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Stock Exchange and Economic Growth in Morocco (1991-2022)

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Abstract: The analysis of the relationship between stock exchange growth and economic growth in Morocco during the period 1991-2022 can help us to assess the degree of integration of financial market activities in the real economy. After a review of the theoretical and empirical literature of this relationship and an econometric analysis of the economic and variables, an explanation of the econometric results is proposed. The non-existence of a statistically significant relationship between economic growth and stock exchange growth can be explained by the weight and ripple effects of the agricultural sector in Morocco (14% of GDP on average), the dominance of few companies listed (47% of stock market capitalization, on average) and the very reduced number of companies listed on the Casablanca Stock Exchange (65 on average). So, it's possible to argue that the very low representativeness of Casablanca Stock Exchange (CSE) in the Moroccan economy explains its low level of integration and, consequently, the disconnection between the dynamics of CSE and the Moroccan economy growth.

Key words: Casablanca Stock Exchange (CSE), economic growth, market model, return, risk
JEL code: G00

1. Introduction

The assessment of the degree of integration of the financial sector in the economy can be approached from the banking sector, from the financial market or from both of them. The appreciation from the financial market is the one that relates stock exchange growth and economic growth. It's more the analysis — of the content of this relationship than its meaning (positive or negative) — that makes it possible to assess the importance of the integration of the financial system in the economy. In systems dominated by market intermediation, market segments are fully integrated into the real economy. The problem arises in systems still dominated by credit intermediation; but which are experiencing a significant development of market activities.

In Morocco, the financing of production activity by market structures is still underdeveloped. But the very strong expansion of financial transactions[1] and the remarkable increase in market capitalization[2] raise many questions, mainly those relating to the role that market financing could possibly play in the future in supporting new investments.

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[1] The Value Traded increased by 199 times between 1991 and 2007. It rose from 1,806 million MAD to 359,780 million MAD in 2007 and fell, in 2022, to 57,600 million MAD (HCP).
[2] Market Capitalization increased by 89 times between 1991 and 2021.

The analysis of the relationship between stock exchange growth and economic growth makes it possible to assess the degree of integration of financial market activities in the real economy and can thereby provide the first elements of an answer to the question raised. This paper is approached in three stages: first, a review of the theoretical foundations and empirical studies of the relationship; then, an econometric analysis of the evolution of this relationship; and finally, an attempt to explain the results.

2. Theoretical Foundations and Empirical Studies

The relationship between stock exchange return and economic growth can find its theoretical foundations in the economic literature relating to the functions of financial markets and in portfolio management models.

The models of J. Greenwood & B. Jovanovic (1990) and J. C. Berthélémy & A. Varoudakis (1994) stipulate that the individual incentive to invest in financial markets increases when the economy develops. Because earnings increase with the amount of funds invested while operating costs and fees increase less, if at all. Indeed, growth leads to an increase in the volume of savings and therefore of funds to be intermediated. However, the savings processing costs are relatively fixed and therefore do not depend (or at the very least quiet slightly) on the volume of savings processed. Thanks to these returns to scale, growth then exerts a positive externality on the development of financial markets. This leads to a constant increase in the size of the financial system. It is possible to eventually arrive at a situation in which all agents participate in this system. This generates a higher growth rate than that obtained in an economy without a financial system.

But the results can be perverse. Indeed, given the double causal meaning between economic growth and financial development, it is possible to see the appearance of "poverty traps" where growth is not sufficient to allow significant development of the financial system and where this atrophy of the financial system in turn slows growth. Symmetrically, it is likely to also see the appearance of virtuous spirals where economic and finance develop together.

Empirically, an inverse "growth→finance" causality link can therefore be observed in certain countries (Levine, 2004). The existence of multiple equilibria was tested by Berthélémy & A. Varoudakis (1995). According to these authors, below a certain level of financial development, countries have slower economic growth with a more difficult catch-up. It's therefore possible to expect to see a relationship appear, in one direction or another, between financial development and economic growth.

Several indicators make it possible to approach the relationship between economic growth and the degree of integration of the financial market in the economy, including in particular the number of listed companies, the trade value, the capital collected via new issued shares, liquidity, return, risk, etc.

The integration of Finance into the economy implicitly assumes a fairly significant relationship between economic growth and stock exchange performance. Indeed, the economic dynamic of a country is an aggregation of that of the various economic agents including in particular the companies of the various sectors. This dynamic will be reflected in the accounts of companies and will thereby determine their performance and return. The more a stock exchange is integrated into a given economy, the more its dynamics are in perfect relation with that of the national economy.

The dynamics of the stock exchange can be approximated by the evolution of its index[3]. The latter can be considered as a portfolio of diversified[4] securities whose evolution can be explained by that of GDP, as stipulated in the market model developed by W. F. Sharpe (1991).

Within the framework of financial market theory in general and portfolio management models in particular, the market model can constitute a theoretical basis for the relationship between stock exchange growth and economic growth. Indeed, as W.F. Sharpe points out, the market model assumes that the returns of individual securities or of a portfolio of securities "are related only to a basic underlying factor […which] may be the level of the in as a whole, the gross national product, a price index or any other factor which may be the most important and only influence on the returns of securities" (W. F. Sharpe, 1991). The evolution of stock portfolios can be explained, in large part if it is well diversified, by a market indicator, a sector indicator or a macroeconomic aggregate such as GDP.

The equation of the market model is expressed as follows:

$$Rit = \alpha i + \beta i\ IMt + \varepsilon it \quad \text{(Altman E. et al., 1972)}$$

with:

- Rit: rate of return of stock (or portfolio) i during period t;
- IMt: growth rate of the underlying factor;
- βi: parameter indicating the relationship between the fluctuations of the share (or portfolio) i and the fluctuations of the underlying factor;
- εit: parameter specific to share (or portfolio) i;
- αi: parameter whose value is such that the expected value of εit is zero; or expected value of Rit when IMt is zero.

Portfolio management models implicitly assume that the market is fairly structured and developed, that it has a long history, that it is deep enough, that its diversity represents that of the economy as a whole and, ultimately, that it tends to be efficient.

These models, which have been developed to explain the evolution of stock exchange growth and economic growth variables in countries with a traditional financial market, can be transposed to a developing market?

3. Econometric Analysis

The results of the econometric test largely depend on the methodological end technical choices.

3.1 Variables, Period and Database

In order to carry out this work, choices were made in terms of variables, study period, periodicity and data source.

3.1.1 Variables

The two main variables studied are economic growth and stock exchange growth. The explanatory variables are the added value created by sector, the number of listed companies, Buffett Indicator[5], the sector index.

[3] A stock index is generally calculated from the prices of listed securities and weighted by the market capitalization of these securities.

[4] In portfolio management, a diversified portfolio is assumed to have a very low specific risk, i.e., it is not very sensitive to individual information related to one or a few securities among those that constitute it. This diversification is optimal, in the Markowitz sense, when it incorporates stocks from several sectors whose dynamics are not the same.

[5] Buffett Indicator = (Stock Market capitalization / Gross Domestic product) × 100

Economic growth[6] is measured by the growth rate of gross domestic product at current prices. This choice is explained by the fact that stock market indicators, in particular stock market prices, are expressed in current currency and that the inflation rate in Morocco during the period of analysis was low.

Stock exchange growth is measured by annual change of the MASI[7] index. It's a general index weighted by the free-float market capitalizations of all listed companies on the Casablanca Stock Exchange.

3.1.2 Period and Periodicity

The study period extends from 1991 to 2022. This choice responds to several considerations: the period is marked by the process of modernization of the Casablanca Stock Exchange from 1993 and the underlying support measures (Investment fonds, electronic trading system, Maroclear, etc.) and by the privatization, which boosted the stock exchange by draining more paper and more savings. This period was also marked by the 2008 financial crisis and the Covid-19 pandemic (2022).

The relationship between stock exchange growth and economic growth can be analyzed at two periodicities: annual and quarterly. Each of these periodicities has advantages and limitations. If the annual periodicity makes it possible to show the general trend of the two variables studied, it remains limited to a small number of observations, due to the short period of analysis (32 years). The quarterly periodicity, on the other hand, offers more observations for an econometric test; but it has the disadvantage of being a carrier of statistical noises which can possibly disturb the possibility of deduction of relations which can exist between the studied variables. The periodicity adopted is annual.

In a situation of efficiency, publications relating to macroeconomic and sectoral aggregates and to the financial information of listed companies are information that must be instantly integrated into share prices and into the expectations of economic agents. This can influence prices of securities and aggregate demand.

3.1.3 Database

The annual data used are published in the various "Statistical Yearbook of Morocco" of the HCP[8] from 1990 to 2021. The 2022 data were collected via the HCP's economic reports[9] and the website of the Casablanca Stock Exchange (http://www.casablanca-bourse.com). The data for other stock markets are those of the World Federation of Exchanges (https://www.world-exchanges.org).

3.2 Results of the Econometric Test

Before presenting the test results, a presentation of the data can give a first idea of the evolution of the two variables.

The evolution of MASI and GDP in absolute values show that they follow the same general trend linked to the time variable. They are two non-stationary series. But the amplitude of the variations is not the same. Hence the interest of presenting the two series in terms of annual growth rate.

[6] The growth rate used in this work is measured by the ratio between the variation of the variable between time t and time t-1 and the value of the variable at time t-1.

[7] Moroccan All Shares Index. It was adopted on January 2, 2002. Data from 1990 to 2001 have been restated based on the evolution of the old IGB stock exchange index.

[8] Haut-commissariat au Plan, http://www.hcp.ma.

[9] Sector data are provisional.

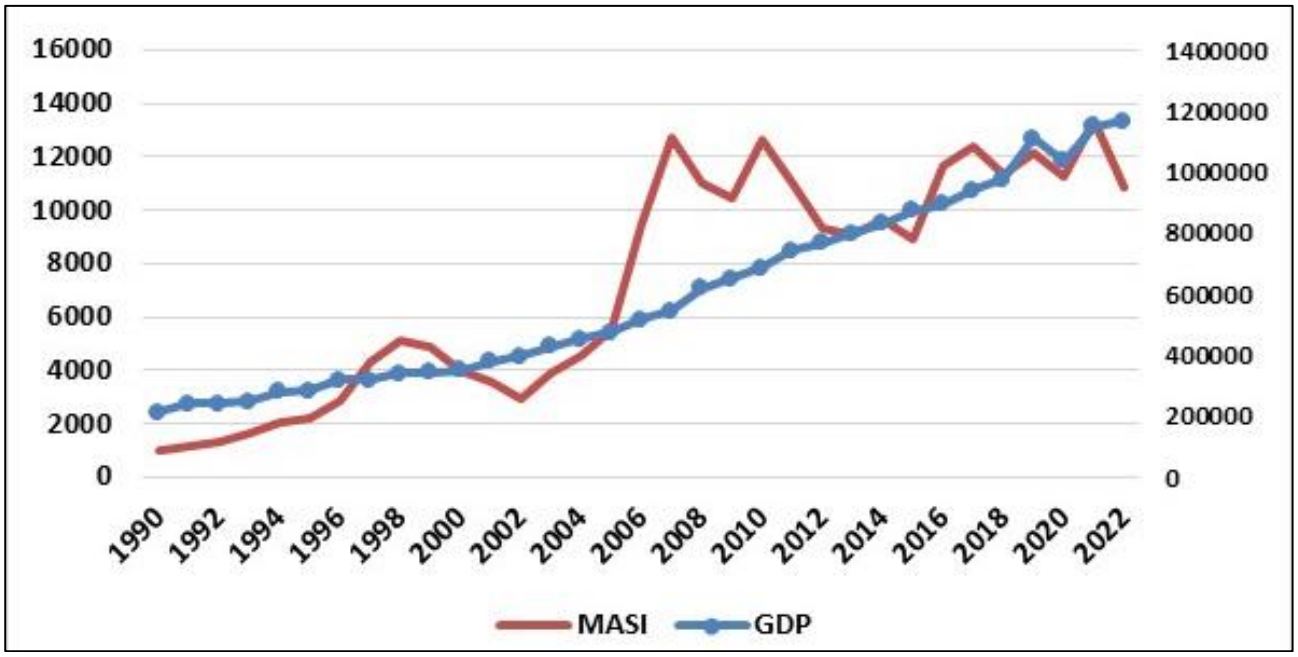

Figure 1 MASI-GDP (1990-2022)

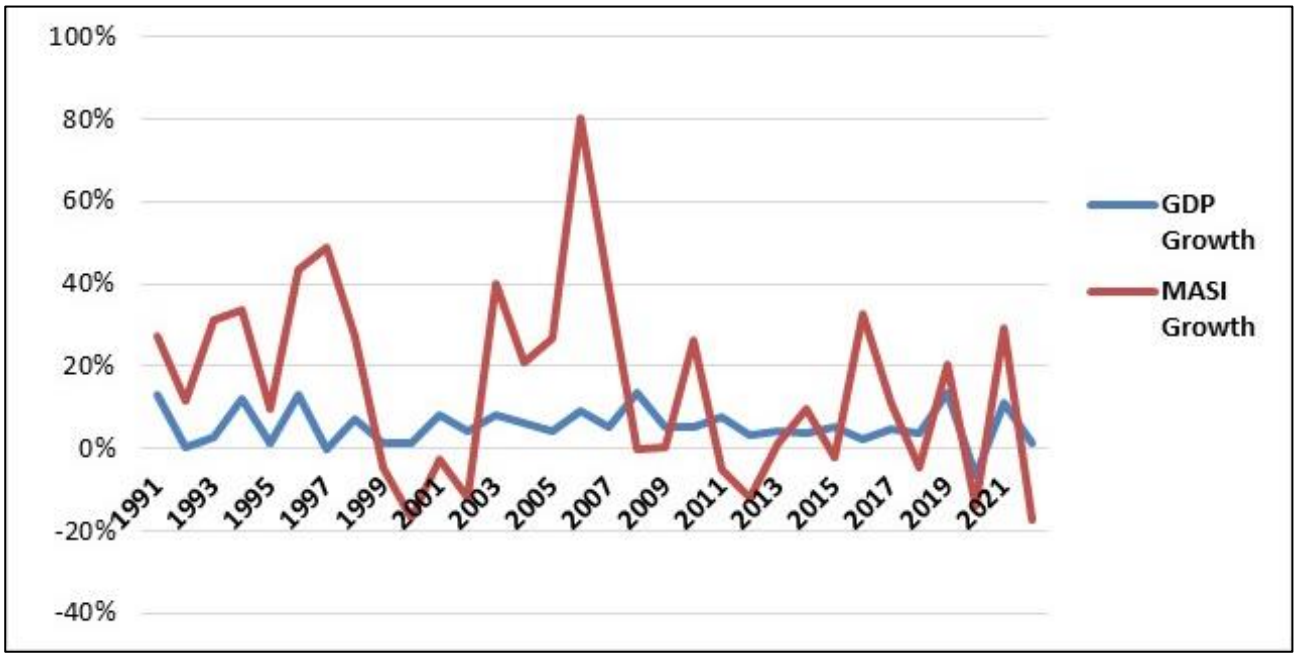

Figure 2 MASI Growth & GDP Growth

Stationarity tests and regressions of the studied time series were performed using E-Views[10] software. The results reproduced in Appendix 1 relating to the growth of the MASI between 1991 and 2022 show that the series is stationary (-3.713403 < -2.960411, with a probability of 0.0088 at the level of error of 5%).

The results reproduced in Appendix 2 relating to GDP growth between 1991 and 2022 show that the series is stationary (-10.73236 < -2.960411, with a probability of 0.0000 at the 5% error level). The series overcome the

[10] EViews, version 9.

ADF test, a test considered to be the most demanding in terms of stationarity (Lardic S., 1996). This makes it possible to analyze the existence of stable correlation links between these variables.

With a coefficient of determination (R^2) of 3.48%, it is impossible to retain the existence of an interaction between the Moroccan stock exchange and the Moroccan economy, as shown in Figure 3.

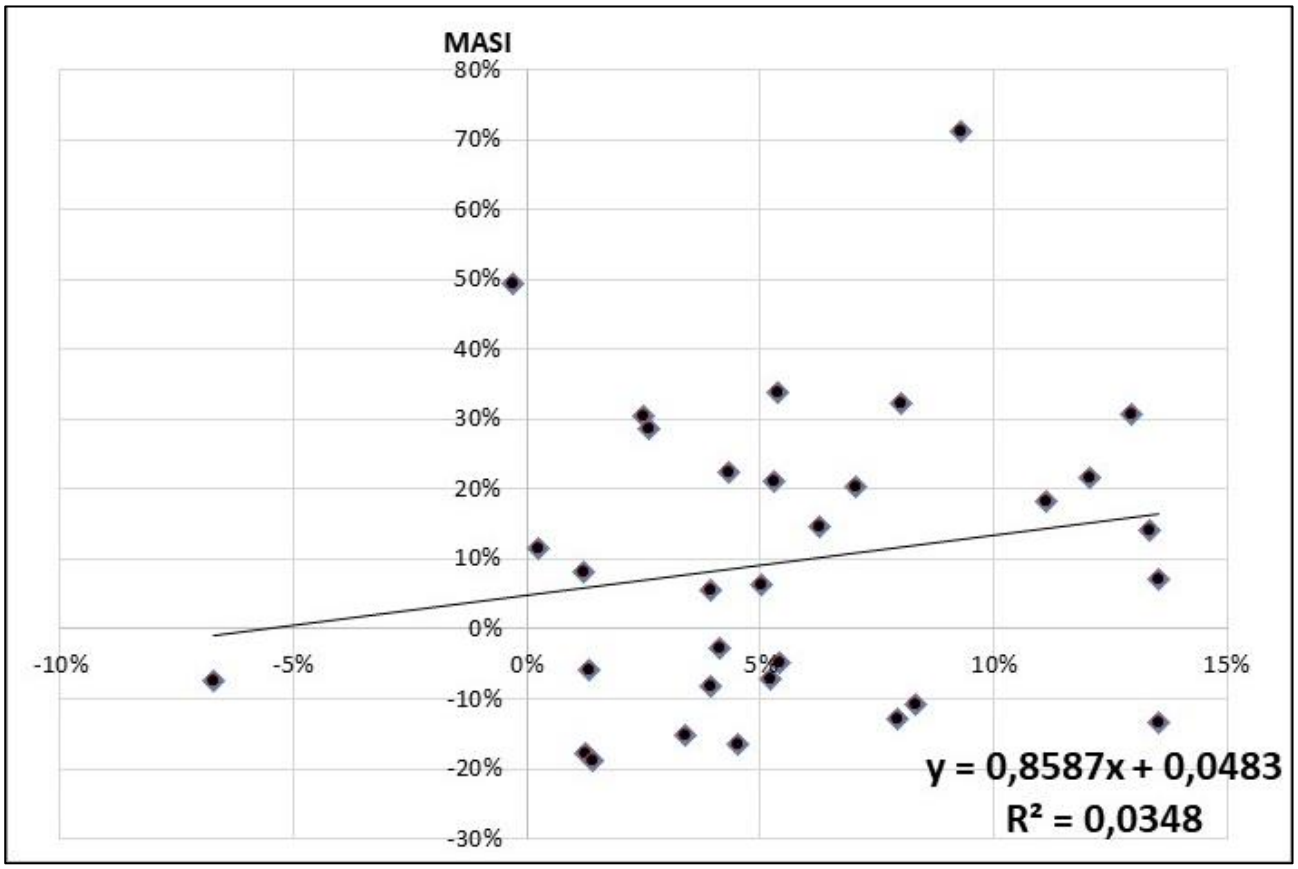

Figure 3 GDP Growth & MASI Growth (1991-2022)

From these results, two questions arise:

- What is the logic behind the evolution of the two variables studied?
- Does not the absence of a relationship between the two variables finally explain the very weak integration, if not the non-integration, of the Casablanca stock exchange in the Moroccan economy?

4. Elements of Explanation of the Results

In an attempt to explain the very weak relationship between the two variables studied, five ways of research were explored:

- The return and risk of the Casablanca stock exchange;
- The level of concentration of the Moroccan stock market;
- The weight of the agricultural sector in the economic dynamics of the country;
- The weight of the sectors dominating the Casablanca stock exchange in the national economy;
- The weight of the stock exchange in the economy.

The case of the 2019-2022 period, marked by the Covid-19 pandemic, is indicative of the special nature of this relationship.

4.1 The Return and Risk of the Casablanca Stock Exchange

Financial theory teaches that the more a market (or a security) is profitable, the more it is risky (Cobbaut R., 1997). Econometric studies on emerging markets have shown that when there is a very weak relationship between economic growth and stock exchange profitability or when it is negative (if it exists), a significant relationship appears, but in the opposite direction, between the level of risk and economic growth (Laroche E. et al., 1995). Indeed, the more volatile the market becomes, the more it creates a climate of uncertainty which, in turn, can harm the dynamics of economic growth by limiting investment and consumption.

During the period analyzed, the Moroccan was marked by very high average return (9.59%) accompanied by very high volatility (21%). Market concentration may explain this level of risk and return.

4.2 The Level of Concentration of the Moroccan Stock Market

Considered as a highly concentrated market, the Casablanca Stock Exchange is a market that is dominated, during the study period, by banks, holding companies, holding companies and a telecommunication company. Three banks[11] represent, on average, more than 30% of the total market capitalization (during the period 1991-2022) in a market where, on average, 65 companies have been listed during the same period. This ratio increases to more than 47% by adding a holding company[12] and an investment company[13] until 2010 and a telecommunication operator[14] from 2004.

Contrary to stock exchange data, national accounts data tell us that the banking sector, as a whole, has created only 5% of the GDP, on average from 1991 to 2022. While the telecommunications sector has created, on average, 3% of GDP. Thus, during the period 1991-2022, the five major capitalizations, which represent almost half of the total market capitalization, determine the stock exchange performance. While all companies in these sectors (listed and or not on the CSE) have created, less than 10% of the GDP.

Figure 4 shows that the performance of banks listed on the CSE (MASI-Bank[15]) is strongly correlated with that of the market as a whole (MASI). In terms of growth rate, the simple linear regression gives a straight line with a significant R^2 of 89.62% as shown in Figure 5.

4.3 The Weight of the Agricultural Sector in the National Economic Dynamics

As the agricultural sector is still dependent on rainfall, which is not regular in Morocco, economic growth is moving up and down as shown in Figure 2 above. The Moroccan economy is also marked by the significant weight of the agricultural sector which determines the dynamics of national economic growth as shown in Figure 6.

[11] ATTIJARIWAFA BANK, BCP, BANK OF AFRICA.
[12] ONA.
[13] SNI.
[14] ITISSALAT AL-MAGHRIB.
[15] Banking Sertor Index.

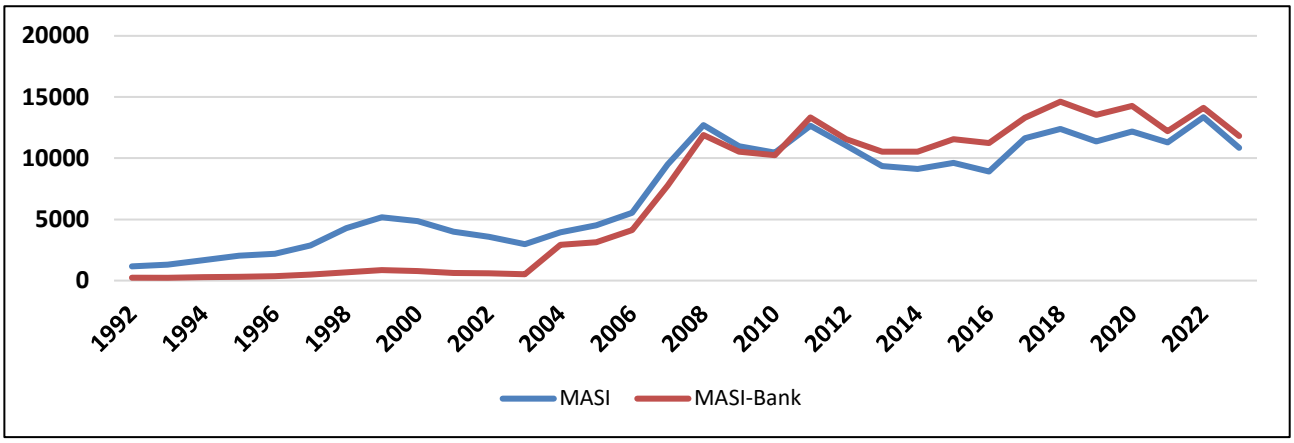

Figure 4 MASI & MASI Bank

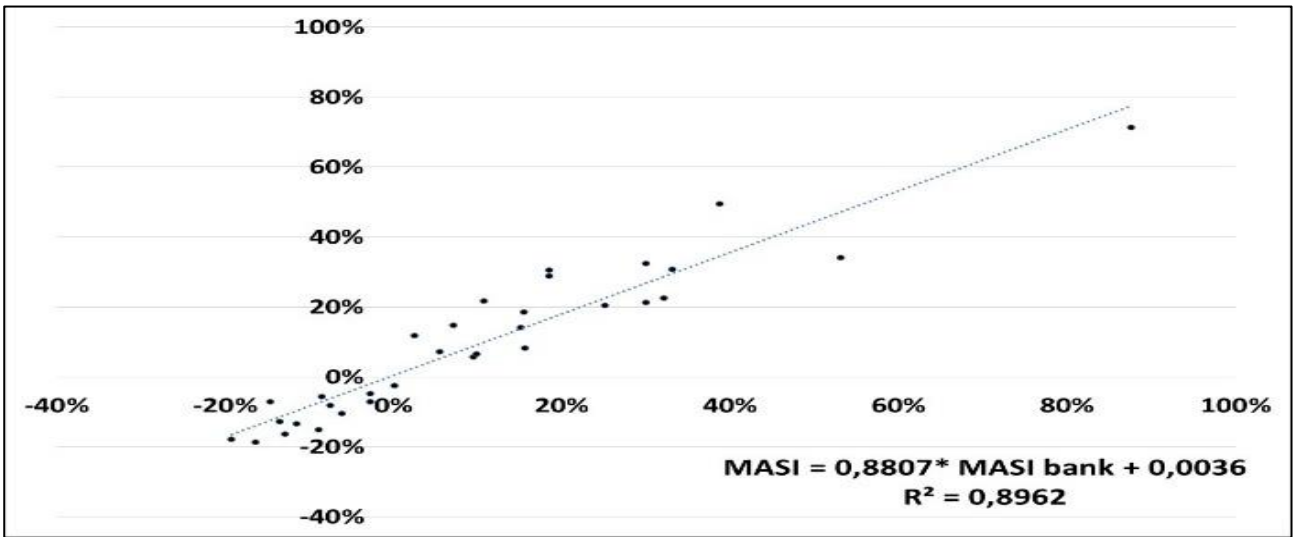

Figure 5 MASI-Bank (1991-2022)

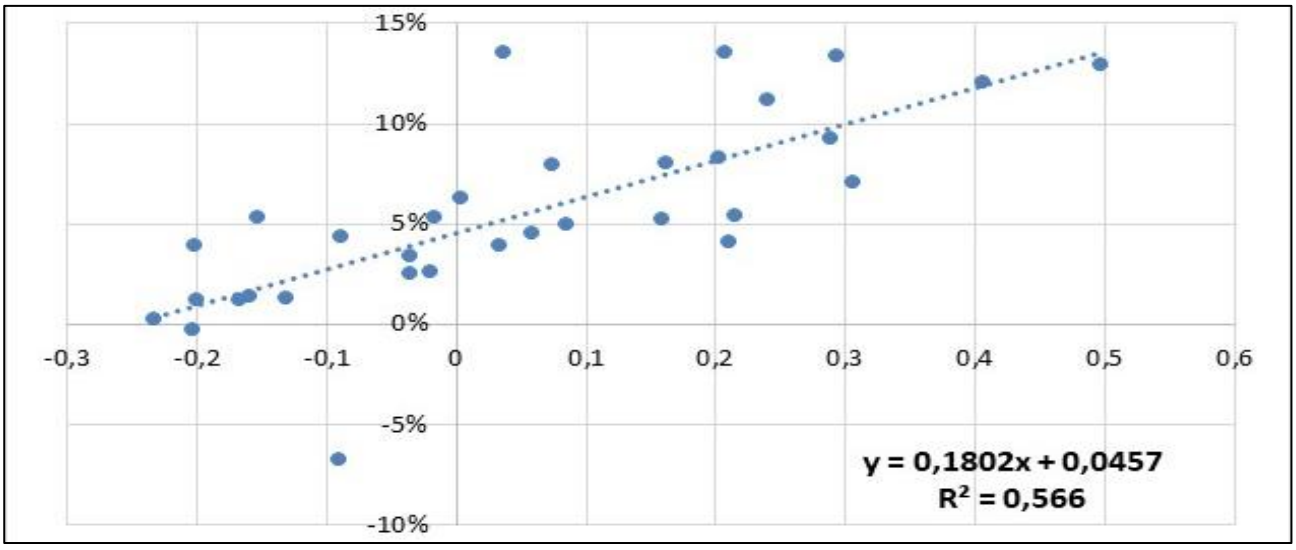

Figure 6 Agricultural Sector Growth-GDP Growth (1992-2022)

With a coefficient of determination of 56.6%, it is clear that the agricultural sector continues to largely influence the country's economic dynamics even if its weight only represents less than 15% of GDP, on average, during the period of analysis as shown in Figure 7.

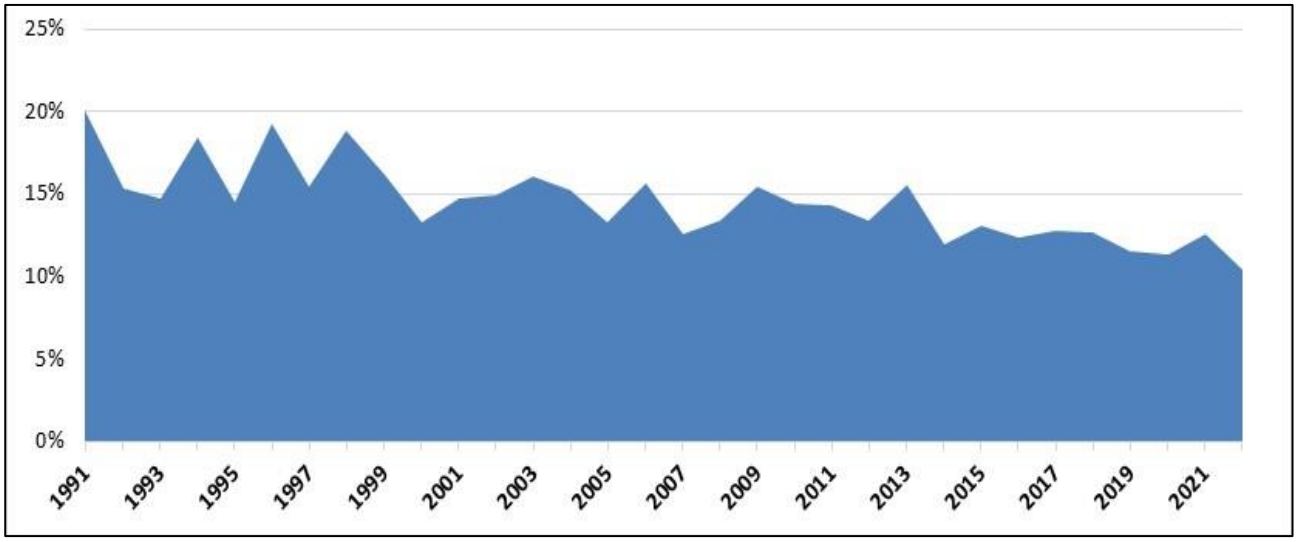

Figure 7 Agricultural Sector/GDP (1991-2022)

Moreover, the absence of agricultural companies in the list of companies listed on the CSE raises questions about the relationship that may exist between market exchange growth and GDP growth and the degree of integration of the stock exchange into the national economy.

4.4 The Weight of the Sectors Dominating the CSE in the National Economy

Sectoral data from national accounts, from 1991 to 2022, show that the added value created by all financial and telecommunications companies, listed or not on the CSE, represents, on average, less than 7% of GDP. But, the market capitalization of the 6 large companies in these sectors listed on the CSE exceeds 59% of the total market capitalization during the same period as shown in Figure 8.

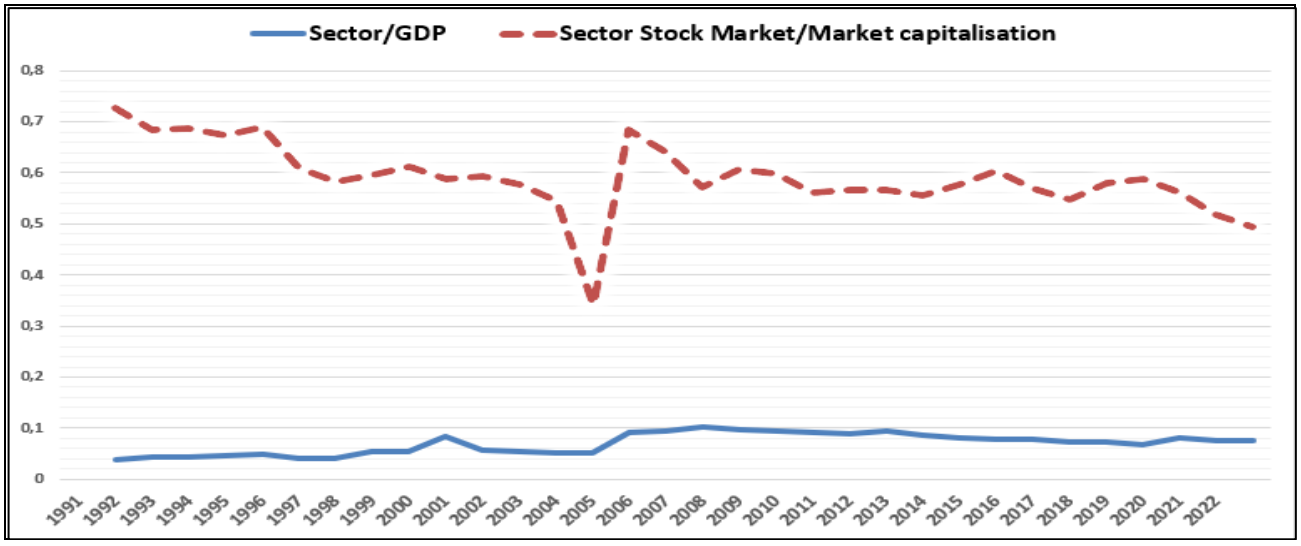

Figure 8 Sectors/GDP & Stock Market Sectors/Market Capitalization

This can further explain the disconnection between the real sphere and the Moroccan financial sphere. Other stock exchange data may support this explanation.

4.5 The Weight of the Stock Exchange in the Economy

Two main indicators have been used to measure the weight of the stock exchange in the economy: the market capitalization ratio (Buffett Indicator) and the number of listed companies.

By definition, "the market capitalization of a company represents the sum of the market capitalizations of all the securities representing its capital" (F. Rosenfeld, R. Hannoset, R. Sabotier, 1992, p. 162). It is the product of the number of companies shares multiplied by the stock exchange price of the share (Jaffeux C., 1994, p. 29). Extended to a financial market, market capitalization is obtained by aggregating individual market capitalizations (Jaffeux C., 1994, p. 29). Market capitalization is meaningful in an international comparison only when related to GDP. This ratio is the market capitalization ratio or Buffett Indicator. Despite its limitations, it is often used as an indicator of market size.

In Morocco, market capitalization increased from 12 to 561 billion MAD between 1991 and 2022 (with a peak of 690 billion MAD in 2021). Buffett Indicator averaged 48% (with a peak of 107% in 2007). As the Figure 9 shows.

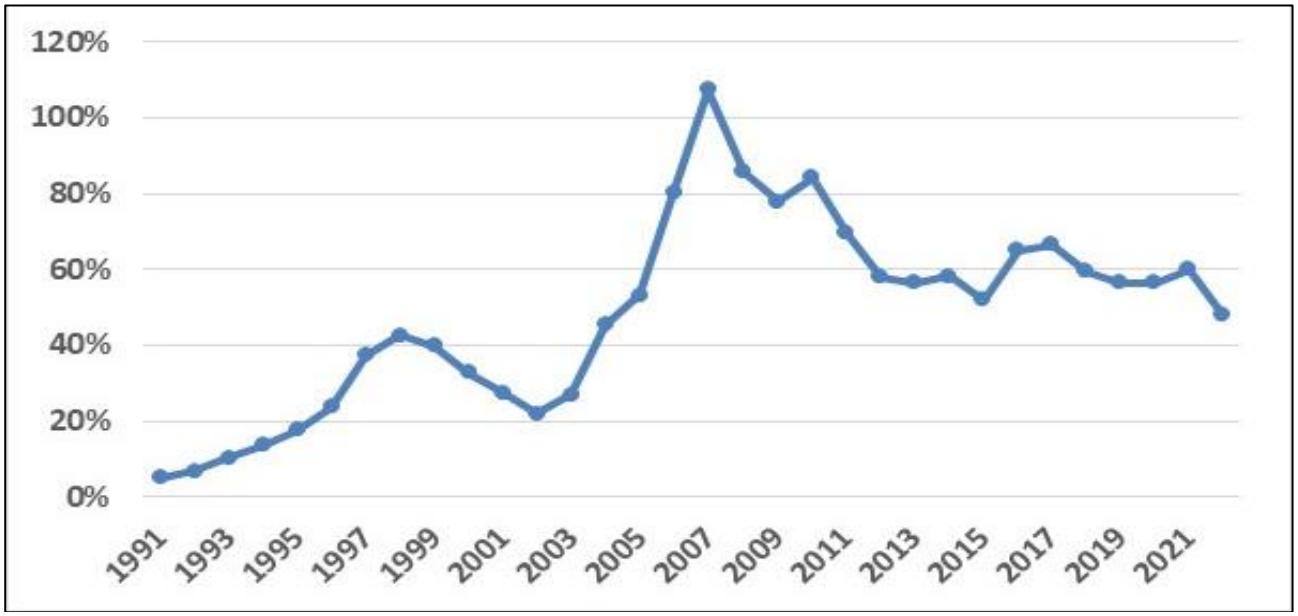

Figure 9 Market Capitalization/GDP (1991-2022)

This level of Buffett Indicator is close to that of many emerging markets (Brazil, Iran, Peru, Greece, Poland). However, it is difficult to rely solely on this indicator to explain the degree of integration of the Moroccan stock exchange into the Moroccan economy. Because it puts in the same basket markets with rather disparate evolution and opening dynamics, such as the case of Brazil and that of Morocco. Hence the interest of integrating other indicators such as the number of listed companies into the analysis.

The Table 1 below shows the number of companies listed on the stock exchanges of countries with Buffett Indicator close to that of Morocco during the same study period.

Table 1 Number of Listed Companies in 2022

Brazil	Egypt	Greece	Iran	Morocco	Peru	Poland	Tunisia
385	242	160	377	76	204	799	80

Source: WFE (http://www.world-exchanges.org).

From the data in the table, it is clear that the number of companies listed on the Casablanca Stock Exchange is very low. This weakness increases if we eliminate the first six values of the stock exchange because the market is concentrated. This keeps Morocco away from these countries.

4.6 Case of the Period 2019-2022 (Covid-19)

Like all countries in the world, the Moroccan economy has suffered the negative effects of the Covid-19 pandemic. The following Figure 10 shows that the growth of its GDP and that of the MASI between 2019 and 2022.

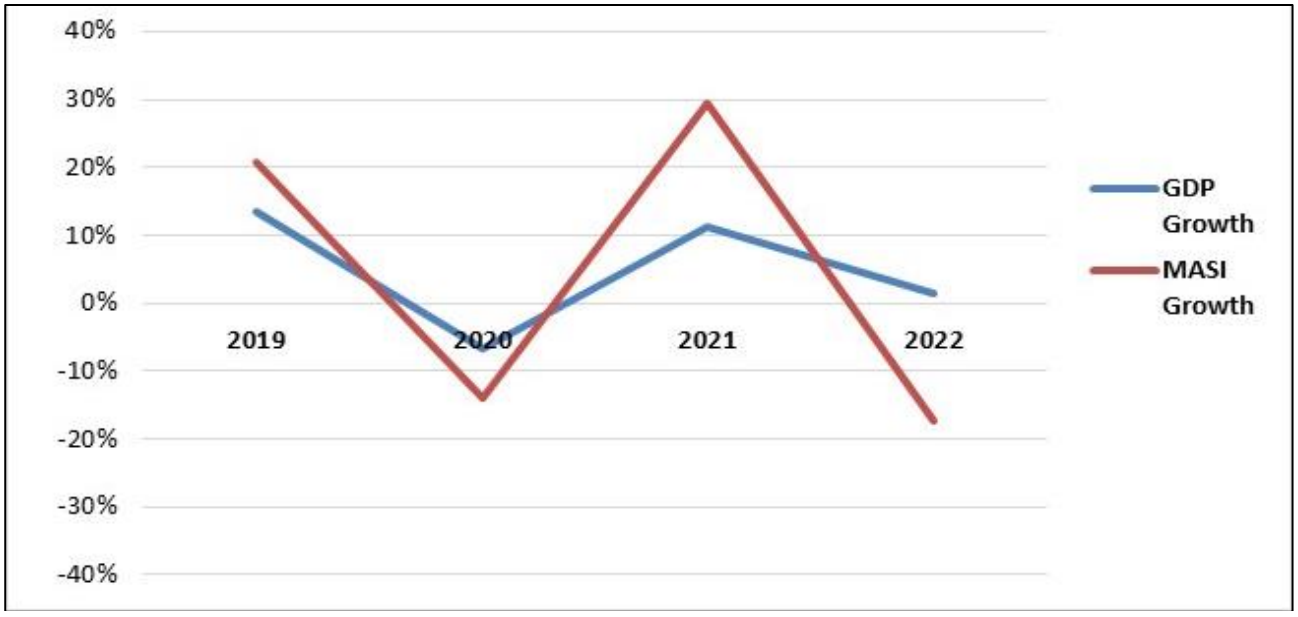

Figure 10 MASI Growth & GDP Growth

The Figure 10 shows that the two curves follow the same evolution but with different degrees. The variability of MASI is greater than that of GDP. In 2020 the fall of the MASI is stronger than that of the Moroccan economy because the stock prices of banks and the telecommunications company have fallen very sharply. With the measures taken by the public authorities to support the national economy and emerge from the crisis in 2021, these companies have benefited more from this policy and have shown remarkable growth which has increased the MASI by almost 3 times that of the GDP. The rise in non-performing bank loans in 2022 and negative anticipations regarding the performance of the telecommunications company have resulted in lower stock prices. This drop caused the MASI to fall by 19% while the GDP increased by 1.4% in 2022. The following two Figures show the influence of these companies on the MASI.

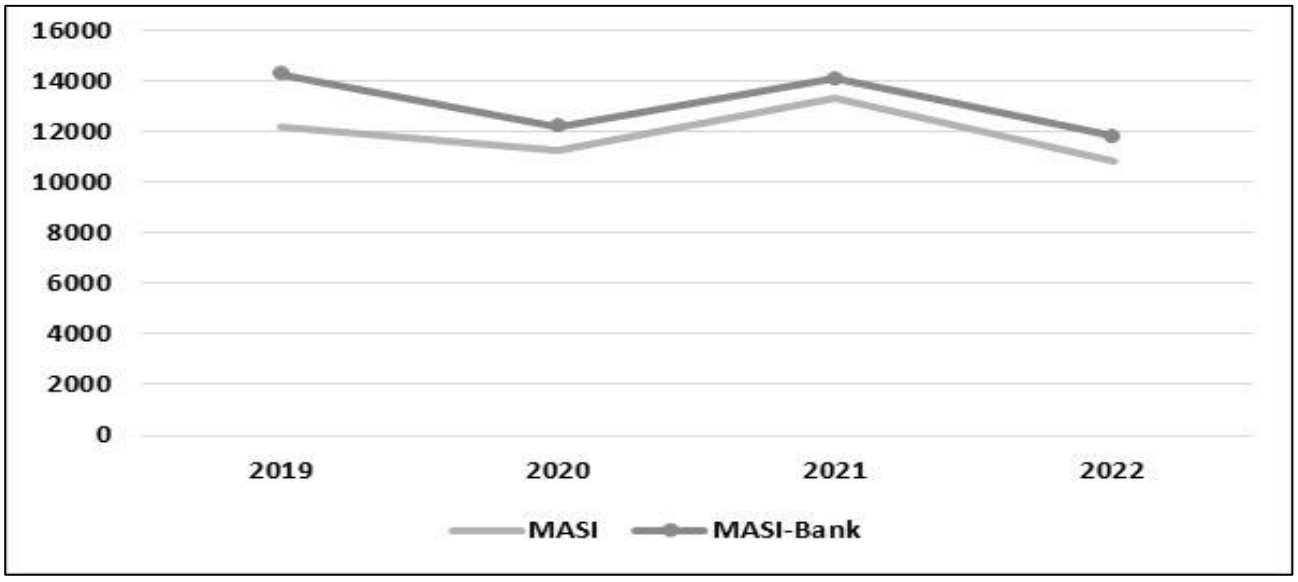

Figure 11 MASI & MASI-Bank (2019-2022)

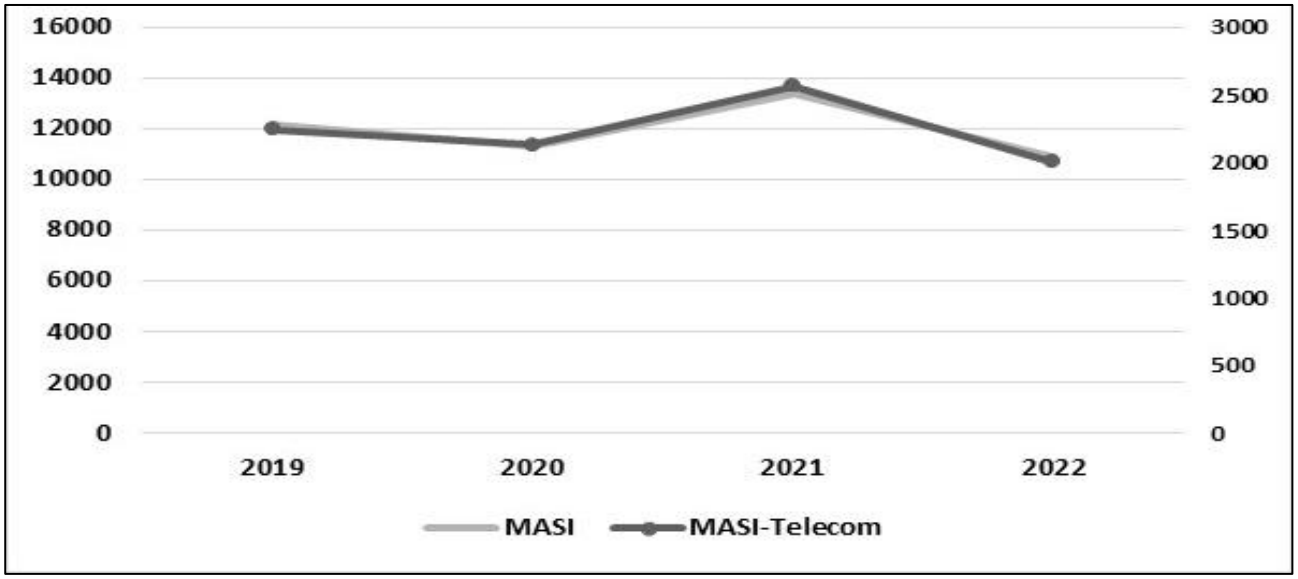

Figure 12 MASI & MASI-Telecom (2019-2022)

5. Conclusion

The study of the relationship between stock exchange growth and economic growth in Morocco during the period 1991-2022 has shown a disconnection between the two spheres. This result can be explained by the following three elements:

- The agricultural sector continues to determine the dynamics and economic growth in Morocco. However, agricultural companies are not listed on CSE. In addition, this sector depends on an uncontrollable variable: rainfall.
- The very high concentration of the Moroccan stock exchange determines its performance. While the added value created by the sectors concerned by this concentration is less than 7% of the GDP.

- The few companies listed on CSE.

During the Covid-19 pandemic, the stock exchange has shown that it is more volatile than the Moroccan economy.

So, it's possible to argue that the very low representativeness of CSE in Moroccan economy explains its low level of integration and, consequently, the disconnection between stock exchange growth and economy growth.

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World Federation of Exchanges (WFE), available online at: http://www.world-exchanges.org.

APPENDIX

Appendix 1 MASI Growth Unit Root Test

Null Hypothesis: MASI_GROWTH has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag = 7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.713403	0.0088
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(MASI_GROWTH)

Method: Least Squares

Date: 02/01/23 Time: 17:14

Sample (adjusted): 1992 2022

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MASI_GROWTH(-1)	-0.673386	0.181339	-3.713403	0.0009
C	0.060145	0.042243	1.423796	0.1652
R-squared	0.322261	Mean dependent var		-0.010604
Adjusted R-squared	0.298891	S.D. dependent var		0.250699
S.E. of regression	0.209916	Akaike info criterion		-0.221879
Sum squared resid	1.277875	Schwarz criterion		-0.129364
Log likelihood	5.439124	Hannan-Quinn criter.		-0.191721

Appendix 2 GDP Growth Unit Root Test

Null Hypothesis: GDP_GROWTH has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag = 7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.73236	0.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDP_GROWTH)

Method: Least Squares

Date: 02/01/23 Time: 17:13

Sample (adjusted): 1992 2022

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP_GROWTH(-1)	-1.562415	0.145580	-10.73236	0.0000
C	0.084922	0.010637	7.983735	0.0000
R-squared	0.798867	Mean dependent var		-0.003857
Adjusted R-squared	0.791932	S.D. dependent var		0.081622
S.E. of regression	0.037231	Akaike info criterion		-3.680988
Sum squared resid	0.040199	Schwarz criterion		-3.588472
Log likelihood	59.05531	Hannan-Quinn criter.		-3.650830