu alanda çeşitli faaliyetlerde bulunarak dış ticareti desteklemektedir. Ekonomi yöneticilerinin ve karar vericilerin en sık kullandığı dış ticareti destekleyici faaliyeti ise kamu teşvikleri ekonomik enstrümanıdır (B.M. Erol, 2026).

Bu kamu teşvikleri sadece maddi destekler olmak zorunda değildir. Bu desteklerden biri de dış ticaret personellerine sağlanan bilgi ve eğitim hizmetleridir.

2.2. Dış Ticaret İstihbaratı

Bugün dünyanın her yerinde; politika yapıcılar, ülke yöneticileri, karar vericiler, iş insanları ve dış ticaret ile ilgili alanlarda çalışmalar yapan akademisyenler dünyanın diğer ucunda hızla değişen ekonomik koşulları ve ticari konjonktürü yakından takip etmek zorundadır (Krugman, Obstfeld, & Melitz, 2017).

Dünya pazarında artan küreselleşme, rekabet ve entegrasyon; kurum ve kuruluşların ihracat operasyonlarına yönelmesinde doğrudan bir etkiye sahiptir. (Keegan, 1998; Kotabe & Helsen, 1998; Leonidou & Katsikeas, 2010).

Dış ticaret istihbaratı on aşamalı bir süreçtir. Bunlar Pazar fırsatlarını analiz etmek, gerekli kaynakları tahsis etmek, teknik sorunları belirlemek, stratejik pazarlama planı geliştirmek, operasyon ekibi organize etmek, pazarlama stratejisi uygulamak ve işlemleri değerlendirip kontrol etmektir.

Dış Ticaret oyucularından biri olmaya karar veren ve ihracat operasyonları için stratejik bir planlama sürecine odaklanan kuruluşlar için önemli adımların başında potansiyel pazarın tespiti ve hedef pazar seçimi yer alır (Darling & Seristo, 2004).

Her ülke kendi içerisinde farklı satın alma gücüne sahip tüketicilerin oluşturduğu eyaletlerden, bölgelerden ve şehirlerden oluşmaktadır. Bu sebeple müşteri araştırmaları kuruluşların odaklanacakları segmentlere karar verdikleri bir dış ticaret istihbaratı sürecidir. (Zimmerman & Blythe, 2017).

Dış ticaret istihbaratı faaliyetleri ülkelerin siyasi, askeri ve ekonomik istihbarat faaliyetlerinden farklı olarak kamuya açık

olarak paylaşılan veya diğer stratejik istihbarat türlerine nazaran çok daha rahat bir şekilde erişilebilinen verilerden yararlanılarak hazırlanan istihbarat faaliyetleridir. Askeri, Ekonomik ve siyasi istihbarat faaliyetlerinin yapılması bütün ülkelerde yasak ve suç olsa da ticari istihbarat faaliyetleri pazarlama amaçlı olmasından dolayı ülkeler tarafından yasaklanmamıştır hatta teşvik edilmiştir.

2.3. Etik

Etik, kelimesi köken olarak yunanca "ethos" sözcüğünden türetilmiştir. Gelenek, alışkanlık, yöntem ve töre gibi anlamlara gelmektedir (Mengüşoğlu 1965: 15). Ahlak bilimi olarak Etik ise, belirli durumların içinde davranışları haklı ya da doğru olarak ayırmaya yarayan davranış standartlarının tümüdür (Ferrell ve Fraedrich 1994: 286).

Başka bir değişle etik, yanlışı ve doğruyu birbirinden ayırmak için kullanılan kurallar topluluğudur. Etik, ahlaki görev ve sorumlulukları inceleyen bir bilim dalıdır (Furman, 2004:215).

Ahlaki birtakım yargılar yaratmak etiğin işlevi değildir. Daha çok var olan ahlak üzerine birtakım şeyler söylemesini olanaklı kılar (Engelhard, 2000: 2).

Etik, ahlaki olanın ne olduğu ve ahlaki eylemin bir anlamının olup olmadığının araştırmasını yapar. (Pieper, 1999: 28)

Eşitlik, adalet ve ödün kavramları etik alanındaki çalışmalarda önemli bir yer tutar. Bu kavramlar daha geniş çerçevelerde ele alına bilinecek kavramlardır. Örneğin adalet bireylerin dinsel ve etnik kimliklerinden bağımsızdır, her birey adalet açısından eşittir (Lamberton ve Minor, 1995: 326).

Etik ölçütler, her bireyin uyması gereken ideal davranışlar veya ideal ilişkiler seti olarak tanımlanır. Toplumsal yaşamda uyumu kolaylaştıran bu ölçütler hukuk öncesi dönemde kendiliğinden oluşan; adet, töre ya da örf olarak

adlandırılmaktadır. Toplumdaki inanışları ve genel kanaatleri yansıttığı için de genel kabul görmüş ve uygulanmıştır (Akdoğan, 2000: 309).

Yukarıda verilmiş kavramlar etiğin her türlü kapsamını derinlemesine yorumlamıştır.

2.4. İş Etiği

İş etiği, işletme yönetiminin, işin ve işçinin etik kurallar çerçevesinde faaliyetlerde bulunması ve kazanç elde etmesini tanımlar. Dünyada etik konusuna verilen değer arttıkça iş etiğine verilen önem ve değerde bu derecede artmaya devam etmiştir. Günümüzde bu alanda çalışmalar hız kesmeden yapılmaktadır ve birçok Avrupalı devletler bu alanda bilimsel araştırmalar yapmaktadır.

İş etiği, hangi iş davranışının doğru ve hangisinin yanlış olduğu konusundaki inançlara dayanan davranış ilkeleri ve kurallarının bir toplamıdır. Bu ilkelere uygun olarak yapılan eylemler iş etiğine uygun olarak kabul edilir. İşletmelerde görülen etik sorunlar; Çalışanlar, pay sahipleri, yöneticiler, müşteriler, tedarikçiler, devlet, genel kamuoyu vb. gibi işletmelerin çıkar grupları ile ilişkilerinden meydana gelmektedir (Sabuncuoğlu ve Tokol, 2001: 51).

İş etiği bir işletmedeki çeşitli etik sorunları ele almaktadır. Ele alınan bu etik sorunlar üç ana kategoride incelenebilir bunlar sistematik, işletme ve bireysel sorunlardır.

Sistematik sorunlar işletmenin faaliyette bulunduğu politik, ekonomik ve kanuni sistemlerinden kaynaklanan sorunlardır. Kapitalizmin Ahlakiliği, düzenlemeler, sosyal pratikler ve endüstriyel yapılar sistematik soruna örnektir.

İşletme sorunları belirli tip ve özellikteki şirketlerden kaynaklanan sorunlardır. İşletmenin politikalarının ahlakiliği,

işletme faaliyetleri veya bir bütün olarak işletmenin kurumsal yapısının ahlaki olup olmadığı işletme sorunlarına örnektir.

Bireysel sorunlar bir işletmedeki tek bir bireyden veya bireyler topluluğundan kaynaklanan sorunlardır. Faaliyetlerin, kararların veya tek bir bireyin karakterinin ahlaki olup olmadığı gibi sorunlar bireysel sorunlara örnektir (Velasquez, 2002: 16).

3. DIŞ TİCARET İSTİHBARATI TARİHİ

3.1. Dış Ticaret İstihbaratında Dünya Tarihi

Dış ticaret istihbaratı bu gün ki halini almadan önce Ekonomik ve Endüstriyel casusluk faaliyeti altında değerlendirilirdi. Ekonomik ve Endüstriyel istihbarat faaliyetleri kökeni bakımından çok eskiye dayanmaktadır. Eskiden tüccarlar ticaret faaliyetlerini gerçekleştirirken gezdikleri ülkelerin gerek ekonomik gerekse de sosyal durumları hakkında bilgileri kendi yöneticilerine anlatırlardı. Bu tür faaliyetler ilk ticari ve ekonomik istihbarat faaliyetleri olarak değerlendirilebilir.

Bilimsel olarak yapılacak ilk inceleme 14. yüzyıl Orta Çağ Avrupası'nın ünlü İtalyan tüccarlarından Francesco Di Marco DATİNİ'nin ticari mektuplarının incelenmesidir. Bu mektuplar salt ticari bir iletişim aracı olmanın ötesinde, sofistike bir ekonomik istihbarat ağı işlevi gördüğü anlaşılmaktadır. Mektuplar; Londra, Cenova, Bruges gibi kilit ticaret merkezlerindeki baharat, yün ve boya gibi emtiaların güncel fiyatlarını, deniz sigortası oranlarını ve navlum maliyetlerini içeriyordu. Bu bakımdan yazılan bu mektuplar günümüz Dış Ticaret İstihbaratının organize ve günümüze ulaşan ilk faaliyetlerinden biri olarak değerlendirebiliriz. Bu istihbaratın en hayati parçası döviz kurları oluşturmaktadır. Oranlar, kişisel beklentilerden ziyade piyasanın genel eğilimini yansıtacak şekilde derleniyordu. Tüccarlar, fiyat ve kur dalgalanmalarını

öngörebilmek için olayları "olağan ve "olağanüstü" olarak analiz etmişlerdir. Gemilerin limanlara varış veya kalkış zamanları ile taşıdıkları yükün hacmi, doğrudan arz-talep dalgalanmaları yarattığı için titizlikle raporlanıyordu. Bu mektup ağının temel amacı, ticari başarı için kritik olan "rakiplerden daha hızlı bilgi edinme" avantajını maksimize etmekti (Bettarini, Bradley, & Moore, t.y.).

Erken modern dönemde (1550-1800) Atlantik ve Akdeniz ticaretinde ticari istihbarat faaliyetleri, kurumsal yapılardan ziyade tüccarların şahsi "güven ve sosyal sermaye" temelleri üzerine kurdukları çok boyutlu sosyal ağlar üzerinden yürütülmekteydi. Bu ağlar sadece emtia transferi değil, Pazar fırsatları ve risklerine dair hayati bilginin gayri resmi yollarla toplayıp küresel çapta dolaşıma sokulmasını sağlayan birer istihbarat mekanizması olarak işlev görmüştür (Herrero Sánchez & Kaps, 2016).

Günümüz dış ticaret istihbaratı teriminin temelleri Orta Çağ Avrupa'sında ticari ağların ve piyasaların evrimiyle birlikte atılmıştır. Tarihsel süreçte piyasalar yalnızca emtia alışverişinin yapıldığı fiziksel mekanlar değil, aynı zamanda uzak mesafeli ticaret rotalarından gelen farklı ürünlerin incelendiği ve tüccarların zihninde yeni ticari kombinasyonların doğmasını sağlayarak inovasyonu teşvik eden birer bilgi merkezi olarak işlev görmüştür. Sınır ötesi pazarlardan sistematik olarak ticari istihbarat toplama süreci, özellikle 18. yüzyıl da yaşanan teknolojik gelişmeler, uluslararası Pazar istihbaratının toplama ve iletilme hızında devrim yaratmıştır. Özellikle 1840'larda telgraf ağlarının ve 1880'lerden itibaren telefon altyapısının kurulması, piyasaların kurumsal yapısını kökten değiştirerek ekonomik istihbaratın uzak mesafeler arası neredeyse gerçek zamanlı olarak aktarılabilmesine olanak tanımıştır. Eşzamanlı olarak demiryollarının yaygınlaşmasıyla mesafelerin kısalmasını, uzak pazarlardaki arz-talep dengeleri, taze ürün akışı ve fiyat

farklılıkları gibi kritik ticari verilerin çok daha hızlı analiz edilmesini zorunlu kılmıştır. Bu yeni iletişim ve hız çağında, yavaş bilgi ağlarına dayanan yerel pazarlar rekabet edemeyerek elenmiş; büyük, entegre ve hızlı bilgi ağlarını kurabilen devasa Pazar merkezleri ayakta kalmıştır. Seri üretimin ve büyük çok katlı mağazaların yükselişi, işletmelerin pazar istihbaratı stratejilerinde de yapısal bir değişime yol açmıştır. 19. yüzyılın başlarında üreticiler, genişleyen coğrafi pazarlara ulaşabilmek ve oradaki talebi okuyabilmek için toptancılara bağımlıyken; yüzyılın sonlarına doğru devasa zincir ve uzmanlık mağazalarının ortaya çıkmasıyla toptancılık sistemden dışlanmıştır. Perakendecilerin doğrudan üreticiden mal almaya başlaması, her iki tarafın da aracıların istihbaratına güvenmek yerine, birbirleri ve pazar hakkında doğrudan, birinci elden ticari istihbarat toplamasını gerektiren yeni bir tedarik zinciri yaratmıştır. Bu dönemde uzak bölgeler de pazar fırsatlarını araştırmak ve müşteri eğilimlerini merkeze raporlamak üzere, modern "saha istihbaratçılarının" tarihsel öncüleri sayılabilecek fabrika temsilcileri ortaya çıkmıştır. Özellikle İngiltere'de doğrudan sanayi fabrikaları için çalışan ve "Manchester Adamları" olarak bilinen gezici temsilciler, kapı kapı dolaşmak yerine dükkandan dükkana giderek sahada hem toptancı hem de perakendeci işlevi görmüştür. Bu gezici tüccarlar, gösterişli kartvizitler ve antetli kağıtlardan kendilerine prestijli bir kurumsal imaj yaratmak, fabrikaları adına sahada ticari zeka toplamak, yeni pazarlara nüfuz etme ve rakipleri analiz etme görevini üstlenmişlerdir.

21. yüzyıla gelindiğinde, küresel markaların yaygınlaşması ve uluslararası piyasaların büyümesiyle birlikte, devletlerin pazar istihbaratı sağlama konusundaki rolü resmi bir nitelik kazanmıştır. Örneğin ABD federal hükümeti, pazar sınırlarını ulusal ve uluslararası çapa genişletmek için yalnızca ulaştırma ve posta sistemlerini sübvanse etmekle kalmamış; aynı zamanda kurduğu uzman bürolar ve ajanslar aracılığıyla

işletmelere doğrudan pazar verisi ve istihbarat hizmeti sağlamıştır. Devlet destekli bu bilgi akışı, kitlesel bir tüketici kültürünün yaratılmasında belirleyici olmuş; modern vitrin tasarımı, reklamcılık ve seri üretim yönetimlerinin gelişmesiyle birlikte orta sınıfın pazar davranışlarını ve tüketici istihbaratını okumak, kurumsal dış ticaretin temel başarı faktörü haline gelmiştir (Casson & Lee, 2011).

3.2. Dış Ticaret İstihbaratında Türkiye Tarihi

Türkiye'nin 1930'lu ve 1940'lı yıllarda Balkan pazarında yürüttüğü dış ticaret istihbaratı ve pazar araştırması faaliyetleri, dönemin siyasi ve ekonomik gelişmeleriyle paralel olarak kronolojik bir gelişim göstermiştir. Sürecin ilk belirgin örnekleri 1931 yılında Yunanistan'ın Selanik Panayırına yaptığı davetle ortaya çıkmıştır. Bu dönemde Atina Elçisi Mehmet Enis (Akaygen) Bey, hedef pazarın güncel durumunu merkeze raporlayarak fiili bir ticari ateşe ve istihbaratçı gibi çalışmıştır. Yunanistan'da dericilik ve dokumacılık sanayisinin gelişmekte olduğunu tespit eden Enis Bey, Türkiye'nin bu pazara ham deri, pamuk, yün ve ipekli kumaş gibi ürünler ihraç edebileceği istihbaratını Hariciye Vekaletine sunmuştur. Aynı yıl içerisinde dönemin basının da adeta bir açık kaynak istihbaratı platformu gibi işlev görmüştür. Örneğin Cumhuriyet gazetesi, Yunan pazarının detaylı bir analiz yayınlayarak Yunanlıların tarım, hayvancılık, dokuma ve inşaat malzemesi ithalatını kısmaya çalıştıklarını; bu nedenle Türk tüccarlarının pazara afyon, tütün, zeytinyağı ve halı gibi spesifik ürünler sunması gerektiğini detaylandırmıştır. 1934 yılında Balkan Antantı'nın imzalanması ve antlaşmaya taraf ülkeler tarafından bir Ekonomik Konsey'in kurulmasıyla siyasi ilişkiler iktisadi sahaya da taşınmış ve dış ticaret istihbaratı daha kurumsal bir yapıya bürünmüştür. Bu kurumsallaşmanın aktörlerinden olan Türkofis'in devreye girmesi ve resmi bültenler (Türkofis Ekonomik Enformasyon Bülteni, Dış Ticaret Dairesi Enformasyon Bülteni vb.)

aracılığıyla Pazar verilerinin işlenmesi bu döneme rastlar. Elde edilen Pazar verilerinin ışığında 1935 yılında Selanik Panayırına ilk kez resmi düzeyde ve organize bir şekilde katılım sağlanmış; pazarın ihtiyaçlarına göre özenle seçilmiş ham deri, pamuk, kömür ve hububat gibi numuneler özel komiserler eşliğinde yabancı alıcılara sunularak hedef pazara doğrudan nüfuz edilmiştir. 1938 yılına gelindiğinde, Belgrad Fuarı ile birlikte pazar istihbaratının yanı sıra, ülkenin ekonomik gelişimini hedef kitleye veri odaklı aktarma stratejisi devreye girmiştir. Türkiye, sanayisinin gelişmişliğini göstermek için ihraç ürünlerin sergilemekle kalmamış; Cumhuriyet rejiminin sanayi ve iktisat alanındaki ilerlemeleri karşılaştırmalı tablolar ve grafikler halinde hedef ülkenin kamuoyuna sunarak pazardaki güvenilirliği ve imajı pekiştirmiştir. İkinci Dünya Savaşı'nın zorlu koşullarına rağmen, 1942 yılında Bulgaristan'da düzenlenen Filibe Numune Sergisi'nde dış ticaret istihbaratının en somut ve sahada teknolojik incelemesi (sanayi ve teknoloji istihbaratı) boyutu hayata geçirilmiştir. İcra Vekilleri Heyeti'nin 24 Nisan 1942 tarihli özel kararıyla sergide bulunan yabancı teknolojik ürünleri, özellikle "kendir soyma, ev ve köy dokumacılığı makine ve malzemelerini" yerinde incelemek ve teknik bilgi toplamak amacıyla İktisat Vekaleti Sanayi Müfettişlerinden Suat Varoşoğlu ile Sümerbank Yüksek Mühendisi İbrahim Akçura özel bir görevlendirmeyle Bulgaristan'a gönderilmiştir. (Şahin, 2022)

Bu süreç, Türkiye'nin erken Cumhuriyet döneminde dış pazarları analiz etme ve ticari varlığını arttırma pratiğinin; elçilik raporları ve basın bildirileriyle başlayıp, zamanla kurumların veri inceleme ve nihayet mühendis ve müfettişlerin katıldığı doğrudan teknolojik ve endüstriyel istihbarat görevlerine doğru nasıl bir şekilde evrildiğini tarihsel bir sırayla açıkça ortaya koymaktadır.

Türkiye'nin dış ticaret ve ihracat serüveni, 1980 yılında yürürlüğe konulan 24 Ocak kararları ile ithal ikameci sanayileşme modelinin ve bürokratik modelin benimsemesiyle büyük bir

kırılma yaşanmıştır. Bu dönemde bürokratik engeller azaltılmış, sabit kurdan ziyade gerçekçi ve esnek kur sistemine geçiş yapılmış ve ihracat seferberliği başlatılmıştır. 1980'lerin başında ağırlıklı olarak tarım ürünlerine dayanan ihracat kompozisyonunu desteklemek ve geliştirmek için, 1983 yılından itibaren dış ticaret rejimi daha da liberalleştirilerek ihracatçılara vergi iadesi, gümrük muafiyeti ve ucuz kredi gibi teşvikler sunulmuştur. İhracatın finansmanını güvence altına almak ve Türk ihracatçısının dış pazardaki rekabet gücünü arttırmak amacıyla 1987 yılında Türk Eximbank kurulmuştur. 1990'lı yılların başlarında Körfez Savaşı gibi dış etkenler ile yüksek enflasyon ve artan kamu açıkları gibi kronik iç sorunların birleşmesi, ihracat performansında bir yavaşlamaya neden olmuştur. Ancak 1994 yılında yaşanan ekonomik krizin ardından uygulamaya konulan 5 Nisan kararları ve gerçekleştirilen yüksek oranlı devalüasyon, Türkiye'nin uluslararası piyasalardaki rekabet gücünü yeniden sağlamıştır. Aynı dönemde, küresel çapta GATT sürecinin tamamlanması ve 1 Ocak 1996 tarihinden itibaren Avrupa Birliği ile Gümrük Birliği'ne gidilmesi kararının alınması, Türkiye'nin dış ticaretini ve ihracat teşvik mevzuatını uluslararası normlara uygun yeni bir yapısal dönüşüm sürecine sokmuştur. 1990'ların sonlarına doğru ihracat, küresel ve bölgesel krizlerin doğrudan hedefi haline gelmiştir; 1997'de Asya'da başlayan ve 1998'de Türkiye'nin en önemli pazarlarından biri olan Rusya'ya sıçrayan mali kriz dış talepte büyük bir daralma yaratmıştır. Ardından 1999 yılından yaşanan 17 Ağustos Marmara Depremi'nin ülkenin en önemli sanayi ve ticaret bölgesini vurmasıyla üretim büyük yara almış ve ihracat 1980'den o güne ilk kez gerileyerek 26.6 milyar dolar düşmüştür. 2000 yılında IMF destekli İstikrar Programı kapsamında kurun çıpa olarak kullanılması nedeniyle Türk Lirası'nın değerlenmesi, ihracatı olumsuz etkileyen faktörlerden biri olmuştur. 2001 yılında Şubat ayında patlak veren krizle birlikte dalgalı kur rejimine geçilmesi ve Türk Lirası'nın hızla değer kaybetmesi, iç piyasada ciddi bir daralma yaratırken

üreticileri zorunlu olarak dış pazarlara yöneltmiştir. Bu süreçte devalüasyonun sağladığı maliyet avantajı ile birlikte "Komşu Ülke Stratejisi" ve dünyada "Türk Malı" imajının yerleşmesi gibi yeni Pazar ve tanıtım atakları başlatılmıştır. Bu atılımların ve toparlanma sürecinin etkisiyle ihracat 2002 yılında 35.7 milyar dolara, 2003 yılında ise yaklaşık 47 milyar dolara ulaşarak çok güçlü bir artış trendi yakalamıştır. Bu tarihte süreç boyunca, 1980 yılında toplam ihracatın %57,4'ünü oluşturan tarım ürünlerinin yerini, 2000'li yıllara gelindiğinde %90'ın üzerinde bir paya ulaşan ve ağırlıklı olarak otomotiv, elektronik ile hazır giyimden oluşan imalat sanayi ürünleri alarak Türkiye'nin ihracat yapısında radikal bir dönüşüm gerçekleşmiştir. (Oskay, 2004)

3.3. 2010 Sonrası Dış Ticaret İstihbarat Merkezleri

Türkiye de ihracatçılara yardımcı olmak için kamu ve kamu yararına çalışan kuruluşlar tarafından kurularak faaliyetlerde bulunan yapılar Dış Ticaret İstihbarat Merkezleri (DTİM) lerdir. Türkiye de kurulan ilk dış ticaret istihbarat merkezi Gaziantep Sanayi Odası tarafından Gaziantep Organize Sanayi Bölgesinde bulunan Gaziantep OSB Dış Ticaret İstihbarat Merkezidir. Uluslararası Ticaretin giderek karmaşıklaşması ve yüksek rekabet ortamının doğması, işletmelerin dış ticaret süreçlerinde nitelikli veriye olan ihtiyacını artırmıştır (Çevikoğlu & Melemen, 2023)

Bu ihtiyaca cevap vermek üzere Türkiye'de Organize Sanayi Bölgeleri (OSB), Ticaret ve Sanayi Odaları ile İhracatçı Birlikleri bünyesinde Dış Ticaret İstihbarat Merkezleri (DTİM) kurulmaya başlanmıştır. (OSBÜK, 2021). Bu merkezlerin kuruluş amacı, bölge firmalarını sistemli bir şekilde dünya pazarlarına açmak ve sürdürülebilir bir ihracat yapısı kurmalarına destek olacak ticari istihbaratı sağlamaktır. Merkezleri kurulum finansmanı genellikle Kalkınma Ajanslarının destek programlarına sunulan projelerle veya ilgili kurumlar (örn.

OSB'lerin) kendi öz kaynaklarıyla karşılanmaktadır. Kurulumun fiziki ve beşeri altyapı aşamasında, ihracat potansiyeline uygun olarak en az iki dış ticaret istihbarat uzmanı ile süreci yönetecek bir merkez koordinatörü istihdam edilir. Uzmanlar, 6 haftası teorik ve 6 haftası pratik olmak üzere toplam 12 haftalık özel bir dış ticaret istihbarat eğitiminden geçirilirler. Merkezin dijital altyapısını kurmak için özel bir web sayfası hazırlanır ve Trade Map, D&B Hoovers, Tendata, Reportlinker ve DG Market gibi uluslararası ticari veri tabanlarına resmi açılış öncesinde üyelik gerçekleştirilir. Resmi faaliyetlere başlamadan evvel ise, bölge firmalarına ücretsiz pilot danışmanlık hizmetleri verilerek sistemin pratiği yapılır ve hizmet kalitesi artırılır. DTİM'ler, geleneksel pazarlama anlayışından farklı olarak doğrudan "nokta atışı" ticari bilgiye ulaşmayı hedefler (Çevikoğlu & Melemen, 2023).

4. DIŞ TİCARET İSTİHBARATININ ETİĞİ

İşletme etiğinin temel taşlarından biri, rekabet ortamının korunması sağlamaktır. Sağlıklı bir rekabetin sürdürülebilmesi için piyasadaki tüm aktörlerin eşit koşullarda mücadele etmesi şarttır. Dış Ticaret İstihbarat faaliyetleri, küçük ölçekli aktörlerin normalde erişemediği kritik verilere ulaşmasını sağlayarak bu dengeyi kurar. Teknik ve operasyonel donanımı kısıtlı olan zayıf aktörleri, bilgiye kolayca ulaşabilen dev yapılar karşısında güçlendirir. Dış Ticaret İstihbarat Merkezlerinin en önemli görevi, ihracat potansiyeli olan KOBİ'lere stratejik bilgi desteği sunmaktır. Bu bilgiler "ticari sır" niteliği taşısa bile, aslında küresel devlerin halihazırda sahip olduğu ve kullandığı verilerdir. Bu merkezler sayesinde bilgi demokratikleşmekte ve rekabet daha adil bir zemine taşımaktadır. Uygun denetim ve mevzuatlar sayesine "Ticari Sır" kapsamında bulunan ticari etik ihlalleri engellenebilir.

5. SONUÇ

Dünya'da birçok ülke çok eski çağlardan beri istihbarat faaliyetlerinde bulunmuşlardır. Bu istihbarat faaliyetleri dünyayı gezen tüccarların gezdikleri yerler hakkında bilgileri ülke yöneticilerine aktarmasıyla başlamıştır. Ekonomik ve Ticari istihbarat faaliyetleri ülkelerin gelirlerini arttırmak için zaman zaman kullanılmıştır. Bunun tarihe geçen ilk örneği İtalyan Tüccar Francesco Di Marco DATİNİ'dir. Onun yazdıkları bu gün ki Dış Ticaret İstihbaratının temellerini oluşturur. Türkiye kuruluşundan itibaren birçok Dış Ticaret İstihbaratı faaliyetinde bulunarak ihracatçısına bilgi sağlamıştır. Günümüzde Organize Sanayi Bölgeleri, Sanayi Odaları, İhracatçılar Birlikleri ve Kalkınma Ajanslarının destekleyerek kurdukları Dış Ticaret İstihbarat Merkezleri tarafından Dış Ticaret İstihbaratı planlı, organize ve kurumsal olarak devam etmektedir. Doğru bilginin doğru zamanda, bu kuruluşlar aracılığıyla ihracatçıya ulaşması çok önemlidir. Bununla birlikte rekabet ortamından doğan sorumlulukları bulunmaktadır. Yerli ihracatçıların müşteri bilgilerinin diğer yerli firmalarla paylaşılması, hem mevcut ihracatçılara hem de potansiyel girişimcilere ticari zarar vermekte; aynı zamanda ticari etik açısından ciddi problemler yaratmaktadır. Buna karşın, yurt dışındaki rakiplerin ihracat verilerine erişim sağlanması, yerli firmalarımıza zaman ve maliyet avantajı sunarak milli sermayeyi güçlendirir ve döviz girişini artırır. Bu süreçte devletin temel sorumluluğu; Dış Ticaret İstihbarat Merkezleri aracılığıyla gerekli etik eğitimleri vermek, bu kuruluşları denetlemek ve yerli ihracatçının ticari sırlarını koruma altına almaktır. Bu ticari sırların saklanması, depolanması ve paylaşılması da yine ticari etik konusunda uzmanlaşmış kişilerce yürütülmelidir. Zira etik standartlar, verinin sadece korunması değil, aynı zamanda haksız rekabet önleyerek yurt içindeki güven ortamının sürdürülebilirliğini sağlar. Kısa kazanç

uzun müşteri getirmez bu yüzden ticaret sadece kar değil güven ve itibar işidir.

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CULTURAL INTELLIGENCE AND JOB PERFORMANCE IN EXPORT COMPANIES: CASE OF KONYA[1]

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1. INTRODUCTION

As the world has become a single market as a result of globalization, people have started to find the opportunity to work not only with companies within the borders of the country but also with companies all over the world. They have started to travel from different regions and different cultures. Especially in exporting companies, it becomes inevitable to have employees from different cultures. Positive or negative interaction between people or groups intertwined with different cultures is inevitable. In this study, the effect of this interaction on job performance is analyzed.

Cultural intelligence is the ability to assimilate, understand, evaluate and adopt different cultures in order to manage differences in multicultural settings where many different cultures coexist. According to their level of cultural intelligence, people can adapt more easily to their new society and change their

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social life skills quickly, thus gaining an important advantage in their new life.

In this study, the possible effect of cultural intelligence of employees in exporting companies on job performance is examined. In particular, it aims to better explain the relationship between cultural intelligence and job performance by analyzing the job performance of employees in exporting companies operating in Konya province. This study will contribute to our understanding of the role of cultural intelligence in the business world and to develop strategies for businesses to succeed in the international platform.

2. LITERATURE REVIEW

Ng et al. (2009) reveal that emotional and practical intelligence affect many organizational behaviors such as leadership and management performance. It was also hypothesized that intelligence tests measuring general mental ability can predict performance in different occupations.

Masrek et al. (2021) examined the relationship between cultural intelligence and job performance in academic librarians. The study was conducted on 305 librarians working in academic libraries in Indonesia. The results showed that all metacognitive, cognitive, motivational and behavioral dimensions of cultural intelligence have a determinant effect on job performance.

Research has demonstrated the ability of cultural intelligence to be effectively applied in a variety of cultural settings. The question that arises in this context is: Can cultural intelligence really make people effective and productive in different cultural settings? Ang et al. (2007) note that although the fieldwork is relatively new, the early results are promising. They showed that there is a relationship between four different

aspects of cultural intelligence and cross-cultural performance. Cross-cultural performance is considered in four different dimensions: cultural decision making, job performance, cultural adaptation and cultural appraisal.

In a study conducted by Wang (2016), the results obtained on the staff of multinational companies operating in the People's Republic of China showed that employees with high levels of cultural intelligence can quickly adapt themselves in new cultural environments and this adaptation can be seen in their body language and behavior. As a result of this flexibility, statistical analyses have demonstrated that employees perform superior job performance in new work environments.

In another study, Templer et al. (2006) found that motivational cultural intelligence is an important factor in cross-cultural adaptation. In this study, motivational cultural intelligence was found to be positively related to three types of responses (general, work-related and behavioral).

Burakova and Filbien (2020) examined the relationship between cultural intelligence and job performance in immigrant individuals and analyzed how intercultural adaptation plays a role in this relationship. The sample group of the study consisted of 201 French immigrants. The findings showed that motivational and behavioral sub-dimensions of cultural intelligence have a positive and significant relationship with job performance. However, the metacognitive dimension of cultural intelligence was not found to be related to job performance.

3. METHODOLOGY

The purpose of this study is to understand the impact of cultural factors on job performance in today's global business world. Exporting companies in Konya are organizations that

interact with different cultures and operate in international markets. In this context, this study aims to examine in depth how cultural intelligence—that is, the ability to understand cross-cultural interactions, adapt, and communicate effectively—affects the job performance of such companies.

The study focused on revealing how cultural intelligence affects managers, employees, and business processes at exporting companies in Konya, and how this effect is reflected in job performance. The research aimed to highlight the importance of cultural intelligence in the business world and to offer a guiding perspective on how companies can develop cultural intelligence to succeed in the global competitive environment.

Foreign labor in our country contributes positively or negatively to our exporting companies. In this context, the evaluation and analysis of cultural intelligence is important. This study is important in terms of evaluating the place of cultural intelligence in exporting companies in the province of Konya and analyzing work performance. Since there are not enough studies in the literature evaluating the effect of cultural intelligence on work performance, this study is important in terms of contributing to the literature and serving as a source for future research.

The research was conducted on companies exporting from the province of Konya. Since the population was inaccessible, it was considered that a sample size of 170 participants, which is five times the number of statements in the research scales, would be sufficient. There are different opinions in the literature regarding the determination of sample size. Studies state that the sample size should be at least five times, ten times, or three to six times the number of statements, that there should be at least 100 participants, or that there should be more than 200 participants (Kilis and Yıldırım 2018). Regarding participation in the research, 170 participants were reached at a 5% significance level

and a 95% confidence interval, who voluntarily completed the questionnaires in full. Since all participants answered the questions completely, there is no missing questionnaire data.

The questionnaire form used as the data collection tool for the study consists of three different sections. The introductory section contains 20 cultural intelligence questions with statements related to cultural intelligence behaviors, the second section contains 14 questions related to participants' job performance, and the third section contains 5 general questions about the participants. The study by İlhan and Çetin (2014) was used as a source in the adaptation process of the cultural intelligence scale, while the study by Köroğlu Kaba and Öztürk (2021) was used as a source in the adaptation process of the work performance scale. The questionnaire forms were administered face-to-face by the researcher by visiting companies.

During the data analysis, the collected data were examined individually, entered into the SPSS25 software package, and organized. Since ready-made scales were used for the research model being measured in the study, confirmatory factor analysis (CFA) was used directly. The statements included in the scales were validated on the studied sample using confirmatory factor analysis (CFA) with the LISREL 8.80 program. CFA was presented in two parts: first and second order. Structural equation modeling (SEM) was preferred to prove the research model.

4. RESULTS

Table 1. Internal consistency values of the cultural intelligence scale

Scale	Number of Expressions	Cronbach Alpha (α)	Composite Relability (CR)
Metacognition	4	,75	,76
Cognition	6	,80	,81
Motivational	5	,74	,73
Behavioral	5	,69	,70
TOTAL	**20**	**,85**	-

The Cronbach Alpha values of the items included in the scale in are presented Table 1. The reliability of the cultural intelligence scale was calculated through analyses based on the responses of 170 participants to the survey. Within the scope of the scale reliability analysis of the study, Cronbach Alpha for internal consistency reliability and CR (Composite Reliability) coefficients for composite reliability were examined. When we compare the obtained values with those of the study from which the scale was taken, the values indicate that the cultural intelligence scale is reliable.

Table 2. Internal Consistency Values of the Job Performance Scale

Scale	Number of Expressions	Cronbach Alpha (α)	Composite Relability (CR)
Task Performance	5	,74	,73
Contextual Performance	6	,74	,76
Counterproductive Work Behaviour	3	,73	,70
TOTAL	**14**	**,84**	**-**

Table 2 presents the Cronbach Alpha values of the items included in the scale. The reliability of the job performance scale was calculated based on analyses of the responses provided by 170 participants in the survey. Within the scope of the scale reliability analysis of the study, Cronbach Alpha for internal consistency reliability and CR (Composite Reliability) coefficients for composite reliability were examined. The obtained values indicate that the scale is reliable. When we compare these values with those of the study from which the scale was taken, it shows that the job performance scale is reliable.

Table 3. Demographic Findings

Variable	Category	f	%	Variable	Category	f	%
Gender	Male	90	52,9	**Marital Status**	Married	78	45,9
	Female	80	47,1		Single	92	54,1
	Total	**170**	**100**		**Total**	**170**	**100**
Age	24 years old and younger	26	15,3	**Education**	Elementary school	3	1,8
	24-30	55	32,4		Middle school	7	4,1
	31-37	48	28,2		High school	30	17,6
	38-44	22	12,9		Bachelor's degree	89	52,4
	45-51	15	8,8		Postgraduate	41	24,1
	52 years of age and older	4	2,4		**Total**	**170**	**100**
	Total	**170**	**100**				

Table 3 shows that 52.9% of participants were male and 47.1% were female. Participants' ages ranged from 24 years old and younger to 52 years old and older. 15.3% are aged 24 and younger, 32.4% are aged 24-30, 28.2% are aged 31-37, 12.9% are aged 38-44, 8.8% are aged 45-51, and 2.4% are aged 52 and older. Of the participants, 45.9% were married and 54.1% were single. Of the participants, 1.8% reported having a primary school education, 4.1% a middle school education, 17.6% a high school education, 52.4% a bachelor's degree, and 24.1% a postgraduate degree.

The findings regarding the answers given by 170 participants to the nationality question are at Table 4.

Table 4. Nationality related to demographic structure

Variable	Category	f	%	Variable	Category	f	%
Nationality	Afghanistan	1	0,6	Nationality	Kyrgyzstan	3	1,8
	Algeria	9	5,3		Lebanon	2	1,2
	Andorra	1	0,6		Luxembourg	1	0,6
	Argentina	1	0,6		Mexico	2	1,2
	Armenia	1	0,6		Moldova	1	0,6
	Azerbaijan	4	2,4		Mongolia	1	0,6
	Bahrain	1	0,6		Morocco	5	2,9
	Bangladesh	2	1,2		Nigeria	1	0,6
	Bolivia	1	0,6		Qatar	1	0,6
	Bosnia Herzegovina	1	0,6		Pakistan	1	0,6
	Brazil	4	2,4		Palestine	1	0,6
	Bulgaria	2	1,2		Peru	1	0,6
	Canada	1	0,6		Republic of Macedonia	8	4,7
	Chad	1	0,6		Russia	8	4,7
	China	1	0,6		Saudi Arabia	6	3,5
	Czech Republic	4	2,4		Senegal	3	1,8
	Egypt	2	1,2		Sweden	1	0,6
	France	1	0,6		Singapore	1	0,6
	Germany	2	1,2		South Korea	1	0,6
	Ghana	1	0,6		Spain	2	1,2
	Haiti	1	0,6		Sudan	1	0,6
	Hungary	2	1,2		Syrian Arab Republic	14	8,2
	India	1	0,6		Tajikistan	3	1,8
	Indonesia	3	1,8		Tunisia	3	1,8
	Iran	10	5,9		Turkish Republic of Northern Cyprus	5	2,9
	Iraq	16	9,4		UK	1	0,6
	Jordan	2	1,2		United Arab Emirates	1	0,6
	Kazakhstan	3	1,8		USA	1	0,6
	Kenya	2	1,2		Uzbekistan	5	2,9
	Kosovo	2	1,2		Yemen	2	1,2
	Kuwait	1	0,6		**Total**	**170**	**100**

According to Table 4, participants represent 61 different nationalities. The nationality with the highest percentage of participants is Iraqi, by 9.4%. Syrian nationality ranks second, by 8.2%. Iranian nationality ranks third, by 5.9%.

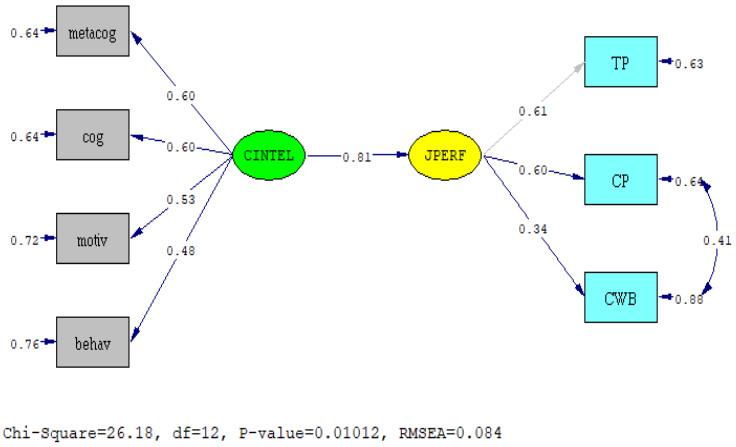

Figure 1. DFA model showing the relationship between cultural intelligence and job performance scale

The DFA model and coefficients related to the Cultural Intelligence and Job Performance scale are shown in Figure 1 as a result of the analysis.

Confirmatory factor analysis (CFA) was conducted to assess the fit of the proposed measurement model to the data. The model includes two latent variables: CINTEL and JPERF. According to the analysis results, the model's fit indices were found to be $\chi^2(12) = 26.18$, $p = .010$ and RMSEA = .084. The fact that the chi-square test was significant indicates that a perfect fit between the model and the data could not be achieved. However, it is known that the chi-square statistic is sensitive to sample size. The fact that the RMSEA value is close to the .08 threshold, however, suggests that the model exhibits an acceptable level of fit.

The latent variable CINTEL was measured by the metacognitive (metacog), cognitive (cog), motivational (motiv) and behavioural (behav) dimensions. The factor loadings were found to be .60, .60, .53 and .48, respectively. The results indicate that the metacognitive and cognitive dimensions represent the relevant construct to a moderate extent. Whilst the factor loading for the motivational dimension falls within acceptable limits, it is relatively lower. The fact that the factor loading for the behavioural dimension remains below .50 suggests that this indicator has a more limited ability to represent the CINTEL construct compared to the other indicators.

The latent variable JPERF, meanwhile, was measured using indicators of task performance (TP), contextual performance (CP) and counterproductive work behaviour (CWB). The standardised factor loadings for these indicators were calculated as .61, .60 and .34, respectively. Whilst the TP and CP variables possess acceptable factor loadings, the CWB indicator is observed to exhibit a rather low loading value. This finding suggests that the CWB variable does not adequately represent the JPERF structure and serves as a weak indicator within the measurement model.

The model also identifies a covariance of .41 between the error terms of the CP and CWB indicators. This indicates that these indicators share additional common variance beyond that explained by the latent structure. Provided that the relationship between the error terms can be theoretically explained, such modifications are regarded as acceptable adjustments that improve the fit of the measurement model.

An evaluation of the structural model results reveals that CINTEL has a strong and positive effect on JPERF ($\beta = .81$). This coefficient indicates that an increase in CINTEL is associated with a significant and substantial increase in JPERF. Taking the

standardised coefficient squared into account, it can be said that CINTEL explains approximately 66 per cent of the variance in JPERF ($R^2 \approx .66$). This result demonstrates that the CINTEL variable is a significant predictor of JPERF.

Table 5. The relationship between cultural intelligence and work performance scale t-values, standardized factor loadings, error variance, and goodness-of-fit indices

Factor	**Proposals**					**Standardized Factor Loadings**	**t Value**	**Variance (%)**
Cultural Intelligence	Metacognition					0,60	7,01	0,64
	Cognition					0,60	6,93	0,64
	Motivational					0,53	6,09	0,72
	Behavioral					0,48	5,55	0,76
Work Performance	Task Performance					0,61	-	0,63
	Contextual Performance					0,60	4,56	0,64
	Counterproductive Work Behaviour					0,34	3,04	0,88
Goodness of Fit	**χ2/df**	**RMSEA**	**GFI**	**NFI**	**AGFI**	**NNFI**	**CFI**	**SRMR**
Value	2,18	0,084	0,96	0,92	0,90	0,92	0,96	0,050
Status	Acceptable Fit	Acceptable Fit	Good Fit	Acceptable Fit	Good Fit	Acceptable Fit	Good Fit	Good Fit

Table 5 presents the results of the confirmatory factor analysis between the cultural intelligence and work performance scales. According to the analysis results, the fit indices of the measurement model were found to be $\chi^2/df = 2.18$, RMSEA = .084, GFI = .96, AGFI = .90, NFI = .92, NNFI = .92, CFI = .96 and SRMR = .050. Taking into account the threshold values accepted in the literature, the fact that the χ^2/df ratio is below 3, the GFI and CFI values are above .95, and the SRMR value is below .08 indicates that the model demonstrates a generally good level of fit. Although the RMSEA value of .084 falls within acceptable fit limits, it indicates that the model could be improved. However, the high levels of the other fit indices demonstrate that the measurement model is sufficiently consistent with the data.

The latent variable of cultural intelligence was represented by metacognitive, cognitive, motivational and behavioural dimensions. The standardised factor loadings for these dimensions were found to be .60, .60, .53 and .48, respectively. The latent variable of job performance, on the other hand, was

measured using the dimensions of task performance, contextual performance and counterproductive work behaviour, with standardised factor loadings calculated as .61, .60 and .34, respectively. It was determined that all factor loadings were statistically significant (t = 3.04–7.01). This finding indicates that the observed variables meaningfully represent the relevant latent structures.

An analysis of the factor loadings reveals that the metacognitive and cognitive dimensions of cultural intelligence represent the cultural intelligence construct to a moderate extent. Similarly, the task performance and contextual performance dimensions have emerged as meaningful indicators of the job performance construct. In contrast, it was determined that the behavioural cultural intelligence dimension (λ = .48) and, in particular, the counter-productive work behaviour dimension (λ = .34) have lower factor loadings compared to the other indicators. However, the fact that the t-values for these indicators are significant indicates that the dimensions in question are statistically significantly related to the relevant latent variables. Furthermore, given that the structures of cultural intelligence and work performance are theoretically composed of multidimensional sub-dimensions with distinct characteristics, a certain degree of variation in factor loadings can be regarded as an expected outcome.

In conclusion, the DFA findings indicate that the predicted two-factor structure of the cultural intelligence and job performance scales has been generally confirmed. The fit indices obtained and the significant factor loadings indicate that the measurement model possesses an acceptable level of construct validity. However, due to the relatively low factor loadings for the behavioral cultural intelligence and counterproductive work behavior dimensions, it is recommended that these dimensions be

retested in different samples in future studies and that the measurement model be compared with alternative structures.

This study is limited to companies engaged in export activities in the province of Konya. Since the companies included in the study are export firms, delays occurred in data collection due to the fact that the respondents were traveling abroad. This situation can be considered a limitation that prevents reaching the entire population.

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ULUSLARARASI TİCARET ALANINDA

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