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Beyond the East–West Divide: The Spatial Pattern of High-growth Firms in Türkiye

Doğu–Batı Ayrımının Ötesinde: Türkiye’de Hızlı Büyüyen Firmaların Mekânsal Örüntüsü

id Feride Gönel, id Hikmet Kaya

Yıldız Technical University, Faculty of Economics and Business Administration, Department of Economics, İstanbul, Türkiye

ABSTRACT

The establishment and growth of new firms play a crucial role in the socio-economic development of regions. Recent research indicates that the geographic distribution of High-growth Firms (HGFs), often referred to as gazelles or leapfrog firms, may help mitigate regional disparities. Birch’s seminal study of the United States in the late 1970s demonstrated that a relatively small number of firms are responsible for generating a substantial share of new employment, prompting subsequent studies to investigate the distinct characteristics and behavioral patterns of these rapidly growing firms. In Türkiye, a large proportion of established firms (41.1%) are concentrated in the Marmara region, particularly in İstanbul, and HGFs are similarly clustered in this area. However, there is limited empirical evidence regarding the geographic distribution and sectoral composition of HGFs across the rest of the country. This study aims to examine the geographic concentration of HGFs outside İstanbul using NUTS-2 regional data and the NACE Rev.2 industrial classification. Firm-level data from 2012 and 2019 are analyzed using the Location Quotient method to identify the regions and sectors in which HGFs outside İstanbul are most concentrated. The results indicate that HGFs are distributed across various regions of Türkiye without a clear east–west divide. A distinct sectoral divergence drives this pattern: while manufacturing HGFs remain anchored in the western industrial core, construction-based HGFs are heavily concentrated in eastern regions, reflecting an infrastructure-led growth trajectory.

Keywords: Geographical concentration; high-growth firms; location quotient; regional development; Türkiye.

ÖZ

Yeni firmaların kurulması ve büyümesi, bölgelerin sosyo-ekonomik kalkınmasında kritik bir rol oynamaktadır. Araştırmalar, genellikle ceylan veya sıçrama yapan firmalar olarak adlandırılan Hızlı Büyüyen Firmaların (HBF’ler), coğrafi dağılımları yoluyla bölgesel eşitsizlikler sorununun çözümüne katkıda bulunabileceğini öne sürmektedir. Birch’in 1970’lerin sonlarında Amerika Birleşik Devletleri için yaptığı öncü çalışma, nispeten az sayıdaki firmaların yeni istihdam fırsatları yaratma potansiyeline sahip olduğunu ortaya koymuş; bu durum, hızlı büyüyen bu firmaların ayırt edici özelliklerini ve davranışsal kalıplarını inceleyen sonraki çalışmalara zemin hazırlamıştır. Türkiye’de yerleşik firmaların büyük bir oranı (%41,1) Marmara Bölgesi’nde, özellikle de İstanbul’da yoğunlaşmıştır ve HBF’ler de benzer şekilde bu alanda kümelenmiştir. Ancak, ülkenin geri kalanında HBF’lerin coğrafi ve sektörel dağılımı konusunda sınırlı ampirik kanıt bulunmaktadır. Bu çalışma, NUTS-2 bölgesel verilerini ve NACE Rev.2 sınıflandırmasını kullanarak, İstanbul dışındaki HBF’lerin coğrafi yoğunlaşmasını incelemeyi amaçlamaktadır. 2012 ve 2019 yıllarına ait firma düzeyindeki veriler, İstanbul dışındaki HBF’lerin en yoğun olduğu bölgeleri ve sektörleri belirlemek amacıyla Lokasyon Katsayısı (Location Quotient) yöntemi kullanılarak analiz edilmiştir. Sonuçlar, HBF’lerin belirgin bir doğu–batı ayrımı olmaksızın Türkiye’nin çeşitli bölgelerine dağıldığını göstermektedir. Bu örüntüyü belirgin bir sektörel ayrışma şekillendirmektedir: İmalat sanayisindeki HBF’ler ağırlıklı olarak batı bölgelerinde konumlanırken, inşaat sektöründeki HBF’lerin doğu bölgelerinde yoğunlaştığı görülmüştür.

Anahtar sözcükler: Coğrafi yoğunlaşma; hızlı büyüyen firmalar; lokasyon katsayısı; bölgesel kalkınma; Türkiye.

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Correspondence: Feride Gönel
e-mail: feride.gonel@gmail.com

 TMMOB
Şehir Plancıları Odası

1. Introduction

Regional development models inspired by firm location theory suggest that a region's growth is significantly linked to the presence of firms within this region (Blair & Premus, 1993). In addition to this perspective, the establishment and growth of new firms are fundamental to regional socio-economic development. Besides, it is suggested that macro decisions taken at the national level for sustainable and balanced growth should be planned with firm-based micro policies determined at the sectoral and regional levels (Fattal-Jaef et al., 2020). Since the traditional sectoral analyses and their resulting policies may be inadequate in a complex competitive environment characterized by intense spatial interactions, it is crucial to combine firm-based analyses with spatial analyses to develop more effective policies. Since the early 2000s, policies have begun to be developed to support the contribution of certain firms to economic and regional development, particularly in developing countries. Research indicates that the geographical distribution of high-growth firms (HGFs), also known as *gazelles* or *leapfrogging firms*, plays a significant role in regional differences and inequalities (Kemp et al., 2000; Mason, 1985).

The concept of HGFs gained recognition in the late 1970s, largely due to Birch's studies (1979, 1981). His findings challenged the prevailing view, showing that a small number of firms were responsible for the majority of new jobs in the U.S. economy. Since these firms were often seen as examples of productive entrepreneurship (Mason, 2016), they were considered influential in supporting existing policies aimed at rapid job creation. Therefore, in an environment where unemployment continues to rise globally, the concentration of these employment-friendly firms in specific regions highlights the impact and benefits of aggregation (Higgins, 1988; Parr, 1973). In this context, one of the objectives of this study is to identify the regions and sectors where HGFs are most concentrated. The fundamental questions we seek to answer are: Which regions in Türkiye are home to HGFs across sectors, and which regions hold the most significant potential? In addition, we explore whether these concentrations follow a particular geographic pattern within the country. The rich literature on the concentration of firms and/or different sectors in Türkiye (Akcigit et al., 2019; Demirez, 2018; Ersoy, 2016; Kaya, 2006; Kaygala"k & Reid, 2016; Kirankabes & Arık, 2022) generally finds that spatial patterns evolve, but major metropolitan areas (especially Istanbul, Izmir, Ankara) continue to dominate. For example, Ersoy (2016) notes that clusters of different industries with their own unique internal structures perform better in major cities. However, little is known about the geographic concentration and industrial structure of these HGFs, and no studies have examined the geographic concentration of sectors from the perspective of HGFs. To the best of our knowledge, this study is the first systematic analysis. Determining the policy priorities to be implemented

through the spatial locations of these firms, which have attracted attention with their employment creation in the last two decades, can also help spatial strategic planning. Therefore, understanding the spatial distribution of HGF activities will significantly contribute to improving regional and local development and identifying their potential.

This study is important because it is the first to use HGFs to evaluate sectoral status at the NUTS-2 level. While a few previous studies (Atiyas & Bakis, 2018; TOBB, 2015, 2024) examined HGFs at the NUTS-3 level, data gaps meant that some provinces could not be included. Moreover, those studies were heavily influenced by the weight of the Istanbul region, which dominated most of the results. Indeed, Istanbul may present statistical distortions in the analysis that may arise from its outlier status. Istanbul's disproportionately large economic scale and firm density compared to other major cities like Izmir and Ankara can create a significant distributional imbalance, potentially biasing the measurement results. As a major commercial and economic center with headquarters for major corporations, Istanbul lacks potential local competitors. This suggests that Istanbul should be evaluated separately from other regions of Türkiye. For this reason, this study focuses on identifying HGF concentrations outside Istanbul, drawing on sectoral data at the NUTS-2 level. Moreover, several cities exhibit stronger performance than major metropolitan areas in certain HGF-related indicators, further supporting the methodological decision to exclude Istanbul from the sample.

The first focus of this study is to examine the regional distribution of HGFs based on employment. Then, by analyzing the obtained data with the Location Quotient (LQ), one of the most frequently used statistical methods in clustering, we aim to determine which HGFs are concentrated in which regions and whether the traditional east-west divide is observed. The database of the Annual Business Records Framework provided by TurkStat at the firm level between 2012 and 2019 was used in the study. To observe the change between these two years, only the years 2012 and 2019 were included in the analysis.

Following the introduction, the study consists of the following sections. The second part briefly explains HGFs' conceptual and empirical characteristics. In the third part, we explain the patterns of HGFs in specific sectors in Türkiye, including manufacturing, wholesale and retail, and construction. The geographical concentration of HGFs is examined at the sectoral level using the LQ method in the fourth section, and the final section concludes the study with a discussion of the results.

2. Overview of Conceptual and Empirical Studies on High-growth Firms

Different findings and approaches confirm that there is no single model or single definition that can fully explain HGFs (Henrekson & Johansson, 2010), and the literature shows

that HGFs are defined in different ways depending on the source of growth. While employment growth is a common metric, other metrics such as turnover (sales), market share, physical output, and profit are also used. The most widely used of these definitions is the OECD definition.

From a theoretical perspective, the study of Storey's (1994) three-component hypothesis, which is frequently cited in the literature and covers the period from 1982 to 1994, explains the growth performance of HGFs in terms of entrepreneurship, firm strategies, and firm characteristics. The study identifies different characteristics for each component and states that firms can be examined within the framework of these characteristics.

There are theoretical explanations that emphasize that to achieve HGF status, especially for small-scale ones, it is necessary to reach a minimum efficient scale (Almus, 2002; Audretsch, 1995; Dunne et al., 1989; Hall, 1987; Mansfield, 1962). The search for this minimum efficient scale, suggesting that smaller firms have a greater need for growth, is also implicit in other approaches to explaining HGFs. However, such rapid growth is not unique to small firms; large firms with more financial and human capital can also grow quickly by leveraging these resources.

Another approach emphasizes the firm's internal dynamics through its ability and learning capacity (Ericson & Pakes, 1995; Jovanovic, 1982). According to this model, firms can only learn about their efficiency after entering the market, meaning they are initially uncertain about their survival. However, the learning process begins after entering the market, and they start to grow rapidly to survive. Access to the minimum efficient scale mentioned above is also essential in this approach.

According to the approach based on the likelihood of seizing opportunities for rapid growth in specific environmental or economic conditions, for example, firms established in the financial conditions following the unification of the two Germanies and the fall of the Berlin Wall (in 1990 and 1991) had a significant opportunity for rapid growth. They were more likely to achieve HGF status than those established later. This approach emphasizes that HGFs are affected by the region in which they are located and that regional characteristics also play a role in their growth.

Theoretical explanations that consider HGFs together with start-ups and try to place them more in advanced technology suggest that firms operating in advanced technology-related sectors can grow faster than others (Agarwal, 1998; Almus & Nerlinger, 1999; Audretsch, 1995).

In empirical studies that are extensions of all these theoretical explanations, it is quite difficult to find common stylized

facts of HGFs, but still, some basic features have been revealed in the literature (Blasco et al., 2016; Coad et al., 2014; Goswami et al., 2019). We summarize these defining facts and the results of related empirical studies as follows:

- If firms are sorted by their growth rates, more firms are found at the extremes of the distribution, forming a tent shape. Consequently, only a small number of firms qualify as HGFs. According to OECD (2010), these firms represent, on average, around 3–6 percent of the total business population when their growth is measured by employment and 8–12 percent when measured by turnover.
- Almost all studies in the empirical literature highlight that HGFs generate a disproportionately large share of new jobs compared to non-HGFs (Coad, 2009; Kirchoff, 1994; Picot & Dupuy, 1998; Segarra & Teruel, 2014; Schreyer, 2000).
- HGFs can generally arise from all sizes of firms, but several studies indicate that the majority of HGFs are small and young firms (Daunfeldt et al., 2016; Delmar & Shane, 2003; Delmar et al., 2003; Henrekson & Johansson, 2010; Kirchoff & Greene, 1998; Schreyer, 2000); however, this characteristic cannot be generalized. In a study by age groups, high growth in turnover and staff growth are more common among younger age groups, while only high growth in turnover is observed among older age groups (ETI, 2015).
- Although the common perception is that HGFs are predominantly technology-intensive due to the global rise of tech companies, it is observed that firms from all sectors can achieve HGF status (Daunfeldt et al., 2016; Goswami et al., 2019; Schreyer, 2000).
- The literature emphasizes that firms generally achieve HGF status only once. Empirical studies from different countries show dramatic decreases in the number of firms that persist in their HGF status for extended periods. Therefore, there is no consensus on what incentives firms should have to maintain their HGF status for long (Acs et al., 2008; Coad & Srhoj, 2020; Coad et al., 2014; Esteve-Perez et al., 2022).
- In contrast to most small and medium-sized enterprises (SMEs), which tend to remain focused on domestic markets, HGFs are believed to demonstrate a high degree of internationalization, particularly in export activities (O'Gorman, 2001; Zahra et al., 2000). They are seen as more likely to engage with international markets than their slower-growing counterparts (BIS, 2010).

While Birch's work has been described as a 'revolution' by some scholars, it also faced criticism from others (Armington & Odle, 1982; Brown et al., 1990; Davis et al., 1996; Storey, 1994; Storey & Johnson, 1987). For example, while Storey (1994) emphasized the different dimensions of HGFs (such

as entrepreneurship and firms' strategies), Storey and Johnson (1987) argue that the contribution of these firms to employment is not as significant as Birch claims, and the reason depends on measurement, time period and different firm dynamics. On the other hand, Armington and Odle (1982) criticize Birch's methodology particularly for accepting small establishments of large firms (such as outlets or branches) as the unit of HGFs. The problem of measurement and definition is also encountered in the study of Storey and Johnson (1987). Similarly, Davis et al. (1996) criticize Birch's measurement method and argue that using initial-size bases can bias results toward finding high growth in small units. In another study (Neumark et al., 2011), results indicate that small firms create more jobs on net, but the difference is much smaller than Birch's methods suggest. Furthermore, in the most recent period, a negative relationship between firm size and job creation was found in both the manufacturing and service sectors. In addition, the research by Decker et al. (2014) attributes the decline in the number of young, extremely HGFs to changes in the distribution of firm growth. This suggests that while these firms may drive net employment, their frequency and impact may vary over time and across contexts. The study particularly highlights the distinction between gross firm entry and exit and net employment, which Birch neglects to consider.

Nevertheless, Birch's research inspired numerous subsequent studies (Anyadike-Danes et al., 2009; Daunfeldt et al., 2010; Hart & Oulton, 1996; Henrekson & Johansson, 2010; Mansfield, 1962; OECD, 2010). Several studies have emphasized that these firms continue to grow even during recessions (Anyadike-Danes & Hart, 2017; Anyadike-Danes et al., 2015; Henrekson & Johansson, 2010), thereby contributing to the clarification of these firms.

Despite these common characteristics, the literature on whether HGFs are affected by their location is quite limited. In this context, while factors such as location-specific characteristics, industrial agglomeration, and specialization are known to influence the performance of high-growth potential firms, the nature of their interactions with the regions in which they are located remains controversial. However, some studies, such as Capello (2011), Audretsch and Dohse (2007), and Camagni and Capello (2009), which treat location as an effective production factor, indicate that firms and regions in which they are located are generally not indifferent to location; thus, we can consider that HGFs can benefit from appropriate territorial capital. But, even if a region creates these conditions, it does not guarantee high growth for firms. Consequently, determining whether HGFs are primarily concentrated becomes critical in assessing regional development.

On the other hand, Perroux's (1950) theory of growth poles offers another perspective, suggesting that economic growth

occurs unevenly, emerging from specific "growth points" or "poles" before spreading through the economy in waves of spatial polarization. Industrial growth tends to be concentrated in specific cities or regions, which can lead to polarization. In clusters—defined as geographic concentrations of firms that simultaneously compete and cooperate, the presence of HGFs can further accelerate regional development. The aggregation of these firms or industries can attract new investments and stimulate broader economic activity, as the benefits tend to spread to surrounding settlements, with access to resources or strong transportation networks.

At this point, we encounter Krugman's (1995) and Porter's (1994) views that the spatial concentration of industries, along with a skilled workforce and innovation, can create regional advantage as the primary drivers of growth and competitiveness. While they do not fully explain why some firms grow faster or create more jobs than others, both argue that the concentration of firms in a single location, along with their suppliers and a skilled workforce, can create a self-perpetuating growth cycle for the region, with increased economies of scale and lower transportation costs (Amin, 1999). The literature on this topic emphasizes the importance of location-related factors such as the amount and structure of the region's human capital, the entrepreneurial ecosystem, the institutional structure of the region, and low transportation costs between local and central locations (Arauzo-Carod et al., 2010). However, it is not clear in the literature whether this accumulation is effective in achieving HGF status. With the awareness that HGF cannot be achieved solely by these factors, the fact that each stage of network-based flexible production processes, which have become stronger and more developed in the last two decades, has been shifted to different geographies explains why HGFs in some sectors appear to be geographically dispersed across different locations. On the other hand, we still see a clustered geographical picture in some sectors. One reason for this is the agglomeration economies that arise due to spatial characteristics, while another is the complementary nature of the sector's production process. It is also stated that if clustering tends to act in favor of agglomeration economies, it leads to the concentration of firms in already developed regions that offer greater agglomeration advantages (Kaygalak, 2012).

On the other hand, the aggregation of firms or industries also enables the development of new investments and economic activities, as it has the potential to spread to surrounding settlements, areas providing easy access to raw materials, or regions with strong transportation facilities. However, it is still controversial whether we can evaluate HGFs within the framework of Porter's definition of a group of companies and common institutions operating in a specific industry that is connected by commonalities and complementarities and their geographical proximity (Porter, 2003). Within the

framework of this definition, HGFs do not prioritize establishing partnerships and complementarities with each other. Therefore, it is more accurate to think of these firms as agglomeration economies rather than thinking of them within the framework of clustering. Indeed, in such agglomeration economies, firms come together to benefit from the advantages offered by cities that are beneficial to them.

As a result, promoting the long-term growth of HGFs has become a priority for regional and national policymakers, particularly in developed countries, where they are actively encouraged. For instance, a recent NESTA report emphasizes that supporting these firms in the UK is now deeply integrated into both national and regional industrial strategies, highlighting their outsized contribution to job creation, as well as the importance of local context and clustering (Brown et al., 2014).

3. Spatial Patterns of High-growth Firms in Türkiye

Most empirical studies on HGFs have been conducted in developed countries, with very few examples from developing countries. Determining how HGFs are distributed geographically is crucial to supporting the competitive environment of the regions and benefiting from positive externalities. One of the first studies in Türkiye, which focused on 330 firms within Technology Development Zones (TDZs), found that 25% of the firms in these zones are HGFs. Critically, the vast majority—84% of the surveyed firms—are highly concentrated in only two cities: Ankara and Istanbul (Cansız, 2013). Another study using KOSGEB data found that the share of HGFs in total firms was between 30–38%, with young, micro-sized firms accounting for the largest share. However, this study's reliance solely on SME data excluded large HGFs (Demirez, 2018). The studies that TOBB has been preparing since 2011 are organized in a competition format, listing applicants, and presenting the different features of the HGFs. Initially, employment growth data was lacking. In the study of 2015, the 100 HGFs increased their number of employees by 88% between 2011 and 2013 (TOBB, 2015), while in a recent 2024 study, this number increased by 49.1% between 2019 and 2021 (TOBB, 2024).

Some recent studies examining the factors affecting HGFs in Türkiye have yielded more comprehensive results. For example, studies conducted by Atiyas and Bakis (2018) sought to identify HGFs and their related sectors at the provincial level. Atiyas and Bakis identified firms as "leapfrogging" in both turnover and employment, as well as in both together. Contrary to the literature, firm age was not the determining factor for leapfrogging, while firm size, exporter status, and productivity were found to be significant. In their study, Utku İsmihan and Pamukçu (2020) found that previous growth performance, human capital and firm size were extremely important factors, while Dalgıç and Fazlıoğlu (2021) found that innovation had a positive and strong effect on HGFs.

3.1. Research Sample

HGFs are essentially characterized by their capacity to create employment over a growth period of 3–4 years. In academic literature, two different types of benchmarks are used to evaluate the employment contribution of HGFs. These studies either compare the employment contribution of HGFs with that of non-HGFs within the total number of firms examined or relate HGFs to aggregates such as total employment growth, unemployment, and the employment contribution of new firms.

Although various metrics such as turnover, market share, and physical output are used in the literature to define HGFs, the OECD definition of employment growth remains the most common metric. Because it offers a standard, comparable, transparent, and methodologically simple framework to identify those firms across different countries and sectors. So, this measure becomes a reliable benchmark in many academic and policy studies. However, the fact that this definition does not consider firms with less than 10 employees is considered an important deficiency in the literature (Daunfeldt et al., 2015). According to the OECD's absolute definition, all firms with an annual growth rate of more than 20 percent over three consecutive years and at least 10 employees at the beginning of the observation period are HGFs. In this definition, growth can be measured by the number of employees or turnover (OECD, 2010).

In this study to identify HGFs, we used the Turkish Statistical Institute's Annual Business Records Framework database at the firm level. The datasets include information on various topics such as employment, year of establishment, sector information according to NACE Rev.2 classification, and NUTS-2 region data. According to the results of a study conducted by the Ministry of Industry and Technology (MoIT, 2023), it is not possible to make generalizations based on provinces because the number of firms in some provinces has fallen below 20. Therefore, NUTS-2 regions were used.

The initial dataset comprised 38.6 million firm-year observations. By applying the OECD definition, we excluded firms with fewer than 10 employees and those with missing establishment dates, which precluded the calculation of firm age. This filtration process yielded 1,976,322 firm-year observations. Subsequently, the exclusion of firms located in Istanbul further reduced the sample to 1,315,577 observations. While a total of 16,275 observations achieved HGF status across Türkiye during the analysis period, the final sample consists of 10,164 HGF observations after excluding Istanbul.

The basis of this calculation is the selection of firms with annual growth rates of 20% or more for three consecutive years and directly aligns with a key policy issue: job creation. This number also includes firms that closed between 2009 and 2019 or firms that may change the number of employees they employ each year. For example, changes in the number

of employees a firm has may turn it into a medium-sized firm one year and a small firm the following year.¹ Due to the high mobility of firms opening and closing in Türkiye, it is possible that a firm observed in any given year may not be included in the database after three or five years or its number of employees may fall below 10. Since the OECD definition uses data from the last 3 years, we took 2012 as the starting year. We also included the beginning (2012) and the end (2019) years in the analysis to be able to make observations about the persistence of HGFs after 8 years.

In the study, all sectors at the NACE 2 level are aggregated into five groups of sectors: agriculture and mining sectors (A and B), manufacturing industry (C), construction sector (F), wholesale and retail sector (G), and others which includes services. Although we anticipated that treating the manufacturing industry as a single group would present some limitations due to its inherent heterogeneity, this aggregation was considered an economically rational choice, as the fundamental issue is the geographical concentration of HGFs and their contribution to employment. Similarly, the existence of common factors such as export or R&D incentives also justifies such groupings in firm growth analyses. Furthermore, aggregation is important for understanding whether HGFs have a tradable production base.

3.2. Descriptive Statistics on High-growth Firms in Türkiye

In Türkiye, HGFs account for a relatively small share of total firms. During the period under consideration, this share, which stood at 1.57% in 2012, has gradually decreased, falling to 0.7% in 2019. In the study, where we included firms with 10 or more employees, the number of HGFs decreased from 1745 in 2012 to 873 in 2019, indicating a 50% decrease. Although the number of HGFs declined, the average number of employees in those firms increased by 15%, from 146 in 2012 to 168 in 2019. In contrast, non-HGFs experienced a comparatively modest growth in average employment of approximately 9.5% over the same period, increasing from 47 to 51 employees. Although this study will not focus on the reasons behind the decrease in the number of firms, we can say that this dramatic decrease is due to the impact of some negative macroeconomic factors generally observed in the Turkish economy after 2011 (Öniş, 2019). Beginning with the 2008–09 global crisis, macroeconomic pressures such as external financing volatility, tighter domestic liquidity conditions, increased financing costs, and restricted access to credit for SMEs led to a wave of firm failures and business closures.

During this process, companies that survive and continue to grow may be considered more productive. Indeed, an

Table 1. Characteristics of High-growth Firms (HGFs) in Türkiye*, 2012 and 2019

| | 2012 | 2019 |
|--------------------------------------|-------------|-------------|
| Total Number of HGFs (inc. Istanbul) | 2.758 | 1.384 |
| Number of HGFs (exc. Istanbul) | 1.745 | 873 |
| Share of HGFs in Total Firms (%) | 63.3 | 63.0 |
| Average Employment of HGFs | 146.63 | 168.67 |
| Average Employment of non-HGFs | 47.08 | 51.52 |
| Number of Exporter HGFs | 402 (23%) | 190 (21%) |
| Number of Young HGFs | 369 (21%) | 239 (27%) |
| Number of Small-sized HGFs | 683 (39%) | 311 (35%) |
| Number of Medium-sized HGFs | 866 (49%) | 451 (51%) |
| Number of Large-sized HGFs | 196 (11.2%) | 111 (12.7%) |

*: Unless otherwise stated, Türkiye figures include regions other than Istanbul. The parentheses show their shares in total HGFs. Small-sized firms: 10 to 49 persons employed, Medium-sized: 50 to 249 and Large-sized: 250 or more persons employed. Firms established 5 years ago or earlier are considered young firms. Source: Authors' own calculations.

increase in the average number of employees can lead to companies with high growth potential being characterized as productive firms.

As commonly observed in the literature, HGFs have disproportionately higher employment than non-HGFs in Türkiye. In 2012, non-HGFs had an average of 47 employees, while employment-based HGFs had an average of 146. By 2019, the average number of employees in HGFs had increased to 168 (Table 1).

Table 1 shows that HGFs provide more employment than non-HGFs, both in terms of average number of employees and the rate of increase in employment. These figures support the main argument in the HGF literature that a small number of firms may contribute disproportionately to employment growth in the Turkish case.

Although it is stated in the literature that HGFs are based on exports (Brown & Mason, 2010; Dobbs & Hamilton, 2007; OECD, 2010), the situation is different in Türkiye. Across all 25 regions, the share of exporting HGFs is approximately 20% on average; this share has even decreased from 23% in 2012 to 21% in 2019.

As a result of the tendency in the literature to evaluate HGFs using frameworks developed for start-ups, empirical findings indicate that HGFs are generally young firms.² However, in Türkiye the share of young HGFs is 21% in 2012 and 27% in 2019.

¹ Firms with 10–49 employees are considered small, those with 50–249 employees are considered medium, and those with more than 250 employees are considered large-sized firms.

² Firms that have been operating for 5 or less years are considered young firms.

Table 2. Average Employment of High-growth Firms (HGFs) and non-HGFs by Region, 2012 and 2019

| 2012 | | | 2019 | | |
|---------|--------|----------|---------|--------|----------|
| Regions | HGFs | non-HGFs | Regions | HGFs | non-HGFs |
| TRAI | 210.43 | 30.76 | TR82 | 380.67 | 37.45 |
| TRCI | 180.81 | 47.65 | TR63 | 315.38 | 43.85 |
| TR21 | 174.65 | 44.33 | TR51 | 275.55 | 59.70 |
| TR51 | 172.98 | 58.43 | TRC2 | 259.00 | 36.63 |
| TR10 | 170.4 | 54.97 | TR72 | 213.69 | 42.56 |
| TR63 | 162.88 | 37.39 | TR22 | 204.82 | 35.60 |
| TR62 | 154.49 | 41.76 | TRC3 | 192.00 | 35.24 |
| TRC2 | 148.55 | 35.67 | TR83 | 181.61 | 34.92 |
| TR61 | 147.92 | 43.28 | TR61 | 164.13 | 47.26 |
| TR32 | 147.79 | 36.63 | TR10 | 161.50 | 62.23 |
| TR33 | 127.78 | 42.38 | TRCI | 159.98 | 54.01 |
| TR41 | 127.37 | 48.18 | TRB2 | 157.00 | 36.62 |
| TR83 | 123.77 | 30.69 | TR62 | 150.20 | 43.82 |
| TRB2 | 116.75 | 38.91 | TR21 | 143.38 | 47.81 |
| TR31 | 115.99 | 43.28 | TR31 | 133.88 | 45.98 |
| TR72 | 113.43 | 41.22 | TR90 | 131.76 | 33.18 |
| TR22 | 105.00 | 31.88 | TR32 | 131.33 | 36.63 |
| TRA2 | 100.42 | 25.53 | TR42 | 130.33 | 49.44 |
| TR42 | 95.95 | 43.39 | TR33 | 127.56 | 48.11 |
| TRB1 | 91.87 | 31.86 | TR41 | 127.09 | 51.54 |
| TR81 | 87.19 | 48.49 | TR81 | 121.50 | 47.68 |
| TR90 | 82.58 | 31.23 | TRB1 | 82.72 | 35.98 |
| TR52 | 80.73 | 39.92 | TR52 | 79.65 | 41.78 |
| TR71 | 79.48 | 29.90 | TRAI | 74.50 | 35.22 |
| TRC3 | 69.36 | 30.42 | TRA2 | 69.33 | 27.02 |
| TR82 | 64.42 | 33.19 | TR71 | 43.60 | 33.53 |

Source: Authors' own calculations.

On the other hand, almost half of the HGFs in Türkiye are in the medium-sized company category. The share of small-scale HGFs, which rank second, decreased from 39% in 2012 to 35% in 2019. Although an increase in its share is observed over time, the share of large-scale HGFs is 11.2% in 2012 and 12.7% in 2019.

Although the Istanbul and the rest of the Marmara Region constitute almost half of the HGFs, it is not at the top of the list of regions with the highest average employment. For example, while the top 5 regions with the highest average employment in HGFs in 2012 were TRAI, TRCI, TR21, TR51 and TR10, in 2019 this ranking was TR82, TR63, TR51, TRC2 and TR72 (Table 2). While both the eastern and western regions of Türkiye were at the top in 2012, this ranking shifted more towards the inner regions in 2019.

Table 2 shows that there were significant changes in the average employment figures of HGFs by region between the two years. While the average employment of HGFs in 11 regions, especially TRAI (Bayburt, Erzincan, Erzurum) and TR71 (Aksaray, Kırıkkale, Kırşehir, Nevşehir, Niğde), decreased, the average employment levels of non-HGFs increased. The average employment rates of HGFs in other regions show an increase of at least 50%. Among these regions, the highest increases are in TR82 (Çankırı, Kastamonu, Sinop) and TRC3 (Batman, Mardin, Şırnak, Siirt).

As shown in Table 3, over time, the share of HGFs has contracted in all sectors except others. According to this table, 31.17% of employment-based HGFs in 2012 were in the manufacturing industry. This was followed by the services sector (27.2%), the wholesale and retail sector (22.86%), and the

Table 3. Sectoral distribution of High-growth Firms outside Istanbul, 2012 and 2019 (%)

| Sectors | 2012 | 2019 |
|--------------------|-------|-------|
| Agriculture-mining | 2.4 | 2.4 |
| Manufacturing | 31.17 | 29.43 |
| Construction | 16.27 | 11.11 |
| Wholesale-retail | 22.86 | 14.43 |
| Services | 27.2 | 42.6 |

Source: Authors' own calculations.

construction sector (16.27%). The share of the agriculture and mining sector is minimal at 2.4%, and it remained unchanged in 2019. As of 2019, 42.6% of HGFs are concentrated in the "others" category, which includes services outside the construction and wholesale-retail sectors, reflecting Türkiye's ongoing structural transformation towards the service sector.

4. Geographical Concentration of High-growth Firms in Türkiye

Identifying which HGFs are concentrated in specific regions and in specific sectors compared to the national level can provide valuable insights for economic decision-makers. This information enables policymakers to prioritize sectors for focused efforts, leading to more effective resource allocation for regional development and giving more substantial support for areas with high growth potential.

There are several measures to calculate concentration, such as the Herfindahl-Hirschman Index (HHI) or the Ellison-Glaeser Index (EG). However, HHI and EG, which are widely used in the literature, are measurements focused more on static industrial or market concentration rather than the spatial distribution of economic activities. They need relatively more complex data, such as firm-level market share, which makes the calculation more difficult. They aggregate data across firms or industries to obtain a single concentration score, which obscures differences between individual firms' growth trajectories. To capture regional aggregations in a more practical, direct, and transparent way, we use the LQ.

4.1. Location Quotient

Many data, such as value-added, export, and production values, can be used in determining the specialization coefficient. However, due to limited data, employment data is used in many studies. Therefore, our study calculated the LQ using employment and local unit (workplace-firm) data to determine the concentration. LQ is an analytical measure used to compare the industrial specialization of a region with a larger geographic area, usually a country; it is calculated by determining the ratio of an industry's contribution to a particular economic indicator (such as earnings, GDP of metropolitan areas, employment, etc.) to the regional total. Since LQ is methodologically

straightforward, it is one of the simplest tools for measuring regional specialization and allows easy comparison across regions or time periods. It is a widely accepted alternative for analyzing regional specialization patterns using available data.

Since it is a method that can be used for any economic activity, provided that the data to be compared is available, the calculation was made using the employment of HGFs. The formula used in this context is as follows:

$$LQ = \frac{e_{ij} / \sum e_j}{E_{ij} / \sum E_j}$$

e_j : employment of HGFs in sector i in region j

$\sum e_j$: total employment in the region

E_j : employment of HGFs in the country

$\sum E_j$: country's total employment

We use the LQ to measure both the regional concentration of HGFs and the sectoral concentration among HGFs. A LQ greater than 1 means that the sector/HGF is more concentrated than the Turkish average in the region, while a ratio less than 1 means that it is below the Turkish average. The critical threshold of the concentration value in the analyses varies in some studies. Therefore, it is a controversial issue from which threshold the localization coefficient value will start. In some studies, conducted on a sectoral basis, the concentration threshold value is accepted as 1.00 (Cromley & Hanink, 2012; Munandar et al., 2017), while in some studies the threshold value is accepted as 1.25 (Baer & Brown, 2006). There are even studies that identify 2.00 as the limit of regional specialization (McCord & Ratcliffe, 2009; Virtanen et al., 2001; Yuanyuan & Bingliang, 2017), on the other hand, there are studies that consider this threshold low and indicate that it should be 3.00 and above (Malmberg & Maskell, 2002).

When the more accepted threshold value of 1.25 is used, the evaluation of the results is as follows:

$LQ < 1.00$: There is no regional concentration

$1.00 \leq LQ < 1.25$: The HGFs are candidates for concentration

$1.25 \leq LQ < 2.00$: Regional concentration has started for HGFs

$2.00 \leq LQ < 3.00$: HGFs have high concentration in the region

$LQ \geq 3.00$: HGFs have reached full concentration level in the region.

We calculated the LQ of employment-based HGFs. According to the calculations, the distribution of firms in 2012 and 2019 is as shown in Figure 1.

4.2. Findings

The localization quotient analysis for Türkiye was first conducted using employment-based HGFs to determine the LQ for 2012 and 2019. According to this analysis, six regions showed concentration exceeding the 1.25 threshold in 2012

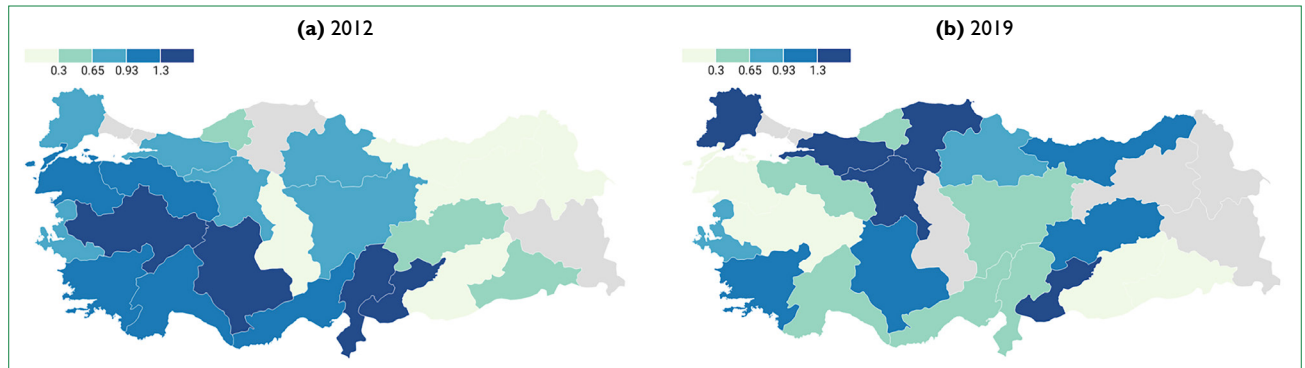


Figure 1. HGF concentration in Türkiye using LQ.

HGF: High-growth Firms; LQ: Location Quotient.

(Fig. 1a). These are TR21, TR32, TR62, TR63, TRA1, and TRC1. It is noteworthy that the concentration is in regions close to Türkiye's borders. Two of these regions are on the west side of the country (TR21 and TR32), two in the Mediterranean (TR62 and TR63), one in northeastern Anatolia (TRA1), and one in southeastern Anatolia (TRC1). However, by 2019, most of these regions no longer exhibited high HGF concentrations (Fig. 1b). Only TRC1 (Adıyaman, Gaziantep, Kilis) and TR63 (Hatay, Kahramanmaraş, Osmaniye) regions remained as regions with high HGF concentrations. The expansion of the local market, particularly in Hatay and Kilis, which host a large number of Syrian refugees, can be considered to have encouraged the rapid growth of firms run by both refugees and locals. In TRC1, the high concentration coefficient and its persistence are closely related to the presence of organized industrial zones, particularly in Gaziantep. It can also be considered that border regions benefit from export opportunities, external demand, and cross-border supply chains. However, HGF concentrations are higher in new regions such as TR51, TR61, TR82, TRC2, and TRC3; suggesting, at first glance, a shift in concentration from west to east.

One of the results we observed in the comparison between these two years is that the TRC1 region and TR63 region, which can be considered the hinterland of this region, emerged as a central hub for HGFs.

Another striking point in this context is that regional inequality in Türkiye has not been significantly reflected in the concentration of HGFs. In this study, we did not find a significant concentration even in the regions around Istanbul. There is even a decrease in HGF concentration in some critical Western regions, as seen in Figure 1b. For example, the TR41 region (Bursa, Bilecik, Eskişehir), which had an HGF concentration of 1.28 in 2012, lost this characteristic and decreased to 0.62 in 2019. Similarly, the TR33 region (Afyonkarahisar, Kütahya, Manisa, Uşak) is one of the regions with decreasing HGF concentration; from 1.60 in 2012 to 0.27 in 2019. We can observe a similar pattern in TR22 (Balıkesir, Çanakkale), TR61 (Antalya, Burdur, Isparta) (Table 4).

Figure 1a, b show that the regional concentrations of HGFs throughout Türkiye do not display a clear distinction between the eastern and western regions. It is quite important and striking that the regional dual structural feature of Türkiye, which has often been highlighted in multidimensional regional studies for many years, has not appeared in the distribution of HGFs. For example, the Ministry of Industry and Technology's study (MoIT, 2023) on HGFs indicates that the firms in question are dispersed across developed industrial zones. Similarly, although mainly focused on manufacturing clusters, Demirez (2018), notes that production centers are dispersed in the nearby and newly developing centers of Ankara and various production centers in Anatolia. In another study focused on the regional distribution of firm sizes, Kent and Donduran (2020) found that firms of different sizes were unevenly distributed across regions between 2005 and 2015, with the share of large firms declining over time in regions such as TR31, TR21, TR41, and TR32. Overall, these findings suggest that the distribution of firms in Türkiye is moving away from a sharp east-west divide, thus pointing to the importance of examining local and firm-level dynamics to better understand how growth occurs, moving beyond macro-regional comparisons.

Especially from 2012 to 2019, the concentration has been shifting from the West to the East and from the South to the North. Although the clustering pattern in coastal regions suggests that natural factors initially affected the concentration of HGF activities, over time the location coefficient (LQ) of HGFs in terms of employment has been decreasing significantly in certain regions. As a result, HGFs are mainly moving away from the West, but some western regions (such as TR21 and TR32) continue to host these firms as of 2019.

According to LQ calculations, the sectoral concentration figures of HGFs in 2012 and 2019 are shown in Figure 2 and Table 5. As seen in the figures, the sectoral concentrations of HGFs show significant differences among themselves and between the two years under consideration.

Table 4. Location Quotient (LQ) Calculations of High-growth Firms

| 2012 | LQ- | 2019 | LQ |
|------|------|------|------|
| TR21 | 0.75 | TR21 | 2.08 |
| TR22 | 1.08 | TR22 | 0.07 |
| TR31 | 0.91 | TR31 | 0.67 |
| TR32 | 0.99 | TR32 | 1.02 |
| TR33 | 1.60 | TR33 | 0.27 |
| TR41 | 1.28 | TR41 | 0.62 |
| TR42 | 0.89 | TR42 | 1.71 |
| TR51 | 0.78 | TR51 | 1.56 |
| TR52 | 1.32 | TR52 | 1.21 |
| TR61 | 1.21 | TR61 | 0.57 |
| TR62 | 1.20 | TR62 | 0.64 |
| TR63 | 1.78 | TR63 | 0.35 |
| TR71 | 0.28 | | |
| TR72 | 0.92 | TR72 | 0.46 |
| TR81 | 0.37 | TR81 | 0.50 |
| TR82 | 0.00 | TR82 | 3.55 |
| TR83 | 0.88 | TR83 | 0.78 |
| TR90 | 0.02 | TR90 | 0.93 |
| TRA1 | 0.07 | | |
| TRA2 | 0.30 | | |
| TRB1 | 0.30 | TRB1 | 1.22 |
| TRB2 | | | |
| TRC1 | 1.59 | TRC1 | 1.77 |
| TRC2 | 0.17 | TRC2 | 0.20 |
| TRC3 | 0.40 | TRC3 | 0.10 |

Source: Authors' own calculations.

The first notable difference between the two years is the decline in regional concentration within the agricultural sector (Fig. 2a, b), attributed to the decrease in employment-based HGFs. In 2012, there are 3 regions where the agriculture sector has a high concentration exceeding the 2.00 threshold;³ these regions are TR32 (Aydın, Denizli, Muğla), TR51 (Ankara), and TR82 (Çankırı, Kastamonu, Sinop) which are in central and western Anatolia. The number of regions exceeding the threshold of 2 increased to 4 in 2019 (TR21, TR51, TR90, and TRA2). A study conducted by Unal (2014) to examine the situation of two regions failing to reflect their agricultural potential in firm growth revealed that, despite the region's continued

agricultural dominance, furniture, wood, and cork products, which belong to the manufacturing industry, were designated as the only three-star sectors.⁴ Wood and wood products are also the sector that provides the most employment in the region. Although the agricultural potential of the TR82 region was once attractive to HGFs, this specialization appears to have disappeared over time and their concentration in manufacturing and wholesale and retail sectors has increased.⁵ TR51 maintains its high concentration in both years, whereas HGF concentration is no longer observed in the TR32 and TR82 regions. The TR51 region also points to a high concentration rate in agriculture in the study conducted by TÜSIAD (2005), which examined the sectoral-regional concentrations in Türkiye. The main reasons why the TR51 region had a high HGF concentration in both years can be attributed to the fact that the region ranks first in the production of many agricultural products and third after Konya and Şanlıurfa in terms of arable land with 11.9 million decare. In addition, the region acts as a logistic junction in the trade between the west and the east and the north and the south due to its geographical location.

Figure 2c, d show that high manufacturing industry concentration is predominantly in the Istanbul hinterland with TR41, TR42, and TR21, in the Izmir hinterland with TR22, TR32, TR33 and on the TR62-TRC1 eastward axis. This picture does not change much in 2012 or 2019; only TR32, TR63, TR72, and TR81 (Bartın, Karabük, Zonguldak) regions have gradually shifted from being regions where manufacturing industry concentration began to being regions where regional concentration disappeared. Particularly, the TR81 region, where public manufacturing industry investments are concentrated, lost this characteristic in 2019. On the other hand, while there was no concentration of manufacturing industry in the TR82, TR83, and TRB1 in 2012, the sector achieved full concentration in these regions by 2019. Notably, the concentration levels of the manufacturing industry in the TR21 and TR82 regions have increased significantly.⁶ The main reason for this increase can be attributed to the significant industrial assets located along the D-100 highway axis in the TR21 region, especially in the districts of Çorlu, Çerkezköy, Kapaklı, Ergene, Lüleburgaz and Muratlı. Furthermore, the increasing clustering of wood, cork, and pulp and paper products in the TR82 region (Alsaç, 2010) may contribute to the rising concentration of HGFs in the region's manufacturing industry.

The most striking and significant difference is observed between the manufacturing and construction sectors. In contrast to the manufacturing industry, the construction clustering is in the eastern regions of Türkiye - Figure 2e, f show that

³ In 2012; TR32 (LQ: 2.45), TR51 (LQ: 2.53), TR82 (LQ: 4.16). In 2019; TR21 (LQ: 2.46), TR51 (LQ: 2.65), TR90 (LQ: 2.71), TRA2 (LQ: 2.64).

⁴ In terms of cluster analysis, a sector can receive 3 stars if it receives a value higher than the threshold value in terms of size, dominance, and specialization criteria.

⁵ The LQ value of the wholesale and retail sector in the TR32 region increased from 0.88 to 1.75, whereas in the TR82 region, the LQ value in the manufacturing industry increased from 0.57 to 3.73.

⁶ The LQ value of the manufacturing industry in the TR21 has increased from 1.06 in 2012 to 3.08 in 2019.

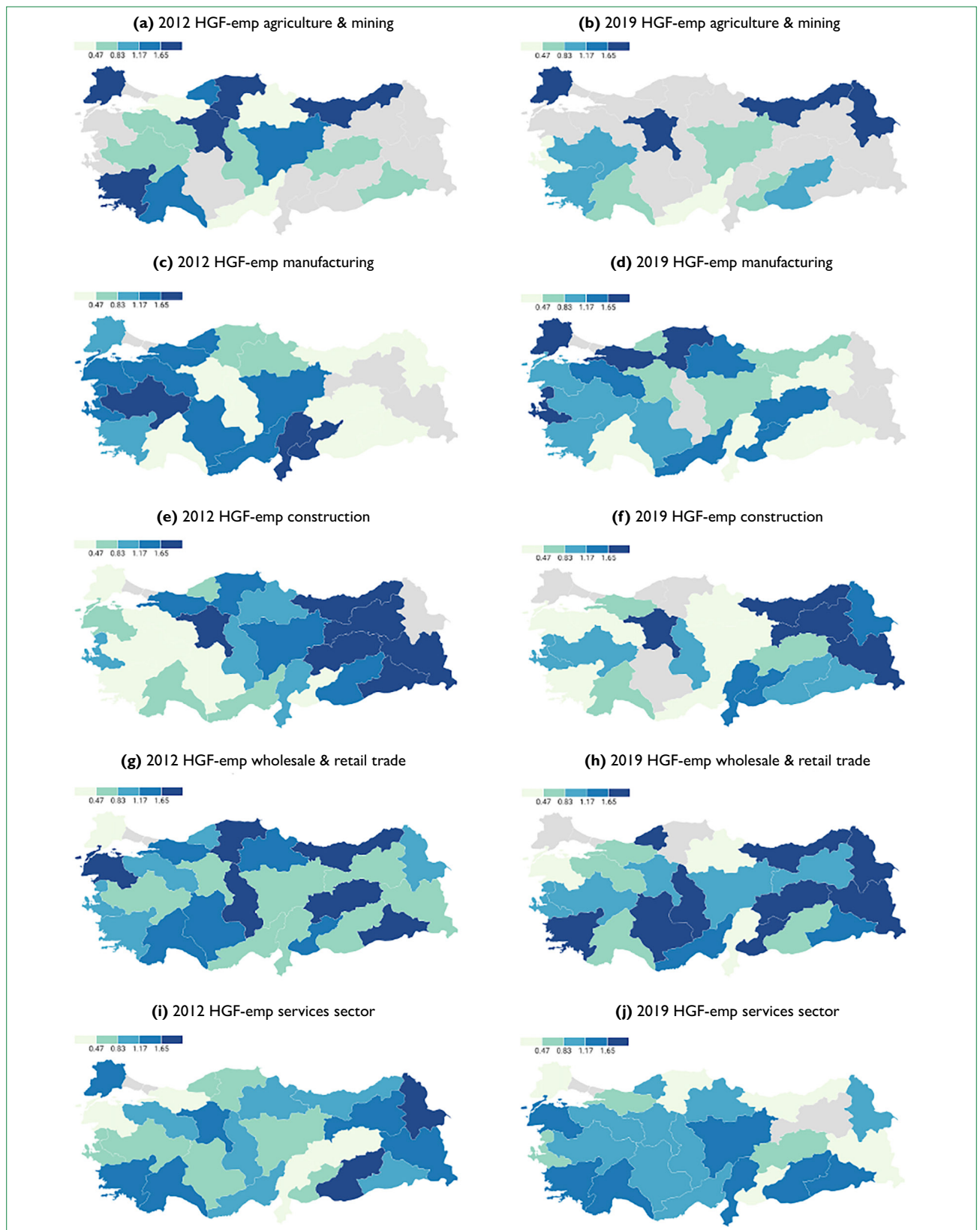


Figure 2. Sectoral concentration of employment-based HGFs.

The maps are based on LQ calculations given in the appendix. HGF: High-growth Firms; LQ: Location Quotient.

Table 5. Location quotient calculations of high-growth firms by sector and regions

| | Agriculture&Mining | | Construction | | Manufacturing | | Wholesale & Retail | | Services | |
|------|--------------------|------|--------------|------|---------------|------|--------------------|------|----------|-------|
| | 2012 | 2019 | 2012 | 2019 | 2012 | 2019 | 2012 | 2019 | 2012 | 2019 |
| TR21 | 1.83 | 2.46 | 0.15 | | 1.06 | 3.08 | 0.36 | | 1.54 | 0.34 |
| TR22 | | | 0.57 | 0.19 | 1.24 | 1.00 | 2.76 | 0.22 | 0.36 | 1.47 |
| TR31 | | 0.18 | 1.15 | 0.83 | 1.20 | 2.14 | 1.13 | 0.92 | 0.75 | 0.55 |
| TR32 | 2.45 | 0.97 | 0.22 | 0.25 | 1.09 | 0.88 | 0.88 | 1.74 | 1.23 | 1.18 |
| TR33 | 0.83 | 1.16 | 0.46 | 0.87 | 1.77 | 1.08 | 0.63 | 1.03 | 0.69 | 0.97 |
| TR41 | 0.73 | | 0.43 | 0.29 | 1.31 | 1.48 | 1.00 | 0.67 | 1.00 | 1.13 |
| TR42 | 0.09 | | 1.36 | 0.69 | 1.31 | 2.42 | 1.57 | 0.60 | 0.37 | 0.53 |
| TR51 | 2.53 | 2.65 | 1.68 | 1.79 | 0.41 | 0.49 | 0.47 | 0.83 | 1.29 | 0.87 |
| TR52 | | | 0.45 | | 1.49 | 1.04 | 1.37 | 3.50 | 0.73 | 0.99 |
| TR61 | 1.49 | 0.55 | 0.82 | 0.53 | 0.31 | 0.39 | 1.63 | 0.52 | 1.44 | 1.57 |
| TR62 | 0.23 | 0.11 | 0.63 | 0.39 | 1.37 | 1.31 | 0.76 | 1.48 | 0.98 | 1.03 |
| TR63 | | | 0.90 | 1.44 | 1.89 | 0.42 | 0.80 | 0.16 | 0.37 | 1.34 |
| TR71 | 0.47 | | 1.00 | 0.86 | 0.36 | | 2.26 | 4.25 | 1.13 | 1.09 |
| TR72 | 1.42 | 0.55 | 1.21 | 0.20 | 1.37 | 0.51 | 0.55 | 0.89 | 0.69 | 1.565 |
| TR81 | 1.22 | | 0.78 | | 1.45 | 0.73 | 1.00 | 3.75 | 0.66 | 1.10 |
| TR82 | 4.16 | | 1.49 | | 0.57 | 3.73 | 2.05 | | 0.50 | 0.21 |
| TR83 | 0.18 | | 1.15 | 0.15 | 0.76 | 1.62 | 1.46 | 0.35 | 1.01 | 1.15 |
| TR90 | 1.83 | 2.71 | 1.68 | 2.69 | 0.04 | 0.61 | 1.96 | 1.87 | 1.10 | 0.33 |
| TRA1 | | | 2.39 | 5.12 | | 0.28 | 0.47 | 1.15 | 1.51 | |
| TRA2 | | 2.64 | | 1.64 | 0.11 | | 0.85 | 2.32 | 2.43 | 0.94 |
| TRB1 | 0.64 | | 3.28 | 0.47 | 0.30 | 1.50 | 1.69 | 2.38 | 0.26 | 0.77 |
| TRB2 | | | 2.23 | 3.54 | | | 0.60 | 4.64 | 1.53 | 0.12 |
| TRC1 | | 0.79 | 0.21 | 1.35 | 1.89 | 1.46 | 1.26 | 2.50 | 0.52 | 0.42 |
| TRC2 | | 0.89 | 1.44 | 0.84 | 0.23 | 0.17 | 0.48 | 0.50 | 1.75 | 1.55 |
| TRC3 | 0.57 | | 1.82 | 1.06 | 0.22 | 0.34 | 1.82 | 1.17 | 1.01 | 1.35 |

Source: Authors' own calculations.

this trend continued in 2019, albeit at a weaker rate. Particularly in some regions, sector concentration is either not seen or has decreased significantly. For example, in the TR82 region, where the construction sector began to concentrate in 2012, no such concentration was observed in 2019. Similarly, regions such as TRB1 (Bingöl, Elazığ, Malatya, Tunceli), TR83 (Amasya, Çorum, Samsun, Tokat), TR72 (Kayseri, Sivas, Yozgat) and TRC2 (Diyarbakır, Şanlıurfa) experienced an initial rise in sector concentration, but this trend has dissipated mainly by 2019. The most notable change occurred in the TRB1 region, where a previously high concentration of the construction sector (LQ=3.28) dropped significantly by 2019 (LQ=0.47). We observe that the concentration values of the construction sector increased significantly from 2012 to 2019,

mainly in the eastern and southeastern regions (TRA1, TRA2, TRB2, and TRC1). Among these, especially in the TRA2 and TRC1 regions, while there was no sector concentration in 2012, the sector started to specialize in the region in 2019.⁷

A notable shift occurred in the services sector between 2012 and 2019. While traces of a clustering trend towards the eastern regions of Türkiye were seen in 2012, this trend was completely reversed in 2019, and the concentration turned towards the west. In fact, the concentration of the service sector has started in regions such as TR22, TR72, and TR63, where there was no sectoral concentration in this sector before. Similarly, the fact that the TRA1 and TRA2 regions were identified as having potential for winter tourism (Alsaç, 2010)

⁷ The LQ value of the wholesale and retail sector in the TRB2 has increased from 0.60 in 2012 to 4.64 in 2019. In other regions with high concentrations increases from 2012 to 2019, LQ values increased from 1.37 to 3.50 for TR52, from 2.26 to 4.25 for TR71 and from 1.00 to 3.75 for TR81, respectively.

within the scope of the National Clustering Policy Development Project carried out by the Undersecretariat of Foreign Trade may have been effective in the rapid growth of companies operating in this field in the region.

On the other hand, in the regions of TR32, TR61, TR22, and TR51, where commercial and tourism activities are concentrated due to international ports and free zones, the concentration value of the service sector is relatively higher compared to the manufacturing industry. The TR61 and TR32 regions, which include Antalya and Bodrum, known for their vibrant tourism sectors, are home to many high-growth potential companies operating in the tourism and hospitality sector.

5. Conclusion

Regional development models based on firm location theory suggest that a region's development is influenced by the firms within that region. Inspired by this model, our study analyzes sectoral concentration in Türkiye by focusing on HGFs in each region. Determining the regions where HGFs are clustered is parallel to the benefits provided by sectoral clusters. Therefore, raising awareness in these areas can facilitate the development of basic infrastructure, attract more qualified labor and, most importantly, more investors with HGF potential, and ultimately improve the regional economy. Within this framework, strategic regional planning focused on regional strengths can direct resources to areas where a concentration of firms with high-growth potential is observed. This will ensure that firms' growth potential is recognized, and their sustainability is enhanced.

HGFs emerged as a recognized phenomenon in the late 1970s and rapidly found an undeniable place in the literature. Policymakers focus mainly on HGFs due to the importance of increasing employment and creating new jobs. Therefore, policies that support the persistence of HGFs have become a priority for regional and national policymakers in both developed and developing countries. In other words, understanding the behavior of HGFs and their status in a country's economy becomes more valuable for decision-making for national and regional development. However, there is no single, established explanation in the literature for their high growing patterns. Therefore, our study focused on the regions where these firms are located.

Using the LQ method, this study focused on the concentration of HGFs at the NUTS-2 level and their concentration in various sectors, along with firm-level employment data. According to the OECD definition, HGFs among firms with 10 or more employees that achieved employment growth of at least 20% or more in the last three years were considered. Considering the undeniable importance and dominant role of Istanbul in the Turkish economy, it was preferred to focus on other regions and only data obtained from firms with high growth potential outside Istanbul were used.

According to the findings of our study, the geographical distribution of HGFs in Türkiye between 2012 and 2019 reveals a dynamic and evolving regional structure that challenges the widely held perception of a regional divide in the country. Despite Türkiye's well-documented East-West divide in socio-economic development, the concentration of HGFs does not align with this pattern. Instead, the data suggest a spatial diffusion and diversification of HGF activity across the country.

While at the beginning of the period (2012), HGF geographical concentrations were observed in border and coastal regions (e.g. TR21, TR32, TR62), by 2019 we understand that there is a clear shift in growth potential away from the Istanbul-centered core and towards the central, eastern and southeastern regions (especially TRCI and TR63). This situation suggests that entrepreneurial dynamism has begun to create new regional centers. In addition, activities carried out through incubation centers/İŞGEMs (Business Development Centers) in smaller provinces (Entrepreneur Support Program) and the widespread institutional linkages with universities may also play a role in this outcome.

Sectoral analysis partially supports this evolution. Manufacturing, once only dominated by the western and İstanbul's hinterland regions, is showing increasing activity in regions such as TR82 and TR83. However, our findings show that the manufacturing sector still dominates the western regions of Türkiye. Particularly in the regions considered as the hinterland of Istanbul, the concentration of the manufacturing industry is higher than in other sectors. Therefore, even if the Istanbul region is excluded, this structure suggests that polarization within Türkiye remains concentrated in the manufacturing industry, particularly in the hinterland of Istanbul. Despite this, there are regions with the potential for concentration in the manufacturing industry, especially in central Anatolia and the Eastern Mediterranean. Central Anatolia particularly confirms this potential due to its location at the intersection of Türkiye's main transportation and logistics corridors, railways, highways and motorway networks connecting west-east and north-south directions. The Eastern Mediterranean region benefits from proximity to ports and export routes, particularly the Port of Mersin, which is a key logistics hub for both the domestic and Middle Eastern markets. Therefore, to eliminate regional inequality, it may be advisable to focus on manufacturing industry incentives in regions with HGFs, such as TR62 (Adana, Mersin) and TR83 (Amasya, Çorum, Samsun, Tokat).

On the other hand, the construction sector has a notable concentration in the eastern regions. This is not surprising considering that Türkiye has preferred a construction-centered growth model for the last 20 years. The concentration

of the construction sector in the eastern regions can be attributed to the construction of hydroelectric power plants (HEPP) in the region. For instance, the completion of two of Türkiye's 10 largest HEPPs—Beyhan and Yukarı Kaleköyü—in the TRB1 region (Bingöl, Elazığ, Malatya, Tunceli) in 2014 and 2018, respectively, may have contributed to the sharp decline in sectoral concentration in this region. The LQ for TRB1 decreased from 3.28 in 2012 to 0.47 in 2019.

Similarly, the dams started in the TRC2 region (especially in Diyarbakır) in 2008–09 and put into operation after 2020 can be cited as an example of this. As a result, the concentration of the construction sector in this region has probably decreased with the completion of the dam, and the LQ for region TRC2 decreased from 1.44 in 2012 to 0.84 in 2019. In addition to dam construction in the region, the development of infrastructure projects, including transportation networks and urban development, is also considered effective in fostering the emergence of HGFs. The growth of the construction sector in the east contrasts with its decline in formerly active regions, while the service sector is shifting westwards with growth in tourism-oriented coastal regions such as TR32 and TR61.

Besides, the rising construction sector in the eastern regions is accompanied by the services and wholesale and retail trade sectors, which also increases LQ values in these regions. For instance, in the TRB2 (Bitlis, Hakkari, Muş, Van), which is notable in the eastern part of Türkiye and is under the 6th investment incentive zone, the wholesale and retail sector has reached a full concentration level, and the LQ value increased from 0.60 in 2012 to 4.64 in 2019. This is consistent with earlier studies that identified the region's competitive sectors. For instance, a 2019 study by Deliktaş and Çelik on the TRB2 region concluded that the wholesale and retail sector is strong in terms of employment and the number of firms, and shows potential for specialization (Deliktaş & Çelik, 2019).

Our study has also raised some questions about whether Türkiye has the potential to produce HGFs regionally. As a result, examining the HGFs regionally over a more extended period will allow for the determination of regions that consistently produce HGF. Additionally, conducting a more detailed sectoral review will be insightful for sector-specific evaluations.

Determining the geographic concentration of HGFs will also open the door to regional strategic planning. Regional recovery opportunities may arise from the strategic location choices made by companies to maximize their growth potential and the deliberate planning policies implemented by governments to promote specific spatial advantages (Appendix I).

Ethics committee approval: As this study does not involve direct human participation or data that requires ethics committee approval, approval from the ethics committee was not obtained.

Informed consent: Since this study does not involve human participation, obtaining informed consent was not required.

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|------|---------------------------------------|------|---|------|---|
| TR10 | İstanbul | TR52 | Konya, Karaman | TR90 | Trabzon, Ordu, Rize, Giresun, Artvin, Gümüşhane |
| TR21 | Tekirdağ, Edirne, Kırklareli | TR61 | Antalya, Isparta, Burdur | TRA1 | Erzurum, Erzincan, Bayburt |
| TR22 | Balıkesir, Çanakkale | TR62 | Adana, Mersin | TRA2 | Ağrı, Kars, Iğdır, Ardahan |
| TR31 | İzmir | TR63 | Kahramanmaraş, Hatay, Osmaniye | TRB1 | Malatya, Elâzığ, Bingöl, Tunceli |
| Tr32 | Aydın, Denizli, Muğla | TR71 | Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir | TRB2 | Van, Muş, Bitlis, Hakkâri |
| TR33 | Manisa, Kütahya, Afyonkarahisar, Uşak | TR72 | Kayseri, Sivas, Yozgat | TRC1 | Gaziantep, Kilis Adıyaman, |
| TR41 | Bursa, Eskişehir, Bilecik | TR81 | Zonguldak, Bartın, Karabük | TRC2 | Şanlıurfa, Diyarbakır |
| TR42 | Kocaeli, Sakarya, Bolu, Düzce, Yalova | TR82 | Kastamonu, Çankırı, Sinop | TRC3 | Mardin, Batman, Şırnak, Siirt |
| TR51 | Ankara | TR83 | Samsun, Tokat, Corum, Amasya | | |

Appendix I. Classification of NUTS-2 statistical regions in Türkiye.