

Regional Inclusive Growth in Türkiye: Measurement, Drivers and Fiscal Policy Implications

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Abstract: This study evaluates the inclusiveness of economic growth across NUTS-1 regions of Türkiye for the period 2007–2023 by constructing a multidimensional regional Inclusive Growth (IG) index. The index combines indicators of income, employment, poverty and inequality, gender gaps, human capital, infrastructure, and social protection. The study provides the most extensive longitudinal assessment of regional IG in Türkiye to date, addressing a significant gap in the sub-national literature. The findings show that western and metropolitan regions consistently achieve higher IG scores, while eastern regions remain at the bottom despite gradual improvement. Correlation and decomposition analyses show that regional disparities in IG are driven less by basic infrastructure gaps and more by differences in health, education, social protection, digital infrastructure, and the labor market. Reducing these spatial inequalities requires regionally differentiated fiscal equalization, public spending on social investment, and targeted redistributive transfers. This study presents an analytical framework that links economic performance to multidimensional social welfare outcomes and offers a public policy perspective that will enable the development of regionally sensitive IG strategies.

Keywords: Inclusive growth, regional disparities, NUTS-1 regions, fiscal policy

Jel Codes: O47, R11, H53, H75

Türkiye’de Bölgesel Kapsayıcı Büyüme: Ölçüm, Yapısal Belirleyiciler ve Maliye Politikası Çıkarımları

Öz: Bu çalışma, çok boyutlu bir bölgesel Kapsayıcı Büyüme (KB) endeksi oluşturarak, 2007–2023 dönemi için Türkiye’nin NUTS-1 bölgelerinde ekonomik büyümenin ne ölçüde kapsayıcı olduğunu değerlendirmektedir. Endeks; gelir, istihdam, yoksulluk ve eşitsizlik, toplumsal cinsiyet farkları, beşerî sermaye, altyapı ve sosyal koruma göstergelerini bir araya getirmektedir. Çalışma, Türkiye’de bölgesel düzeyde kapsayıcı büyümeye ilişkin bugüne kadarki en kapsamlı uzun dönemli değerlendirmeyi sunarak alt-ulusal literatürdeki önemli bir boşluğu doldurmaktadır. Bulgular, batı ve metropol bölgelerin sürekli olarak daha yüksek KB skorları elde ettiğini, doğu bölgelerinin ise kademeli iyileşmelere rağmen en alt sıralarda yer aldığını göstermektedir. Korelasyon ve ayrıştırma analizleri, KB’deki bölgesel farklılıkların temel altyapı eksikliklerinden ziyade sağlık, eğitim, sosyal koruma, dijital altyapı ve istihdam piyasasındaki farklılıklardan kaynaklandığını göstermektedir. Bu mekânsal eşitsizliklerin azaltılması, bölgesel olarak farklılaştırılmış mali tevzin mekanizmaları, sosyal yatırım odaklı kamu harcamaları ve hedefli yeniden dağıtım transferlerini gerektirir. Bu çalışma, ekonomik performansı çok boyutlu sosyal refah sonuçlarıyla ilişkilendiren analitik bir çerçeve sunmakta, bölgesel duyarlılığa sahip KB stratejilerinin geliştirilmesini sağlayacak bir kamu politikası perspektifi sunmaktadır.

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Anahtar Kelimeler: Kapsayıcı büyüme, bölgesel eşitsizlikler, İBBS-1 bölgeleri, maliye politikası

Jel Kodları: O47, R11, H53, H75

1. Introduction

The dominance of neoliberal policies in the 1980s led to a weakening of state intervention in socio-economic domains, including education, healthcare, poverty reduction, and income distribution. However, public finance and development thinking underwent a fundamental change during the late 1990s with the “pro-poor growth” approach. (Saad-Filho, 2011; Lopes, 2012). Following the 2008 global financial crisis, it became increasingly evident that the state needs to concentrate on its redistributive and social investment functions because market mechanisms did not generate equitable results. Within this context, the governments and international organizations started to focus on the Inclusive Growth (IG) concept, which requires fiscal policy to support both wide economic participation and equal benefit distribution from growth (Ianchovichina & Lundstrom, 2009; OECD, 2012).

The public economics perspective shows that development is dependent not only on market dynamics but also on fiscal policy choices. While the initial approach to pro-poor growth focuses on reducing poverty among the lowest-income groups in society, inclusive growth points to a framework where all segments of society contribute to the growth process and benefit fairly from its advantages (Klasen, 2010). In this framework, states are expected to play an active role, ensuring both the participation of society in the growth process and its fair benefit through public social spending and progressive taxation. Evaluating the effectiveness of fiscal policy focuses on the development of human capital, the reduction of income inequality, and its contribution to indicators of individual well-being beyond per capita income (Sabir & Qamar, 2019; Zouhar et al., 2021).

This issue is particularly important for Turkey because, despite achieving high growth rates since the mid-2000s, regional development inequalities persist. This sharp divide between western and eastern regions demonstrates that national growth performance alone provides a limited insight into inclusivity. Therefore, it is essential to examine whether growth is inclusive at the subnational level and to develop targeted public policy recommendations accordingly.

Multiple studies have investigated IG in Türkiye through national-level indicators, but have not conducted enough research to understand how public policy results relate to inclusiveness at the regional level. The purpose of this study is to assess the inclusiveness of Türkiye’s growth trajectory across NUTS-1 regions between 2007 and 2023 through the construction of a regional IG index. In addition to presenting a regional IG index as its main finding, the study utilizes correlation and decomposition methods to reveal the factors that create persistent spatial differences between regions. In doing so, it provides an empirical foundation for the design of territorially sensitive fiscal policies, particularly in the areas of public expenditure composition, social spending, and labor-market-related public interventions.

The remainder of the article proceeds as follows: The next section presents the approaches to define IG, while the third section investigates measurement approaches. The fourth section presents a summary of empirical research that focuses on Türkiye. The fifth section displays the data and research methods used to develop and assess the regional IG index. The sixth section presents the results, while the seventh section examines the drivers of regional disparities by using correlation and decomposition analysis. The last part discusses the fiscal policy recommendations for reducing regional disparities in IG.

2. Defining Inclusive Growth

There is no universally accepted definition of inclusive growth. Within this concept, societal well-being is primarily associated with sustained income growth and the equitable distribution of the benefits derived from this income among individuals,

regions, and social groups. Table 1 summarizes the definitions and perspectives of international organizations regarding the inclusiveness of growth.

Table 1. Definitions of Inclusive Growth

| Institution | Definition |
|--|--|
| Asian Development Bank (ADB, 2011) | Economic growth that provides equal opportunities for all; built on three pillars: (i) high, efficient, and sustained growth creating productive jobs; (ii) social inclusion ensuring equal access to opportunities; (iii) social safety nets protecting the vulnerable. |
| African Development Bank (Hakimian, 2013) | Growth process not confined to the poor, but one that broadens benefits to large segments of society. |
| Organization for Economic Co-operation and Development (OECD, 2018) | People-centered growth model where well-being—not GDP per capita—is the measure of success; everyone contributes to and fairly benefits from growth regardless of background, and receive a fair share of the benefits |
| World Economic Forum (WEF, 2018) | Broad-based improvement in living standards reflecting the shared prosperity of society |
| United Nations Development Programme (UNDP, 2017) | Broad-based welfare increase achieved through economic growth or equitable distribution of opportunities created by growth. |
| United Nations Conference on Trade and Development (UNCTAD, 2023) | Provision of equal and non-discriminatory opportunities for all to participate in and benefit from the economy, with emphasis on environmental sustainability and gender equality. |
| International Monetary Fund (IMF, 2017) | Growth that is robust and broad-based across sectors, promotes productive employment, ensures equal access to markets and resources, and protects the vulnerable. |
| European Commission (EC, 2010) | Growth contributing to vocational skills, poverty reduction, labor market improvement, and social protection, empowering people through high employment levels. |

Source: Author's compilation

As displayed in Table 1, international organizations converge on three core elements of IG: broad-based participation in economic activity, equitable access to opportunities and services, and protection against social and economic risks.

3. Measuring Inclusive Growth

Because IG is multidimensional, measurement requires composite frameworks combining economic and social indicators. Table 2 summarizes major approaches.

Early approaches measured IG mainly through growth and income distribution (Ali & Son, 2007; Anand et al., 2013). Later studies developed multidimensional indices incorporating employment, human capital, inequality, and social protection (McKinley, 2010; WEF, 2018; UNCTAD, 2023). While some frameworks rely on equal weighting and others on PCA-based weights, policy-oriented indices such as McKinley's have been widely applied in developing-country contexts.

Scholars have further refined these frameworks through diverse index-based models. Mlachila et al. (2016) introduced the Quality of Growth Index (QGI) to balance growth fundamentals with social outcomes, while Mitra and Das (2018) employed PCA to derive objective weights for 16 Asian economies. The Multidimensional Inclusiveness Index (MDI) which Dörffel and Schuhmann (2022) created assesses 171 countries through two indicator sets which evaluate equity and achievement for long-term assessment.

Table 2. Selected Frameworks and Indices to Measure Inclusive Growth

| Author/Institution | Coverage | Main Approach | Dimensions | Weighting Method |
|----------------------------|------------------------------------|--|--|--|
| Ali & Son (2007) | Philippines, 1998 | Social opportunity functions | Average opportunities (y), distribution of opportunities (φ) | Formula-based decomposition ($dy = \varphi dy + y d\varphi$) |
| Anand et al. (2013) | Emerging markets, 1970-2010 | Extension of social opportunity curves | Growth + income distribution | Formula-based (change in income and inequality) |
| McKinley (2010) | 6 Asian countries | IG Index | 10 sub-indicators | Predetermined weights |
| Hakimian (2013, 2016) | Africa | IG Index | 8 main axes | Equal weights |
| WEF (2015–2018) | Global | Inclusive Development Index (IDI) | 3 main pillars, 12 sub-indicators | Equal weights |
| ADB (2011, 2014) | Asia-Pacific | IG Framework | 9 pillars, 35 indicators | No weighting |
| OECD (2018) | OECD countries | IG Dashboard | 4 pillars, 24 sub-indicators | No weighting |
| UNCTAD (2019, 2023) | 86 → 134 countries | IG Index | 3 pillars, 21 indicators (2019) 4 pillars, 27 indicators (2023) | Equal weights |
| World Bank (2023) | Since 2006, 88 countries | Global Database of Shared Prosperity | Growth of bottom 40% | Direct measure |
| Mlachila et al. (2016) | Developing & emerging countries | Quality of Growth Index | Growth fundamentals + social outcomes | Equal weights |
| Mitra & Das (2018) | 16 Asian countries | IG Index | 4 pillars, 24 sub-indicators | PCA |
| Dörffel & Schuhmann (2022) | 171 countries (1960–2018) | Multidimensional Inclusiveness Index (MDI) | 2 sub-indices: equity and achievements Basic version: 5 indicators Extended version: 14 indicators | PCA |
| Veneri & Murtin (2016) | 15 OECD countries (regional level) | Multidimensional Living Standards (MDLS) | Income, Jobs, and Health | Equivalent-income approach |

Source: Author's compilation

Research from recent times demonstrates that national statistical data fails to reveal the actual disparities which exist between different geographic areas. Veneri and Murtin (2016) show that regional assessments need to exist because they help create targeted policies which must account for how quality of life differs across regions more than income levels do. This focus has led to various adaptations of international frameworks to regional contexts, including studies on China (Sun et al., 2018), Indonesia (Prabowo, 2022), and Russia (Mikheeva, 2020; Sharafutdinov et al., 2019; Rytova et al., 2021).

This regional perspective provides essential value to Türkiye, where the country experiences fast development alongside ongoing geographical inequalities between different areas. The following section reviews Türkiye-specific literature on IG which examines measurement methods and comparative evaluation techniques.

4. Literature Review

There is a limited body of research attempting to measure the inclusiveness of growth in Türkiye. The national-level evidence available suggests that the IG performance of the country has generally been positive over the past two decades. For the period 2002-2011, Taşkın (2014) used Ali & Son (2007)'s social opportunity index, while Can, Can & Bal (2019) and Avcı & Tonus (2020) for 1991-2015 and 2006-2018 respectively applied McKinley (2010)'s framework. All three studies consistently reached the conclusion that economic growth during review periods had an inclusive character. More recently, Deniz Karakoyun & Yorulmaz (2024) took both McKinley (2010) and Hakimian (2013) approaches to estimate the IG index of 2002-2019 and found that after a sharp rise between 2002-2009, the IG index followed a more stable pattern from 2012 to 2019. These studies, taken together, provide a foundation for understanding Türkiye's overall progress in IG.

Table 3. Türkiye's IG Rankings in Comparative Perspective

| Index / Source | Countries/ Year | Türkiye's Rank | Key Dimensions or Sub-Indices | Highlights for Türkiye |
|--|--|--|---|---|
| Inclusive Development Index (IDI) – WEF (2018) | 74 emerging economies (2018) | 16th | Growth, inclusion, intergenerational equity, sustainability | Strong growth and low absolute poverty; however, persistent income and wealth inequality. The report calls for expanding formal wage employment and investing in human capital. |
| Quality of Growth Index (QGI) – Mlachila et al. (2016) | 93 developing and emerging countries (2005–2011) | 22nd | Growth fundamentals, social outcomes (education, and health) | Reflects Türkiye's robust growth fundamentals, but limited inclusiveness of outcomes. |
| Multidimensional Inclusiveness Index (MDI) – (Basic Version) Dörffel & Schuhmann (2022) | 168 countries (2018) | 63rd | Equity (income Gini), Achievements (GDP per capita, savings, life expectancy and human capital) | Moderate performance; structural and institutional constraints hinder equitable growth. |
| Inclusive Growth Index (IGI) – UNCTAD (2025) | 134 countries (2023) | Overall: 69th Economy: 46th Living Con.: 43rd Equality: 118th Environment: 97th | Economy, living conditions, equality, environment | Average overall performance; strong economy and improved living conditions contrast with weak equality and environmental indicators. |

Source: Author's compilation

The inclusiveness of Türkiye has also been examined in comparative, cross-country contexts. Bocutoğlu (2017) examined the D-8 countries (Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Türkiye, and Pakistan) based on the WEF (2015) IDI. The study found that Malaysia, Türkiye, Indonesia, and Iran were generally more inclusive than average. Murat & Güzel (2022) compared BRICS countries and Türkiye with the WEF (2018) IDI. They identified Türkiye, Russia, and Brazil as the best performers. Keskin & Abuk Duygulu (2024) chose representative UNCTAD IGI indicators from which to evaluate and compare the IG characteristics of Türkiye on entering the present century. Their comparative framework was made up of countries such as those of upper-middle-income countries (UMIC) and the OECD member states. The results show that Türkiye's performance on living conditions indicators is good, while its effort to promote equality and its promotion of the environment obviously need to be more intensive. Its equality-related performance is clearly below the UMIC and OECD averages; this calls for equal redistribution of income and ecological civilization-building.

Recent international IG rankings also show Türkiye's mixed performance: strong growth and poverty reduction coexist with persistent weaknesses in equality and environmental sustainability (see Table 3).

Research on regional studies across Türkiye shows that different areas throughout the country experience varying levels of IG. The research of Taşkın (2014) and Soyyiğit & Elverdi (2021) applied Ali & Son's (2007) method to NUTS-1 data which revealed major inequalities in opportunity access between metropolitan and eastern areas. The research by Berber et al. (2024) applied the McKinley framework for 2014-2021 period, to analyze IG development. The results showed that the progress remained stagnant, because different clusters only experienced small changes in their performance levels.

While findings in the current literature highlight persistent interregional inequalities, they are based on pioneering studies that limited the scope of growth inclusivity to income magnitude and distribution, or the index-based measures developed are based on shorter time periods. This study fills this gap by adopting McKinley's (2010) framework for NUTS-1 regions over an extended period (2007–2023). The research includes social and economic elements together with infrastructure assessment to create the most detailed time-based study of regional IG in Türkiye which exists currently. The research method produces strong evidence which enables policymakers to create their best place-based fiscal programs that will maximize public resource allocation for solving persistent geographic disparities.

5. Data and Methodology

Multiple conceptual frameworks exist because different theoretical approaches to IG have produced them which show substantial differences (Rytova et al.,2021). The initial definitions of the concept concentrated on two specific aspects which included economic expansion and how wealth distribution affects society (Ali & Son, 2007; Anand et al., 2013), while recent studies adopted new frameworks which study multiple factors including public debt, corruption, and carbon intensity (WEF, 2018; UNCTAD, 2025; Dörffel & Schuhmann, 2022). However, the lack of consistent regional data in Türkiye precludes the use of these broader indices. The research of Mlachila et al. (2016) are excluded for omitting income inequality. Consequently, this study implements McKinley's (2010) method which provides a complete multi-dimensional framework that matches the regional data which Türkiye has available.

Following the compilation of regional data, the regional IG index is created in two stages. First, variables with different scales are standardized into indices on a common scale and then aggregated into a single composite index using a weighting method. Standardization of variables happens through two main approaches which are the Z-score method and the Min-Max method. The Z-score method becomes extremely responsive when outliers exist in the data. Given the pronounced heterogeneity of economic and social indicators across Turkish regions, this may produce excessively dispersed distributions. The Min–Max method serves as a solution to prevent this issue which enables researchers to establish rankings between different regions. The Min–Max method achieves its highest accuracy when processing different regional data points which matches the requirements of this study (Mlachila et al.,2016; Jiang et al.,2022). Normalization is carried out using Equation (1) and (2). The first one is applied to “desirable” variables—such as real GDP per capita—whose increase raises the index; the second one is used for “undesirable” variables—such as the Gini coefficient—whose increase lowers the index.

$$X_{st} = \frac{X_t - (\min X)}{(\max X - \min X)} * 100 \quad (1)$$

$$X_{st} = 100 - \left(\frac{X_t - (\min X)}{(\max X - \min X)} * 100 \right) \quad (2)$$

The second step in creating an index is to weight the variables. According to the literature, this can be done using subjective or objective methods, as summarized in Table 2. In the subjective method, the weight of each indicator in the index is determined according to the decision-maker's preference, while the equal weighting method offers a simpler framework. Objective methods such as Principal Component Analysis (PCA) are also used to eliminate subjectivity in weighting.

Among these alternatives, purely statistical approaches such as PCA reduce researcher discretion but may assign greater weight to indicators with higher variance rather than higher conceptual relevance, which can weaken the policy interpretability of the index. Equal weighting, by contrast, treats all dimensions as equally important but risks oversimplifying the multidimensional structure of IG. McKinley's (2010) framework offers a policy-based normative compromise that is particularly suited to developing-country contexts, where IG depends simultaneously on economic performance and the state's redistributive and social-investment functions. Employing this framework also ensures comparability with earlier empirical studies on Türkiye, such as Avcı and Tonuş (2020) and Berber et al. (2024), which similarly rely on McKinley's structure to preserve the multidimensional and policy-oriented character of the index.

Table 4 reports the four main dimensions and ten sub-dimensions of McKinley's index, together with their weights. Each indicator is scored from 0 to 10, reflecting the region's performance: scores of 1–3 indicate unsatisfactory, 4–7 satisfactory, and 8–10

superior performance. Each score is multiplied by its corresponding weight, and the weighted values are summed to obtain the overall IG index for each region.

Table 4. McKinley Index, Indicators and Weights

| Dimensions | Weight | Areas | Weight |
|---|--------|-----------------------------|--------|
| Economic growth, productive employment, economic infrastructure | 50% | Economic growth | 25% |
| | | Employment | 15% |
| | | Economic Infrastructure | 10% |
| Poverty, inequalities, gender inequality | 25% | Poverty | 10% |
| | | Inequalities | 10% |
| | | Gender Inequality | 5% |
| Human capabilities, accessibility to resources | 15% | Health and Nutrition | 5% |
| | | Education | 5% |
| | | Accessibility to safe water | 5% |
| Governance and social protection | 10% | Social Protection | 10% |

Source: McKinley (2010).

McKinley also proposes a set of potential indicators that can be used to capture these areas of inclusiveness. Drawing on this framework and the availability of regional data in Türkiye, this study operationalizes the index using the indicators and weights shown in Table 5.

Table 5. Regional IG Index for Türkiye, Indicators and Weights

| Dimensions | Weight | Areas | Weight |
|---|--------|--|--------|
| Economic growth, productive employment, economic infrastructure | 50% | Real GDP per capita (TL) | 25% |
| | | Employment rate (15+) | 15% |
| | | Number of mobile phone subscribers per 100 people* | 10% |
| Poverty, inequalities, gender inequality | 25% | The poverty rate at 60% of the median income | 10% |
| | | Gini coefficient | 10% |
| | | Female rate in employment | 5% |
| Human capabilities, accessibility to resources | 15% | Under 5 mortality rate | 5% |
| | | Net enrollment ratio in secondary education | 5% |
| | | The share of the population served by drinking and utility water networks | 5% |
| Governance and social protection | 10% | The share of the population receiving monthly salaries in the passive status** | 10% |

Source: All variables retrieved from Turkish Statistical Institute (TURKSTAT, 2025) except * retrieved from The Information and Communication Technologies Authority (ICTA, 2025) and ** retrieved from Social Security Institution (SSI, 2025).

Note: Unlike Berber et al. (2024) who used GDP per capita in US\$ as an indicator of economic growth, this study calculates real GDP per capita in Turkish Lira, obtained by dividing each region's real GDP by its population. Therefore, the review period started in 2007, when the address-based population registration system was introduced. McKinley proposed two economic infrastructure indicators which included the percentage of population accessing electricity and the number of mobile phone subscribers that serve 100 people. Since there is no population without access to electricity in Türkiye, Berber et al. (The research by (2024) analyzed electricity usage through per capita electricity consumption but this study uses mobile phone subscription data because it shows better regional differences. Regarding productive employment, McKinley recommends the share of employment in industry. However, consistent regional data for this variable is not available for the full period, so the total employment rate is used as a broader but reliable proxy. In the gender inequality dimension, Berber et al. (2024) use female school enrolment rates, which display only modest male–female differences across regions. To better capture gender-based disparities in economic participation, this study instead uses the female employment rate as the gender component of the IG index.

To explore the drivers of regional IG, we complement the index construction with two descriptive exercises. First, we compute Spearman rank correlations between the IG index and each component using the regional panel for 2007–2023. Spearman correlation

is preferred because the IG index is a composite measure based on normalized indicators and the relationships between outcomes and components need not be strictly linear.

Second, we perform a cross-sectional decomposition of regional IG gaps for 2023. For each region r and each component j , we take the normalized component score (0–10 scale) used in the index and compute its deviation from the Türkiye average in 2023. This deviation is multiplied by the corresponding McKinley weight w_j to obtain the component contribution:

$$\Delta IG_{rj} = w_j \times (S_{rj} - \bar{S}_j) \tag{3}$$

where S_{rj} is the region’s normalized score and \bar{S}_j is the 2023 Türkiye’s average score of that component. Summing across components yields the region’s total deviation from the Türkiye average IG score. The decomposition therefore shows, in a transparent and policy-relevant way, which dimensions account for each region’s relative performance in the most recent year.

6. Results

Table 6 shows that IG increased in all regions between 2007 and 2023, but as noted by Taşkın (2014), Soyyiğit and Elverdi (2021), and Berber et al. (2024) substantial interregional disparities persisted. In Türkiye, average index value rose from 3.46 to 5.59 during the review period.

Table 6. Regional IG Index for Türkiye, 2007-2023

| | TR1-Istanbul | TR2-West Marmara | TR3-Aegean | TR4-East Marmara | TR5-West Anatolia | TR6-Mediterranean | TR7-Central Anatolia | TR8-West Black Sea | TR9-East Black Sea | TR10-Northeast Anatolia | TR11-Central East Anatolia | TR12-Southeast Anatolia | TR-Türkiye (avg.) |
|------|--------------|------------------|------------|------------------|-------------------|-------------------|----------------------|--------------------|--------------------|-------------------------|----------------------------|-------------------------|-------------------|
| 2007 | 5.64 | 5.12 | 4.05 | 4.61 | 4.62 | 3.41 | 3.69 | 4.43 | 5.02 | 2.33 | 2.21 | 1.83 | 3.46 |
| 2008 | 5.45 | 4.93 | 3.98 | 5.12 | 4.44 | 4.06 | 3.46 | 4.66 | 4.70 | 2.52 | 2.23 | 1.69 | 3.52 |
| 2009 | 5.43 | 4.64 | 4.19 | 4.72 | 4.21 | 3.59 | 3.26 | 4.51 | 4.97 | 2.87 | 2.21 | 1.44 | 3.41 |
| 2010 | 5.33 | 4.93 | 4.46 | 5.08 | 4.57 | 4.00 | 3.80 | 4.55 | 4.86 | 2.95 | 2.26 | 1.89 | 3.74 |
| 2011 | 5.74 | 5.26 | 4.88 | 5.79 | 4.66 | 4.10 | 4.24 | 5.17 | 5.21 | 3.22 | 2.40 | 1.79 | 4.08 |
| 2012 | 5.97 | 5.34 | 5.08 | 5.62 | 5.03 | 4.03 | 4.40 | 5.12 | 5.44 | 3.41 | 3.08 | 1.97 | 4.21 |
| 2013 | 6.29 | 5.79 | 5.44 | 6.04 | 5.23 | 4.33 | 4.73 | 5.27 | 5.23 | 3.71 | 3.46 | 2.48 | 4.45 |
| 2014 | 6.52 | 5.84 | 5.62 | 6.19 | 5.30 | 4.11 | 4.79 | 5.22 | 5.43 | 3.70 | 3.34 | 2.65 | 4.60 |
| 2015 | 6.54 | 5.64 | 5.61 | 6.06 | 5.47 | 4.27 | 5.06 | 5.17 | 5.45 | 3.87 | 3.55 | 2.50 | 4.70 |
| 2016 | 6.59 | 5.78 | 5.84 | 6.29 | 5.61 | 4.33 | 4.97 | 5.62 | 5.41 | 4.08 | 3.20 | 2.88 | 4.83 |
| 2017 | 6.60 | 5.84 | 6.14 | 6.41 | 5.94 | 4.74 | 5.29 | 5.78 | 5.65 | 4.59 | 4.00 | 3.48 | 5.09 |
| 2018 | 6.64 | 5.80 | 6.09 | 6.38 | 5.93 | 4.82 | 5.03 | 5.70 | 5.79 | 4.32 | 3.84 | 3.17 | 5.09 |
| 2019 | 6.85 | 5.87 | 6.10 | 6.49 | 6.03 | 4.78 | 4.97 | 5.67 | 5.59 | 4.09 | 4.06 | 3.07 | 5.10 |
| 2020 | 6.45 | 5.88 | 5.74 | 6.53 | 5.95 | 4.53 | 4.93 | 5.48 | 5.47 | 3.93 | 3.61 | 3.17 | 4.87 |
| 2021 | 6.96 | 6.24 | 6.04 | 6.91 | 6.32 | 4.83 | 5.08 | 5.75 | 5.92 | 3.97 | 4.10 | 3.37 | 5.29 |
| 2022 | 7.48 | 6.29 | 6.15 | 6.81 | 6.35 | 5.08 | 5.26 | 5.76 | 5.68 | 4.37 | 4.23 | 4.08 | 5.45 |
| 2023 | 8.00 | 6.46 | 6.29 | 6.96 | 6.45 | 4.93 | 5.09 | 5.83 | 5.68 | 4.46 | 4.54 | 4.08 | 5.59 |

Source: Author’s calculations

In 2007, Türkiye's average score was below 4 points, representing what McKinley calls *unsatisfactory IG performance*. Mediterranean, Central Anatolia, Northeast Anatolia, Central East Anatolia, and Southeast Anatolia regions also shared this characteristic. By

2023, all regions had scores above 4 points and achieved *satisfactory performance*. Furthermore, the Istanbul region's score reached 8 points, reaching what McKinley calls *superior IG performance*.

Fluctuations occurred in the IG indices of all regions in 2009 (global crisis) and 2018–2020 (exchange rate shock + COVID-19). In 2020, the Turkish average decreased from 5.10 to 4.87, with a recovery in 2021–2023 (5.59). The pace of recovery in the post-COVID-19 period appears to be stronger in the western regions.

The data in Figure 1 shows that all NUTS-1 regions demonstrated increasing IG scores from 2007 to 2023 yet their positions in the regional ranking system did not change significantly. The 'parallel improvement' shows that economic growth across the nation delivered advantages to all regions but it did not establish a lasting solution to reduce economic disparities between different areas. The heatmap shows that Istanbul (TR1) and East Marmara (TR4) continue to lead all other regions while Southeastern Anatolia (TRC) and Northeast Anatolia (TRA) show improved absolute scores yet stay in their respective lower performance brackets. The main fiscal policy problem involves more than economic expansion because it requires solutions to handle the spatial inertia which blocks peripheral areas from reaching core region levels. The correlation and decomposition analysis in the next section addresses this question by identifying the structural and policy-related drivers underlying these persistent spatial patterns.

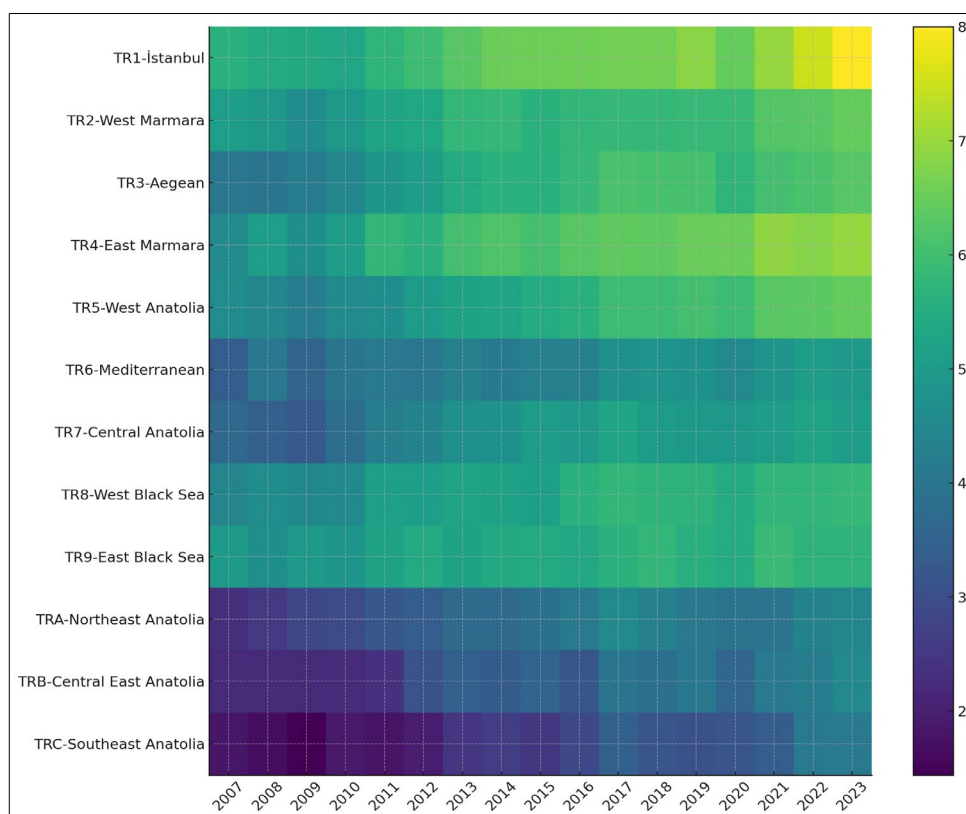


Figure 1. Heatmap of IG Index by Region and Year, 2007-2023

Figure 2 on the other hand shows the change in IG index of regions in points between 2007 and 2023. Istanbul and Eastern Marmara are the regions with the fastest improvement in index points. These are followed by the Aegean, Southeastern Anatolia, and Central Eastern Anatolia regions. The Eastern Black Sea region saw the smallest increase in points, followed by the Western Marmara, Central Anatolia, and Western Black Sea regions (For overall trends of IG index by region, see Figure 4 in the Appendix).

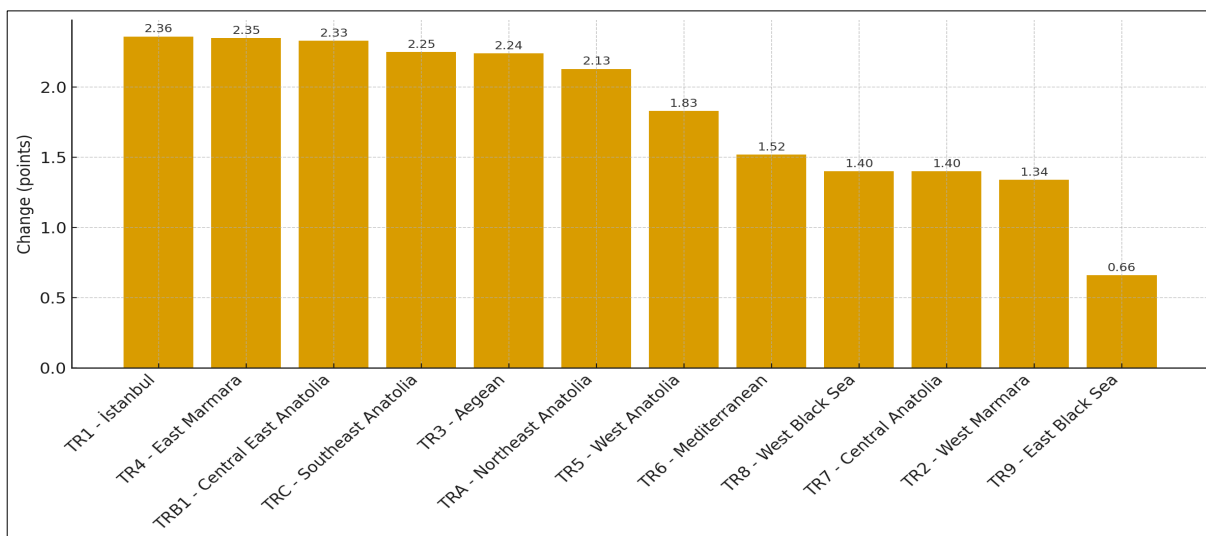


Figure 2. Change in IG Index between 2007-2023 in Absolute Terms by Region

Table 7 below shows the change in the inter-regional IG rankings during the review period. While the core-periphery relationship along the east-west axis has largely been preserved, the table reveals a significant shift for three regions. Significant improvement in the Eastern Marmara region has propelled it from 5th place in 2007 to 2nd place in 2023. Similarly, Aegean region has shifted from 7th place to 5th due to prominent increase in IG index. Limited improvement in the Eastern Black Sea region has caused it to drop from 3rd to 7th place.

Table 7. Change in IG Ranking of Regions, 2007-2023

| Ranking 2007 | Regions | 2007 score | Ranking 2023 | Regions | 2023 score | Change in ranking |
|--------------|---------------------------|------------|--------------|---------------------------|------------|-------------------|
| 1 | TR1-Istanbul | 5.64 | 1 | TR1-Istanbul | 8.00 | ↔ |
| 2 | TR2-West Marmara | 5.12 | 2 | TR4-East Marmara | 6.96 | ↑↑↑ |
| 3 | TR9-East Black Sea | 5.02 | 3 | TR2-West Marmara | 6.46 | ↓ |
| 4 | TR5-West Anatolia | 4.62 | 4 | TR5-West Anatolia | 6.45 | ↔ |
| 5 | TR4-East Marmara | 4.61 | 5 | TR3-Aegean | 6.29 | ↑↑ |
| 6 | TR8-West Black Sea | 4.43 | 6 | TR8-West Black Sea | 5.83 | ↔ |
| 7 | TR3-Aegean | 4.05 | 7 | TR9-East Black Sea | 5.68 | ↓↓↓↓ |
| 8 | TR7-Central Anatolia | 3.69 | 8 | TR7-Central Anatolia | 5.09 | ↔ |
| 9 | TR6-Mediterranean | 3.41 | 9 | TR6-Mediterranean | 4.93 | ↔ |
| 10 | TRA-Northeast Anatolia | 2.33 | 10 | TRB-Central East Anatolia | 4.54 | ↑ |
| 11 | TRB-Central East Anatolia | 2.21 | 11 | TRA-Northeast Anatolia | 4.46 | ↓ |
| 12 | TRC-Southeast Anatolia | 1.83 | 12 | TRC-Southeast Anatolia | 4.08 | ↔ |

Source: Author’s calculations

Figure 3 shows the relative position of the regions' IG scores relative to the Türkiye average. The coefficients obtained by dividing the regional score by the Turkish average show how far it deviates from the average.

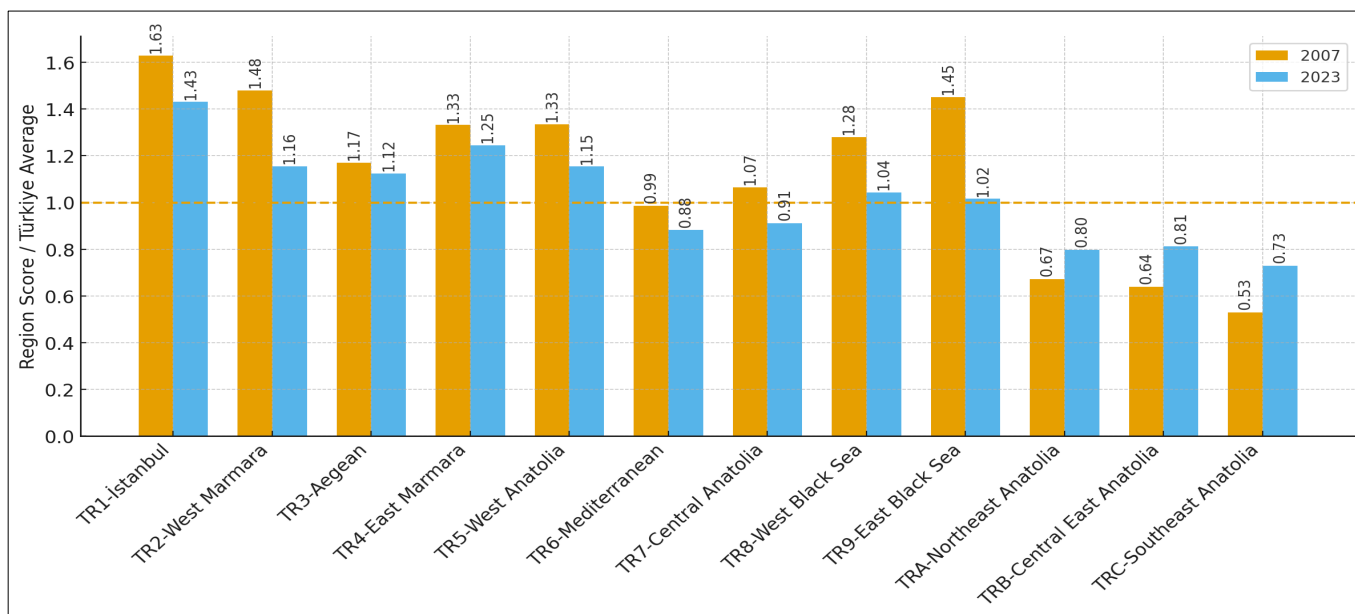


Figure 3. Regions Position Relative to Türkiye Average (2007 vs 2023)

Accordingly, the rapid recovery in the Eastern subregions suggests that they are approaching to the Turkish average. The Southeastern region's ratio to the Türkiye average increased from 0.53 (1.83/3.46) in 2007 to 0.73 (4.08/5.59) in 2023. Similarly, in the Central East, this ratio increased from 0.64 to 0.81, and in the Northeast, from 0.67 to 0.80. In contrast, the Central Anatolia and Mediterranean regions diverged from the Turkish average in 2023 compared to 2007. While some of this impact is related to the earthquake disaster in 2023, the IG index in these two regions generally showed limited increases during the review period. A similar pattern applies to the Western and Eastern Black Sea regions. While the IG index of the Black Sea regions was above the Turkish average in 2007, it declined to a line close to the average in 2023 as it followed a non-accelerating pattern.

7. Drivers of Regional Inclusive Growth: Correlation and Decomposition Analysis

To identify the main drivers of regional IG, Spearman rank correlations were computed between the IG index and its components using the regional panel for 2007–2023. The descriptive of these indicators can be found in Table 10 in the Appendix.

Table 8. Correlation between the IG Index and Its Components (2007–2023)

| Indicators | Spearman r | Interpretation |
|----------------------------|------------|---|
| Under-5 mortality | −0.90 | Strongest determinant; highlights the central role of health conditions |
| Social protection | 0.84 | Social security coverage is a key driver of inclusiveness |
| GDP per capita | 0.83 | Income level is important but not sufficient on its own |
| Education | 0.80 | Human capital is a critical dimension of IG |
| Mobile phone subscriptions | 0.75 | Proxy for digital and economic infrastructure |
| Employment rate | 0.63 | Labor market participation plays a significant role |
| Female employment | 0.48 | Gender inclusion contributes to regional differences |
| Poverty rate | −0.48 | Higher poverty is associated with lower inclusiveness |
| Income inequality (Gini) | −0.30 | Inequality matters, though its effect is moderate |
| Access to water | 0.41 | Shows limited differentiation; infrastructure is largely saturated across regions |

Source: Author’s calculations

Table 8 reveals that the health conditions show the strongest (negative) correlation while social protection, real GDP per capita, and education show strong positive correlations. Employment rate show a moderate correlation with IG performance through the total employment and the female employment indicator while poverty and inequality measures show weaker negative correlations. The availability of water infrastructure does not explain much about the situation because water services reach almost every area throughout the regions. The number of mobile phone subscribers shows a strong relationship with IG indicating that digital infrastructure serve as a factor that distinguish different levels of inclusiveness between regions.

The findings show that regional disparities in inclusive growth (IG) stem from differences in health outcomes, educational attainment, social protection coverage, digital connectivity, and employment rates. Since the level and composition of public spending are key determinants of these dimensions, IG depends on deliberate public policy choices rather than market forces alone.

While the Spearman correlations indicate which dimensions are most strongly associated with IG over 2007–2023, they do not show how much each component contributes to the cross-sectional gap between a given region and the national benchmark. Therefore, we complement the correlation results with a decomposition study for 2023; this study separates each region's deviation from the Turkish average IG into weighted component-level contributions.

Table 9. Decomposition of Regional IG Gaps by Component (2023)

| Indicators | TR1-Istanbul | TR2-West Marmara | TR3-Aegean | TR4-East Marmara | TR5-West Anatolia | TR6-Mediterranean | TR7-Central Anatolia | TR8-West Black Sea | TR9-East Black Sea | TRA-Northeast Anatolia | TRB-Central East Anatolia | TRC-Southeast Anatolia |
|----------------------------|--------------|------------------|------------|------------------|-------------------|-------------------|----------------------|--------------------|--------------------|------------------------|---------------------------|------------------------|
| GDP per capita | 1.38 | 0.17 | 0.12 | 0.4 | 0.55 | -0.10 | -0.40 | -0.18 | -0.11 | -0.67 | -0.75 | -0.66 |
| Employment rate | 0.25 | 0.21 | 0.11 | 0.23 | 0.08 | -0.05 | -0.11 | 0.05 | 0.07 | 0.06 | -0.31 | -0.41 |
| Mobile phone subscriptions | 0.55 | -0.05 | 0 | 0.03 | 0.14 | 0.04 | -0.13 | -0.02 | -0.01 | -0.17 | -0.20 | -0.15 |
| Poverty rate | 0.02 | -0.06 | 0.02 | 0 | 0.06 | -0.13 | -0.08 | 0.01 | 0.02 | 0.07 | 0.28 | 0.52 |
| Income inequality (Gini) | -0.19 | 0.08 | 0.01 | 0.30 | -0.22 | 0 | -0.12 | 0.10 | 0.02 | -0.14 | 0.43 | 0.16 |
| Female employment | 0.05 | 0.04 | 0.05 | 0.03 | 0.01 | 0.02 | -0.05 | 0.04 | 0.02 | 0.04 | -0.03 | -0.09 |
| Under-5 mortality | 0.11 | 0.09 | 0.08 | 0.12 | 0.07 | -0.54 | 0.11 | 0.05 | 0.04 | 0.07 | -0.05 | -0.25 |
| Education | 0.05 | 0.03 | 0.03 | 0.05 | 0.04 | 0.06 | 0.07 | 0.03 | 0.01 | -0.01 | -0.02 | -0.03 |
| Access to water | 0.07 | 0.06 | 0.04 | 0.07 | 0.04 | 0.08 | 0.09 | 0.02 | -0.04 | 0.02 | 0.06 | -0.02 |
| Social protection | 0.12 | 0.30 | 0.25 | 0.14 | 0.1 | -0.05 | 0.12 | 0.14 | 0.07 | -0.42 | -0.45 | -0.58 |
| IG gap | 2.41 | 0.87 | 0.7 | 1.37 | 0.86 | -0.66 | -0.50 | 0.24 | 0.09 | -1.13 | -1.05 | -1.51 |

Source: Author’s calculations

Notes: Positive values indicate that a component has raised the region above the Turkish average; negative values indicate that the component has pulled the region below the average.

The Istanbul (TR1) region leads all others because it maintains its position as the top region through its powerful income and its sophisticated digital infrastructure. However, its IG performance is not driven by economic capacity alone. The high IG score results from better access to social services and labor market integration which brings positive effects from employment and social protection, health, and education sectors. The negative impact of inequality proves that the most developed region faces distributional obstacles which limit its ability to achieve inclusiveness.

The western and industrialized regions of East Marmara (TR4), West Marmara (TR2), West Anatolia (TR5), and the Aegean (TR3) maintain a similar yet less intense distribution pattern. The regions achieve high GDP per capita but their IG performance receives additional support from their social protection systems and their students' high education rates and their improved health results. Social protection programs create positive effects on TR2 and TR3 because public transfer systems working with formal social security mechanisms enable economic growth to establish social inclusion for citizens.

The lowest IG values appear in three regions of Türkiye which include Southeast Anatolia (TRC) and Northeast Anatolia (TRA) and Central East Anatolia (TRB) because their economic and social challenges create mutual reinforcement. The regions receive substantial negative impacts from their income levels, education levels, social protection systems, and their health outcomes. High poverty rates and weaker labor market participation further deepen the gap. The research findings show that IG inequality between regions stems from the dual lack of economic possibilities and insufficient social programs.

The Mediterranean (TR6) and Central Anatolia (TR7) show signs of being at an intermediate risk level which is still concerning. Although their income levels are not as low as those of the eastern regions, negative contributions from employment, inequality, and, in the case of TR6, health outcomes pull their IG scores below the national average. The two regions show signs of economic separation because their labor markets and social welfare systems have started to deteriorate.

The Black Sea regions (TR8 and TR9) have a position close to the national average based on three main factors: higher employment rates for both men and women, low social inequality, and comprehensive social welfare programs. Lagging digital infrastructure and per capita income lead to deviations from the national average, demonstrating that these societies maintain social stability but their economies fail to develop. The research shows that protection against structural weaknesses depends on social indicators showing high results, but achieving lasting results in IG convergence requires both productivity growth and economic sector development.

Overall, regional inclusiveness depends on the combined effect of economic development and effective social policy. These results support the local-based fiscal policy recommendations presented in the next section.

8. Policy Implications: Place-based Fiscal Strategies for Inclusive Growth

Correlation and decomposition results show that regional inequalities are shaped not only by income disparities but also by the scope and effectiveness of health, education, social protection, and employment policies. These areas are strongly influenced by regional provision of public services. Therefore, the following section presents regional fiscal strategies that link these regional disadvantages to specific fiscal instruments.

8.1. Lagging Eastern Regions (TRA, TRB, TRC): Integrated Fiscal Packages for Cumulative Disadvantage

In TRA, TRB, and TRC, the decomposition analysis reveals a reinforcing pattern of disadvantage: income and employment deficits coincide with limited social protection coverage and less favorable health outcomes, while high poverty levels further deepen the gap. The implementation of growth-led strategies will not produce inclusive results when operating under these circumstances because fiscal policy needs to enhance capabilities and decrease exposure to risk. A credible policy framework should therefore combine four fiscal instruments:

(1) *Fiscal equalization and transfer reform*: The intergovernmental transfer system requires changes because local governments do not receive enough funding to deliver services to communities which need more social services. When formulating allocations for central government transfers to municipalities, the weighting of population and land area should be reduced, and more weight should be given to multidimensional

development indicators such as the IG index. In addition, a performance component could be introduced by linking a portion of transfers to measurable improvements, consistent with a performance-based budgeting approach.

(2) *Region-sensitive tax policy and tax expenditures*: The current tax incentive system needs to evolve into conditional tax expenditures because it should replace its current method of using general tax reduction techniques. Special tax and social security contribution incentives should be provided to firms operating in regions with low inclusive growth that aim to improve women's employment and formal employment. Similarly, regional investment incentives can be explicitly linked to inclusive development goals.

(3) *Rebalancing public expenditure toward social investment*: The public spending problem in underdeveloped areas results from two main factors which include insufficient funding and incorrect budget allocation. The current funding system requires a change in its functional allocation because it should dedicate resources to human development instead of building physical infrastructure. Priorities include early childhood education and childcare services, school-retention support mechanisms (such as transport and meal programs), community health centers and preventive care, and vocational training aligned with local labor market demand. The regions should use gender-responsive and child-focused budgeting practices to help ensure that public spending reaches the groups most excluded from economic opportunities.

(4) *Targeted transfers and in-work support*: To address persistent poverty and vulnerability, targeted income-support instruments should be strengthened. The expansion of conditional cash transfer programs for low-income workers will decrease poverty rates while it will drive more people to join the formal employment market. Financing these measures through more effective taxation of higher-income and rent-based revenue sources in better-performing regions would reinforce the redistributive function of fiscal policy while maintaining fiscal sustainability.

8.2 Stagnating Black Sea Regions (TR8, TR9): Social Stability and Productivity-Oriented Fiscal Support

TR8 and TR9 remain close to the national average in IG performance despite modest income levels. The decomposition shows that employment results which are strong together with female workforce participation and reduced social gaps and expanded social welfare programs work to reduce the impact of limited economic strength. The data indicates that social stability existed alongside economic stagnation during this time. The fiscal policy of these areas needs to work toward improving productivity levels and market expansion while protecting the current social achievements:

(1) *Productivity-Oriented Fiscal Equalization*: To permanently improve the region's level of economic development, public support measures that increase productivity should be planned. In this context, measures such as supporting agricultural-industrial cooperatives, utilizing technological infrastructure in production processes, and improving logistics networks can encourage high value-added production. Supporting private investments with public investments can create a crowding-in effect.

(2) *Tax expenditures for development and formalization*: The government should create specific tax incentives to encourage businesses to adopt programs such as technological transformation, digitalization, and quality certification to increase their productivity. Targeted employer social security contribution reductions for firms that formalize employment, especially women's employment, can transform the strengths of the existing labor market into higher-quality jobs.

(3) *Social investment to increase opportunities and the quality of workforce*: Locally specific vocational training programs can accelerate specialization and growth mechanisms. Expanding child and elder care services creates opportunities for women to transform their existing strengths in employment into skilled jobs. Widespread technological and

digital skills training can increase productivity as well as develop flexible and hybrid work models.

(4) *Connectivity and digital public services*: Given the continuing importance of digital infrastructure for regional inclusiveness, prioritizing broadband expansion and digital public service delivery can reduce the costs of distance and improve business performance.

8.3 Diverging Regions (TR6, TR7): Inclusive Recovery and Labor Market Re-integration

TR6 and TR7 regions underperformed in 2023 compared to previous years due to conditions such as earthquake damage and a general economic slowdown. The government should develop recovery plans through fiscal policy to prioritize IG strategies:

(1) *Time-limited recovery transfers*: Local authorities should receive specific short-term funds to help them protect essential public services to prevent permanent social disruption in education continuity, access to basic health services and housing-related needs.

(2) *Active labor market programs*: Budget-funded wage subsidies, retraining initiatives, rapid job placement programs and SME working capital support should focus on displaced workers and affected firms by establishing clear links with formal employment.

(3) *Temporary income support and inequality reduction*: The government should strengthen emergency financial assistance programs that protect vulnerable families from poverty while ensuring their access to education and health services to prevent poverty from becoming permanent and inequality from worsening.

8.4 Leading Western and Metropolitan Regions (TR1, TR2, TR3, TR4, TR5): Addressing the Inequality Constraint

High-scoring regions combine income advantages with stronger social protection and human development outcomes. However, in Istanbul (TR1), the negative contribution of inequality shows that distributional pressures can limit inclusivity even in the most developed region. Therefore, policy priorities in these regions should focus on redistribution and service quality:

(1) *Targeted urban equalization and neighborhood-based budgeting*: The distribution of funds according to metropolitan area needs enables equal service delivery of schools, primary healthcare, childcare and transportation services which reduces regional inequality.

(2) *Progressive local revenue instruments and value capture*: The current tax system of local governments needs better and more progressive property taxation, fee structures and land value capture mechanisms to generate funds which will support urban development projects such as affordable housing and public transportation systems.

(3) *Quality upgrading in social services within the "Inclusive Cities" framework*: To prevent socio-spatial dichotomy between low and high-income regions, public policy should prioritize social investments in disadvantaged neighborhoods. This includes improving education, health, and social assistance mechanisms. Adopting an "Inclusive City" approach enables neighborhood-level inclusivity monitoring and targeted budgeting, allowing for the strategic allocation of financial resources to address spatial inequalities.

8.5 Governance and Implementation: Linking Central Fiscal Tools with Local Delivery Capacity

The findings of the study show that when economic development and social capacity building occur simultaneously, IG performance also improves. Achieving this requires governance arrangements that align national fiscal priorities with local implementation capacity:

(1) *IG-based budgeting and monitoring*: Using IG components to guide spending priorities and monitor results can strengthen targeted budgeting at both central government and local government levels.

(2) *Strengthening local government capacity*: Improving the administrative and financial capabilities of municipal budgets in less developed regions will create funding opportunities that enable them to deliver services tailored to the specific needs of the regions for faster IG results.

(3) *Coordination mechanisms*: Implementing institutionalized coordination between central ministries, development agencies, and local governments will ensure efficient allocation of resources while tailoring financial instruments to region-specific needs.

9. Conclusion

This research develops a multidimensional inclusive growth index by evaluating various economic and social indicators in Türkiye's regions between 2007 and 2023. The results show a persistent gap in the inclusiveness of growth between regions. Despite the relative convergence observed after 2010, it was found that sustainable advantages persist for Istanbul and western regions, while persistent gaps exist for eastern regions.

The findings from correlation and decomposition analysis highlight that lagging regions face cumulative disadvantages in both economic and social dimensions, while income inequality may be a problematic area in leading regions. The study also shows that economic growth does not automatically lead to inclusive development. In this context, how fiscal policies should redistribute resources, expand opportunities and skills, and support labor market integration plays a decisive role.

Based on these findings, the research underlines that fiscal policies are central tools in reducing spatial inequalities. Regionally differentiated fiscal equalization, social capital-focused spending, and targeted redistribution transfers are among the policy recommendations of the study. In this context, instead of passively observing growth outcomes, the state should be a key player in shaping how growth becomes inclusive across regions.

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Yazar Katkısı: Gözde Nalbant EFE (%100)

Appendix

Table 1. Descriptive of Indicators used to Construct Regional IG Index (2007-2023 average)

| Region Code | Regions | Real GDP per capita | Emp. Rate | Mobile Phone subs. | Poverty | Gini | Female emp. | Mortality | Enr. sec. edu. | Access to water | Social Protection |
|-------------|-----------------------|---------------------|-----------|--------------------|---------|------|-------------|-----------|----------------|-----------------|-------------------|
| TR1 | Istanbul | 32672 | 46.01 | 133.38 | 17.87 | .402 | 28.60 | 10.21 | 81.09 | 100 | 15.35 |
| TR2 | West Marmara | 19679 | 48.52 | 85.30 | 19.28 | .357 | 31.39 | 10.36 | 84.75 | 99.11 | 19.64 |
| TR3 | Aegean | 18727 | 47.11 | 90.70 | 18.88 | .372 | 32.22 | 11.73 | 81.95 | 98.58 | 19.06 |
| TR4 | East Marmara | 22652 | 46.53 | 91.01 | 16.42 | .335 | 29.29 | 10.62 | 87.07 | 100 | 16.68 |
| TR5 | West Anatolia | 23665 | 44.98 | 100.08 | 18.86 | .387 | 28.32 | 11.45 | 82.34 | 99.23 | 16.08 |
| TR6 | Mediterranean | 15214 | 44.68 | 89.18 | 20.58 | .395 | 30.25 | 14.13 | 80.38 | 98.64 | 12.63 |
| TR7 | Central Anatolia | 14025 | 42.39 | 80.32 | 18.13 | .357 | 26.80 | 12.55 | 79.38 | 99 | 14.80 |
| TR8 | West Black Sea | 12651 | 48.78 | 83.82 | 18.46 | .347 | 35.74 | 11.61 | 83.40 | 97.64 | 19.28 |
| TR9 | East Black Sea | 12774 | 52.04 | 84.91 | 16.82 | .338 | 38.70 | 10.78 | 84.36 | 89.29 | 17.76 |
| TRA | Northeast Anatolia | 10276 | 46.8 | 72.07 | 21.10 | .384 | 32.01 | 15.97 | 68.85 | 98.29 | 8.04 |
| TRB | Central East Anatolia | 9240 | 41.09 | 69.16 | 18.94 | .379 | 27.81 | 18.04 | 66.60 | 98.23 | 7.59 |
| TRC | Southeast Anatolia | 9482 | 34.33 | 70.95 | 18.34 | .380 | 20.65 | 19.51 | 63.47 | 95.58 | 5.47 |
| TR | Türkiye | 19267 | 45.02 | 94.26 | 22.19 | .404 | 29.90 | 13.58 | 77.3 | 98.47 | 14.51 |

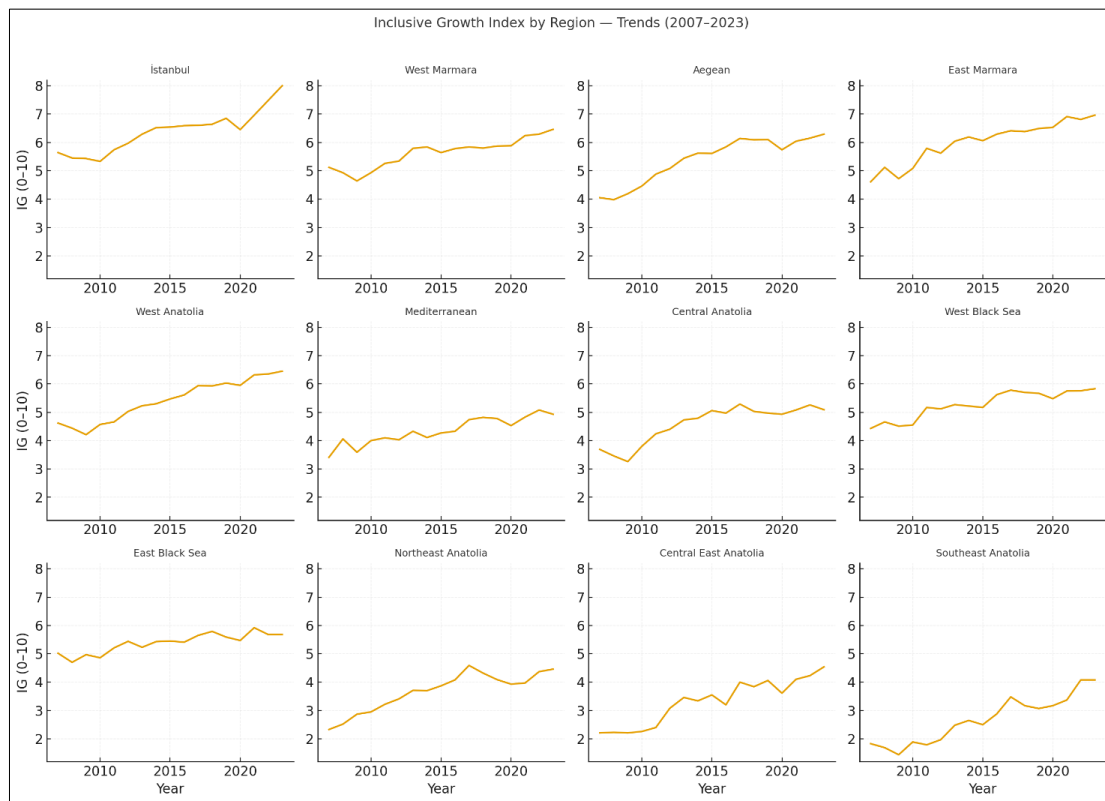


Figure 1. Trends of IG Index by Region (2007-2023)