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Investigating the relationship between banking competition and the development of stock and insurance markets, and economic growth within the Persian Gulf region countries

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Abstract

The present study investigates the relationship between banking competition and the development of stock and insurance markets, along with economic growth in the countries of the Persian Gulf region, employing econometric methods, including panel data analysis and error correction causality test, over the period 1996-2020. The results of the random effects test indicate that the variables of banking competition, stock market development, and insurance market development have a significant and positive impact on economic growth. The development of the stock market has the greatest impact on economic growth, while banking competition has the least impact on the economic growth of the Persian Gulf countries. The results of the Granger causality test indicate that there is a significant relationship between banking competition and economic growth. Furthermore, there is a significant relationship between insurance market development and economic growth. Additionally, there is a significant relationship between stock market development and economic growth. There is also a significant relationship between banking competition and insurance market development. Furthermore, there is a significant relationship between banking competition and stock market development. Moreover, there is a significant relationship between stock market development and insurance market development.

Keywords: economic growth, banking competition, stock market development, insurance market development, Persian Gulf countries
2020 MSC: Primary 91B55; Secondary 62P20, 62J05, 62H20, 91G10

1 Introduction

Economic growth is consistently considered one of the primary objectives of policymakers and economists. In this regard, numerous studies have been conducted, demonstrating the varying pace of economic growth and development trends in countries worldwide. Countries, within the framework of economic growth, can aim to increase societal welfare, reduce poverty, and mitigate inequality. However, the issue here is that in order to achieve this objective (increase in welfare), economic growth is pursued alongside other goals at the national level, to ensure the preservation of their primary objective, which is essentially a metric for measuring welfare. The factors influencing economic growth vary from one time period to another and from one country to another, depending on environmental, cultural,

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social, and economic characteristics, which are different and variable. The role of financial markets and deepening financial systems is crucial for the progress of all modern societies. This aligns with modern growth theories that emphasize the importance of stock markets and financial development in pursuing macroeconomic objectives, even though both empirical and theoretical literature are inconclusive and filled with mixed findings. It is more important that; most empirical literature has focused on the most advanced economies of North America, Europe, and some emerging economies in Asia, due to the long history of financial markets, their strength, and the availability of data. The stock market plays various roles, including breaking down large trades, capital allocation, and generally serving as an informational channel for investors [48]. Insurance companies are important institutions in the capital market, as they play an effective role in economic development by accepting various risks and also by equipping and strengthening financial resources for investment in the money and capital markets. The insurance industry, with its extensive human resources and wide network of branches, agencies, and other insurance entities, can play a significant role in the economic development of the country [34]. The stock markets play a strategic role in capital allocation to companies, which has an impact on the real economy. Financial resources are scarce in developing countries. Bank loans are limited to a small number of companies and individual investors. The financial sector, including stock markets, affects long-term economic growth through capital accumulation and technological advancement rates. Greenwood and Jovanovic [29] argue that stock market liquidity promotes long-term economic growth in developing countries. Levine [44] contends that stock market and well-developed banks liquidity contribute to economic growth. The notable point is that increased liquidity in the stock market leads to faster growth regardless of the level of banking development. Conversely, banking sector development, regardless of stock market liquidity, leads to faster economic growth. Each of these components (banks and stock markets) of the financial system serves as a strong independent predictor of growth. Considering the above, the stock exchange plays a vital role as a backbone of the economy, influencing the growth of industry and commerce [2].

Beyond the financial-growth relationship, financial development encompasses a group of various financial markets, namely the banking sector, stock market, and insurance market. In empirical studies conducted, the results indicate a direct relationship between the development of the insurance market, stock market, banking competition, and economic growth, suggesting that with economic growth, the insurance market, stock market, and banking competition have also developed. This direct relationship has been confirmed in most countries; however, it should be noted that this matter needs to be examined in a more advanced and specialized manner, making it more tangible and evident. Therefore, considering that in the present study, the researcher investigates the relationship between banking competition and the development of stock and insurance markets, as well as economic growth in the countries of the Persian Gulf region, it is necessary for the discussions on banking competition and the development of stock and insurance markets to be applicable for recording and reporting value in line with Iran's economic growth. Therefore, the importance and necessity of the research become apparent, considering that banking competition and the development of stock and insurance markets are influenced by certain factors, and the research conducted on this subject has been very limited, with only a few studies conducted. Consequently, this matter demonstrates the necessity of conducting this research. Therefore, this study will examine the relationship between economic growth and each of the three types of financial development mentioned, namely banking competition, stock market development, and insurance market development, for the countries of the Persian Gulf region.

2 The relationship between insurance market development and economic growth

In this section, the direction of causality between economic growth and insurance market development is examined. The claim that the development of the insurance market is one of the key financial indicators for achieving high economic growth, as argued by Arena [11], Chang et al. [20], and Pradhan et al. [58], has encouraged economists and policymakers. Examine whether such a relationship truly exists or not. Various articles present conflicting results in support of different hypotheses.

The first assumption, the supply-leading hypothesis, suggests that insurance sector development is a necessary precondition for economic growth. Here, the cause stems from insurance sector development to economic growth. Supporters of this hypothesis believe that the development of the insurance sector may induce higher economic growth by facilitating savings in the form of financial assets, thus promoting capital formation and consequently enhancing economic growth. Studies supporting this hypothesis include Adams et al. [58], Alhassan and Fiador [8], Lee et al. [43], Su et al. [63], Haiss and Sümegi [30], Kugler and Ofoghi [41], Lee [42], and Ward and Zurbruegg [67]. The second is the demand-following hypothesis, which claims that causality includes development from economic growth to insurance sector development. Supporters of the demand-following hypothesis suggest that insurance sector development plays only a marginal role in economic growth and that insurance sector development is merely an output or consequence of economic growth in the real sector. The idea is that with economic growth, additional insurance

coverage may appear in response to increased demand for financial services in the market. Studies supporting this hypothesis have been conducted by Beck and Webb [16], Beenstock et al. [17], Catalan et al. [19], Su et al. [63], Kugler and Ofoghi [41], and Pradhan et al. [56]. The third hypothesis is feedback, which believes that economic growth and insurance sector development can be complementary and reinforce each other, causing insurance sector development and economic growth to be mutually causal. The argument in favor of this bidirectional causality is that insurance sector development is essential for economic growth, as economic growth inevitably requires a developed insurance market. Studies supporting this hypothesis have been conducted by Beck and Webb [16], Su et al. [63], Kugler and Ofoghi [41], Nejad and Kermani [51], and Pradhan et al. [58]. The fourth hypothesis is neutrality, which supports the idea that insurance sector development and economic growth are independent of each other.

3 The relationship between stock market development and economic growth

The third strand of literature focuses on examining the direction of causality between economic growth and stock market development. The claim that stock market development is one of the fundamental indicators of economic growth, as argued by Beck et al. [15], Calderón and Liu [18], Levine [44], and Graff [28], has prompted economists and policymakers to investigate this issue. The potential relationship in various articles presents conflicting results in support of different hypotheses. The first case is the supply-leading hypothesis, which posits that stock market development is a significant driver of economic growth. Here, the causality occurs from stock market development to economic growth. Studies in the literature supporting this hypothesis suggest that stock market development may lead to higher economic growth through various channels. First, the stock market provides an opportunity for investors to allocate their savings into an alternative financial instrument, which may offer higher returns based on investors' risk appetite. It also enables investors to diversify their financial portfolios and risk profiles. Second, it provides opportunities for individual and institutional investors to acquire ownership in listed companies, allowing them to share their economic risks. Third, the stock market also provides the necessary capital for companies to undertake productive economic endeavors. Fourth, the stock market not only serves as an efficient financial tool for allocating capital for corporate productive activities but also provides avenues for investment for both domestic and foreign investors. Increasing domestic and foreign direct investments into the country through the stock market is vital for empowering companies to expand their activities and create new employment opportunities. All of these will stimulate economic growth [35, 58]. Studies supporting this hypothesis have been published by Pradhan et al. [56], Kolapo and Adaramola [40], Enisan and Olufisayo [25], and Van Nieuwerburgh et al. [66]. The second assumption is the demand-following hypothesis, which suggests that causality extends from economic growth to the development of the stock market. Supporters of this hypothesis indicate that the development of the stock market is merely an outcome or result of economic growth in the real economy. The idea is that with economic growth, additional stock market coverage may emerge in response to higher demand for financial services in the market. Studies supporting this hypothesis have been conducted by Kar et al. [39], Panopoulou [55], Liu and Sinclair [46], Odhiambo [54], and Ang and McKibbin [9]. The third assumption is feedback, which believes that economic growth and stock market development can be complementary and reinforcing to each other. The argument in favor of this two-way causality is that stock market development is essential for economic growth, as economic growth inevitably requires a developed stock market. Studies supporting this hypothesis have been conducted by Rashid [59], Kapoor et al. [38], Hasapis and Kalyvitis [31], Sharma and Wongbangpo [61], and Huang et al. [36]. The fourth assumption is neutrality, which suggests that the development of the stock market and economic growth are independent of each other. Supporters of this hypothesis believe that the development of the stock market does not affect economic growth. The only study confirming this hypothesis is one conducted by Pradhan et al. [57]. Why does financial development lead to economic growth? Levine provides a useful framework regarding the role of financial intermediaries. He believes that financial intermediaries affect economic growth through liquidity variables, risk diversification, corporate information acquisition, corporate governance, and the provision of savings [45]. Liquidity in stock markets enables firms to quickly raise large amounts of capital they need. Therefore, stock markets reduce investment risk, as assets of shareholders are more easily traded in these markets [32]. Stock markets support investors against unsystematic inherent risks by creating diversity in asset portfolios through companies [44]. Diversification of risk leads to increased investment in long-term projects with higher returns and boosts economic growth rates [24, 53, 60]. Therefore, without stock markets, investment funds may exit long-term investment projects, leading to a reduction in economic growth. Due to the ability of firms to acquire a share of the market through asset baskets, they introduce differentiation and diversification into the produced goods. This phenomenon leads to specialization in production, thereby increasing firm efficiency and promoting specialization in the economy [4]. Specialization leads to technological advancement, reduction of transaction costs, and economic growth [22]. The presence of diverse ownership of shares contributes to political stability, which in turn leads to increased economic growth. Political instability has a negative impact on the development of the stock market and

economic growth [12]. Stock markets strengthen economic growth by providing regular information about companies. Timely and easy dissemination of influential information about the prices and profits of listed company shares increases the level of research and development, which in turn promotes economic growth. Greenwood and Smith argue that the capital market reduces the cost of moving savings and provides investment opportunities with the best technology. Obstfeld [53] believes that international stock market risk, through market integration, improves resource allocation and accelerates economic growth. Stiglitz [62] states that the stock market cannot improve asymmetric information because of high price change speeds and the problem of free riding.

4 Research background

Hosseinzadeh and Khodadadpour [34] in a study titled 'The Impact of Insurance Industry Development and Insurance Companies' Investment in the Stock Market on Economic Growth in Iran' investigated the effect of insurance industry development and insurance companies' investment in the stock market on economic growth in Iran. To this end, hypotheses were examined using time series data for Iran. The study employed the method of distributed lag regression for analysis, and ultimately, the research findings indicate that the development of the insurance industry has a significant impact on economic growth in Iran. Furthermore, the investment of insurance companies in the stock market also has a significant effect on economic growth in the country.

Faramarzi et al. [26] in a study titled 'Investigating the Impact of Economic Growth and Population Growth on the Insurance Industry of Iran Using the System Dynamics Approach' examined the effects of economic growth and population growth on the insurance industry of Iran using the system dynamics approach. To assess the behavior of economic growth and population growth on the insurance industry, a dynamic systems approach was employed. It is evident that various quantitative and qualitative indicators with different degrees of importance in determining the behavior of economic growth and population growth on the insurance industry are relevant and should be considered in decision-making processes. In this study, in addition to identifying the effective indicators in the behavior of economic growth and population growth on the insurance industry, the importance and prioritization of these indicators and the manner of their interdependent relationships were analyzed. They were analyzed in the form of interdependent loops. Then, by designing a model in the form of a flow diagram, simulations were conducted using Vensim software. Subsequently, four scenarios of changes in economic growth and population growth and their impact on the insurance industry were examined. Ultimately, it has been concluded that population growth plays a more significant role compared to its decline in influencing the insurance industry. Additionally, increasing economic growth has a significant impact on the insurance industry and its penetration coefficient compared to its decline.

Ahmadi [6] in a study titled "Investigating the Effects of Insurance Industry Development on Economic Growth in Iran" examined the effects of insurance industry development on economic growth in Iran. The study covers the period from 2008 to 2020. The results indicated that the development of the insurance industry can contribute to economic growth.

Yari [68] in a study titled "The Relationship between the Expansion of the Insurance Industry and Economic Growth in Iran 2009-2021" has investigated the relationship between insurance development and economic growth in Iran during the years 2000 to 2012. The current research results indicate that there is a one-way relationship from insurance development and the expansion of individual insurances to economic growth, but this relationship is not confirmed for property insurances. he results indicate that there is no significant relationship between the development of fire insurances and economic growth. However, there is a one-way relationship from the development of automobile insurance to economic growth, and this one-way relationship is confirmed both in the short and long term for cargo insurances contributing to economic growth. Additionally, a one-way relationship from the development of life insurances to economic growth is dominant.

Nongnit et al. [52] in a study titled "Stock Market Development and Economic Growth in Thailand: An ARDL Approach" have examined the dynamic relationship between stock market development and economic growth during the global financial crisis in Thailand. The dataset covers the period from 1991 to 2020 and includes monthly time series data divided into three periods: pre-crisis period, spanning from January 1991 to December 2000. The crisis period, which lasted from January 2001 to December 2010, and the post-crisis period, covering January 2011 to December 2020. The turnover ratio of the stock market, stock price index, and total market capitalization traded against the inflation rate were used as indicators for stock market development in this study. According to the findings, both negative and positive causality were discovered in the expansion of the stock market for the dynamism of short-term economic growth and long-term economic development links. Additionally, both in the short term and in the long term, economic expansion is only negatively correlated with liquidity.

Thaddeus et al. [64] in a study titled "Stock Market Development and Economic Growth in Sub-Saharan Africa (1990-2020): An ARDL Approach" have examined the short-term and long-term relationship between stock market development and economic growth in Sub-Saharan African countries during the period of 1990-2020. The findings indicate that the stock market value has a positive and significant effect on economic growth in the long term and a negligible negative effect in the short term, while stock market liquidity measured through the total value of traded stocks and turnover ratio has a significant negative impact on economic growth in Sub-Saharan African countries during the period of 1990-2020. Granger causality test showed an inconclusive result regarding the causality between stock market development and economic growth.

Bayar et al. [14] in a study titled "Does the Insurance Sector Really Matter for Economic Growth? Evidence from Central and Eastern European Countries" have examined the impact of insurance sector development on economic growth based on a sample consisting of 14 Central and Eastern European countries over a 19-year period from 1998 to 2016. Given the presence of cross-sectional dependence and multiple structural breaks, recently developed panel econometric techniques have been employed, leading to the following results: (1) Life insurance does not have a significant effect on economic growth in both panel and individual country analyses, (2) Non-life insurance has a positive impact on economic growth, both in panel and individual countries, (3) The Dumitrescu-Hurlin causality test indicates a one-way causality from economic growth to life and non-life insurance.

5 Conceptual model of research and research method

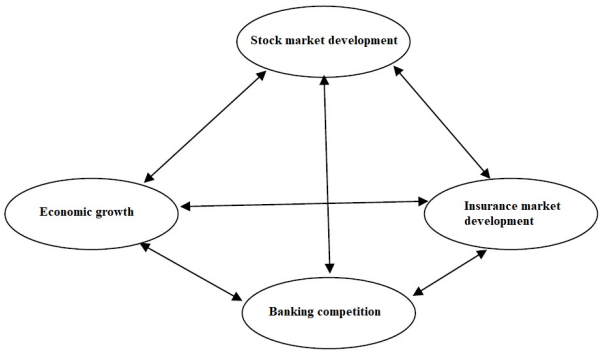

Figure 1: The conceptual model of the study derived from the model of Pradhan et al. [56].

The statistical population of this study consists of selected countries in the Persian Gulf region (Iran, Qatar, Kuwait, UAE, Saudi Arabia, Bahrain).

The present study is, in terms of objective, an applied research because its results are utilized by a wide range of users. In nature, it is a correlational research as it seeks to examine the relationship and impact of two variables on each other. In terms of timing, it is a retrospective study because it utilizes information related to past events from the sample members. From a methodological perspective, it is an inductive research as it attempts to generalize the findings to the entire population based on limited observations (sample). In terms of nature, the data of this research is quantitative. In the present study, data collection relied on statistics and information from the World Bank. Data analysis in this research is divided into two sections: descriptive statistics and inferential statistics. Descriptive statistics involve collecting, summarizing, presenting, and processing information without drawing any conclusions beyond the data. In the descriptive statistics section, the calculation and presentation of the most important descriptive statistics related to the research variables such as mean, median, skewness, kurtosis, standard deviation, maximum, and minimum values are provided. In the inferential statistics section of the research, hypothesis testing is also conducted using simple linear regression analysis of multiple variables. The reason for using the regression model in hypothesis testing is to determine the relationship between multiple variables and the direction of their relationship. That is, the present research is perceived as descriptive-correlational in nature, and under such circumstances, regression analysis is employed for hypothesis testing purposes. The equations used in this research are as follows:

Mean (Average):

The mean of a set of n numbers $x_1, x_2, ..., x_n$ is calculated as:

$$Mean = \frac{1}{n}\sum_{i=1}^{n} x_i \tag{5.1}$$

Median:

The median of a set of n numbers $x_1, x_2, ..., x_n$ is the middle value when the numbers are arranged in ascending order. If n is odd, the median is the value at position $\frac{n+1}{2}$, and if n is even, the median is the average of the values at positions $\frac{n}{2}$ and $\frac{n}{2} + 1$.

Skewness:

Skewness measures the asymmetry of the probability distribution of a real-valued random variable about its mean. It can be calculated using different formulas, but we are using Pearson's moment coefficient of skewness in the present study:

$$Skewness = \frac{\frac{1}{n}\sum_{i=1}^{n}(x_i - Mean)^3}{\left(\frac{1}{n}\sum_{i=1}^{n}(x_i - Mean)^2\right)^{\frac{3}{2}}} \tag{5.2}$$

Kurtosis:

Kurtosis measures the "tailedness" of the probability distribution of a real-valued random variable. It quantifies whether the tails of the distribution are heavier or lighter than a normal distribution. There are different formulas for calculating kurtosis, but we are using Pearson's moment coefficient of kurtosis in the present study:

$$Kurtosis = \frac{\frac{1}{n}\sum_{i=1}^{n}(x_i - Mean)^4}{\left(\frac{1}{n}\sum_{i=1}^{n}(x_i - Mean)^2\right)^2} - 3 \tag{5.3}$$

Standard Deviation:

The standard deviation of a set of n numbers $x_1, x_2, ..., x_n$ measures the dispersion or spread of the values around the mean. It is calculated as the square root of the variance:

$$\text{Standard Deviation} = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(x_i - Mean)^2} \tag{5.4}$$

Maximum Value:

The maximum value in a set of numbers is simply the largest value present in the dataset.

Minimum Value:

The minimum value in a set of numbers is the smallest value present in the dataset.

Simple linear regression analysis:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \varepsilon \tag{5.5}$$

where:

Y is the dependent variable (the variable being predicted).

$X_1, X_2, ..., X_n$ are the independent variables (predictor variables).

β_0 is the intercept (the value of Y when all independent variables are zero).

$\beta_1, \beta_2, ..., \beta_n$ are the coefficients (the slopes of the regression lines).

ε is the error term (the difference between the observed and predicted values).

The t-test used to assess the significance of the correlation coefficient between two variables is as follows:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \tag{5.6}$$

where,

r is the sample correlation coefficient,

n is the number of observations.

The degrees of freedom for the t-test in this context are $n - 2$.

The Jarque-Bera test statistic:

$$JB = \frac{n}{6}\left(S^2 + \frac{1}{4}(K-3)^2\right) \tag{5.7}$$

where,

n is the sample size, S is the sample skewness, K is the sample kurtosis.

White test statistic:

$$LM = nR^2 \tag{5.8}$$

where,

n is the sample size.

R^2 is the coefficient of determination from the auxiliary regression of squared residuals on additional independent variables.

The Durbin-Watson statistic:

$$d = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2} \tag{5.9}$$

where,

e_t is the residual at time t.

T is the number of observations in the sample.

The Durbin-Watson statistic ranges from 0 to 4. A value near 2 suggests no autocorrelation, while values significantly different from 2 indicate the presence of autocorrelation. Specifically, values close to 0 indicate positive autocorrelation, and values close to 4 indicate negative autocorrelation.

Augmented Dickey-Fuller (ADF) Test: The ADF test examines the presence of a unit root in a time series. The test statistic for the ADF test is calculated as:

$$\Delta y_t = \rho y_{t-1} + \alpha + \beta t + \sum_{i=1}^{p-1} \phi_i \Delta y_{t-i} + \epsilon_t \tag{5.10}$$

where,

y_t is the time series variable at time t, Δy_t is the differenced series, ρ is the coefficient being tested for the presence of a unit root, α and β are coefficients, t is a time trend, ϕ_i are autoregressive coefficients, and ϵ_t is the error term.

The Leamer F-test:

$$F = \frac{(RSS_R - RSS_{UR})/(p-q)}{RSS_{UR}/(n-k)} \tag{5.11}$$

where,

RSS_R is the residual sum of squares from the restricted model (with equal coefficients across groups).

RSS_{UR} is the residual sum of squares from the unrestricted model (without the equality constraint).

p is the number of parameters estimated in the restricted model.

q is the number of parameters estimated in the unrestricted model.

n is the total number of observations.

k is the total number of parameters estimated in the unrestricted model.

6 Findings

The average of the stock market development variable is 4.21, indicating that most of the data related to this variable are concentrated around this point. Dispersion parameters are generally measures to determine the spread of data from each other or their dispersion relative to the mean. One of the most important dispersion parameters is the standard deviation. The value of this parameter for the economic growth variable is 4.30 and for the banking competition variable is 0.20, indicating that among the research variables, the economic growth variable and the banking competition variable have the highest and lowest levels of dispersion, respectively. The extent of asymmetry of the frequency curve is called skewness. If the kurtosis coefficient is zero, the distribution is completely symmetrical,

Table 1: Descriptive statistics results of research model variables

Statistics	Mean	Median	Max	Min	Standard deviation	Skewness	Kurtosis	Number of observations
Economic growth	0.21	-0.04	15.98	-12.51	4.30	0.17	4.96	150
Banking competition	0.58	0.60	0.93	0.09	0.20	-0.17	2.06	150
Insurance market development	0.18	0.14	1.40	0.040	0.371	1.83	4.98	150
Stock market development	4.21	2.88	9.93	-0.06	3.27	0.96	2.32	150

and if the coefficient is positive, it indicates positive kurtosis, and if it is negative, it indicates negative kurtosis. For example, the kurtosis coefficient of the banking competition variable is -0.17, meaning this variable has negative kurtosis and deviates from the center of symmetry by this amount. The extent of curvature of the frequency curve relative to the standard normal curve is called kurtosis. If the kurtosis is close to zero, the frequency curve is considered balanced and normal in terms of kurtosis. If this value is positive, the curve is sharp, and if it is negative, the curve is flat. All variables in this model have positive kurtosis.

6.1 Hypothesis tests of regression models

6.1.1 Correlation test of research variables

If the research variables be with the ratio scale and continuous, the correlation coefficient is used to examine their correlation. The results of the correlation test of research variables are presented in Table 1.

As can be seen in Table 2, the correlation between each pair of variables has been estimated, and below it, the probability value obtained using the t-test for the significance of the mentioned correlation is also provided. For each pair of variables where this probability is less than 0.05, the correlation between the two respective variables is significant at the 95% confidence level, and if this probability is less than 0.01, the correlation between the two respective variables is also significant at the 99% confidence level.

Table 2: Correlation test results (Numbers in parentheses are probability values)

Variable	Economic growth	Banking competition	Insurance market development	Stock market development
Economic growth	1			
Banking competition	0.28 (0.005)	1		
Insurance market development	0.71 (0.000)	0.07 (0.435)	1	
Stock market development	0.22 (0.000)	0.02 (0.009)	0.33 (0.000)	1

Considering these factors and the sign obtained for the correlation coefficient, the significance and direction of the correlation between the research variables can be examined pairwise. For example, based on the obtained probability for the correlation between the variables of banking competition and economic growth, it can be stated that regardless of controlling for the effects of other variables on economic growth, there is a relationship between these two variables, and the positive sign obtained for the correlation indicates that the relationship between the two mentioned variables is direct. Since the correlation coefficient only indicates the existence of a simultaneous relationship between two variables, it is necessary to control for the effects of other influential factors on the dependent variable and determine the effect of the independent variable on the dependent variable using multiple regression. Therefore, in the following, we will proceed to hypothesis testing using the regression model.

Table 3: Jarque-Bera normality test

T-statistics	The significance level	Result
1.901	0.386	Confirmation of H_0

As can also be observed in the above table, given that the significance level of the research model's error is greater than 0.05, the null hypothesis H_0 regarding the normality of the model's error at a 95% confidence level is confirmed.

6.1.2 Homogeneity of variance test

Next, using the White test, the homoscedasticity of the model's error has been examined. The results of the research model's error test are presented in Table 4.

H_0: Homogeneity of variance

H_1: Heterogeneity of variance

Table 4: The results of the homogeneity test of the error variance of the research model

T-statistics	The significance level	Result
1.058	0.369	Confirmation of H_0

As can also be seen in the above table, considering that the significance level of the model error is greater than 0.05, the null hypothesis H_0 regarding the equality of the variance of the model error at the 95% confidence level is confirmed, indicating that the regression model error has homoscedasticity.

6.1.3 Investigating autocorrelation (independence of errors from each other)

In order to test for the absence of autocorrelation in the model, the Durbin-Watson statistic is used. This statistic, based on the findings in Table 5, is equal to 2.05 for the model. If these statistics fall within the range of 1.5 to 2.5. Given the obtained statistic, it can be stated that the model accepts the absence of correlation among the residuals.

$H_0: \ \rho = 0$ Absence of autocorrelation

$H_1: \ \rho \neq 0$ Existence of autocorrelation

Table 5: The results of the Durbin-Watson test of independence of errors of the research model

Test	T-statistics	Result
Autocorrelation	2.05	Confirmation of H_0

6.1.4 Unit root test (reliability test)

Based on the combined unit root tests, if the significance level of the test statistic is less than 0.05, the independent and dependent variables of the study are stationary over the research period. The results of examining the reliability of research variables using these tests are presented in Table 6. As observed, all independent and dependent variables, based on all four tests, including Im, Pesaran and Shin, Dickey-Fuller adjusted, Phillips-Perron, as well as Levin, Lin, and Chu, are stationary over the research period. This implies that the mean and variance of the variables over time and the covariance of the variables between different years have remained constant. Therefore, the companies under study have not undergone structural changes, and the use of these variables in the model does not lead to spurious regression. The null hypothesis in this test is the presence of a unit root.

Table 6: The results of the reliability test of the variables at the level with width from the origin

Variable		Levin, Lin, and Chu	Im, Pesaran and Shin	Dickey-Fuller adjusted	Phillips-Perron
Economic growth	T-statistics	-2.24	-3.94	38.76	63.91
	Significance	(0.012)	(0.000)	(0.001)	(0.000)
Banking competition	T-statistics	-1.98	-2.14	22.89	32.69
	Significance	(0.023)	(0.016)	(0.028)	(0.001)
Insurance market development	T-statistics	-2.83	-1.50	18.73	29.45
	Significance	(0.023)	(0.066)	(0.043)	(0.001)
Stock market development	T-statistics	-2.80	-2.45	26.90	35.60
	Significance	(0.025)	(0.007)	(0.008)	(0.000)

Based on the results in Table 6, the null hypothesis of unit root has been rejected, and the variables are significant at the 1% level. According to the obtained results, it can be argued that all variables are stationary. For hypothesis testing, the dependent variable, economic growth, along with the independent variables, banking competition, insurance market development, and stock market development, were examined. After examining the reliability of the variables and before estimating the model, it must be ensured that the regression relationship in the sample under study has homogeneous intercepts and homogeneous slopes, or that the hypothesis of common intercepts and common slopes across sections is accepted. If the data are put in the model as Pooling Data, the same intercept and slope are considered for all sections. In this case, the effects of sections are not considered. For this purpose, the Leamer F-test is used.

After standardization, these two statistics are displayed with the symbols of the extended Dickey-Fuller panel statistic and the extended group Dickey-Fuller statistic, respectively. Since these two statistics have standard normal

distributions, the critical value at -1.95 is used for comparison with the obtained results. The results of this test are shown in Table 7. According to the results obtained from these two statistics, it is observed that in the considered sections, the absolute values of the numbers obtained are greater than 1.95, and thus the null hypothesis of no joint relationship among the variables can be rejected. Based on this, it can be said that there is a long-term relationship between the variables. It should be noted that the joint test only indicates the presence or absence of a long-term relationship and does not determine the extent of this relationship or its sign.

Table 7: Pedroni's covariance test

	Statistic	**Prob.**
$paneladf - stat$	-4.529	0.000
$groupadf - stat$	-6.944	0.000

Table 8: The results of Leamer F-test at the 5% level

Computational F-Leamer	**Prob.**	**Result**
101.54	0.000	The H_0 hypothesis that the data are pooled is rejected.

Since the computed Leamer F-statistic (54.101) is greater than the critical F-value from the table at the five percent level (2.21), the null hypothesis is rejected and the alternative hypothesis is accepted. Alternatively, the level of significance displayed in this table as "Prob.", is less than 0.05, thus the null hypothesis is not acceptable, and the alternative hypothesis is accepted. This means that the possibility of the existence of pooled data in favor of panel data is rejected. Therefore, in our study, all countries have a common intercept.

6.1.5 Estimation by random effects method

After determining the appropriate method for estimating the parameters, the results of estimating the model for economic growth are examined. Based on the Hausman test, the random effects method has been used to estimate the model. The results are presented in the table below. According to the results obtained from estimating the model, all variables are significant, and all coefficients have acceptable signs and magnitudes. Thus, the results obtained for the variables are reliable.

Table 9: The results of estimating the model using the random effects method

Symbol	**Independent variable**	**Coefficient**	**Standard deviation**	**t-statistic**	**Possibility**
C	Width from the origin	0.67	0.042	15.92	0.000
BA	Banking competition	0.13	0.063	2.05	0.042
IM	Insurance market development	0.17	0.052	3.31	0.001
SM	Stock market development	0.48	0.033	14.13	0.000
R^2			0.57		
Adjusted R^2			0.55		
Table F statistic			9.89 (0.000)		
D.W.			2.05		

7 Discussion

Based on these results, the level of correlation coefficient between the variables is 0.57, meaning that 57% of the economic growth is explained by the variables included in the model. On the other hand, considering that the adjusted correlation coefficient is 0.55, which is close to the value obtained for the correlation coefficient, the model specification can be confidently stated. Additionally, the level of significance indicates the minimum probability of confirming the null hypothesis of the coefficient being zero. If this probability is greater than 5%, the null hypothesis cannot be rejected; otherwise, the coefficient in question is significant. According to the results obtained, since the level of significance for all variables is less than 5%, all the coefficients obtained are significant. As a result, the coefficient of determination has taken a high value; therefore, there is no multicollinearity issue in the model (If despite the high value of $\overline{R}^2$, a significant number of variables were not significant, this indicates the presence of multicollinearity among the model variables.). The term "multicollinearity" is attributed to Ragnar Frisch. Multicollinearity essentially means the presence of a linear relationship among some or all of the explanatory variables in the model. The F-statistic also indicates that the null hypothesis of all coefficients being zero is rejected at the 1% significance level, and the entire model is significant. The value of the F-statistic (9.89) with a significance level (p-value) of 0.000 indicates that

the null hypothesis (H_0) of the model's insignificance (i.e., all coefficients being zero) is rejected, and the estimated regression model is overall significant. The Durbin-Watson statistic for the large sum regression exceeds critical values at the 1% significance level; therefore, a long-term equilibrium relationship between the variables exists. The results obtained from examining the autocorrelation of error terms using the Durbin-Watson statistic indicate that since the Durbin-Watson statistic should be between 1.5 and 2.5 and the obtained statistic for the model is 2.05, it indicates the absence of autocorrelation errors in the model. The results presented in Table 9 and related to the t-statistic indicate that the coefficient of the independent variable is significant at the 1% level. All coefficients obtained have acceptable signs and magnitudes, thus the results for the variables can be trusted. Therefore, the coefficient for each variable can be interpreted as follows: The variable related to banking competition has a positive coefficient, meaning that an increase in banking competition leads to an increase in economic growth. In other words, a one percent increase in banking competition results in a 0.13 percent increase in economic growth. Therefore, considering that the significance of the coefficient for the variable of banking competition (0.042) is less than 0.05, it can be concluded that at the 5% error level, there is a positive and significant impact between banking competition and economic growth. The variable related to insurance market development has a positive coefficient, meaning that an increase in insurance market development leads to an increase in economic growth. In other words, a one percent increase in insurance market development results in a 0.17 percent increase in economic growth. Therefore, since the significance of the coefficient for the variable of insurance market development (0.001) is less than 0.05, it can be concluded that at the 5% error level, there is a positive and significant impact between insurance market development and economic growth. The variable related to stock market development has a positive coefficient, meaning that an increase in stock market development leads to an increase in economic growth. In other words, a one percent increase in stock market development results in a 0.48 percent increase in economic growth. Therefore, considering that the significance of the coefficient for the variable of stock market development (0.000) is less than 0.05, it can be concluded that at the 5% error level, there is a positive and significant impact between stock market development and economic growth.

Table 10: Summary of the results of the hypothesis test

Row	**Hypothesis**	**Accept or reject the hypothesis**
The first hypothesis	There is a significant relationship between banking competition and economic growth.	Accepted
The second hypothesis	There is a significant relationship between the development of the insurance market and economic growth.	Accepted
The third hypothesis	There is a significant relationship between stock market development and economic growth.	Accepted
The forth hypothesis	There is a significant relationship between banking competition and insurance market development.	Accepted
The fifth hypothesis	There is a significant relationship between banking competition and stock market development.	Accepted
The sixth hypothesis	There is a significant relationship between the development of the stock market and the development of the insurance market.	Accepted

8 Conclusion

In order to investigate the relationship between banking competition, stock market development, insurance market development, and economic growth in the countries of the Persian Gulf region, a combined econometric approach has been employed. The sample under study covers the period from 1996 to 2020. After conducting unit root tests to examine the stability of the model variables, it was determined that all variables are stationary at both levels and first differences. The results of the random effects test indicate that the variables of banking competition, stock market development, and insurance market development have a positive and significant impact on economic growth. Stock market development has the greatest impact on economic growth, while banking competition has the least impact on economic growth in the countries of the Persian Gulf region.

The results of the short-term and long-term Granger causality test using the error correction model

The coefficient of the error correction term in the economic growth model is significant at the 5% level, indicating that a strong long-term causality from banking competition, insurance market development, and stock market development towards economic growth is confirmed. Additionally, based on the results of the Wald test on the variables of banking competition, insurance market development, and stock market development, it is observed that short-term causality from banking competition, insurance market development, and stock market development towards economic growth is confirmed. The coefficient of the error correction term in the banking competition model is significant at the 5% level, suggesting a strong long-term causality from economic growth, insurance market development, and

stock market development towards banking competition. Furthermore, based on the results of the Wald test, it is observed that short-term causality from economic growth and insurance market development towards banking competition is confirmed, but in the short term, there is no relationship from stock market development towards banking competition. The coefficient of the error correction term in the insurance market development model is not significant, suggesting that there is no long-term causality from economic growth, banking competition, and stock market development towards insurance market development. Short-term causality only exists from economic growth towards insurance market development. The coefficient of the error correction term in the stock market development model is significant at the 5% level, and it can be concluded that there is strong long-term causality from banking competition, insurance market development, and economic growth towards stock market development. Additionally, based on the results of the Wald test on the breakpoints of banking competition, insurance market development, and economic growth variables, it is observed that short-term causality from banking competition, insurance market development, and economic growth towards stock market development is confirmed.

First hypothesis: There is a significant relationship between banking competition and economic growth

Long-term bidirectional causality between banking competition and economic growth is confirmed. Additionally, short-term causality from banking competition towards economic growth is also confirmed. The banking sector competition can impact economic growth in two ways: first, by facilitating access to credit for small and new companies, and second, by aiding the faster growth of financially affiliated companies. The findings of this study are consistent with the results of researchers such as Mohammadi Khiyareh and Rostami [49], Mosayebzadeh Ghovarchin [50], Michael et al. [48], Chinoda and Mashamba [21], Abuselidze [3], Liyanagamage [47], Ijaz et al. [37], Pradhan et al. [56], Folarin [27], and Ajisafe and Ajide [7].

Second hypothesis: There is a significant relationship between the development of the insurance market and economic growth

Long-term bidirectional causality between insurance market development and economic growth is confirmed. Additionally, based on the results of the Wald test on the insurance market development variable, it is observed that short-term causality from insurance market development towards economic growth is confirmed. Insurance sector development may induce higher economic growth by facilitating savings in the form of financial assets and consequently enhancing capital formation and, hence, economic growth. Economic growth and insurance sector development can be complementary and reinforce each other, contributing to the causality between insurance sector development and economic growth. The argument in favor of this bidirectional causality is that insurance sector development is essential for economic growth, as economic growth necessitates a developed insurance market. The results of this study are consistent with the findings of researchers such as Hosseinzadeh and Khodadadpour [34], Faramarzi et al. [26], Ahmadi [6], Yari [68], Torabi Goudarzi [65], Dehmordeh et al. [23], Bayar et al. [14], Apergis and Poufinas [10], Pradhan et al. [56], Lee [42], and Balcilar et al. [13].

Third hypothesis: There is a significant relationship between stock market development and economic growth

Bidirectional long-term causality between stock market development and economic growth is confirmed. Additionally, based on the results of the Wald test on the interruption of the stock market development variable, short-term causality from stock market development towards economic growth is confirmed. The stock market facilitates the transfer of funds for economic growth. It enables governments and industries to increase their long-term capital for financing existing industrial units' development and modernization or implementing new projects. Therefore, the stock market contributes to economic growth through the specialized services it provides. Stock market development may lead to higher economic growth through various channels. First, the stock market provides an opportunity for investors to allocate their savings to an alternative financial instrument, which may offer higher returns based on investors' risk tolerance. It also enables investors to diversify their financial portfolios and risk profiles. Second, it offers opportunities for individual and institutional investors to acquire ownership of listed companies' shares, allowing them to share their economic risks. Third, the stock market also provides the necessary capital for companies to conduct productive economic activities. Fourth, the stock market not only serves as an efficient financial tool for allocating capital to productive corporate activities but also provides investment avenues for both domestic and foreign investors. Increasing domestic and foreign direct investments into the country through the stock market is crucial for empowering companies to expand their activities and create new employment opportunities. All of these will stimulate economic growth. The findings of this research are consistent with the results of researchers such as Abdollahpour and Beryani [1], Hosseini and Bagheri [33], Nongnit et al. [52], Thaddeus et al. [64], Michael et al. [48], Abel et al. [2], and Pradhan et al. [56].

Fourth hypothesis: There is a significant relationship between banking competition and insurance market development

Long-term causality from insurance market development towards banking competition is confirmed. Additionally, based on the results of the Wald test, short-term causality from insurance market development towards banking competition is observed. Moving towards increased competition adds to the number of banks. The multiplicity of banks complicates external supervision of banks. Likely, with decreased efficiency of supervision, the risk-taking coefficient of banks will increase. The findings of this study are consistent with researchers such as Pradhan et al. [56].

Fifth hypothesis: There is a significant relationship between banking competition and stock market development

Long-term causality from stock market development towards banking competition is confirmed. However, in the short term, there is no causal relationship from stock market development towards banking competition. The increase in real bank interest rates has an inverse relationship with the stock market as one of its competitors. In other words, if bank interest rates increase, many individuals, especially risk-averse ones, move towards investing in the banking sector and withdraw their capital from the stock market. As bank interest rates rise, the opportunity cost of investing in the stock market increases, and investment in this market decreases. Furthermore, with an increase in bank interest rates, the financial costs of companies listed in the stock market increase, reducing their profitability and diminishing the attractiveness of investing in the stock market. The findings of this study are consistent with researchers such as Pradhan et al. [56] and Ajisafe and Ajide [7].

Sixth hypothesis: There is a significant relationship between the development of the stock market and the development of the insurance market Long-term causality from insurance market development towards stock market development is confirmed. Also, short-term causality from insurance market development towards stock market development is confirmed. The insurance industry cannot guarantee its survival solely by collecting insurance premiums; therefore, not only in Iran but also in most countries, the insurance industry generates little income from its insurance operations and can only create significant income through investing the proceeds of its insurance operations. For investment purposes, this industry always faces challenges, with the most important being the financial and liquidity status of insurance companies. Therefore, maintaining desirable liquidity should always be considered in investments. On the other hand, profitability in such investments is only achievable with access to substantial, desirable, and low-risk capital. Therefore, increasing capital is considered one of the main objectives of the insurance industry, as factors involved in it pave the way for the advancement of this industry and subsequently the prosperity of the capital market in all financial markets of the country. The role of reinsurance in this regard is particularly important because the presence of robust reinsurance reduces the risk of insurance companies, leading to increased investment in the country's stock market, resulting in increased income and, overall, increased capital in this industry. The results of this study are consistent with the findings of researchers such as Hosseinzadeh and Khodadadpour [34] and Pradhan et al. [56].

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