





## İktisat Politikası Araştırmaları Dergisi Journal of Economic Policy Researches

Research Article

 Open Access

### Exploring the Factors Influencing the Export Performance of Manufacturing SMEs in Türkiye



Güzin Emel Akkuş<sup>1</sup>   & Deniz Yalabırtorkaman<sup>2</sup> 

<sup>1</sup> Istanbul University, Faculty of Economics, Department of Economics, İstanbul, Türkiye

<sup>2</sup> Istanbul University Institute of Social Sciences, Faculty of Economics, Department of Economics, İstanbul, Türkiye

#### Abstract

This study investigates the factors influencing export performance among manufacturing small and medium-sized enterprises in Türkiye. Situated at the intersection of Europe and Asia, Türkiye has increasingly prioritized exports as a central component of its economic development strategy, with particular emphasis on integrating small and medium-sized enterprises into global markets. Despite their importance to the national economy, many of these enterprises continue to face challenges in achieving sustained export growth.

Drawing on internationally recognized theories of internationalization, such as the gradualist Uppsala Model and Born Global Model, this study examines how firm-level characteristics, such as firm age and innovation capacity, are associated with export behavior. The empirical analysis is based on the most recent wave of the World Bank Enterprise Survey for Türkiye, which provides nationally representative firm-level data. The focus is placed exclusively on manufacturing firms to ensure sectoral consistency.

To capture the dual structure of the export decision process, a two-stage econometric approach is applied. A Probit model is used to estimate the probability of a firm participating in export activities, whereas a Tobit model assesses the intensity of export sales among exporting firms.

The results reveal that firm age, labor productivity, innovation activities, quality certifications, research and development investments, and website ownership are all statistically significant determinants of export performance. These findings indicate that enhancing innovation capabilities and digital presence, along with promoting internationally recognized quality standards, may strengthen the competitiveness of manufacturing enterprises in Türkiye's export markets.

#### Keywords

SMEs · Export Performance · Manufacturing Industry · Probit · Tobit

#### JEL Classification


F14 · L25 · M21



Citation: Akkuş, G. E. & Yalabırtorkaman, D. (2026). Exploring the factors influencing the export performance of manufacturing SMEs in Türkiye. *İktisat Politikası Araştırmaları Dergisi–Journal of Economic Policy Researches*, 13(1), 165-179. <https://doi.org/10.26650/JEPR1721970>

 This work is licensed under Creative Commons Attribution-NonCommercial 4.0 International License. 

© 2026. Akkuş, G. E. & Yalabırtorkaman, D.

 Corresponding author: Güzin Emel Akkuş [eakkus@istanbul.edu.tr](mailto:eakkus@istanbul.edu.tr)



## Exploring the Factors Influencing the Export Performance of Manufacturing SMEs in Türkiye

Small and medium-sized enterprises (SMEs) are typically defined by criteria such as the number of employees, annual turnover, or capital investment, though exact definitions vary across institutions and countries. In Türkiye, SMEs are enterprises with fewer than 250 employees and an annual turnover or net sales not exceeding 250 million TRY and are further classified as micro, small, or medium-sized according to their size (KOSGEB, 2023).

SMEs are widely recognized as key drivers of economic growth, innovation, and employment in emerging and advanced economies. In Türkiye, SMEs constitute 99.7% of all enterprises and employ approximately 71% of the workforce, playing a crucial role in the country's economic development (Turkish Statistical Institute, 2021). Exports have long been a strategic priority for Türkiye, seen as a mechanism to enhance industrial modernization, access broader markets, foster innovation, and reduce external vulnerabilities. Positioned at the crossroads of Europe and Asia, Türkiye leverages its unique geographical location to connect with diverse regional and global markets.

Foreign trade plays a key role in economic growth by enabling firms to reach wider markets, specialize in their strengths, adopt new technologies, and improve their competitiveness. For SMEs, exporting not only enables growth beyond the saturated domestic market but also drives improvements in efficiency, quality standards, and innovation capacity (European Commission, 2019). However, despite the strategic emphasis on exports, Turkish SMEs face structural barriers that limit their internationalization potential, including access to finance, regulatory constraints, and limited technological capabilities, as evidenced by comparative analyses using the Small Business Act (SBA) Fact Sheets.

Türkiye performs relatively strongly in entrepreneurship indicators compared to EU averages. According to the SBA Fact Sheets, Türkiye's early-stage entrepreneurial activity rate is 11.42%, compared to the EU average of 7.64%, and entrepreneurial intention among adults reaches 24.83%, significantly above the EU average of 12.56% (European Commission, 2019). In terms of innovation activities, 50.4% of Turkish SMEs engage in marketing or organizational innovation, and 41% conduct in-house innovation, exceeding the EU averages of 33.43% and 28.95%, respectively. Nevertheless, challenges persist, particularly in access to finance, where 32.18% of Turkish SMEs report deterioration in bank financing conditions compared to 9.68% in the EU, and payment periods average 81 days, far longer than the EU average of 33.36 days. Integration into international digital markets also remains limited, with Turkish SMEs' cross-border e-commerce activity significantly lower than that of their European counterparts.

Understanding the process of SME internationalization has been extensively studied within different theoretical frameworks. Among the most prominent are the Uppsala Model and Born Global Model. The Uppsala Model posits that firms gradually internationalize based on incremental learning and accumulated experiential knowledge. It implies that older firms with broader market experience are more likely to engage in export activities (Johanson & Vahlne, The internationalization process of the firm: A model of knowledge development and increasing foreign market commitments, 1977). Conversely, the Born Global Model emphasizes that firms can achieve early and rapid internationalization due to strong innovation capacity, global vision, and proactive international strategies from inception (Knight & Cavusgil, The Born Global Firm: A challenge to traditional internationalization theory, 1996).

While a substantial body of literature exists on SME internationalization, empirical research specifically investigating the determinants of export performance among Turkish manufacturing SMEs remains limited.

Considering the pivotal role that SMEs play in Türkiye's economy, there is a pressing need to deepen our understanding of the factors that enable or hinder their successful integration into global markets.

This study aims to explore the firm-level determinants influencing the export performance of manufacturing SMEs in Türkiye. Using data from the World Bank Enterprise Survey (ES), the empirical analysis applies a two-stage approach: a Probit model is used to estimate the probability of export participation, and a Tobit model is used to analyze the extent of export intensity among exporting firms. The variables considered include labor productivity, firm age, SME status, quality certifications, website ownership, and research and development (R&D) investments. The findings offer valuable insights for policymakers and stakeholders striving to strengthen the global competitiveness of Turkish SMEs and foster sustainable economic development.

## Theoretical Framework

The internationalization of firms has been the subject of extensive research within international business and economic literature. For SMEs, internationalization is particularly significant, given their constraints in terms of resources, organizational structures, and market power compared to large multinational corporations. Several theoretical models have been developed to explain the internationalization process of SMEs, of which the Uppsala Model and Born Global Model are the most influential.

The Uppsala Model, originally proposed by Johanson and Vahlne (1977), emphasizes the gradual and evolutionary nature of firms' international expansion. According to this model, firms initially enter geographically and culturally proximate markets and, over time, gradually expand to more distant and complex markets as they accumulate experiential knowledge. A key concept within this framework is defined by the authors as "psychic distance", which refers to factors that hinder or disrupt the flow of information between a firm and a foreign market, such as differences in language, culture, political systems, education levels, or industrial development. Firms tend to begin their internationalization journey in markets with low psychic distance, as these environments are perceived as more familiar and less uncertain. As firms acquire market knowledge and international experience, they become better equipped to manage risks and recognize opportunities in psychic distant markets, thus expanding gradually (Johanson & Vahlne, The internationalization process of the firm: A model of knowledge development and increasing foreign market commitments, 1977).

The model highlights the importance of firm-specific learning, market commitment, and risk management. Firms are assumed to incrementally increase their international involvement based on their growing knowledge of foreign markets and operations and a parallel reduction in perceived uncertainty. In the Uppsala framework, firm age and accumulated experience play crucial roles in the internationalization trajectory. Older firms are expected to possess broader knowledge bases, more extensive networks, and more resources to manage the complexities of foreign operations. Consequently, older SMEs are more likely to engage in export activities and to achieve higher levels of export intensity than younger firms.

Despite the significance and wide application of the Uppsala Model in explaining the internationalization process of firms, it has received several criticisms over the years. The most prominent critiques include its overemphasis on gradualism and experiential learning, which do not fully capture the accelerated internationalization paths observed in many modern firms (Oviatt & McDougall, 1994; Bell et al., 2003).

Critics argue that the model assumes a linear and incremental expansion process that overlooks instances where firms enter distant markets rapidly, often driven by global networks, digital capabilities, or niche opportunities (Coviello & Munro, 1997). Moreover, the model has been criticized for being too firm-centric, underestimating the role of inter-organizational relationships, strategic alliances, and external

networks in shaping international behavior (Chetty & Blankenburg Holm, 2000). It is also seen as less applicable to knowledge-intensive industries and digitally enabled firms, where the barriers associated with geographical or cultural distance can be bypassed more easily through technology.

In response to these limitations, Johanson and Vahlne introduced a revised version of the model in 2009, shifting the focus from individual learning and market-specific knowledge to a more network-based perspective. The updated framework highlights the importance of relationship-building, trust, and mutual commitment within international business networks, recognizing that firms often expand abroad not only through step-by-step learning but also through leveraging connections and shared knowledge with other actors in their ecosystems (Johanson & Vahlne, 2009).

In contrast to the gradualist and experiential learning-based approach of the Uppsala Model, the Born Global Model introduces a fundamentally different perspective on SME internationalization. Born Global firms, also referred to as “International New Ventures” (Oviatt & McDougall, 1994), are defined by their rapid and proactive engagement in international markets, often within the first few years of establishment. Unlike traditional models that emphasize a step-by-step expansion from domestic to nearby foreign markets, Born Globals target international markets from the outset, treating global opportunities not as extensions of domestic success but as primary strategic goals.

The term “Born Global” was first popularized in a McKinsey report (Rennie, 1993), and subsequent literature has used similar terms such as “global startups” (Oviatt & McDougall, 1994), “innate exporters” (Ganitsky, 1989), and “instant internationals” (Preece, Miles, & Baetz, 1999). While definitions vary slightly, a commonly cited criterion is that Born Global SMEs begin exporting within 2–3 years of their founding and generate at least 25% of their revenue from foreign markets (Knight, 1997; Andersson & Wictor, 2003). More ambitious definitions require foreign sales to reach 75% within the same period (Rennie, 1993).

The theoretical foundation of Born Globals heavily draws on the Resource-Based View (RBV), which emphasizes the strategic importance of firm-specific resources, particularly intangible assets such as knowledge, innovation capability, and entrepreneurial orientation. These resources must be valuable, rare, inimitable, and organizationally embedded to serve as a basis for competitive advantage (Penrose, 1959; Grant, 1996). The RBV is further complemented by the dynamic capabilities perspective, which highlights a firm's ability to adapt, absorb knowledge, and innovate in response to changing international environments (Teece et al., 1997; Weerawardena et al., 2007). Among these, absorptive capacity, the ability to acquire and apply external knowledge, has been found to be a particularly critical capability for Born Global success (Rodríguez-Serrano & Martín-Armario, 2017).

Technological advancements, digital platforms, and the liberalization of trade have also played a key role in facilitating the emergence of Born Globals. By leveraging flexible structures, advanced communication tools, and market intelligence, these firms can overcome traditional constraints related to firm size, age, or limited resources. Additionally, the reduced relevance of psychic distance in the digital era has further enabled early and wide-reaching internationalization.

While Born Global firms have been associated with innovation, agility, and rapid growth, recent empirical studies caution that their long-term performance may vary significantly across contexts. For instance, Ferguson and Henrekson (2021) find that stage-model firms outperformed Born Globals eventually in Sweden, raising questions about the sustainability of early internationalization. Nevertheless, Born Globals continue to be a vital and growing phenomenon in international entrepreneurship, especially in dynamic and technology-driven sectors (Ferguson & Henrekson, 2021).

Beyond these dominant models of SME internationalization, additional theoretical perspectives, such as the Overextension Hypothesis and sectoral specialization theories offer complementary insights into why firm-level productivity and competitiveness do not always translate into export success.

The Overextension Hypothesis, which argues that highly productive firms may not always pursue international expansion despite having superior resources. Instead, such firms may concentrate on domestic markets or specialized niches where they already enjoy strong competitive advantages. International expansion can divert managerial attention and financial resources, potentially reducing efficiency if the firm lacks a clear advantage abroad (Salomon & Jin, 2010). This framework provides an explanation for why some highly productive SMEs engage less in exporting, as their competitive strengths are often better used within domestic contexts.

Complementing this view, sectoral specialization theories highlight that firms' internationalization patterns are strongly influenced by industry characteristics. Firms operating in highly specialized or niche sectors may face limited global demand for their products, even if they are productive and competitive domestically. In such cases, the scope for export expansion is constrained not by internal inefficiencies but by structural factors related to global market size and demand distribution (Melitz, 2003). These theories underscore the importance of considering sectoral context alongside firm-level resources when analyzing SME export behavior.

In addition to these theoretical perspectives, recent empirical studies, including those based on the Small Business Act (SBA) Fact Sheets for Europe, emphasize the role of other firm-level characteristics in facilitating SME internationalization. Factors such as labor productivity, research and development (R&D) activities, quality certifications, and digital presence (e.g., website ownership) have been identified as significant enablers of export performance. Higher labor productivity is often associated with better competitiveness in international markets, while R&D investments support innovation and product differentiation. Quality certifications can enhance credibility and market access abroad, and website ownership facilitates international visibility and communication.

Given these theoretical foundations, this study investigates the export performance of Turkish manufacturing SMEs by examining the roles of firm age, innovation capacity, labor productivity, R&D investments, quality certifications, and digital presence. By integrating the gradualist insights of the Uppsala Model with the rapid-internationalization characteristics of the Born Global Model, the study seeks to provide a comprehensive understanding of the factors influencing SME export performance in the Turkish context.

## Literature Review

The relationship between firm characteristics and export performance has been a central topic in the internationalization literature, especially concerning SMEs. Numerous studies have emphasized the importance of firm-specific factors such as age, productivity, innovation capacity, quality standards, and digitalization in shaping export behavior (World Bank, 2020; European Commission, 2019).

One key area of empirical interest is the role of labor productivity. Higher productivity levels are commonly associated with greater export propensity and intensity, as more productive firms are better equipped to absorb the fixed costs of exporting and compete effectively in international markets (Love & Roper, 2015). Research by Wagner (2007) and Bernard & Jensen (2004) show that exporters tend to outperform non-exporters in terms of productivity, even before entering foreign markets, suggesting that more productive firms self-select into exporting (Wagner, 2007; Bernard & Jensen, 2004). Supporting this view, Akhan et al. (2018) analyze Turkish manufacturing firms between 2007 and 2014 and find that high-

productivity firms both export more and respond more strongly to exchange rate depreciations by further expanding their export volumes. However, they also show that firms heavily dependent on imported inputs benefit less from currency depreciations, as rising input costs partly offset the gains from increased competitiveness.

Research and development (R&D) investments also play a critical role in enhancing a firm's international competitiveness. R&D facilitates innovation, supports product adaptation for foreign markets, and strengthens the firm's ability to respond to international customer demands. Studies by Cassiman & Golovko (2011) and Ganotakis & Love (2012) have found a positive and significant relationship between R&D intensity and export performance, especially among high-tech and knowledge-intensive SMEs. This link is further reinforced by dynamic capabilities theory, which argues that continuous innovation and knowledge integration are essential for firms operating in volatile global markets (Teece, Pisano, & Shuen, 1997). Recent firm-level evidence from Türkiye also highlights the importance of digital technologies in supporting internationalization. A study by Yalçınkaya and Tiryakioğlu (2024) shows that the adoption of information and communication technologies (ICT) significantly improves firms' export performance, particularly by enhancing efficiency and reducing barriers to accessing foreign markets. This indicates that, alongside R&D investments, ICT capabilities have become a key driver of competitiveness in global trade.

The importance of quality certifications, such as ISO or CE marks, has also been widely documented. These certifications serve as signals of credibility and reliability in foreign markets, helping SMEs reduce information asymmetries and comply with technical standards abroad. Bangwayo-Skeete & Moore (2015) analyzed a 2006-2013 firm-level and national-level data for 111 developing countries primarily from the World Bank Enterprise Survey and indicated that firms with ISO certifications are more likely to enter export markets.

Another increasingly relevant factor is digitalization. The adoption of digital tools, such as websites, e-commerce platforms, and online marketing strategies, allows SMEs to reach international customers more easily and at a lower cost. Website ownership, in particular, has been associated with higher export likelihood and intensity, as it enhances visibility and facilitates communication with foreign clients (Morgan-Thomas & Bridgewater, 2004; Eurostat, 2020). Digitalization also enables firms to overcome traditional constraints, such as limited physical presence or high psychic distance.

In addition to firm capabilities, entrepreneurial orientation and managerial experience have been shown to influence export outcomes. Managers with prior international exposure or multilingual skills are more likely to recognize foreign opportunities and guide their firms towards internationalization (Andersson & Wictor, 2003; Majocchi et al., 2018). This insight aligns with the Born Global and International New Venture literature, which emphasizes the role of globally minded leadership in accelerating early and rapid internationalization (Cavusgil & Knight, 2015).

Despite the growing body of literature on SME internationalization, several gaps remain. First, most empirical studies are concentrated in developed economies, leaving the dynamics of SME export behavior in emerging markets, such as Türkiye, less explored. Second, many cross-country analyses aggregate firms across various sectors, which may obscure patterns specific to manufacturing SMEs, especially those engaged in medium-technology production. Third, few studies jointly assess both gradualist (e.g. firm age, experience) and rapid-internationalization (e.g., innovation, digital presence) determinants within the same empirical framework, leaving a limited understanding of how these factors interact.

Addressing these gaps, the present study investigates the export performance of Turkish manufacturing SMEs by examining how firm-specific factors, namely labor productivity, firm age, innovation capacity, R&D investment, quality certification, and digital presence, are associated with export participation and intensity.

By adopting a firm-level analytical approach, this study contributes to a more nuanced understanding of how internal capabilities shape internationalization outcomes in the context of an emerging economy.

## Methodology and Dataset

This study investigates the factors influencing the export performance of manufacturing SMEs in Türkiye by employing firm-level data and econometric modeling techniques. The empirical analysis is based on cross-sectional data, which provides a snapshot of firms' export behavior at a single point in time. It focuses on two dimensions of export performance: (i) the decision to engage in exporting (export participation) and (ii) the intensity of export activities among exporting firms (export intensity). To reflect this two-stage decision-making process, Probit and Tobit regression models are applied.

### Methodology

Given the binary nature of the export participation variable (exporter = 1, non-exporter = 0), a Probit model is employed to estimate the probability that a firm engages in exporting activities. The Probit model is particularly suitable because it accounts for the nonlinear relationship between the explanatory variables and the likelihood of export participation, ensuring that the estimated probabilities remain within the theoretically meaningful range of 0–1. In contrast, a simple linear regression (OLS) would be inappropriate in this context, as it could produce predicted probabilities below zero or above one, which are both economically and statistically invalid. The model is grounded in the assumption that an underlying, unobserved latent variable, such as a firm's propensity to export, drives the observed binary outcome. By doing so, the Probit model enables consistent estimation of how each explanatory variable influences this latent propensity and, consequently, the probability of a firm becoming an exporter.

The second stage of the analysis investigates the extent of export activities among firms that already export, measured as the share of direct exports in total sales. Because export intensity is a continuous variable censored at zero (non-exporters have no export sales), a Tobit model is employed. The Tobit model is specifically designed to handle censored dependent variables, providing a consistent and efficient method to estimate the relationship between independent variables and the underlying continuous latent variable of export intensity. This framework recognizes that while observed export intensity is zero for non-exporters, each firm possesses a true latent value that is unobserved but conceptually less than or equal to zero. By accounting for left-censoring, the Tobit specification ensures a consistent estimation of how explanatory variables affect export intensity.

Together, the two-stage estimation strategy, Probit for export participation and Tobit for export intensity, offers a comprehensive understanding of how firm characteristics influence both the decision to enter export markets and the degree of export engagement.

The econometric specifications can be summarized as follows:

#### Probit model for export participation:

$$\Pr(\text{Exporter}_i = 1) = \Phi(\beta_0 + \beta_1 X_i) \quad (1)$$

where  $\Phi$  denotes the cumulative distribution function of the standard normal distribution, and  $X_i$  is the vector of firm-specific explanatory variables.

#### Tobit model for export intensity:

$$\text{ExportIntensity}_i^* = y_0 + y_1 X_i + \epsilon_i \quad (2)$$

$$\text{ExportIntensity}_i = \begin{cases} \text{ExportIntensity}_i^* & \text{if } \text{ExportIntensity}_i^* > 0 \\ 0 & \text{if } \text{ExportIntensity}_i^* \leq 0 \end{cases} \quad (3)$$

Where the  $ExportIntensity_i^*$  is latent (unobserved) export intensity, and  $\epsilon_i$  is the error term. The explanatory variables used in both models include the following variables:

- **Labor productivity:** measured as sales per worker
  - **Firm age:** logarithm of the number of years since establishment
  - **SME status:** dummy variable for SME classification (0 – no, 1 – yes)
  - **Quality certification:** dummy variable indicating possession of an internationally recognized certificate (0 - no, 1 - yes)
  - **Website ownership:** dummy variable for having an official website (0 - no, 1 - yes)
  - **Research and development (R&D) investment:** dummy variable for active R&D engagement (0 - no, 1 - yes)
  - **Business plan strategy:** dummy variable for a firm having a written business plan strategy (0 - no, 1 - yes)
- All continuous variables are transformed into natural logarithms where appropriate to reduce skewness and interpret coefficients as elasticities.

## Dataset

The empirical analysis draws on data from the World Bank Enterprise Survey (WBES) for Türkiye, conducted in 2019. This dataset is highly suitable for the purposes of this study for several reasons. First, it provides comprehensive firm-level information on key characteristics directly aligned with the research framework, including firm age, size, productivity, R&D activity, digital presence, quality certifications, and export behavior. Second, the WBES is nationally representative of the formal, non-agricultural private sector, making the results generalizable across a wide range of Turkish manufacturing SMEs. Third, the survey's design follows a standardized and internationally comparable methodology, allowing for reliable empirical analysis and alignment with global best practices. While the dataset may appear somewhat dated, it remains the most recent wave of the WBES available for Türkiye that includes all relevant variables required for this study. Moreover, it has been widely used in academic and policy research, confirming its credibility, transparency, and continued analytical value in assessing SME performance and internationalization in emerging markets. From the original dataset, the sample was restricted based on the following criteria:

- Firms operating in the manufacturing sector
- Firms classified as SMEs according to employment size
- Firms with complete information on export status and other key explanatory variables.

The dataset comprises 1,002 firms, and the key variables provide valuable insights into firm characteristics and strategies. The primary dependent variable, export status, shows that out of the 1,002 firms in the sample, the frequency values show that 432 of the total observations are involved in exporting, and the rest are not. This means that 43% of the firms are engaged in export activities, while the remaining 57% do not participate in exporting. With a standard deviation of 0.50, this binary variable shows an even distribution, indicating a fairly balanced split between firms that export (1) and those that do not export (0). The share of export, which measures the proportion of export in total sale, shows a mean value of 22.12% with a high standard deviation of 32.34. This variation highlights that some firms export a significant portion of their production, whereas others do not export at all. Given this boundary clustering, where many firms have a share of export at 0% (non-exporters) and others at 100% (fully exporting firms), the Tobit model is well-suited for analyzing this dataset. It accounts for cumulative observations at both ends, enabling us to better understand the factors influencing export intensity while properly handling the censored values at these boundaries.

## Findings

This section presents the empirical results of the Probit and Tobit estimations used to analyze the determinants of export performance among manufacturing SMEs in Türkiye. The analysis follows a two-stage structure: first, the factors influencing the probability of export participation are examined; second, the determinants of export intensity among exporting firms are investigated. Before presenting the regression results, descriptive statistics of the key variables are discussed to provide an overview of the sample characteristics.

### Descriptive Statistics

Among the 1,002 observed firms, 923 are classified as manufacturing SMEs, representing approximately 92% of the sample. This strong representation makes the dataset particularly valuable, as it provides a robust basis for analyzing the characteristics and performance of SMEs, which form the primary focus of this study. Furthermore, the dataset mirrors the actual business landscape, where SMEs constitute the vast majority of firms. This alignment with real-world distributions enhances both the relevance and applicability of our findings to the broader SME sector.

**Table 1**

*Descriptive Statistics*

	Number of Observation	Frequency	Mean	Standard Deviation	Min	Max
<b>Dependent Variables</b>						
<b>Export</b>	1.002	432	0,43	0,50	0 (NO)	1 (Yes)
<b>Share of Export</b>	1.002		22,12	32,34	0	100
<b>Explanatory Variables</b>						
<b>SME</b>	1.002	923	0,92	0,27	0 (NO)	1 (Yes)
<b>Labor Productivity</b>	1.002		915.091	1.067.950	11.667	8.572.727
<b>Firm Age</b>	1.002		20,34	14,22	2	99
<b>Business Plan Strategy</b>	1.002	263	0,26	0,44	0 (NO)	1 (Yes)
<b>Quality Certificate</b>	1.002	476	0,48	0,50	0 (NO)	1 (Yes)
<b>Website</b>	1.002	756	0,75	0,43	0 (NO)	1 (Yes)
<b>R&amp;D</b>	1.002	199	0,20	0,40	0 (NO)	1 (Yes)

Table 1 summarizes the descriptive statistics of the variables used in the empirical models. Labor productivity has a mean of 915,091 with a standard deviation of 1,067,950, indicating strong heterogeneity across firms, with some highly efficient and others far less productive. The average firm age is 20.3 years, with a standard deviation of 14.2, indicating a balanced mix of younger and more established firms. Regarding business strategies, 26% of firms report having a formal written business plan, whereas the remaining 74% operate without one. Quality certification is held by 48% of firms, showing a nearly even split in quality management practices. Digital adoption is comparatively high, as 75% of firms maintain a website, highlighting the growing importance of online presence in competitiveness. By contrast, only 20% of firms engage in R&D activities, underscoring relatively weak innovation efforts among the sample. Overall, the data reflect a business environment characterized by large productivity differences, limited formal planning, mixed quality assurance practices, strong digitalization, yet low R&D engagement, all of which are critical in shaping firms' export performance.

## Regression Results

The results of the Probit model for export participation are presented in Table 2. Several firm-level characteristics have been found to have statistically significant effects on the likelihood of exporting.

**Table 2**  
*Estimation Results for Probit and Tobit Models (The Marginal Effects)*

VARIABLES	PROBIT Model	TOBIT Model
Dependent Variable	Export Probability	Export Intensity
Labor productivity	-0.06*** (0.000)	-13.219*** (0.000)
Firm Age	0.05** (0.008)	5.435 (0.166)
SME	-0.187** (0.003)	-14.319* (0.047)
Business Plan Strategy	0.031 (0.362)	4.451 (0.434)
Quality Certificate	0.249*** (0.000)	36.088*** (0.000)
Website	0.120** (0.002)	26.341** (0.003)
R&D	0.163*** (0.000)	17.712** (0.002)

Standard errors are in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

For labor productivity, the Probit model shows a statistically significant negative marginal effect of  $-0.06$  at the 1% level. This result suggests that, holding other factors constant, an increase in labor productivity is associated with a lower probability of the firm engaging in export activities. This may imply that more productive firms prioritize domestic markets or specialized, high-margin products, aligning with theories suggesting that highly productive firms are more competitive locally than internationally due to potential entry costs or challenges competing in price-sensitive foreign markets.

The Tobit model similarly indicates that a 1% increase in labor productivity corresponds to a 13.219 % reduction in the level of export activities, reinforcing that, as firms' labor becomes more productive, their engagement in exporting decreases. This strong negative association, also significant at the 1% level, aligns with the Probit results, showing that highly productive firms tend to have lower export levels. This pattern is consistent with the Overextension Hypothesis, which posits that highly productive firms may have less incentive to expand into foreign markets where they may lack a competitive advantage. Additionally, sectoral specialization theories posit that high-productivity firms might operate in niche markets with limited global demand, which may explain the results for the surveyed firms.

For the age variable, in the Probit model, the positive coefficient of 0.05, significant at the 5% level, suggests that a 1% increase in firm age is associated with a 5% increase in the likelihood of engaging in export activities. This indicates that older firms are more likely to export due to their accumulated experience, market knowledge, and established networks, which enhance their international competitiveness.

In the Tobit model, a 1% increase in firm age corresponds to a 5.435% increase in the level of export activities, although this result is not statistically significant. This difference in significance between Probit and Tobit might indicate that while age plays a role in the decision to engage in the outcome, it may not

strongly affect the extent or level of engagement. A theory like the learning-by-doing hypothesis suggests that older firms have accumulated knowledge, but the lack of significance in Tobit could mean that the intensity of engagement is more influenced by other strategic factors, such as R&D and quality certifications. This finding also aligns with the Uppsala model, which posits that firms gradually accumulate knowledge and experience over time, making older firms more capable of handling the uncertainties associated with internationalization.

In the Probit model, the negative coefficient of the SME variable is statistically significant at the 5% level, indicating that SMEs are 18.7% less likely to engage in export activities than larger firms. This finding aligns with the Resource-Based View (RBV) theory, which argues that firms' competitive advantage and ability to pursue strategies like exporting depend on their access to unique resources and capabilities. SMEs, compared to larger firms, often have limited resources, such as financial capital, skilled labor, and technological assets, which are critical for entering and sustaining positions in international markets. These resource constraints can hinder SMEs' ability to cover the high costs associated with exporting, such as compliance with foreign regulations, logistical complexities, and adapting products to meet diverse international standards.

In the Tobit model, the negative and statistically significant coefficient of the SME dummy at the 10% level implies that SMEs not only have a lower probability of engaging in export activities but also participate at lower levels compared to larger firms. This result further supports the RBV perspective, which posits that smaller firms may struggle to scale their export activities due to their resource limitations. Unlike larger firms, SMEs may lack the internal capabilities, such as dedicated export departments, advanced technology, and strong networks, that are often necessary to expand in foreign markets. As a result, SMEs might either avoid exporting or engage at minimal levels, focusing instead on domestic markets where their limited resources can be more effectively leveraged.

In both the Probit and Tobit models, the coefficient for having a business plan is not statistically significant. This result may stem from the fact that most of the sample comprises SMEs, many of which may lack a formal business plan, making it reasonable that this variable does not significantly impact export engagement. While a business plan is useful for organizational strategy, it does not directly drive export performance unless paired with other resources, such as R&D or technological capabilities, which more directly affect competitive advantage.

The coefficients of possessing a quality certificate, maintaining a website, and incurring R&D expenses in the last three years are positive and statistically significant for both Probit and Tobit models. These results indicate a positive relationship between these variables and the likelihood of engaging in export activity, as well as a higher probability of greater export intensity.

Quality certifications likely enhance a firm's credibility, making it more appealing to international clients and reducing transaction costs related to compliance with various regulatory standards. A website, on the other hand, offers greater visibility, facilitates marketing, and simplifies communication across time zones and geographical barriers, further reducing transaction costs.

## Robustness Checks

To ensure the reliability of the results, several diagnostic tests were applied to the Probit model.

**Table 3**

*Diagnostic Tests Table*

Diagnostic Test	Purpose	Result	p -Value
Link Test (_hat coefficient)	Checks for model specification errors	Coefficient = 1.0196	$p < 0.001$
Link Test (_hatsq coefficient)	Further checks for model specification (non-linearity)	Coefficient = 0.0866	$p = 0.303$
Constant (_cons)	Evaluates the baseline level of outcome	Coefficient = -0.0367	$p = 0.523$
Pearson Chi <sup>2</sup> Goodness of Fit Test	Assesses goodness of fit by comparing observed and expected values	Chi <sup>2</sup> = 993.7; df = 991	$p = 0.4699$
ROC Curve Analysis (Iroc)	Evaluates the model's classification ability	AUC= 0.7872	-
Likelihood Ratio Chi-Square (LR chi <sup>2</sup> )	Tests the overall significance of the model	Chi <sup>2</sup> = 279.98	$p < 0.001$
Pseudo R <sup>2</sup>	Provides a measure of explanatory power for the model	Pseudo R <sup>2</sup> = 0.2044	-

The link test confirmed that the model was correctly specified, as the coefficient for the predicted values was close to one and highly significant, whereas the squared term was non-significant, indicating no omitted non-linearities. The constant term was also non-significant, implying that no unmodeled baseline effect remained. The Pearson Chi<sup>2</sup> goodness-of-fit test showed no significant difference between observed and predicted outcomes, further supporting the model's adequacy. To address potential heteroskedasticity, robust standard errors were used, ensuring reliable inference. Model performance was evaluated through the ROC curve, which produced an AUC of 0.79, indicating acceptable discriminatory power between exporters and non-exporters. Additionally, the likelihood ratio chi-square test confirmed the overall statistical significance of the predictors, while the Pseudo R<sup>2</sup> value of 0.20 suggested a reasonable explanatory power for a binary outcome model. Collectively, these diagnostics demonstrate that the Probit model is well specified, statistically sound, and capable of providing meaningful insights into firms' export participation.

## Conclusion and Policy Implications

This study examined the determinants of export performance among manufacturing SMEs in Türkiye using firm-level data from the World Bank Enterprise Survey. By applying Probit and Tobit models, the analysis explored both the decision to engage in exporting and the intensity of export activities among exporting SMEs. The empirical findings highlight the critical roles of firm age, quality certifications, website ownership, and R&D investments in shaping export behavior.

Firm age is positively associated with the likelihood of exporting, indicating that experiential learning and accumulated knowledge continue to play an important role in the internationalization process. However, firm age does not significantly affect export intensity, implying that deeper international engagement requires capabilities beyond experience, such as innovation and strategic investments.

Quality certifications and website ownership consistently emerge as strong predictors of export participation and intensity, reflecting the increasing importance of compliance with international standards and digital visibility in global trade. SMEs that actively invest in R&D also demonstrate higher probabilities

of exporting, highlighting the role of innovation in enabling firms to develop competitive advantages in foreign markets.

From a policy perspective, the findings point to several important implications. First, policies aimed at improving SME productivity, such as support for technological upgrading and process innovation, can have significant positive effects on export performance. Second, programs that facilitate the acquisition of internationally recognized quality certifications can help SMEs build credibility and reduce informational barriers when accessing new markets. Third, promoting digitalization among SMEs through support for website development, e-commerce capabilities, and online marketing strategies can enhance their international reach and competitiveness. Fourth, fostering a stronger innovation ecosystem by incentivizing R&D activities and easing access to innovation financing can further strengthen SMEs' ability to compete globally.

Finally, while firm age contributes to initial export participation, policymakers should recognize that fostering sustainable and intensive export engagement requires more than accumulated experience. Targeted support for enhancing dynamic capabilities, particularly innovation, quality assurance, and digital transformation, will be crucial in enabling Turkish SMEs to fully realize their export potential and integrate more effectively into global value chains.

However, the analysis is based on data from the most recent Enterprise Survey for Turkey, conducted in 2019. Given the profound economic and structural changes following the COVID-19 pandemic, an updated study using more recent data is warranted. While the dataset is comprehensive, it may not fully capture all factors influencing export performance, such as specific government support programs, firm ownership structures, or regional economic conditions. Furthermore, the cross-sectional nature of the data restricts the ability to track changes in export performance over time. A more robust approach would involve pooled or panel data collected across multiple periods to better capture evolving trends.

Future research could also benefit from the inclusion of additional variables and a more targeted analysis of specific firm segments. For instance, examining the data exclusively for SMEs, who represent the majority of the sample, could reveal more direct relationships. Moreover, disaggregating SMEs into micro, small, and medium-sized enterprises and comparing their export behaviors and constraints may provide valuable insights for both academic inquiry and policy formulation.



---

Peer Review	Externally peer-reviewed.
Author Contributions	Conception/Design of Study- G.E.A.; Data Acquisition- D.Y.; Data Analysis and Interpretation- G.E.A., D.Y.; Drafting Manuscript- D.Y.; Critical Revision of Manuscript- G.E.A.; Final Approval and Accountability- G.E.A., D.Y.; Technical or Material Support- G.E.A., D.Y.; Supervision- G.E.A.
Conflict of Interest	The authors have no conflict of interest to declare.
Grant Support	The author declared that this study has received no financial support.

---

**Author Details** **Güzin Emel Akkuş (Assoc. Prof. Dr.)**

<sup>1</sup> Istanbul University, Faculty of Economics, Department of Economics, İstanbul, Türkiye

 0000-0002-0200-4123  eakkus@istanbul.edu.tr

**Deniz Yalabırtorkaman**

<sup>2</sup> Istanbul University Institute of Social Sciences, Faculty of Economics, Department of Economics, İstanbul, Türkiye

 0009-0002-6257-5080

---



## References

- Akhan, N. N., Dönmez, A., Erzan, R., & Kuzubaş, T. U. (2018). Exchange rates and export behavior: Firm-level evidence from Turkey. Boğaziçi University Department of Economics Working Paper Series, 2018/02.
- Andersson, S., Wictor, I. (2003). Innovative internationalisation in new firms: Born globals—the Swedish case. *Journal of International Entrepreneurship*, 1(3), 249–275.
- Bangwayo-Skeete, P., Moore, W. (2015). ICT adoption and the export performance of firms in developing countries. *Journal of International Development*, 27(7), 1196–1210.
- Bell, J., McNaughton, R., & Young, S. (2003). Born-again global firms: An extension to the born global phenomenon. *Journal of International Management*, 173–189.
- Bernard, A. B., Jensen, J. B. (2004). Why some firms export. *Review of Economics and Statistics*, 86(2), 561–569.
- Cassiman, B., Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42(1), 56–75.
- Cavusgil, S. T., Knight, G. (2015). The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization. *Journal of International Business Studies*, 46(1), 3–16.
- Chetty, S., Blankenburg Holm, D. (2000). Internationalisation of small to medium-sized manufacturing firms: A network approach. *International Business Review*, 77–93.
- Coviello, N. E., Munro, H. J. (1997). Network relationships and the internationalisation process of small software firms. *International Business Review*, 361–386.
- European Commission. (2019). *2019 SBA Fact Sheet: Türkiye*. Brussels: European Commission.
- Eurostat. (2020). *SMEs go digital: Trends and challenges*. From <https://ec.europa.eu/eurostat>
- Ferguson, S., Henrekson, M. (2021). Getting the facts right on born globals. *Small Business Economics*, 57(2), 883–900.
- Ganitsky, J. (1989). Strategic orientations of born global companies and the internationalization process. *Journal of International Business Studies*, 20(3), 69–83.
- Ganotakis, P., Love, J. H. (2012). Exporting, innovation and productivity in the UK: Evidence from a matched firm-level data set. *Economics Letters*, 117(3), 508–511.
- Grant, R. M. (1996). Towards a knowledge-based theory of the firm. *Strategic Management Journal*, 17(Winter Special Issue), 109–122.
- Johanson, J., Vahlne, J.-E. (1977). The internationalization process of the firm: A model of knowledge development and increasing foreign market commitments. *Journal of International Business Studies*, 23–32.
- Johanson, J., Vahlne, J.-E. (2009). The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies* 40(9), 1411–1431.
- Knight, G. A. (1997). *Emerging paradigm for international marketing: The born global firm (Doctoral dissertation)*. East Lansing, MI: Michigan State University.
- Knight, G. A., Cavusgil, S. T. (1996). The born global firm: A challenge to traditional internationalization theory. *Advances in International Marketing*, 11–26.
- Love, J. H., Roper, S. (2015). SME innovation, exporting and growth: A review of existing evidence. *International Small Business Journal*, 33(1), 28–48.
- Majocchi, A., D'Angelo, A., Forlani, E., & Buck, T. (2018). Internationalisation, cultural distance and firm performance: A meta-analysis of the institutional and resource-based views. *Management International Review*, 58(6), 855–888.
- Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71(6), 1695–1725.
- Morgan-Thomas, A., Bridgewater, S. (2004). Internet and exporting: Determinants of success in virtual export channels. *International Marketing Review*, 21(4/5), 393–408.
- Oviatt, B. M., McDougall, P. P. (1994). Towards a theory of international new ventures. *Journal of International Business Studies*, 25(1), 45–64.
- Penrose, E. T. (1959). *The theory of the growth of the firm*. Oxford: Oxford University Press.
- Preece, S. B., Miles, G., & Baetz, M. C. (1999). Explaining the international intensity and global diversity of early-stage technology-based firms. *Journal of Business Venturing*, 14(3), 259–281.
- Rennie, M. W. (1993). Global competitiveness: Born global. *The McKinsey Quarterly*, 45–68.
- Rodríguez-Serrano, M. Á., Martín-Armario, E. M. (2017). Born-global SMEs, performance, and dynamic absorptive capacity: Evidence from Spanish international new ventures. *Journal of Small Business Management*, 56(3), 447–464.

- Salomon R., Jin B. (2010). Do leading or lagging firms learn more from exporting? *Strategic Management Journal*, 31(10), 1088–1113.
- Small and Medium Enterprises Development Organization of Turkey (KOSGEB). (2023). From <https://www.kosgeb.gov.tr>
- Small and Medium Enterprises Development Organization of Turkey (KOSGEB). (2023). *SME Statistics and Policy Outlook 2023*. Ankara: Small and Medium Enterprises Development Organization of Turkey.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Turkish Statistical Institute. (2021). *Small and Medium-Sized Enterprises Statistics, 2021*. Ankara: Turkish Statistical Institute.
- Wagner, J. (2007). Exports and productivity: A survey of the evidence from firm-level data. *The World Economy*, 30(1), 60–82.
- Weerawardena, J., Mort, G. S., Liesch, P. W., & Knight, G. A. (2007). Conceptualizing accelerated internationalization in the born global firm: A dynamic capabilities perspective. *Journal of World Business*, 42(3), 294–306.
- World Bank. (2020). *Türkiye 2019 Country Profile*. From Enterprise Surveys: <https://www.enterprisesurveys.org>
- Yalçınkaya, İ., Tiryakioğlu, M. (2024). ICT and export performance: Firm-level evidence from Türkiye. *Journal of Business, Economics and Finance*, 13(2), 124–141.