



Evaluating the Security Competitiveness of Kermanshah  
among Metropolises in Iran based on Multiple-Criteria  
Decision Making (MCDM)

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ABSTRACT

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The concept of competitiveness encompasses various economic, social, and environmental dimensions. However, one often overlooked aspect in the literature is the security dimension of competitiveness, which can serve as the foundation for other dimensions of competitiveness. This research focuses on evaluating the security competitiveness of Kermanshah, a metropolis in Iran, among other metropolises in the country. Library and document studies were conducted to collect the necessary data and information. The collected data were analyzed using Multiple-Criteria Decision-Making (MCDM) techniques. The findings indicate that Kermanshah, with a TOPSIS coefficient of 0.297, ranks seventh in security competitiveness. In terms of 17 security competitiveness indicators, including theft of vehicle accessories (S1), motorcycle and bicycle theft (S2), shop theft (S5), theft in other locations (S8), addicts and drug users (S9), drug keepers (S10), drug traffickers (S13), intentional poisoning (S14), pretending to commit stabbing (S15), coercion and compulsion (S16), threat (S17), injury and harm (S18), accidental deaths (S19), involuntary manslaughter (S20), resulting in injuries (S25), resulting in damages (S26), resulting in fatalities (deceased) (S27), Kermanshah is below the national average. In other words, in these mentioned indicators, it is in a better position compared to the national average, while in 12 other indicators; it is above the national average. The results suggest that considering the interrelationship among various dimensions of competitiveness, improving the security competitiveness of Kermanshah requires enhancements in other dimensions of competitiveness, such as economic and socio-cultural aspects.

## 1. Introduction

Currently, the development and empowerment of cities are of great importance, as cities are considered vital centers for attracting populations and economic, social, and cultural activities. Enhancing the competitiveness of cities to attract domestic and foreign investments, improve the lives of citizens, and achieve sustainable urban development is among the priorities of urban managers and policymakers.

Alongside economic, social, and environmental dimensions, security competitiveness is crucial to urban competitiveness. This means that both the internal and external security of a city play a significant role in attracting investment, economic development, improving the quality of life for citizens, and preserving the environment. Therefore, a comprehensive and detailed analysis of security competitiveness dimensions is a

fundamental tool for policymakers to make decisions towards improving urban security and enhancing overall city competitiveness.

Urban competitiveness, as a multidimensional and challenging concept, holds significant importance. In this regard, the main issue is how to analyze and improve urban competitiveness and provide solutions for improving and developing cities, especially in the security dimension, which is often considered the foundation for other dimensions of urban competitiveness. This issue can be addressed by evaluating the security competitiveness of cities and comparing it with other cities to develop effective strategies for improving their security status and, consequently, achieving sustainable development.

Conversely, given that sustainable development has economic, social, and environmental elements as well (Garfias Royo et al., 2022; Luczak & Just, 2021; Li et al., 2022), various components of the competitiveness index ought to be synchronized with sustainable development objectives. Since sustainable development meets the current generation's requirements without endangering future generations' interests, this makes sense (De Andrade, 2021). Stated differently, emphasizing the relationships and interactions between natures.

Competitiveness in cities nowadays is not solely correlated with economic competitiveness. Environmental and sociocultural competitiveness are also included. Sociocultural elements are thought to be among the most crucial components of sustainability and competitiveness. Additional dimensions of sustainability and competitiveness (economic, environmental, etc.) may also be impacted by this issue.

At the global level, numerous studies have sought to evaluate the competitiveness of cities and regions, utilizing various factors for this purpose (Peng & Zhanxin, 2011; Jiang & Shen, 2010; Saez & Perianez, 2015; Komasi et al., 2022, Komasi et al., 2023). Research on urban competitiveness from different perspectives is essential, including: Enhancing the quality of life for citizens: A deep understanding of the factors influencing urban competitiveness aids in organizing and proposing practical solutions to improve the living conditions of citizens. These factors include security, economy, culture, infrastructure, and urban services.

Attracting investments: Cities with good competitiveness often have more fantastic attractiveness for investors. Examining and evaluating this competitiveness can assist urban managers and policymakers devise strategies to attract domestic and foreign investments. Sustainable urban development: Studying urban competitiveness helps cities adopt strategies for sustainable and continuous urban development. This includes optimal resource utilization, environmental preservation, regional economic development, and social and cultural development. Comparison and alignment with other cities: Evaluating and comparing urban competitiveness with other cities provides valuable information to urban managers about their city's strengths and weaknesses compared to competitors. This information can be valuable in formulating effective urban strategies and planning. Ensuring urban security: Security is a crucial dimension of urban competitiveness. Research in this area helps urban managers identify vulnerabilities and weaknesses in urban security and propose solutions to enhance it (Mahrinasari et al., 2024; Komasi et al., 2024; Verissimo et al., 2024; Tian et al., 2023).

The metropolis of Kermanshah, serving as the administrative, political, and economic center of Kermanshah Province, had a population of 651,946 in 2016. Kermanshah is the second most populous and largest city in the western and northwestern regions of the country, ranking ninth among all cities in Iran in terms of population. Positioned on the periphery of the regional transportation corridor (East-West Corridor), Kermanshah benefits from favorable proximity to the country's economic hubs. It also plays a pivotal role in land use planning, as it is situated on the main transit route for goods to Iraq (bordering the Sulaymaniyah and Duhok provinces of Iraq). The city boasts unique natural, cultural, and historical attractions, making it a significant tourist destination. Additionally, it benefits from relatively adequate water resources, with an annual precipitation of 439 millimeters, ranking second in precipitation after the metropolis of Rasht. Despite these advantages, with an unemployment rate of 15.7%, it holds the highest unemployment rate in Iran. Furthermore, its industrial workforce constitutes only 1.23% of the total workforce, significantly lower than the national average of 27.42% and the neighboring metropolis of Hamadan at 28.35%. In terms of cultural and social competitiveness, Kermanshah has 0.19 libraries per ten

thousand populations, significantly lower than the national average of 0.56 libraries for metropolises and even less compared to Hamadan and Mashhad, which have the highest number of libraries at 1.86 and 1.33 per ten thousand populations, respectively (Statistical Yearbook of Kermanshah Province, 2011-2015).

The spatial manifestation of these differences can be observed in issues such as marginalization and informal settlements (10 marginalized neighborhoods), irregular urban hierarchy (suburban), migration, environmental issues (pollution), low social capital, and undesirable urban governance, as well as the closure of over 40% of small and large industrial units and the destruction of natural and human opportunities.

This thesis seeks to elucidate the competitive position of Kermanshah metropolis among the regional metropolises of Iran and determine its desirable competitiveness scenario in the future, based on an understanding of the above issues. Accordingly, the central question of this research is: What is the position of Kermanshah metropolis in terms of competitiveness indicators among the regional metropolises of Iran?

In Iran, one of the fundamental development strategies that has been considered in the country's twenty-year vision and five-year development plans is to develop an economy independent of oil, rely on non-oil exports, and eliminate regional inequalities (Kargarsamani, 2014). Therefore, the need to identify the competitiveness capacities of cities, especially metropolises, is doubled because metropolises can play a significant role as hubs of global flows, especially economic flows. Unfortunately, Iranian metropolises, like metropolises in developing countries, have not been able to demonstrate a global function like developed world metropolises and have generally been unsuccessful in this regard.

Today, urban areas in most countries of the world, especially developed countries, have utilized their potential economic, socio-cultural, environmental, and security capabilities in a way that strengthens their competitive position with other urban areas. Therefore, the need for competitive behavior in cities has increased, and as a result, attention to urban issues and a focus on power and wealth in cities have become more prominent in scientific circles, social sciences, economics, geography, urban planning, and alongside all of these, governments. Given that the competitiveness of any place is directly influenced by relative advantages and the structure governing the planning system of places, any decision and planning regarding the utilization of competitiveness capacities in the current situation will have positive or negative effects on the future competitiveness of places. Therefore, it is essential to consider the factors influencing the competitiveness of places in the future space and identify desirable competitiveness scenarios for places accordingly.

The primary orientation of the sixth development plan, as the third step of the Vision Document for the country, emphasizes productivity, knowledge and technology, competitiveness, foresight, regional balance, private sector involvement, export development, and ultimately utilizing untapped capacities, which has provided an opportunity for consensus and national unity to improve conditions through fundamental reforms and reducing or eliminating the country's vulnerable points.

In this regard, preparing the sixth development plan for Kermanshah Province from 2016 to 2020 is a logical outcome of the continued process of creating decentralization in the decision-making and implementation system of the government. This plan has a medium-term perspective and covers the timeframe of the country's development plan (Preface to the Sixth Development Plan of Kermanshah Province, 2016). Considering the discussions raised, identifying the competitive position of Kermanshah metropolis in the current situation and presenting a desirable competitiveness scenario for it by 2014, while converging and directing spatial, social, and economic development plans, and providing a roadmap for success in all development programs of this metropolis, contributes to achieving a desirable competitive position for Kermanshah metropolis (given its natural and human potentials) to fulfill its role as a regional center in the west of the country to achieve legal and higher-level documents, especially the objectives of the 2014 Vision Document. Additionally, it leads to reducing the intensity of centralization in planning and policymaking by identifying the competitiveness capacities of the Kermanshah metropolis and nationally moderating the role of the national metropolis of Tehran and reducing regional inequalities. The complex and multi-dimensional nature of urban competitiveness has been the focus of various researchers, including Porter (1998, 2008), Lever and Turok Begg (1999, 2002), Malecki (2002), Parkinson (2004), and Pengfei and Kresl (2010).

According to Kresl (2010), urban competitiveness refers to the degree to which a city or urban region compares to other cities or metropolitan areas. Competitive cities must have the ability to provide jobs, income, cultural or recreational facilities, social cohesion, governance, and urban environment for current and future residents.

The accepted concept of competitiveness in cities in recent scientific studies has primarily evolved into the idea of territorial (regional and urban) competition. It has expanded into regional and urban political discourses. Several international organizations have defined competitiveness in relation to land; they, on one hand, at least place this competition with the physical and real environment, and on the other hand, aim to achieve efficiency. Consequently, they see achieving higher performance than natural resources, workforce, and capital as necessary (Bisognin Garlet et al., 2022; Moradi et al., 2022; Saez & Perianez, 2015: 77).

In the literature on competitiveness, there is not much consensus on classifying factors of urban competitiveness. Some researchers classify these factors based on their impact on development, while others classify them based on controlling factors. One classification that has received more attention is the valuation of internal and external competitiveness resources and factors. Table (1) illustrates the diversity of competitiveness factors, disaggregated by the focus of studies.

Table 1: Classification of Determinants of Urban Competitiveness

| Researchers                                                                                            | Factors                                                                                       |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Ausra Liucvaitiene, Kestutis Paleckis, 2011                                                            | General factors, key characteristics of a market economy, operational infrastructure factors. |
| Cheshire and Hay, 1989                                                                                 | External factors                                                                              |
| Hall (1998), Scott (2001), Florida (2002), Budd (1998), Webster and Muller (2000), Turok et al. (2003) | Internal factors                                                                              |
| Kresl (1995), Bristow (2005)                                                                           | Economic factors, Strategic factors                                                           |
| Reiljan et al. (2000)                                                                                  | Geographical factors, Export factors, Created factors, Environmental factors                  |

Paliulis & Cincikaite, 2013: 492

## 2. Materials and Methods

This research is descriptive and analytical. Twelve variables were selected based on study background. The information on these variables was collected from 2011 to 2016 through library and document reviews. TOPSIS (Technique for Order Preference by Similarity to Ideal Solution).

## 3. Entropy Weighting Method

Shannon (1948) proposed the concept of entropy for dealing with insecure information and incomplete data. This method evaluates the criteria weights based on actual data examination.

Step 1. Create the initial decision matrix based on “m” alternatives and “n” criteria

$$F = [f_{ij}] = \begin{bmatrix} f_{11} & \dots & f_{1n} \\ \vdots & \ddots & \vdots \\ f_{m1} & \dots & f_{mn} \end{bmatrix}, i = 1, 2, \dots, m; j = 1, 2, \dots, n \quad (1)$$

Step 2. Normalize the initial decision matrix using Equation (2):

$$n_{ij} = \frac{f_{ij}}{\sum_{i=1}^m f_{ij}} \quad (2)$$

Step 3. Compute the entropy value for each criterion using Equation (3):

$$e_j = -\frac{1}{\ln(m)} \sum_{i=1}^m v_{ij} \ln(v_{ij}) \quad (3)$$

Step 4. Evaluate the diversification level of each criterion using Equation (4):

$$DIL_j = 1 - e_j, j \in [1, \dots, n] \quad (4)$$

Step 5. Obtain the final weights of criteria by implementing Equation (5):

$$w_{ij} = \frac{w_{ij}}{\sum_{i=1}^m w_{ij}} \quad (5)$$

#### 4. TOPSIS

Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) is one of the most known MCDM methods to solve various problems. In this method, the best alternative is the one with the shortest Euclidean distance from the ideal solution and, simultaneously, the longest Euclidean distance from the anti-ideal solution (Hwang & Yoon, 1981). TOPSIS steps are described as follows:

Step 1. Establish the primary decision matrix based on “m” alternatives and “n” criteria

$$A = [a_{ij}] = \begin{bmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \dots & a_{mn} \end{bmatrix}, i = 1, 2, \dots, m; j = 1, 2, \dots, n \quad (6)$$

$a_{ij}$  Shows the performance of alternative (i) according to criterion (j).

Step 2. Normalize the primary decision matrix using Equation (5):

$$n_{ij} = \frac{a_{ij}}{\sqrt{\sum_{i=1}^m a_{ij}^2}} \quad (7)$$

Step 3. Calculate the weighted normalized decision matrix  $T = [t_{ij}]_{m \times n}$ :

$$t_{ij} = n_{ij} \times w_j \quad (8)$$

where  $w_j$  represents the weight of criterion j.

Step 4. Determine the ideal ( $S^+$ ) and anti-ideal ( $S^-$ ) solutions for each criterion based on their origin:

$$S_j^+ = \max t_{ij} \text{ if } j \text{ is a Benefit criterion} / \min t_{ij} \text{ if } j \text{ is a Cost criterion. } \forall j \in J \quad (9)$$

$$S_j^- = \min t_{ij} \text{ if } j \text{ is a Benefit criterion} / \max t_{ij} \text{ if } j \text{ is a Cost criterion. } \forall j \in J \quad (10)$$

Step 5. Calculate the Euclidean distance of each alternative values from the ideal and anti-ideal solutions:

$$ED_i^+ = \sqrt{\sum_{j=1}^n (t_{ij} - S_j^+)^2} \quad (11)$$

$$ED_i^- = \sqrt{\sum_{j=1}^n (t_{ij} - S_j^-)^2} \quad (12)$$

Step 6. Obtain the relative closeness to the positive the ideal solution:

$$R_i = \frac{ED_i^-}{ED_i^+ + ED_i^-} \quad (13)$$

Step 7. Rank the alternatives based on  $R_i$  values in decreasing order.

## 5. Research Findings and Discussions

The quantitative values of various indicators of urban competitiveness security in the Kermanshah regional metropolitan area compared to other regional metropolitan areas of Iran can be observed in a comparative table in Table 2. Comparing the indicators with the national average reveals significant differences among the security indicators of regional metropolitan areas in Iran, some of which are highlighted below. In terms of the indicator of motorcycle and bicycle theft rate, Kermanshah, with 3.92 cases of theft per 10,000 populations is approximately 2.5 times lower than the national average of 9.26 cases. The highest rate of motorcycle and bicycle theft has been reported in Tehran and the pilgrimage city of Qom, which is about twice the national average, while the lowest rate, with 2.92 cases of theft per 10,000 populations, is in West Azerbaijan. Additionally, the indicator of car theft rate is 7.63 cases of theft per 10,000 populations on the national average, with Tehran having the highest rate at 27.04 instances of theft and Gilan having the lowest at 2.02 cases of theft per 10,000 populations. Kermanshah, with 9.47 cases of theft, is 1.77 cases higher than the national average.

The most significant difference in security competitiveness can be observed in the distribution of drug dealers, with the national average being 11.81 cases per 10,000 populations. The difference in this rate in Alborz, with 49.4 cases, is noticeably higher than the national average. Kermanshah ranks third with 12.25 cases of drug distribution after Alborz and Hamedan. In indicators of suicide attempts and deaths due to suicide, there is not much difference observed among the regional metropolitan areas of Iran. The highest rate is in Kermanshah with 0.83 cases per 10,000 populations. In intra-urban accident indicators resulting in injuries, the most significant difference exists among regions, with Qom having about seven and a half times more accidents resulting in injuries than Alborz. Kermanshah, with 15.12 cases, has 9.51 cases, which is less than the national average of accidents resulting in injuries. In accidents resulting in fatalities outside the city, Sistan and Baluchestan province has the highest rate with 3.83 cases per 10,000 populations, which is approximately 17.5 times higher than Tehran, which has the lowest rate with 0.22 instances. Although the differences in these security competitiveness indicators are largely rooted in factors such as cultural issues, border proximity, migration rates at origin and destination, economic issues, and especially unemployment, the difficulties and sensitivities in recording these statistics in various dimensions of national security have also had some impact, necessitating further in-depth studies and investigations.

Table 2: Status of Security Competitiveness Index Indicators for Urban Areas of Iran 2011-2016 (Per 10,000 People)

| Metropolitan                                          | Tehran   | Razavi<br>Khorasan | Isfahan | Fars    | East Azerbaijan | West<br>Azerbaijan | Kerman  | Sistan and<br>Baluchestan | Gilan   | Alborz  | Kermanshah | Hamedan | Markazi | Qom     | Average |
|-------------------------------------------------------|----------|--------------------|---------|---------|-----------------|--------------------|---------|---------------------------|---------|---------|------------|---------|---------|---------|---------|
| Regional population                                   | 12183391 | 5994402            | 4879312 | 4596658 | 3724620         | 3080576            | 2938988 | 2534327                   | 2480874 | 2412513 | 1945227    | 1758268 | 1413959 | 1151672 |         |
| Factors of social<br>security                         |          |                    |         |         |                 |                    |         |                           |         |         |            |         |         |         |         |
| Theft of vehicle<br>accessories (S1)                  | 94.03    | 30.15              | 19.03   | 22.56   | 12.27           | 10.27              | 13      | 4.86                      | 4.61    | 43.34   | 17.73      | 8.45    | 16.68   | 25.15   | 22.23   |
| Motorcycle and bicycle<br>theft (S2)                  | 19.66    | 16.66              | 14.24   | 11.98   | 3.98            | 2.92               | 9.51    | 5.72                      | 4.14    | 3.71    | 3.92       | 4.89    | 8.52    | 18.05   | 9.26    |
| Car theft (S3)                                        | 27.04    | 15.71              | 10.73   | 6.03    | 5.26            | 2.35               | 4.07    | 3.07                      | 2.02    | 18.07   | 9.40       | 3.13    | 2.38    | 3.48    | 7.63    |
| Theft in industrial and<br>commercial centers<br>(S4) | 0.83     | 2.63               | 0.03    | 0.15    | 0.00            | 0.01               | 0.06    | 0.39                      | 0.06    | 4.39    | 1.91       | 0.01    | 0.51    | 0.00    | 0.73    |
| Shop theft (S5)                                       | 3.79     | 3.91               | 3.47    | 1.65    | 1.14            | 1.39               | 2.32    | 1.53                      | 2.56    | 4.18    | 1.87       | 1.27    | 2.26    | 2.14    | 2.32    |
| House theft (S6)                                      | 13.75    | 11.30              | 11.77   | 7.74    | 4.17            | 4.22               | 8.30    | 6.08                      | 7       | 12.37   | 9.79       | 4.02    | 7.48    | 7.90    | 8.19    |
| Theft in governmental<br>facilities (S7)              | 0.84     | 0.51               | 0.73    | 0.67    | 0.31            | 0.49               | 0.59    | 0.32                      | 0.53    | 0.35    | 0.68       | 0.00    | 0.58    | 0.23    | 0.49    |
| Theft in other locations                              | 10.03    | 2.97               | 12.24   | 5.87    | 4.97            | 7.26               | 2.76    | 1.16                      | 1.62    | 3.39    | 0.42       | 1.62    | 4.19    | 5.70    | 4.43    |

|                                     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| (S8)                                |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Addicts and drug users (S9)         | 11.45 | 0.55  | 12.55 | 2.52  | 11.90 | 11.35 | 2.60  | 5.28  | 1.81  | 0.00  | 2.06  | 2.59  | 4.96  | 0.06  | 4.88  |
| Drug keepers (S10)                  | 8.02  | 14.73 | 26.13 | 14.63 | 1.03  | 0.28  | 18.95 | 3.49  | 44.25 | 3.52  | 9.62  | 12.66 | 28.64 | 46.06 | 15.78 |
| Drug carriers (S11)                 | 1.74  | 2.58  | 2.46  | 3.64  | 1.20  | 3.12  | 7.95  | 4.36  | 1.12  | 0.78  | 3.92  | 1.46  | 2.09  | 1.27  | 3.23  |
| Drug distributors (S12)             | 9.32  | 11.19 | 8.99  | 3.80  | 6.88  | 10.93 | 6.80  | 2.41  | 5.61  | 49.40 | 12.25 | 22.50 | 8.69  | 11.80 | 11.81 |
| Drug traffickers (S13)              | 1.76  | 2.38  | 1.56  | 0.66  | 0.33  | 2.68  | 1.14  | 0.93  | 1.61  | 1.96  | 0.52  | 2.43  | 0.92  | 1.95  | 1.44  |
| Intentional poisoning (S14)         | 0.01  | 0.00  | 0.00  | 0.02  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.19  | 0.00  | 0.01  | 0.00  | 0.01  | 0.02  |
| Pretending to commit stabbing (S15) | 0.17  | 0.01  | 0.12  | 3.61  | 0.25  | 0.53  | 0.67  | 0.94  | 0.00  | 0.17  | 0.11  | 0.67  | 0.03  | 0.36  | 0.51  |
| Coercion and compulsion (S16)       | 0.31  | 0.00  | 0.08  | 2.38  | 0.06  | 0.21  | 0.01  | 0.00  | 0.00  | 0.02  | 0.00  | 0.85  | 0.28  | 0.01  | 0.28  |
| Threat (S17)                        | 0.31  | 0.12  | 0.00  | 0.00  | 0.11  | 0.02  | 0.00  | 0.03  | 0.00  | 0.86  | 0.00  | 0.03  | 0.00  | 0.47  | 0.13  |
| Injury and harm (S18)               | 10.58 | 4.57  | 8.28  | 12.05 | 5.22  | 5.64  | 10.96 | 18.88 | 0.19  | 7.47  | 0.00  | 11.47 | 3.88  | 34.59 | 8.92  |
| Accidental deaths (S19)             | 5.71  | 1.31  | 1.78  | 0.00  | 1.58  | 1.02  | 1.56  | 1.40  | 1.63  | 0.34  | 0.42  | 0.00  | 3.01  | 4.55  | 1.62  |
| Involuntary manslaughter (S20)      | 0.02  | 0.00  | 0.02  | 0.07  | 0.08  | 0.02  | 0.00  | 0.02  | 0.00  | 0.00  | 0.00  | 0.03  | 0.03  | 0.00  | 0.02  |
| Intentional homicide (S21)          | 0.19  | 0.20  | 0.19  | 0.34  | 0.14  | 0.22  | 0.34  | 0.78  | 0.18  | 0.21  | 0.38  | 0.27  | 0.18  | 0.09  | 0.27  |



|                                                          |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Suicide attempt (S22)                                    | 0.27  | 0.35  | 0.34  | 0.55  | 0.28  | 0.51  | 0.40  | 0.36  | 0.62  | 0.27  | 0.83  | 0.53  | 0.36  | 0.31  | 0.41  |
| Suicide deaths (S23)                                     | 0.18  | 0.26  | 0.34  | 0.46  | 0.26  | 0.48  | 0.33  | 0.27  | 0.68  | 0.26  | 0.83  | 0.13  | 0.45  | 0.26  | 0.34  |
| Urban accidents resulting in fatalities (deceased) (S24) | 0.58  | 0.82  | 1.01  | 0.19  | 0.59  | 0.51  | 0.89  | 0.73  | 0.66  | 0.51  | 0.76  | 0.55  | 0.79  | 0.97  | 0.68  |
| Urban accidents resulting in injuries (injured) (S25)    | 32.74 | 33.84 | 20.32 | 16.19 | 24.43 | 18.49 | 21.57 | 16.15 | 17.58 | 9.20  | 15.12 | 13.91 | 35.91 | 69.41 | 24.63 |
| Urban accidents resulting in damages (S26)               | 35.21 | 0.92  | 71.70 | 26.55 | 10.79 | 8.70  | 1.36  | 13.87 | 3.71  | 9.82  | 10.53 | 2.64  | 63.83 | 6.96  | 18.49 |
| Rural accidents resulting in fatalities (deceased) (S27) | 0.22  | 1.37  | 1.28  | 1.84  | 1.57  | 1.56  | 2.80  | 3.83  | 2.63  | 0.90  | 1.74  | 2.64  | 3.66  | 1.93  | 1.97  |
| Rural accidents resulting in injuries (injured) (S28)    | 2.55  | 15.47 | 11.39 | 9.74  | 16.61 | 9.81  | 9.92  | 9.69  | 28.19 | 2.94  | 26.83 | 7.36  | 37.29 | 14.67 | 13.91 |
| Rural accidents resulting in damages (S29)               | 1.99  | 3.18  | 10.20 | 4.19  | 10.65 | 8.42  | 1.16  | 1.66  | 9.96  | 19.94 | 14.07 | 5.35  | 24.72 | 12.87 | 9.34  |

Reference: (Statistical Yearbooks of Provinces: Statistical Center of Iran, 2013, Researcher's calculations)

Due to lack of information on homicide, Khuzestan province has been excluded from the comparison process.

As observed in Table (3), based on the calculated weights using the entropy method for identifying and comparing the security competitiveness of Kermanshah among regional metropolises of Iran in the TOPSIS technique, the incidence of fatal urban accidents (S24) and suicide (S22) have the highest importance and impact on the security competitiveness index of the country's regional metropolises. Following them, the most significant roles and shares are allocated to drug trafficking (S13), residential burglary (S6), and shoplifting (S5). In contrast, deliberate poisoning (S14) and coercion and compulsion (S16) have the least weight and impact on the security competitiveness of regional metropolises.

Table 3: Weight of Indicators of Security Competitiveness Index of Regional Metropolises in Iran Using Entropy Method

| Factors | S1      | S2      | S3      | S4      | S5      | S6      | S7      | S8      | S9      | S10     | S11     |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Weight  | 0.03503 | 0.03608 | 0.03503 | 0.03017 | 0.03683 | 0.03695 | 0.03649 | 0.03564 | 0.03429 | 0.03475 | 0.03605 |
| Factors | S12     | S13     | S14     | S15     | S16     | S17     | S18     | S19     | S20     | S21     | S22     |
| Weight  | 0.03528 | 0.03652 | 0.02432 | 0.03152 | 0.02841 | 0.02939 | 0.03489 | 0.03449 | 0.03295 | 0.03637 | 0.03701 |
| Factors | S23     | S24     | S25     | S26     | S27     | S28     | S29     |         |         |         |         |
| Weight  | 0.03661 | 0.03706 | 0.03642 | 0.03350 | 0.03652 | 0.03596 | 0.03548 |         |         |         |         |

Table (4): Final Position of Kermanshah among Other Provinces in Terms of Security Competitiveness Index Kermanshah province, with a population of 1,945,227 people, ranks eleventh in terms of provincial population among the 14 regions studied (excluding Khuzestan province, which lacks homicide data for comparison). As indicated in Table (4), with a Topsis coefficient of 0.297, Kermanshah ranks seventh in security competitiveness.

In the 17 security competitiveness indicators, including theft of car parts (S1), theft of motorcycles and bicycles (S2), theft of shops (S5), theft of other places (S8), drug addicts and consumers (S9), drug holders (S10), drug trafficking (S13), intentional poisoning (S14), simulated knife attacks (S15), coercion and compulsion (S16), threats (S17), assault and injury (S18), accidental deaths (S19), unintentional homicide (S20), resulting in injury (S25), resulting in damage (S26), resulting in death (S27), Kermanshah is below the national average. In other words, in these indicators mentioned, it is in a better position than the national average, and in 12 other indicators, it is above the national average. Factors such as being a border province, economic conditions, especially unemployment, and low employment rates for women and men (with women's employment rate at 36.56% and men's employment rate at 39.77%, the lowest employment rate among the 14 provinces studied in the security competitiveness index) are among the influential factors on Kermanshah's security competitiveness index. As the neighboring province of Kermanshah, Hamedan holds the first position in the security competitiveness index with a Topsis coefficient of 0.240. The proximity to the safest province in Iran (Hamedan) provides opportunities such as a sense of security for Kermanshah. If it influences Kermanshah's security, it could improve not only the security competitiveness but also other economic and socio-cultural dimensions of competitiveness in Kermanshah in the future. Tehran, with a competitiveness coefficient of 0.426, ranks last (fourteenth) in security competitiveness. Being the capital city, the concentration of administrative, commercial, health, and political centers in Tehran has led to high immigration rates and, consequently, ethnic and religious diversity. Along with the extensive urban sprawl and issues related to controlling and supervising a metropolis of over eight million people, Tehran's adjacency to Alborz province, which ranks thirteenth in security competitiveness, has contributed to Tehran's decline in security competitiveness among the 14 provinces studied. An important point regarding Kermanshah's security competitiveness compared to Tehran is the number of intra-city and inter-city accidents. Tehran has approximately 5.2 times more intra-city accidents than Kermanshah, while Kermanshah has about 9 times more inter-city accidents than Tehran. This underscores the need for managers to focus on improving the quality of roads and highways in Kermanshah.

Table 4: Ranking of Security Competitiveness of Regional Major Cities in Iran and the Position of Kermanshah Regional Major City

| Metropolitan       | Hamadan | West Azerbaijan | East Azerbaijan | Gilan | Kerman | Sistan and Baluchestan | Kermanshah | Razavi Khorasan | Markazi | Isfahan | Qom   | Fars  | Alborz | Tehran |
|--------------------|---------|-----------------|-----------------|-------|--------|------------------------|------------|-----------------|---------|---------|-------|-------|--------|--------|
| TOPSIS coefficient | 0.240   | 0.261           | 0.265           | 0.271 | 0.283  | 0.292                  | 0.297      | 0.298           | 0.363   | 0.364   | 0.387 | 0.398 | 0.422  | 0.426  |
| Rank               | 1       | 2               | 3               | 4     | 5      | 6                      | 7          | 8               | 9       | 10      | 11    | 12    | 13     | 14     |

## 6. Conclusion

Security competitiveness, among other dimensions of competitiveness, has not received much attention from the academic community, and the existing studies have mostly been in the realm of socio-cultural studies. Security and the existence of a sense of security (safe environment) can be considered as a foundational element for other dimensions of competitiveness. Establishing security can lead to increased domestic and foreign investment in various sectors, boost domestic and international tourism, and consequently reduce unemployment and migration. The geographical location of Kermanshah and its proximity to relatively underprivileged provinces like Lorestan, Ilam, and Kurdistan, as well as its proximity to the border with Iraq, are among the influential factors on the security competitiveness of Kermanshah, contributing to a prevailing sense of insecurity compared to the entire western region of the country. Additionally, one of the main reasons for social insecurities such as theft, murder, suicide, and drug abuse is unemployment, which significantly affects Kermanshah's competitiveness and has its roots in economic issues.

In the security competitiveness index, Kermanshah province ranks below the national average in 17 security competitiveness indicators, including theft of car accessories, theft of motorcycles and bicycles, theft of shops, theft of other places, addicts and drug consumers, drug dealers, drug smuggling, deliberate poisoning, pretending to knife, coercion and intimidation, threats, assault and injury, accidental deaths, involuntary manslaughter, resulting in injury (wounded), causing damage, leading to death (deceased), demonstrating a relatively better situation compared to the national average in these indicators. Consequently, Kermanshah's lower position in terms of security competitiveness compared to the national average across various indicators is a major reason for its less favorable position among the regional metropolitan areas of Iran.

Moreover, attention should be paid to the limitations of this study. Some limitations include the constraints of available data, the quality and accuracy of the information used, and the selection of security criteria. These aspects require further scrutiny and investigation in future research to achieve greater precision in evaluating the security of Kermanshah and other cities.

Based on the experiences gained from conducting this research, the following suggestions are proposed for researchers who choose competitiveness as their field of study:

- It is recommended to pay attention to other dimensions of competitiveness, including economic, social, and environmental competitiveness, alongside security competitiveness.
- Approach competitiveness with a future-oriented perspective to anticipate and address future challenges and opportunities.
- Conduct comparative studies among Iranian provinces across various dimensions using new techniques such as Multiple Criteria Decision-Making (MCDM).

## References

- Bisognin Garlet, T., Duarte Ribeiro, J. L., de Souza Savian, F., Mairesse Siluk, J. C. (2022). Competitiveness of the value chain of distributed generation of photovoltaic energy in Brazil. *Energy for Sustainable Development*, 71, 447–461. <https://doi.org/10.1016/j.esd.2022.10.019>
- De Andrade, L.C., Borges-Pedro, J.P., Gomes, M.C.R.L., Tregidgo, D.J., Silva do Nascimento, A.C., Pozzan Paim, F., Marmontel, M., Benitz, T., Pucci Hercos, A., Valsecchi de Amaral, J. (2021). The sustainable development goals in two sustainable development reserves in central Amazon: achievements and challenges. *Discover Sustainability*, 2, 54. <https://doi-org.ezproxy2.ucn.cl/10.1007/s43621-021-00065-4>
- Garfias Royo, M., Diep, Loan., Mulligan, J., Mukanga, P., Parikh, P. (2022). Linking the UN Sustainable Development Goals and African Agenda 2063: Understanding overlaps and gaps between the global goals and continental priorities for Africa. *World*, 1, 100010. <https://doi.org/10.1016/j.wds.2022.100010>
- Jiang, Y., Shen, J. (2010). Measuring the urban competitiveness of Chinese cities in 2000. *Cities*, 27(5), 307–314.
- Kargar Samani, A. (2014). Designing a model of urban competitiveness based on indicators of good urban governance in the context of globalization. Doctoral dissertation in Strategic Management, Tarbiat Modares University. (In Persian)
- Komasi, H., Hashemkhani Zolfani, S., Prentkovskis, O., Skačkauskas, P. (2022). Urban Competitiveness: Identification and Analysis of Sustainable Key Drivers (A Case Study in Iran). *Sustainability*, 14(13), 7844. <https://doi.org/10.3390/su14137844>
- Komasi, H., Nemati, A., Hashemkhani Zolfani, S., Mehtari Taheri, H. (2024). Road safety evaluation in inner-city roads and suburban roads based on a novel-hybrid MCDM model. *Ain Shams Engineering Journal*, 102796. <https://doi.org/10.1016/j.asej.2024.102796>
- Komasi, H., Zolfani, S. H., Nemati, A. (2023). Evaluation of the social-cultural competitiveness of cities based on sustainable development approach. *Decision Making: Applications in Management and Engineering*, 6(1), 583–602. <https://doi.org/10.31181/dmame06012023k>
- Lever, William. F. Turok, I. (1999). Competitive Cities: Introduction to the Review. *Urban Studies*, 36(5–6), 791–793.
- Li, X., Xiao, L., Tian, Ch., Zhu, B., Chevallier, J. (2022). Impacts of the ecological footprint on sustainable development: Evidence from China. *Journal of Cleaner Production*, 352, 131472. <https://doi.org/10.1016/j.jclepro.2022.131472>
- Luczak, A., Just, M. (2021). Sustainable development of territorial units: MCDM approach with optimal tail selection. *Ecological Modelling*, 457, 109674. <https://doi.org/10.1016/j.ecolmodel.2021.109674>
- Mahrinasari, M. S., Bangsawan, S., Sabri, M. F. (2024). Local Wisdom and Government's Role in Strengthening the Sustainable Competitive Advantage of Creative Industries. *Heliyon*, e31133. <https://doi.org/10.1016/j.heliyon.2024.e31133>.
- Malecki, E. J. (2002). Hard and soft networks for urban competitiveness. *Urban Studies* 39 (5–6), 929–945.
- Moradi, E., Ehsani, M., Saffari, M., Norouzi Seyed Hosseini, R. (2022). Developing an integrated model for the competitiveness of sports tourism destinations. *Journal of Destination Marketing & Management*, 26, 100743. <https://doi.org/10.1016/j.jdmm.2022.100743>
- Paliulis, N. Cincikaite, R. (2013). Assessing competitiveness of Lithuanian Cities, *Economics and Management*, 18, 3, 490–500. <http://dx.doi.org/10.5755/j01.em.18.3.4307>
- Parkinson, M. Boddy, M. (2004). Introduction. *City Matters: Competitiveness, cohesion and urban governance*. The Policy Press, Bristol, 1–10.
- Peng, Li; Zhanxin, Ma. (2011): The Evaluation of City Competitiveness in Shandong Province, *Energy Procedia*, 5, pp 472–476.
- Pengfei, Ni., Kresl, P .K. (2010). *The Global Urban Competitiveness Report: 2010*. Edward Elgar Publishing Limited.
- Pengfei, Ni., Kresl, P .K. (2010). *The Global Urban Competitiveness Report: 2010*. Edward Elgar Publishing Limited.
- Porter, M. E. (1998). *The competitive advantage of nations*. Macmillan, London.

Porter, M. E. (2008). The competitive advantage of the inner city. In *On Competition: updated and expanded edition*. A Harvard Business Review book, Harvard Business School Publishing, 373–404.

Saez, L., Perianez, I. (2015). Benchmarking urban competitiveness in Europe to attract investment, *Cities* 48, 76–85. <https://doi.org/10.1016/j.cities.2015.06.002>

Sixth Economic, Social, and Cultural Development Plan of Kermanshah Province (2016-2020). Presidency Institution, National Planning and Budget Organization, Provincial Planning and Budget Organization, Cross-sectoral Division, Budget and Planning Coordination Deputy.

Tian, J., Deng, W., Yuan, J. (2023). Evaluation of sports tourism competitiveness of urban agglomerations in Guangdong-Hong Kong-Macao Greater Bay Area. *Heliyon*, 9, 12, e22780. <https://doi.org/10.1016/j.heliyon.2023.e22780>

Veríssimo, C., Pereira, L., Fernandes, A., Martinho, R. (2024). Complex problem solving as a source of competitive advantage. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(2), 100258. <https://doi.org/10.1016/j.joitmc.2024.100258>