

## The Impact of Company Geographic Location on Stock Market Indices

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### Abstract

**Objectives:** This study investigates the relationship between the geographical distribution of firms and stock market indices, aiming to understand how regional firm location influences market behavior and overall index performance.

**Methodology/Design/Approach:** Company location data were collected using Geographic Information Systems (GIS) and relevant APIs. The research follows a descriptive-survey approach, complemented by analytical methods. Regression analysis and fixed effects models were used to test the hypotheses and analyze the data, examining the correlation between firm location and stock market performance.

**Findings:** The empirical findings reveal a negative regression coefficient between geographic location and the overall stock market index. Specifically, each unit increase in the geographic location metric corresponds to an approximate 93.297-unit decrease in the index. Moreover, if all companies were hypothetically located in the same geographic region, the projected overall market index would be 12,235. These results emphasize the significant effect that relocating companies from higher to lower geographic locations can have on the market index.

**Innovation:** This study contributes to the literature by quantifying the impact of geographic distribution on stock market indices. It highlights that firm location is not merely a contextual factor but a determinant that can meaningfully affect overall market performance, offering new insights for investors, policymakers, and urban economic planners.

**Keywords:** Operational Efficiency; Regional Distribution; Economic Indicators; Market indices.

## 1. Introduction

The transmission of information within regional energy stock markets can generate significant ripple effects across global financial markets and has attracted considerable scholarly attention over the past two decades. Given the critical role that energy industry stock markets play in various regions worldwide, coupled with their vulnerability to a broad spectrum of influencing factors, conducting a thorough and comprehensive analysis of the determinants governing these markets is of paramount importance. Such an investigation offers invaluable support to investors and industry stakeholders by facilitating well-informed decisions related to investment strategies and risk management.

Within this framework, the stock exchange index emerges as a key determinant in guiding the selection and allocation of investments across energy stock markets situated in diverse geographic regions. This study aims to scrutinize, evaluate, and monitor stock exchange indices across different locales to provide investors with insights derived from an integrated analysis of company performance, economic growth, and employment trends within these regions. As noted by Alawi et al. (2023), the energy market is influenced by a constellation of factors, including corporate performance, geographic location, stock market conditions, employment dynamics, and economic growth. Accordingly, a rigorous exploration of these determinants can yield nuanced and valuable insights for investors and other market participants.

Among the array of factors shaping energy stock market dynamics, geographic location is particularly salient. Certain regions possess abundant natural resources relevant to the energy sector, enabling higher levels of energy production. This advantage can lead to significant increases in the valuation of energy companies operating within these regions. The stock exchange index functions as a fundamental metric for evaluating market performance and exerts a profound influence on stock prices and market fluctuations.

A recent study by Saadawi et al. (2023) examined the impact of geographical risks on the Saudi Arabian

stock market index, revealing that such risks materially influence market volatility and index performance. This underscores the critical importance of the stock market index as a key indicator of market health and a determinant of company stock prices, with its fluctuations bearing direct and indirect consequences for investment decision-making.

Furthermore, Daniel Mascare's work on the importance of geographic location for stock market participation highlights the influence of rural-urban disparities on investor behavior in Canada. Additional studies, including those by Fleming and Ali (2016) and Lian and Hamoudi (2017), have investigated the effect of geographic location on corporate performance across various industries in Mexico and France, respectively. Moreover, Fakhari and Naqdi (1396) identified a significant negative relationship between a company's geographic location and reported information asymmetry, alongside a positive correlation between geographic distance and corporate cash holdings.

Broadly, the literature consistently underscores the considerable impact of geographic location on corporate performance within stock markets. This influence holds particular significance for investors, as a precise understanding of geographic effects enables more effective investment strategies and risk management approaches. Geographic positioning also represents a critical determinant of physical and logistical risks faced by firms.

Additionally, research on the relationship between geographic location and company performance generates valuable insights applicable across diverse economic sectors. Economic policymakers, equipped with comprehensive knowledge of these geographic influences, are better positioned to engage in effective planning and make well-informed decisions.

The primary objective of this study is to investigate the influence of companies' geographic locations on the stock market index, recognizing it as a pivotal factor closely linked to corporate performance in financial markets. This inquiry aims to benefit a broad spectrum of stakeholders navigating the

complex financial landscape. While the effect of geographic proximity between auditors and stakeholders has been examined within auditing research (e.g., Seyyednejad Fahim and Khodashahri, 2023), the specific impact of companies' geographic locations on the stock market index remains an underexplored area. This study seeks to address this gap, contributing to the expanding body of knowledge in this domain.

## Literature Review

The influence of geographic location on stock market indices, corporate profitability, and audit practices has been extensively examined, leading to the development of various foundational theories and concepts. Among these, the theory of local markets, first proposed by Robert Patlon (1993), stands out prominently. This theory posits that unique local and cultural conditions within different regions shape investor behavior, resulting in distinct local markets where stock prices are primarily influenced by region-specific factors. Consequently, variations in stock market indices and corporate profitability can be observed across geographic locales. Complementing this perspective, the theory of semi-predictable markets, introduced by James Sanders and Timothy McDaniel (1990), offers an additional explanatory framework regarding the impact of geographic location on stock market indices and corporate profitability. According to this theory, markets influenced by local factors demonstrate a degree of predictability in approximately half of their behaviors, while the remainder is governed by unpredictable, stochastic dynamics.

In the domain of corporate auditing, geographic location has also received significant scholarly attention. Choi, Kim, Koo, and Jang (2012) highlighted that auditors operating in various regions within a country encounter distinct challenges and disparities in the auditing process due to divergent local conditions and regulatory environments. This regional variability can substantially affect audit quality and procedures. Furthermore, the theory of

semi-predictable markets has been employed to elucidate how geographic factors contribute to differential outcomes in stock market indices and corporate profitability, reinforcing the notion that local environmental influences play a critical role in shaping financial market behavior.

A recent study by Wilkens, Decaizer, Bruynseels, and Neumann (2023), titled "Reviewing Market Power of Auditors and Audit Quality: Concentration Effects, Market Share Disparity, and Leadership," reevaluates the relationship between auditor market power and audit quality. Utilizing audit data from publicly listed companies on the Belgian Stock Exchange, the study finds that increased market concentration, characterized by dominant auditor market power, correlates with a decline in audit quality. Moreover, disparities in market share and the presence of market leadership further exacerbate variations in audit outcomes. These findings underscore the critical influence of market structure on the integrity and reliability of financial audits.

Parallel to these investigations, emerging research has explored the impact of environmental, social, and governance (ESG) factors on corporate financial performance, particularly in the Levant region. Al Aamush, Khateeb, and Ananzeh (2023) analyzed financial data from companies listed on stock exchanges in Jordan, Syria, and Palestine, demonstrating that firms exhibiting strong ESG performance experience marked improvements in financial performance metrics. The study emphasizes that effective management of environmental and social responsibilities can exert a direct and significant positive influence on corporate financial outcomes. Collectively, these findings highlight the growing importance of integrating ESG considerations into corporate strategies to enhance financial performance.

Amini and Rahmani (2023) provide a comprehensive review of recent research concerning sustainable investments, environmental and social objectives, and financial performance. Their analysis covers key concepts such as the competitive advantages gained through sustainable projects,

methods for evaluating financial performance in sustainability contexts, and the role of sustainable investments in fostering economic and social development. The authors conclude by proposing directions for future research, emphasizing the evolving importance of sustainability in financial decision-making.

Alavi et al. (2023) investigate information transmission across energy industry stock markets in different regions. Using vector regression and quantity models, the study analyzes inter-market relationships and identifies price linkages among these markets. The findings demonstrate that energy stock markets worldwide influence one another directly and indirectly, underscoring the interconnectedness of regional markets. This work offers valuable insights for investors and industry professionals seeking to understand cross-regional market dynamics in the energy sector.

Fleming and Ali (2016) explore the effects of companies entering the retail market in various Mexican regions. Their results reveal that new company entries significantly affect market competition, although the magnitude and nature of these effects differ geographically. Nonetheless, the study does not extensively address the implications of these entries for local communities and employment levels.

Maskar (2018) examines the impact of geographic location on Canadian stock market participation. The study finds that firms situated in rural areas tend to have lower stock market participation, likely due to greater physical distance from central markets and limited access to information. However, the consequences of company location on local communities and employment are not thoroughly investigated.

Lian and Hamoudi (2015) analyze the influence of company establishment and dissolution on employment patterns across French regions. Their findings indicate that new company formations positively correlate with employment growth, while company closures contribute to employment decline.

The authors caution that these results may vary in different contexts due to regional economic, geographic, and cultural heterogeneity.

Levine and Rubinstein (2017) empirically examine how indigenous enterprises and communities affect stock market participation in the United States. Defining “community” as groups bound by common cultural, linguistic, historical, and religious traits within geographic areas, they find that indigenous communities foster higher local market engagement, encouraging firms to participate actively in the stock market. This study highlights the critical role of localized social factors in shaping corporate market behavior and provides valuable insights for investors and researchers.

Haque and Islam (2017) offer a comprehensive study on geographic determinants impacting Indian stock market performance. Their results affirm that factors such as urban location, political and economic stability, and proximity to central markets significantly influence corporate performance metrics. However, the study stops short of fully elucidating the mechanisms by which these geographic factors affect firm outcomes or their complex interrelations.

Rai and Deyang (2018) focus on the contribution of corporate geographic locations to regional economic growth. Their empirical evidence suggests that companies situated in particular regions can enhance local economies by creating jobs and increasing production capacity. Yet, the authors acknowledge challenges in directly comparing their findings with other studies, given differences in research focus and geographic characteristics.

In summary, this review of extant literature reveals the profound influence of geographic determinants—including urban positioning, closeness to central markets, and regional development levels—on the operational performance of corporations and stock markets. Nevertheless, it is essential to consider that research outcomes vary due to cultural, economic, and geographic disparities across regions. Hence, further empirical investigations that account for the distinctive features of various geographic locales are vital to

deepen understanding of how these factors shape corporate and market performance.

Using the bibliometric software **Reviewer** and data extracted from the **Scopus** scientific database, a keyword co-occurrence map was generated to analyze the most frequent terms in the field of geographical location of companies and stock market indicators. The dataset comprised scholarly articles and publications indexed in Scopus between 2010 and 2023.

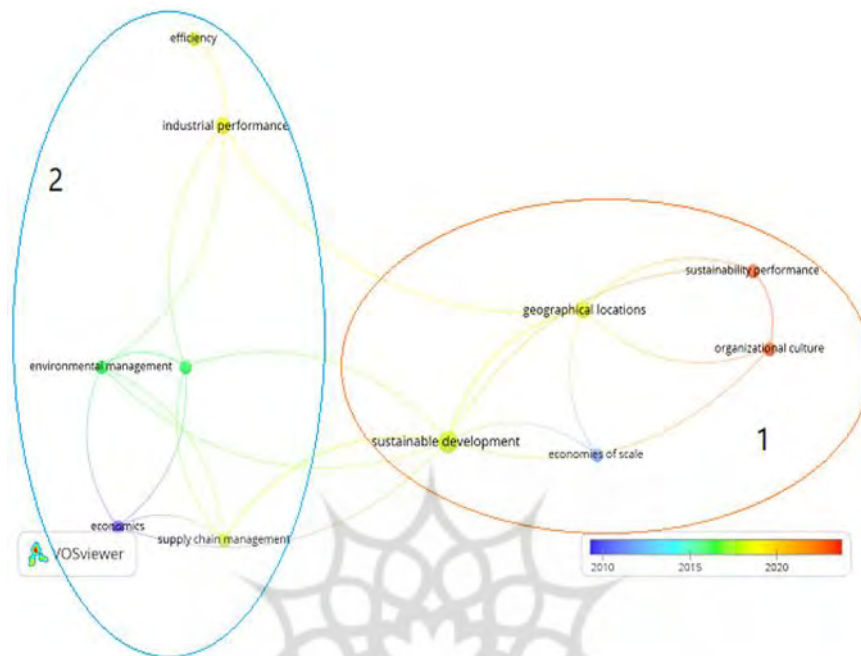
The analysis revealed that the majority of scientific research in this domain originates from India, accounting for approximately 35% of the total publications. Notably, Iran ranks above countries such as Italy, Australia, and Spain, highlighting the significant research activity and impact of Iranian scholars in this area. A historical search identified pioneering contributions by Sandaram and Lu from the Michigan Business School, who published their seminal paper in 1996, accumulating 51 citations to date. The most recent indexed article was authored by Ahmed et al. from the School of Information Management and Technology in Egypt, which, at the time of analysis, had not yet received citations. The most cited publication remains the work of Norris et al., which has garnered 171 citations.

To compile this dataset, keywords including "corporate performance," "geographical location," "stock market," and "stock index" were queried within the Scopus search engine, yielding an initial pool of 287 articles. Subsequently, specialized filters were applied to focus on publications within the disciplines of accounting, management, business, economics, and

finance. The selection was further refined to include only English-language journal articles, conference proceedings, and business journals. After applying these criteria, the final validated corpus comprised 159 articles.

(TITLE-ABS-KEY ( company AND performance ) AND TITLE-ABS-KEY ( geographical AND location ) OR TITLE-ABS-KEY ( stock AND market ) AND TITLE-ABS-KEY ( stock AND exchange AND index )) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "re" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) OR LIMIT-TO ( SRCTYPE , "p" ) OR LIMIT-TO ( SRCTYPE , "d" ) ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) OR LIMIT-TO ( PUBSTAGE , "aip" ) )

The details of these research papers were entered as data into the visual bibliography software called VOSviewer. Within the visual representations created by this software, every data point is symbolized by a circle and a link line. The bigger the size of the circle, the thickness of the link line, and the shorter length of the line signify the strength of that particular data point. In essence, a larger circle, a thicker line, and a shorter link line convey a higher level of significance for that data point.



**Fig1. Overlay visualization Map of the Most Frequent Author Keywords**

The visual map underscores the relative importance of frequently employed keywords by authors over time, with a particular focus on geographical location, sustainable development, and organizational culture. In this visualization, two distinct clusters become apparent: the concise connections between "sustainable performance," "organizational culture," and "geographical location" highlight a concentrated exploration of organizational criteria and sustainable development within the first cluster. Meanwhile, the grouping of keywords such as "efficiency," "industrial performance," "environmental management," "supply chain management," and "economics" in the second cluster suggests that researchers have specialized in two specific research domains. Notably, there seems to be a research gap in the areas of supply chain management, economics, geographical location, and efficiency. Therefore, it is recommended that researchers allocate more attention to these domains.

Additionally, this map encapsulates the changing trends in keywords used by authors over the period from 2010 to 2023, represented by shifts in color. Cool blue and purple hues represent the author's interests from 2010 to 2015. As the colors transition to warmer tones, it signifies a shift in researchers' focus toward emerging topics. The prevalence of yellow color suggests that authors currently emphasize geographical location and sustainable development. Expectations indicate that in the coming years, as indicated by the red color, researchers will predominantly delve into the realm of organizational culture and sustainable performance within the context of geographical location.

## Research Methodology

This study employs a descriptive-analytical approach with a cross-sectional time frame, concentrating exclusively on the year 2021. Therefore, the results

and conclusions are applicable only within the context of this specific period. Utilizing a quantitative research method, the study investigates the impact of companies' geographic locations on stock market indices through the analysis of secondary data sourced from publicly available platforms such as financial websites and official stock exchange databases.

The data analysis employs statistical tools including correlation coefficients and t-tests to explore the relationships and differences between relevant variables.

Complementing these traditional quantitative methods, the research introduces an innovative technique by constructing a behavioral map of companies based on their trading volumes using AutoCAD software. This novel approach is unprecedented in accounting and financial research, offering a distinctive visualization of trading behavior relative to geographic location.

The study population encompasses all publicly listed companies on the Tehran Stock Exchange (TSE). To assess the influence of geographic location on market performance, the research utilizes the overall stock market index as the primary indicator, reflecting the aggregated performance of all listed companies and thus capturing the potential effects of geographic factors on the stock market.

The Iranian stock market index comprises numerous key companies operating across diverse economic sectors. The following section organizes these companies by their respective provinces:

- Tehran:

1. Iran Minerals Development Company
2. National Iranian Oil Products Distribution Company
3. Pars Welfare and Sports Services Company
4. Telecommunication Company of Iran
5. Pars Oil and Gas Company
6. Esfahan Mobarakeh Steel Company
7. Mobile Telecommunication Company of Iran (Hamrah-e-Avval)
8. Iran Airports Company
9. Bandar Abbas Oil Refining Company

10. Jam Petrochemical Company
11. Khuzestan Steel Company
12. National Iranian Copper Industries Company
13. SAIPA Group
14. Iran Steel Company
15. Khorasan Petrochemical Company

Isfahan:

- Isfahan Casting Industries Company
- Esfahan Mobarakeh Steel Company

Khuzestan:

- Khuzestan Steel Company

Hormozgan:

- Bandar Abbas Oil Refining Company

Fars:

- Bandar Abbas Oil Refining Company

Razavi Khorasan:

- Pars Oil and Gas Company

Qazvin:

- Telecommunication Company of Iran

This methodology underscores the systematic approach employed in this research, combining quantitative analysis with an innovative behavioral mapping technique to comprehensively explore the influence of geographic locations on stock market indices.

The research questions regarding the impact of geographical location on the stock market index are as follows:

1. Does the location of stock exchange-listed companies in different regions affect the performance of the stock market index?
2. Is there a direct relationship between geographical location and the performance of the stock market index?
3. Do geographical differences between regions have an impact on the analytical state of the stock market?

## Research Findings

The table presented above offers an overview of the distribution of companies across various provinces. For example, based on the list of companies included in the Tehran Stock Exchange's comprehensive index, **15 companies operate in Tehran province**. The **average number of companies per province** according to this index is **4.14**.

**Table 1. Descriptive Statistics of Trading Volume in Each Province**

Province:	The number of companies present in each province
Tehran	15
Isfahan	2
Khuzestan	1
Hormozgan	1
Fars	1
Khorasan Razavi	1
Qazvin	1
The average number of companies present in each province	4
The standard deviation of the number of companies present in each province is	5.49

The **standard deviation** of the number of companies per province, which measures the degree of dispersion in the data, is relatively high at **5.49** for the Tehran Stock Exchange's overall index. This indicates a significant deviation from the mean, reflecting considerable variability in the number of companies distributed across provinces. These findings highlight notable differences in company presence among provinces.

In the following table, several statistical measures related to transaction volumes are provided:

- The **coefficient of variation** is defined as the ratio of the variance of transaction volumes to the mean transaction volume, serving as a relative measure of dispersion.
- **Skewness** quantifies the asymmetry of the transaction volume distribution relative to its mean. A skewness value below zero indicates a distribution with longer tails on the left

(wider tails than a normal distribution), while a skewness value above zero signifies longer tails on the right (narrower tails than normal).

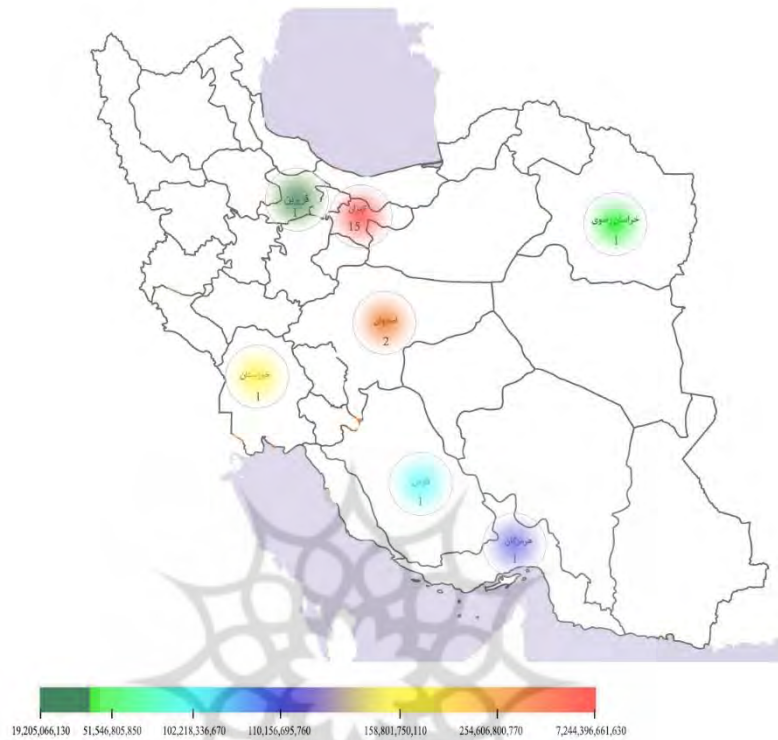
- Specifically, skewness measures the degree of imbalance between small and large transaction volume data compared to a normal distribution. A skewness value equal to 1 indicates a perfectly normal skewness; values less than 1 suggest a wider distribution, and values greater than 1 imply a narrower distribution.

**Table 2. Trading Volume of Companies in the Overall Index by Province**

Province	Trading Volume	Minimum	Maximum	Trading Volume
Trading Volume	Skewness	Kurtosis	Coefficient of Variation (%)	Volume
Tehran	7,244,396,661.630			
	51,546,805,850	3,036,620,664,200		
	2249	2419	5/514	
Isfahan	264,606,800,770	1,745,558,550		
	61,361,507,260	3.270	8.734	636
Khuzestan	158,801,750,110	1,604,903,950		
	39,352,936,630	6.054	5.497	106
Hormozgan	110,156,695,760	387,754,600		
	32,282,935,160	6.542	8.360	1.356
Fars	102,218,336,670	1,439,695,400		
	25,768,357,680	4.669	7.994	177
Khorasan Razavi	51,546,805,850	1,478,169,100		
	10,135,597,800	2.111	3.663	546
Qazvin	19,205,066,130	129,092,700		
	2,547,518,490	19.585	81.836	
	11.780			
Average	1,625,696,465,957	6,266,945,725.7		
	20,116,587,365.2	4.21		
	12.811	2.761.714		
Median	110,156,695,760	1,604,903,950		
	32,282,935,160	4.669	7.994	546
Standard Deviation	3,285,367,097,289			
	15,803,991,137.6			
	18,195,096,559.9	3.07		
	28.272	4,175.904		

Furthermore, a behavioral map of the studied companies based on their trading volume is presented, which has been drawn using AutoCAD software.





**Figure 2. Schematic representation of the behavioral map of trading volume by companies based on geographical location.**

In Figure 1, the color transition from green to red signifies a progressive increase in trading volume. This schematic depiction distinctly showcases that Tehran, Isfahan, and Khuzestan take the lead in this trading index. These findings indicate that geographical location significantly influences trading volume. Considering the implications of these findings, it raises an intriguing question for future research: Why does Qazvin, despite its geographical proximity to Tehran, exhibit relatively lower trading volume? What unique infrastructural or contextual elements distinguish Tehran and Isfahan from other cities in this regard? This exploration into regional disparities in trading volumes can offer valuable insights into the dynamics of economic activities and market behavior.

### Houseman Test Results

In our research, we begin with the null hypothesis that posits a uniform impact of geographical location on the stock index across all provinces. To scrutinize this null hypothesis, we employ two distinct statistical models: the random effects model and the fixed effects model. Our initial step involves calculating the parameter governing the influence of trading volume using the random effects model. Subsequently, we estimate the parameter associated with geographical location effects using the fixed effects model. Ultimately, we turn to the Hausman statistic as a means to compare the disparities in estimators between these two models. This statistical examination is crucial in assessing whether geographical location

significantly affects the stock index in varying ways across provinces.

**Table 3. Hausman Test**

Pattern	Statistic Value	Significance Level
Random Effects Model Results		
Fixed Effects:	-0.0000865	
Trading Volume Effect		
Fixed Effects Model Results:	-0.0000913	
Trading Volume Effect		
Geographic Location Effect:	-0.0000048	

As per the conducted analyses, the p-value registers at zero, which is significantly smaller than the chosen significance level of 0.05. Consequently, we must reject the null hypothesis, indicating that the geographic location exerts differing effects on stock prices across various provinces. In essence, the fixed-effects model, which takes into account these geographic variations, emerges as a more suitable approach compared to the random-effects model. It's essential to emphasize that this test's validity hinges upon both the random-effects and fixed-effects models having sound estimators, as well as the accurate establishment of the null hypothesis (that geographic location effects are uniform). Furthermore, it's crucial to note that the results derived from this test are specific to the utilized dataset and require reevaluation when applied to new data.

#### Diagnostic tests:

df1 test: 0.1271151 (p-value: 0.722301)

df2 test: 1.234134 (p-value: 0.217020)

Hansen test: 17.16515 (p-value: 0.507771)

In this model, an additional variable, trading volume, has been introduced, with coefficients of -551.48095 and 143.79069 for the geographical and trading volume variables, respectively. Notably, both coefficients exhibit p-values below the 0.05 significance threshold, indicating their significant influence on the overall stock price index. The incorporation of the trading volume variable into the

model not only enhances the results but also improves the precision of forecasting the comprehensive stock price index.

**Table 4. Regression Results**

	Pr(> t )	t-value	Std.	Error
Estimate Coefficients :				
2.094e-05	-4.2818	128.71656	-	
551.48095 location				
< 2.2e-16	13.2875	10.83148	143.79069	
volume				
Two-Step (GMM) estimation results:				
=====				
GMM criterion: 1.399e+03				
Q(2) test: 83.53 p-value: 7.497e-19				
-----				
	Estimate	Std. Error	z-value	Pr(> z )
(Intercept)	159.7461	14.1266	11.3029	< 2.2e-16 ***
location	-551.4809	128.7166	-4.2818	2.094e-05 ***
volume	143.7907	10.8315	13.2875	< 2.2e-16 ***
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Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1" 1				

**Table 5. Coefficients, statistical metrics**

Residuals:				
Min	1Q	Median	3Q	Max
-1345.17	-287.61	19.91	283.37	1070.34
Coefficients:				
	Estimate	Std. Error	t-value	Pr(> t )
(Intercept)	12235,000	126.904	96.425	< 2e-16 ***
location	-93.297	30.911	-3.016	0.00274 **
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Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1" 1				
Residual standard error: 413.6 on 476 degrees of freedom				
Multiple R-squared: 0.0189, Adjusted R-squared: 0.01633				
F-statistic: 9.095 on 1 and 476 DF, p-value: 0.00274				

In the table presented above, you can examine the intricacies of the model, including its coefficients, statistical metrics, and the p-values associated with each coefficient. Within this model, the coefficient for the "location" variable is calculated at -93.297, with a

p-value that falls below the significance threshold of 0.05. This signifies that the "location" variable exerts a meaningful influence on the overall stock index, indicating that stock prices can indeed exhibit significant variations across different geographical regions, thereby affecting the comprehensive stock index.

**Table 6. Analysis of Residuals**

Residuals:					
	Min	1Q	Median	3Q	Max
	-1345.17	-287.61	19.91	283.37	1070.34
Coefficients:					
	Estimate	Std. Error	t-value	Pr(> t )	
(Intercept)	12235.000	126.904	96.425	< 2e-16	
location	-93.297	30.911	-3.016	0.00274	**
Sign if. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Residual standard error: 413.6 on 476 degrees of freedom					
Multiple R-squared: 0.0189, Adjusted R-squared: 0.01633					
F-statistic: 9.095 on 1 and 476 DF, p-value: 0.00274					

This analysis provides a comprehensive overview of various statistical metrics that shed light on the formulation of a pertinent model designed to address the research question. At its core, the output initiates with the invocation of a linear regression model, skillfully constructed through the amalgamation of the provided input data and specified commands.

Subsequently, the ensuing output furnishes key statistical indicators central to the model, encompassing:

**Residuals:** A collective representation of the model's residuals.

**Coefficients:** Illuminating the coefficients attributed to each independent variable within the model.

- **Sign if. Codes:** Offering insight into the statistical significance of each coefficient, signified in this output by the "location" coefficient's significance level (0.01) indicated by three asterisks (\*).

**Residual standard error:** Quantifying the standard error of the residuals concerning the model's degrees of freedom.

**Multiple R-squared:** Presenting the model's multiple correlation coefficient.

**Adjusted R-squared:** Reflecting the adjusted multiple correlation coefficient tailored to the model.

**F-statistic:** A pivotal statistical measure determining the collective significance of the model's coefficients.

**p-value:** Unveiling the p-value associated with each coefficient.

With these metrics in consideration, it becomes apparent that the "location" variable exerts a substantial and statistically significant influence on the overarching stock index. The "location" coefficient, denoted as -93.297 with a p-value below 0.05, attests to this significance. The linear regression model is succinctly expressed as:

$$\text{index} = 12235 - 93.297 * \text{location}$$

In this model configuration, "index" is representative of the overall stock index, while "location" denotes the geographic positioning. Furthermore, the determination coefficient (R-squared) for this model approximates 0.019, signifying that approximately 1.9% of the variability observed in the overall stock index can be attributed to variations in the "location" variable.

Interpreting the positive or negative nature of regression coefficients, it becomes evident that with each positive unit increment in geographical location, the overall stock index experiences an approximate decrease of 93.297 units. In essence, the act of relocating from a region marked by a higher geographical location to one characterized by lower geographical coordinates may precipitate a diminishment in the overall stock index.

Within the framework of linear regression models, the constant value assumes the role of predicting the value of the dependent variable (y) when all independent variables (x) are set to zero. In this context, the constant value (12235) signifies the anticipated value of the overall stock index when the "location" variable equals zero. Thus, were all companies positioned within a specific region boasting a distinct geographical location, disregarding actual "location" variable values, the overall stock index would be forecasted at 12235. This underscores the premise that geographical shifts from regions characterized by higher to lower geographical coordinates could potentially yield a decline in the overall stock index.

## Discussion and Conclusion

The primary objective of this study was to investigate whether the geographical locations of publicly traded companies across various regions exert a tangible influence on the performance of the stock market index. The research findings provide strong evidence supporting the notion that geographical factors significantly affect the overall stock index of the Tehran Stock Exchange. Specifically, cities such as Tehran and Isfahan, characterized by higher trading volumes, exert a more substantial impact on the index. This suggests that, alongside systemic and internal factors extensively examined in prior research, geographical location constitutes an important element influencing stock market performance.

Figure 1 visually illustrates the relative significance of specific companies in shaping the index based on their geographic locations. This

representation highlights the critical importance of examining infrastructural disparities among cities, which have contributed to the success of these companies. These findings align closely with earlier studies conducted by Fleming and Ali (2016), Lian and Hamoudi (2017), and Masgar (2018).

The model's coefficient of determination ( $R^2$ ) is approximately 0.019, indicating that around 1.9% of the variance observed in the Tehran Stock Exchange's overall stock index can be attributed to geographical variables. These results carry practical implications for corporate management, including strategic considerations such as branch establishment, potential mergers with companies located in different regions, and other regional growth strategies.

Moreover, this study opens avenues for future research, particularly in exploring whether unique infrastructural factors within different regions influence corporate valuations. Further investigation could shed light on the specific infrastructural components that meaningfully affect company performance and stock market outcomes.

One noteworthy caveat of this study pertains to its cross-sectional nature, constrained within a delimited timeframe. Consequently, the discerning course of action would entail extending such investigations across protracted temporal horizons, affording insight into the evolving dynamics of the stock market.

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