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THE EFFICIENCY OF ARAB STOCK MARKETS: A COMPARATIVE STUDY FROM 2002 TO 2018

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SUPPLICATION

اللّٰهُ

My Lord, Expand For Me My Breast [with assurance], and Ease For Me My Task, and Untie a Knot from My Tongue, That They May Understand My Speech

DEDICATIONS

This Work is dedicated

To My Mother
"The Number One For Me"

To My Great Father's Soul
"Daddy ; Now I'm Here For You"

To My Brothers;
My Two Sisters
"You're the most precious person in my life"

To My Wife
"You are my Everything"

To My Friends and Teachers
"For Their Continuous Encouragement and Support"

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ABSTRACT

ABSTRACT:

In an efficient stock market, where information is almost freely available to all participants, competition among the many intelligent participants leads to a situation where stock prices always fully reflect the available information; In other words, in an efficient market the using of technical and fundamental analysis to predict the stock prices Movements are completely useless i.e. any investor cannot obtain a yield exceeding the normal level. This thesis investigates the efficiency of some selected Arab stock markets namely: Saudi Arabia, Egypt, and Morocco over the period from 2002 to 2018; To do so, "Run Test" and "Fixed- and Random-effects models of Panel data" are employed respectively to test the weak-form and the semi-strong form efficient market hypothesis. The findings showed that Arab stock markets under study are efficient in weak-form, and inefficient in semi-strong form.

Key words: Technical and Fundamental analysis; Efficient market hypothesis; Arab stock markets; The "Run Test"; "Fixed- and Random-effects models of Panel data".

الملخص:

في سوق أوراق مالية كفؤ ، أين تكون المعلومات متاحة مجانًا تقريبًا لجميع المشاركين، تؤدي المنافسة بين العديد من المشاركين الأذكياء إلى وضع تعكس فيه أسعار الأسهم دائمًا المعلومات المتاحة بشكل كامل؛ بعبارة أخرى، في سوق كفؤ يكون التحليل الفني والتحليل الأساسي للتنبؤ بحركات أسعار الأسهم عديم الفائدة تمامًا ما يعني أنه لا يمكن لأي مستثمر الحصول على عائد يتجاوز المستوى الطبيعي. تبحث هذه الأطروحة في فرضية الكفاءة في بعض أسواق الأوراق المالية العربية المختارة وهي: المملكة العربية السعودية ومصر والمغرب خلال الفترة الممتدة من سنة 2002 إلى غاية 2018؛ وقد تم استخدام إختبار الأنماط الطارئة ونماذج التأثيرات الثابتة والتأثيرات العشوائية لبيانات "بانل" تواليا لإ ختبار فرضية كفاءة السوق بصيغتها الضعيفة وشبه القويتي. أوضحت النتائج أن أسواق الأسهم العربية قيد الدراسة تتسم بالكفاءة في صيغتها الضعيفق وغير كفؤة في الصيغة شبه القويتي.

الكلمات المفتاحية: التحليل الفني والتحليل الأساسي؛ فرضية السوق الكفؤ؛ أسواق الأوراق المالية العربية؛ "إختبار الأنماط الطارئة"؛ نماذج التأثيرات الثابتة والتأثيرات العشوائية لبيانات "بانل".

RESUME

Dans un marché boursier efficient où les informations doivent être gratuites à l'ensemble des participants, la concurrence entre des nombreux intelligents participants mène à une situation où les cours des actions reflètent pleinement toujours toutes les informations disponibles. En d'autres termes, dans un marché efficient l'analyse technique et l'analyse fondamentale ne peut pas prédire les mouvements futurs des cours des actions, c'est-à-dire aucun investisseur ne peut obtenir un rendement plus élevé au niveau normal. Cette thèse examine l'efficience de certaines bourses arabes: L'Arabie saoudite, l'Egypte et le Maroc durant la période allant de 2002 à 2018. Le test "Run Test" et le "Modèle à Effets Fixes et Modèle à Effets Aléatoires des Données de Panel" sont utilisés respectivement pour tester la forme faible et la forme semi-forte de l'efficience. Les résultats obtenus ont montré que les bourses d'Arabie saoudite, l'Egypte et le Maroc sont efficients en forme-faible et ne sont pas efficients en forme semi-forte.

Mots clés: L'analyse Technique et l'analyse Fondamentale**;** L'hypothèse d'efficience des marchés; Les marchés boursiers Arabes**;** Le test "Run Test"; "Modèle à Effets Fixes et Modèle à Effets Aléatoires des Données de Panel"

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LIST OF ABBREVIATIONS

ABBREVIATIONS	MEANING
EMH	Efficient Market Hypothesis
W-F EMH	Weak Form Efficient Market Hypothesis
S-SF EMH	Semi-Strong Form Efficient Market Hypothesis
S-F EMH	Strong Form Efficient Market Hypothesis
RWT	Random walk Theory
CMA	Capital Market Authority
GCC	Gulf Cooperation Council
USD	United States dollar
GDP	Gross Domestic Product
FEM	Fixed Effects Model
REM	Random Effects Model

General Introduction

I. Overview:

"This market is efficient" is a description that light on paper, but is often difficult to apply in real life, the term "efficient" was formed a principal disagreement among economists, some adopted this term, while, others were opposed. So, is the efficiency worth all this hype? Or is it just a fantasy? To answer to the hypothesis that says "this market is efficient" let's first get to enter into a traditional stock market.

Once you enter into traditional stock market you will see a trading floor, called "an auction market", where there is an assembly of people for the purpose of trade, purchase and sale. They are the market makers e.g. Investors buy and sell stocks or bonds to grow their wealth and seeking income, they are following long-term goals. Speculators purchase stocks for short periods of time in order to the quick profit. Gamblers throw darts without doing any research or picking certain stocks to buy or sell. Brokers work as experts of the stock market; they trade on behalf of clients. Banks and brokerage firms as financial institutions help the traders to buy and sell stocks. Stockholders that who owning a part of the company as equity shares. Bondholders have debt instruments. Companies listed that issues shares by open their capital to the public to raise funds to finance their activities, technical and fundamental analysts work for predicting these stock prices, and the other hundreds amateurs who trade to looking for easy money…

Also you hear: high, low, open, close and ask price, buy and sell orders, disclosure of information, a public information and complete the trades etc. On the other hand the goods of this market often are the stocks (Ordinary and Preference stock) that represent a share of ownership in a corporation. The ordinary and Preference stockholders have different rights in bankruptcy or voting, though they are form of equity. And sometimes the goods of the market are a Portfolio (is a collection of diversify financial instruments: stocks, bonds… to maximize returns and minimize risk).

Simply, that is a stock market in its traditional form, although the markets need not have a physical location, i.e. the stock market may be an electronic system where buyers and

sellers interacted or over-the counter (OTC) markets where investors trade unlisted stocks. But in the midst of all that, where is the "efficiency"?

EUGENE FAMA will answer the question, he was the first one who introduced the "efficient market hypothesis" in his dissertation entitled "The Behavior of Stock-Market Prices", and it was published in the Journal of Business, January, 1965. The basic idea behind efficiency is quite simple that there are at all times, the stock prices adjust rapidly to the new available information.

According to this general definition, our dissertation is centered between two ideas: the first is analysis the impact of new information on the stock prices; the second idea answers a question: is there a possibility to predict this impact?

Also, this study presents the term "efficient" and "the stock price behavior" exclusive from EUGENE FAMA's viewing angle, regardless of the works of other economists e.g. (KENDALL, 1953); (ROBERTS, 1959); (PAUL A. SAMUELSON, 1964). Or exposure to alternative research such as (THALER, 1999), (SHILLER, 2003) and (LO, 2004) about "the Behavioral Finance", and "The Adaptive Market Hypothesis".

Back to reality, on the practical side of the dissertation, In order to demonstrate the reality of the efficient market hypothesis in our Arab countries, and before starting to investigate, it is important to point out that our stock markets took an important role in the transition from the socialist economy to the capitalist economy; thereafter, these countries undertook economic reforms to developing their financial systems, especially the stock markets and improve its performance, several studies have covered this, of course, there is different results of an extensive Arab studies examining the performance of stock markets and the efficient market hypothesis. Generally, most previous studies have shown that Arab markets are efficient in weak-form, While are inefficient in the semi-strong form, and the strong form.

II. Statement of the problem:

Therefore, within this context of economic reforms, improve the performance, and achieve the efficiency, the objective of this dissertation is to answer the following general question:

Were the stock markets in Saudi Arabia, Egypt and Morocco efficient during the last two decades?

III. Sub-research Questions:

To answer the aforementioned general question, our research enquiries mainly fall on four sub-research questions as follows:

- How did the Efficient Market Hypothesis become the alternative of technical and fundamental analysis?
- Were Saudi, Egyptian and Moroccan Stock Markets Efficient in weak-form during the period (2002 to 2018)?
- Is there a statistically significant effect of macroeconomic variables represented i.e.: Inflation Rate, Unemployment rate, Broad money growth, Annual Growth Rate of GDP on Saudi, Egyptian and Moroccan stock market index from 2002 to 2018?
- Were Saudi, Egyptian and Moroccan Stock Markets Efficient in Semi-Strong form during the period (2002 to 2018)?

IV. Hypotheses of the thesis:

In return, in hope to reach adequate answers to the aforementioned four sub-research questions, we will put forward the following hypotheses:

- The Saudi, Egyptian and Moroccan Stock Markets were efficient in the Weak-Form during the period (2002 to 2018).
- All macroeconomic factors under study have a statistically significant effect on Saudi, Egyptian and Moroccan stock market indices during the period (2002 to 2018).
- The Saudi, Egyptian and Moroccan Stock Markets were efficient in the Semi-Strong Form during the period (2002 to 2018).

V. Aim of the thesis:

Based on the elements of the problematic, the main objective in this thesis has been to know the reality of Efficient Market Hypothesis on Saudi, Egyptian and Moroccan Stock Markets; in sum, the aim of this study is to shed light on the following:

- To Supply a thorough understanding of the Efficient Market Hypothesis.
- To find the relationships between variables that can influence stock values.
- To determine the feasibility of technical and fundamental analysis to predict the future changes in stock prices.
- To test the weak-form efficient market hypothesis on Arab stock markets under study, to determine whether it is efficient or if not.
- To test the Semi-Strong Form efficiency on this Arab stock markets.
- To compare the Arab Stock Markets with emerging stock markets of Central and Eastern European, Latin America, and Middle East.

VI. Early Studies of the Efficient Market Hypothesis (EMH):

First early studies conducted to investigate the efficient market hypothesis of the beginning of the last century. It was BACHELIER (1900) who first studied the walk of the stock prices, concluding that these prices walk randomly.

In the middle of the twentieth century, EUGENE FAMA and PAUL SAMUELSON laid the foundation and the building blocks of the efficient market hypothesis as revealed by an examination of the studies in the literature on this hypothesis.

This table shows the important milestones and the historical chronology of the researches that gave birth to the efficient market hypothesis:

AUTHORS / YEAR	STUDY / REFERENCE	CONTRIBUTIONS
LOUIS BACHELIER (1900)	THE THEORY OF SPECULATION "Ph.D. THESIS"	LOUIS BACHELIER Discovered the theory of Random Walk of prices; He tracked the Commodity Prices, He said that these prices are not correlated, and there is not any specific form of price movement ("bizarre" upward movements followed by similar downward variations which he called "martingales". So, we can say that LOUIS BACHELIER build a mathematical model of Brownian motion, it was the fundamental of weak-form efficient market hypothesis.

DAVID G. KENDALL (1953)	THE FIRST MODEL TO MEASURE THE RANDOM WALK "STUDY"	KENDALL conducted a study on 22 companies in the British stock market. He studied the common stock prices in different periods to attempt to find repeated models for those prices. His model equation: $P_t = P_{t-1} + r_t$ P_t:The price of security for the period (t) P_{t-1}:The price of security for the period (t-1) r_t:The random variable KENDALL conclude that: - The successive price changes are independent. - The successive changes are distributed symmetrically. - Prices fluctuate randomly.
EUGENE FRANCIS «GENE» FAMA (1964)	THE BEHAVIOR OF STOCK-MARKET PRICES "Ph.D. THESIS"	In 1964, EUGENE FAMA presents his doctoral dissertation of Ph.D. degree from the University of Chicago. Was entitled:"The Behavior of Stock-Market Prices" was published in 1965 on the Journal of Finance, Vol. 38.Issue. 1. PP. 34-105. Where he talked about: The theory of random walks in stock prices, independence, the distribution of price changes, and a first look at the empirical distributions …The results of this study can be summed up in two points: (1) The distribution of stock prices has fat-tailed. (2) Its variations are independent.

PAUL ANTHONYSAMUELSON (1965)	PROOF THAT PROPERLY ANTICIPATED PRICES FLUCTUATE RANDOMLY "ARTICLE"	PAUL SAMUELSON in his article in Industrial Management Review, 6:2 (1965:Spring)conclude that price changes are unforecastable in an efficient markets. He presented the idea of efficient markets according to temporal pricing models. SAMUELSON developed the fundamental notion of the efficient market theory with the contributions of FAMA.
BENOIT MANDELBROT (1966)	FORECASTS OF FUTURE PRICES, UNBIASED MARKETS, AND "MARTINGALE" MODELS "ARTICLE"	MANDELBROT was published his article in the Journal of Business Vol. 39, No. 1, Part 2: Supplement on Security Prices (Jan., 1966), pp. 242-255. This study is one of the most important empirical evidence on successive Price changes in stocks. MANDELBROT said that prices are very nearly independent. This claim consistent with the idea an “efficient” stock market.

EUGENE FAMA; LAWRENCE FISHER; MICHAEL C. JENSEN; RICHARD ROLL; (1969)	THE ADJUSTMENT OF STOCK PRICES TO NEW INFORMATION "ARTICLE"	This article was published in International Economic Review, Vol. 10, February 1969. FAMA, FISHER, JENSEN, and ROLL supported the efficient market theory according to the rapid adjust of stock prices to the new available information.
EUGENE FRANCIS «GENE» FAMA (1970)	EFFICIENT CAPITAL MARKETS: A REVIEW OF THEORY AND EMPIRICAL WORK "ARTICLE"	EUGENE FAMA published an article on the Journal of Finance, Vol. 25, N°. 2. PP. 383-417 He displays a theory and empirical evidence of the efficiency on the capital markets, he also presented three degrees of the efficient market hypothesis according to the fully reflect of information on stock prices: (1) The weak-form, (2) The Semi-Strong form, and (3) the Strong-Form efficient market hypothesis.

VII. The scope of the thesis:

Our results will be valid exclusively for the sample, time, Data, and tests used selected in this thesis; the major limitations and of this thesis and the delimitations, might be summarised in the following:

- Time limits: These results achieved are related to a limited time from 2002 to 2018; the results may have been different if the time is changed.
- Place limits: The thesis involves a small sample of Arab countries (Saudi Arabia, Egypt, and Morocco) which restricts the generalizability of the findings to larger Arab areas.
- Data used: This study uses the annual data of Stock Market Index and macroeconomic variables of each stock market during the period of study. While; the results may have been different if we use daily or monthly data.
- Tests used: In our thesis to investigate the weak-form efficient market hypothesis and the Semi-Strong form hypothesis, we used respectively the Run Test and Fixed and Random Panel Data Models ; our results may have been different if we utilized one of the following tests i.e.: Unit Root Test; Variance Ratio Test; Auto Correlation Test; Co-integration Test; Autoregressive Distributed Lag (ARDL); Multiple Linear Regression;

At last; greater depth studies, is needed to understand the efficiency; the further works to covered the Aspects that still mysterious.

VIII. Research approach:

The research approach that was followed for this PhD thesis was the descriptive one. According to this approach, the thesis begin with describes the hypothesis of the market efficiency (definitions, theories, assumptions, and critique); Next, the Arab stock market (laws, statistics, and comparisons). While, On the other hand; we used the experimental method to test the forms of efficiency on Arab stock markets (Saudi Arabia, Egypt, and Morocco) as a true experiment of this study.

IX. Key-Terms Description:

- **The Stock:** Is a form of security, represents a share of ownership (equity) in a company. There are two types of stock: common and preferred, those are traded usually in stock markets.
- **The Technical Analysis:** Is a method used by chartists to interpret the stock charts, they attempt to find the pattern that stock prices evolve, to predict the future prices; and to make the right investment decision (to buy or sell a stock).
- **The Fundamental Analysis:** assumes that stock has an "intrinsic value", fundamental analysts attempts to determine this value of stock by focusing on studies of economic factors (inflation, interest rates, unemployment, etc...), Industry components (competition, demand and supply, technological changes, etc…), and companies' financial statements (company growth, dividends, sales, etc…) That leads in the end to predict the future stock prices, and make the right investment decision.
- **The Random Walk Theory:** is a phenomenon was discovered by "LOUIS BACHELIER" in 1900, the theory means that future changes in stock prices cannot be predicted. So, Chartists and fundamental analysis procedures for predicting stock prices are completely useless.
- **The Efficient Market Hypothesis:** The term "efficient market hypothesis" was first defined by "EUGENE FAMA" in 1970, he used this term to explain the fully reflect of stock price to the available information in the stock market.
- **The Weak-Form Efficient Market Hypothesis:** is the low degree of the hypothesis, assumes that the stock price fully reflect all past available information. So, nobody would not be able to obtain abnormal yield by using historical available information.
- **The Semi-strong Form Efficient Market Hypothesis:** was based on fully reflect of all publicly available information and besides the past stock prices on the stock prices. So, investors would not be able to obtain abnormal yield by using all publicly available information and besides the historical information.
- **The Strong-Form Efficient Market Hypothesis:** the stock price will present all relevant information. Where the stock price fully reflect all available information.

X. Structure of the thesis:

This PhD thesis was designing according to the "**IMRAD**" format:

- **Introduction.**
- **Materials and Methods.**
- **Results.**
- **Discussion**.

To answer to sub-research questions and testing our hypotheses, three parts included eight chapters are devoted to this dissertation as the following:

The First Part is entitled **"Literature Review"** consists of three theoretical chapters that support the practical application part of the study, provides review literary texts of Information disclosure, the technical and fundamental Analysis of information and the efficient market hypothesis (EMH) as an interesting alternative to analyzing. This part was organized into three chapters as follows:

Chapter One: "From Information to Prices" consists of three points:

- The first point which is entitled "Searching for Information in stock markets" displays sources of information, advice, and news in the stock markets.
- The Second point "Disclosure and Information Asymmetry in Stock Market" presents the levels of disclosure of information, its importance, and information asymmetry phenomenon and its effects.
- The third point "Stock Prices Moves" we try to answer to the question: how stock prices moving?

- **Chapter Two** "Technical and Fundamental Analysis" It proposes two methods of stocks analysis to predict the future changes in its prices, and we highlights the conflict between them about stock value:
  - The first analysis is the Charts, The Dow Theory and technical analysis categories.
  - The second analysis is the fundamental analysis and its levels.

- **Chapter Three** which is entitled "The Efficient Market Hypothesis" is about the core of this thesis; it consists of three points; starts with an overview about The Random Walk Theory (RWT), and entry to the Efficient Market Hypotheses (EMH), and ends with evidence on the Efficient Market Hypothesis (in favor or against).

The Second Part:"Markets and Comparisons" concerned with markets statistics, analyses and comparisons, it includes also three chapters:

- **Chapter Four** "Comparing the Performance of Arab Stock Markets" displays the milestones of Arab stock market under study (Saudi Arabia, Egypt, and Morocco). Also, we provide some statistics data of its performance. Finally we compare these markets by comparative charts.

- **Chapter Five**: "Comparing the Performance with emerging markets" presents a comparative study of Arab stock market (Saudi, Egyptian and Moroccan Stock Market) with some of emerging Stock Markets ; (The Poland and Romania stock markets) in Central and Eastern European; (Argentine and Brazilian stock markets) in Latin America; and (Turkish and Iranian Stock Markets) in Middle East.

Chapter Six: "Empirical investigations of the (EMH)" provides empirical studies about the Efficient Market hypothesis from Arab empirical evidence and empirical investigations on emerging markets.

The Concluding Part is entitled **"Empirical Evidence"** tests the efficient market hypothesis i.e. investigate the weak-form efficiency and the Semi-Strong efficiency of this selected Arab stock market namely: (Saudi Arabia, Egypt and Morocco) and discusses their results.

This last part includes two chapters: one tests the Weak-Form Efficiency on Arab stock markets under study, and the other investigates the Semi-Strong Form Efficiency of these markets.

Materials and Methods (is devoted to the Tests): we use two tests to investigate of the weak-form efficient market hypothesis and the semi-strong efficiency hypothesis.

- **The Run Test:** to investigate of the weak-form efficient market hypothesis, Data used in this test are taken from stock markets under study (Saudi Arabia, Egypt, and Morocco). During the period 2002 to 2018 this data concern the number of listed companies, market capitalization, and liquidity.
- **Fixed and Random Panel Data Models:** to investigate the Impact relations between Arab stock market Indices ("TASI" Index, "EGX30" Index, and "MASI" Index) and macroeconomic indicators (Inflation rate, Unemployment rate, Broad money growth, Annual growth rate of gross domestic product) "have a statistically significant" during the period (2002-2018).; then, we will decide that there is a semi-strong efficiency or not.

Finally; the study is closed by a "**General Conclusion**"; Based on the three parts presented in this thesis, the General Conclusion strives attempting possible to confirm or deny our hypotheses, then to answer the general question and the sub-research questions set out at the onset of this thesis. Then we offer some suggestions and recommendations.

Part One:

Literature Review

Chapter One:

From Information to Prices

* Searching for Information

Introduction:

What is the value of news and information in the stock market? Why the disclosure? The usual answer given by researchers and market makers to these questions is to say that the information has an effective role in stock markets for all participants that work in these markets (Investors, Issuers, Members of stock exchange, Information provider …).The changes of stock markets are driven by information, where this information is considered to be a real or expected value. Its role is to develop and increase the knowledge and reduce the risks of investment. In the last, although the information must be accurate, appropriate and inclusive, but its interpretation varies from one person to another (Brunnermeier, 2001, p. 1)

1.1. Searching for Information:

There are many sources from which the stock market makers draw information; this information is related to the market situation, the issuing institution, and the stock itself. The most important information sources are listed underneath: (Becket & Essen, 2010, pp. 72-105)

a) Advice

Advice is one of the most important sources of information in stock markets, but the question naturally arises as to the authenticity, trust and accuracy of advisors, while it easily to find these theorists, publishers of guides and explanations about stock market work. Advice is not always right, it is probably that there is a self- motivation behind the advisors opinions, but the last decision to accept lies with investor, as simply "The investor choose". Finally, in the stock market we find different advisors, it often are our source of information to deal in the markets. Listen to them as information source and take your self-decisions.

- **General Advice from Newspapers:**

Daily newspapers and newspapers specialized in investing and money management are interested to the stock market affairs, which made them an real source of news and information, it represents a flood of information, such as: "Investors Chronicle", "What Investment", "Bloomberg Money" etc… these newspapers carry news and information about companies listed on stock markets (Display Profits, the sales, analysis the results, advice from stockbrokers, takeovers news etc...), that help the traders to buy or sell, and move a stock according to the general messages that presented on these newspapers.

- **Advice from Specialist Magazines:**

In addition to the previous newspapers, the Specialist Magazines are concerned to all stock markets events, which make them another source of information and news. What distinguishes these Specialist Magazines from the newspapers are those charts, pictures, analyzes and summaries issued by specialists in financial market affairs, such as: Pearson, the financial times etc).

- **Radio and Television Advice:**

Giving an interview on the radio or television can be an essential source of information of stock market; it is free and readily available. Financial News Feed or Hosting a general manager, a professional adviser, stock market broker or independent market commentators on radio or television Provides information and recommendations from professionals that helps to buy or sell the stock. Also, investors will be able to ask those at the very top of the decision making and market makers about their opinions, future orientations of the markets etc.

- **Financial Advisers:**

The process of obtaining information is available to all, but any such information is useful to us? Some investors find a big problem in the classification and evaluation of the information collected. Here we asked financial advisers for the best financial advice: What is the best information, stocks and portfolio the investor's need? The financial advisers offer

recommendation on certain types of financial instruments, and provide various tips and guidelines for investors about all information.

b) Information

- **Lists of Stock Prices Pages:**

The lists of stock prices pages are other source of information, these lists show columns that including information about the company name, the stock issued currency and the company stock price moved (the closing price, the highest stock price, the lowest price, the previous day's closing level, the mid-market price, the volume of trade, ex-dividend, and the price moved over the previous year).According to these lists of stock prices pages, investors can then compare all information of listed companies in the same industry sector.

c) Indices

The indices display the behavior of a group of stocks in stock markets (Averages).(Mishkin& Eakins, 2017, p. 316), these indices represented a specific sector movement, and it based on the performance of stocks of the largest companies. Every stock market has a general index, it measure the market movement as a whole. The most famous global indices are: (DJIA) (Nasdaq 100), (NYSE)(Standard & Poor's)of USA, (Nikkei 225)of Japan, (Dax)of Germany, (CAC40)of France etc... In summary of the foregoing, investors can gain information as to how a broad group of stocks have performed by tracking these indices.

d) Online

In the last years, The Internet pages is by far the most popular source of information and the preferred for traders and investors in the stock market, every exchange has a website that displays the development of indices, stock prices, issuing companies and the movement of the market as a whole. Online market brokers provide valuable information that helps traders to buy and sell stocks. Online have information and news display stock prices and indices movements from the historical prices to its current prices, whether these websites are free or costly its news and information are very valuable.

e) Data from the Company

The company issuing stocks is considered a main source of information in the stock market; it informs the market authorities, shareholders and investors of all news, information and data that would affect prices, as the following:(Graham & Dodd, 2008, pp. 89-99)

- **Reports to Stockholders (Including Interim News Releases):**

The companies issue reports for shareholders to inform them of financial and operational numbers, such as net income and gross profit etc, in monthly, quarterly, semi-annual or annual statements of accounts.

- **Monthly Statements:**

All companies regularly publish their monthly statements of accounts; it includes some statistics on sales, vacancies, deliveries, and monthly net profits etc. According to these monthly statements, the shareholders explore the general state of the company and take a clear idea of its performance.

- **Quarterly Statements:**

Publishing data for the quarterly statements of companies is one of the obligations imposed by all markets and industries sector. These quarterly statements include data on net profits for three months, the income account, and the balance sheet; Attached with some important notes from the heads of companies.

- **Semiannual Reports:**

It is reports that companies issue to shareholders every six months. It is mostly non-standard, but it is somewhat important to the market, it provides the markets too much information about companies and its development in a medium period.

- **Annual Reports:**

Annual statements are considered the most important company statements, it cover large periods in which the owners of companies often provide observations about last year's statements and future projections for the next year. In addition, the annual reports must be clear, comprehensive, and bear accurate data e.g. The income account that it's good to include (in detail) the following items: Sales, net earnings, depreciation, interest charges, non-operating, income taxes, dividends paid, surplus adjustments. While, the annual balance sheet is better than the income account, due to its standardized format across all companies.

The main items in the "Annual reports and accounts" are:

- Chairman's and directors' report: In the introduction of the annual reports, we find the words of the Chairman's and directors' report, they talk about the most important events and milestones of the ending year, with some comments, expectations, and hopes. This report is the key of the annual reports, so, everyone (shareholders, investors, traders ...) must pay close attention to what they write.
- Profit and loss account: This account includes: (1) company's tradingresults of the previous financial year i.e. the "turnover" or the company's sales. The results of this ended year are compared with the results of the previous year, and upon recording any note; see the reports of the chairman and directors to know the causes and the explanations. (2) Operating costs, which are (manufacturing costs, distribution, research and wages ...), and the result of operating profit is the deduction of the cost of sales from the total turnover. (3) Pre-tax profit. (4) Other items: such as dividends to shareholders, retained earnings, and earnings per share.
- The balance sheet: is the mirror of the company's financial position on the last day of financial year, it represents a group of assets and liabilities in a range of headings as follows: (1) the fixed assets (long-term investments as the equipment, Lorries, and office blocks…) (2) Investments in other companies, (3) the current assets (as raw materials, finished products…) (4) The company's short-term debts (suppliers, money borrowed…) (5) Long-term debt etc…So, the balance sheet is a real measure to the knowledge of the company's current status and compares it to what it was previously.

- Cash-flow statement: Another statement included in the annual reports and accounts is the cash-flow, which represents the source of the company's funds from profits, investment, etc. Any deficiency or growth in the cash-flow statement is monitored to judge the success or failure of the company's management.
- Auditors′ report: The auditors review all accounts prepared by the directors of companies, and they prepare reports about the application of accounting measures, compliance of laws, and the company's compliance of the rules and regulatory texts. Often times, the auditors' reports record reservations about some elements. This creates a conflict with company's directors, but does not deviate from the routine accounting and auditing process.
- Notes: Finally, we will find the notes, which are a huge collection of different data, news, and statistics, for example we will find the number of employees, directors' gains etc.

- **Periodic Reports to Public Agencies:**

The periodic reports submitted by companies to the public agencies are more accurate and abundant than those reports provided by the companies to the shareholders (as we have seen above).Because the periodic reports submitted to public agencies, bodies or committees to exanimate it are mandatory and include some values that were not previously announced, which makes them more important, and more credible.

- **Official Reports:**

These reports represented by various official documents, the committees provide these official reports from companies as information had not previously been published; the reports have utmost importance because they are formal written documents, and they are the most important sources of information.

- **Statistical and Financial Publications:**

Were presented by annually comprehensive manuals, include detailed reproduction of individual companies reports and its data. These manuals are not as original sources, generally, we cannot relied it alone to take all information that we need.

- **Requests for Direct Information from the Company:**

There are no objection hinder shareholders from going to the company to get all the information and data they need. Sometimes the information held by the shareholders is inadequate, forcing them to go to the company to take the information from the source; the company is to provide shareholders with information necessary unless there is no reason for it to refuse.

- **Miscellaneous Of Company Reports:**

Moreover, if some need to get more information, news, and reports about companies, they can find it in the following documents:

- **Interim reports**

Many companies listed in the stock market provide information at different times of the year, which are documents that provide a summary of the trading results and a simplified budget, and other data about profits, the volume of trade, which represents a source of information before the announcement of the annual reports.

- **Prospectuses and listing particulars**

The companies' brochures are considered a huge amount of relevant information, and they are the most important source of information at all, for example among the requirements of the first subscription for a company in the stock market to provide a subscription prospectus and listing details, it is a listing of all the information about the listed company related to: its assets, owners, Its board of directors, its auditors, its attorney, and a comprehensive description of its activities.

- **Circulars on disposals and acquisitions:**

Another source of information is the presentation of the accounts of the target company to the disposals and acquisitions and provides its statement of business during large acquisitions, noting that the acquisitions must be approved by the shareholders, so they must be informed of all information and data. This large information display during the acquisition may be equivalent to the annual report due to the volume of information it carries in order to defending and preserve its company independence.

f) Information Regarding the Industry

The Shareholders and investors are interested in monitoring all information about the industry to which the company belongs, as it foretells the future and prospects of the industry and the company alike, this information is widely available in the market, so, obtaining it is easy and without exorbitant costs, it can be indicated that there are statistical agencies that are interested collect and distribute these general information about the industry.(Graham & Dodd, 2008, pp. 89-99)

At last; we can be classified these sources into six categories, according to our interests to information from the attributes of the decision makers to the companies' news and to their general environment as the following summary will show: (Schwartz & Francioni, 2004, p. 36)

1- Historical Information: The historical prices, values, covariances of return etc…

2- Current Information: current financial Information concerning earnings forecasts...

3- Current strategy of management: Information of the strategic business and future outlook.

4- Current Economic Information: as all Information about the company's product market, the competition, the national economic and international events…

5- Structural change Information: displaying the current acquisitions, divestitures, discoveries...

6- Organizational efficiency Information: is concerning the corporate structure, management...

Chapter One:

From Information to Prices

* Disclosure and Information Asymmetry

1.2. Disclosure and Information Asymmetry in Stock Market:

After we saw in the previous papers the most of informational sources in the stock markets, economists and analysts divide this enormous information into three groups: (a) Public information, (b) Inside information, (c) Private information.(Schwartz & Francioni, 2004, p. 37)

a) Public information: is that information available to everyone in the market, and obtaining it is very easy without much effort, and access to public information is often free or in small amounts and this information includes: past stock prices, advice, etc.
b) Inside information: It is information that a certain group of individuals possess, such as the officials of the corporation and some auditors of the companies, or the executive frameworks of the corporation.
c) Private information: This type of information can only be obtained for some individuals, after they carry out investigations and analyzes. Also,we cannot get this type of information easily in the market without having relationships with the influential persons in companies.

These three types of information are concerned with disclosure, which in turn must be rapid (in a timely manner), accurate (including all information important to investors), and at the lowest cost.Also, the increase in the individual disclosure of the companies increases the volume of disclosure for the market as a whole. The Disclosure has three levels:(1) Comprehensive Disclosure, (2) Fair disclosure, (3) Total disclosure.(Masry, 2015, p. 28)

(1) **Comprehensive Disclosure:** This first form of disclosure represents the minimum of information that the market is obligated to provide to investors, such as providing some important elements in the financial statements of the companies, so that the investor does not fall into the trap of information asymmetry that leads him to make the wrong investment decision.

(2) **Fair disclosure:** This second disclosure is related to how the information is distributed, where the disclosure is sufficient, fair, and meets the needs of everyone, which makes competition among investors fairer.

(3) **Total disclosure:** This disclosure lists all information about the companies by presenting their financial statements and reports, which include a boring detail for all information of the company(the Corporate Balance Sheet, the Corporate Income Statement, the Cash Flow Statement, and other Factors for Analysis) (DeGennaro, 2014, pp. 75-81). The total disclosure helps investors and fundamental analysts to take a real look at the company and try to predict its future.

Another division of the information disclosure which is: the financial disclosure and non-financial disclosure. The financial disclosure means that the companies provide their financial position data, while, the non-financial disclosure is when the companies provide all information about the company's activities, plans, and administrative information.

The Importance of disclosure:

The ideal disclosure is of great importance to all market parties, whether for investors, analysts, or the performance of the market as a whole, and the importance of disclosure lie in:(Masry, 2015, pp. 27-29)

1- Supporting the positive investment and trading climate.
2- Creating fairness in the distribution of information among all by providing adequate information to all in a fair manner.
3- Providing a general atmosphere that helps predict the future direction of prices and the market as a whole.
4- Facilitating the work of basic and technical analysts in reading the incoming information and analyzing prices.
5- Reducing the incomprehensible price fluctuations, so that each piece of information has its expected effect on the share price.
6- Stocks are priced at their real prices, so there will be no room for misleading news to influence prices.

7- Encouraging investors to enter these markets that are characterized by perfect disclosure, which increases the performance of the market as a whole and enhances its efficiency.
8- Reducing the phenomenon of information asymmetry and its effects on investors and on the market as a whole.

Information Asymmetry Phenomenon at a Glance:

In 1970; the American "Nobelist" GEORGE ARTHUR AKERLOF discovered the idea of asymmetric information; He analysed the stock market information. AKERLOF ran into real problem as he began to study market information, in his study: **the Market for "Lemons": Quality Uncertainty and the Market Mechanism**. He introduced an example from: the Automobile Market, he notes that there is a disparity between the buyer's statistics (he has a general idea of the average market as a whole) and the seller's knowledge (the seller has a specific idea of its good) to measure the value of goods traded. AKERLOF called this problem "the asymmetric information" according to the "adverse selection" from the example of Automobile Market. If there is asymmetric information, the seller will sell of less than the average market quality, which leads to reducing the average quality of goods in the market and reducing the market size. (Auronen, 2003, p. 7)

According to the above, we display this general definition of the phenomenon of asymmetry of information:

"Information asymmetry—a condition wherein one party in a relationship has more or better information than another"(Bergh, Orlandi, Heugens, & Boyd, 2019, p. 123)

Information Asymmetry (Conceptualizations):

From the previous definition, varied perceptions of economists around the idea of the asymmetry of information, each one of them sees a special vision on the subject, some of them are:(Bergh, Orlandi, Heugens, & Boyd, 2019, pp. 128-130)

a) Private Information:

The first approach to the phenomenon of information asymmetry depends on the topic of "private information". The proponents of this approach believe that obtaining privileged or private information will make them in a stronger position than those who do not have that information. Whoever owns the private information will ensure the best opportunities for successful investment. On the other hand, this approach can be seen even in corporate activity, as it provides special information for a department in the company or a specific company without the rest, which makes it achieve the best results from others. Therefore, the first perception of the phenomenon of asymmetry of information may be the source of some obtaining private information and not the rest.

b) Different Information:

The second approach to describing the phenomenon of asymmetry of information is based on the interest of "different information", we mean by different information that market information is not distributed equally to all, meaning that this distribution is unequal, as some have different sources of information from the sources of others, which makes them closer to successful investment opportunities.

c) Hidden information leads to pre- or postcontractual opportunism:

Another approach to describing the asymmetry of information is "Hidden information leads to pre- or postcontractual opportunism", it is mainly represented in the problem of "adverse selection" for some as a result of the fact that the information provided by the current owner can be biased, that is, based on an opportunistic formula. This formula has been defined by many economists as the gap between the owner and the agent that has hidden information and uses it in an opportunistic manner that leads to the information asymmetry.

d) Information asymmetry as the lack of perfect information:

The lack of perfect information is a form of information asymmetry. The supporters of this approach argue that the deep gap between the buyer who does not have enough information about the goods and the seller who is fully informed about it, that establishes the so-called phenomenon of asymmetry of information. Many companies and individuals face this description of information asymmetry, which causes them to incur huge losses.

e) Information impactedness:

The last description of the phenomenon of information asymmetry is the "Information impactedness", the high costs of transactions leads to this description, the presence of the phenomenon of asymmetry of information in any market, forcing some people to search for "information parity" through paying of high costs. The attempt of these people to acquire information leads to some companies seizing this opportunity to achieve high profits.

Generally, through previous descriptions, we conclude that the phenomenon of information asymmetry makes the market lame, it have been a longstanding concern to markets, where some people have information that others do not possess, and this matter often leads to "adverse selection" in investment decisions.

Applications of asymmetric information theory:

There's many different applications related to the asymmetric information theory. So we can use this theory in the following:(Auronen, 2003, pp. 21-27)

a) Minimum Quality Constraints:

Markets that place constraints on quality are considered an appropriate environment for the activity of the phenomenon of asymmetry information; this was the focus of research for "HAYNE E. LELAND" who called for the relaxation of these restrictions and setting minimum quality constraints in order to combat the phenomenon of asymmetry of information that leads to "the reverse selection".

Thus, minimum quality constraints were one of the earliest applications of information asymmetry theory that LELAND investigated in 1979.

b) Contingency Contracts:

The second application of the theory of information asymmetry that JOSEPH STIGLITZ and ANDREW WEISS is presented in 1983;itwas called "Contingency Contracts", they provided an example for that as a loan contracts granted by banks that include if there is default of a payment prevents this borrower from obtaining another future loan request. The result is that contingency contracts stimulate the behavior that everyone desires, the two researchers showed that there are intertemporal linkages produced by competitive behavior, that is, if a loan contract is terminated for individual, he will not be able to obtain a new loan from any other bank. So, these contracts stimulate agents, which create more competition before the contracts are signed.

c) Used Pickup Truck market:

According to AKERLOF study, ERIK BOND tried to apply the same theory on the used pickup truck market (in 1982 and 1984). He compare between second-hand and first-owner trucks. ERIK BOND found that there are no differences in the condition of the two types, although that the asymmetric information phenomenon may present in the market.

d) Job market:

Another example of the applications of information asymmetry phenomenon can found in the job market, SPENCE, STIGLITZ, SANFORD GROSSMAN, and OLIVER HART provided examples for the application of the information asymmetry in this market; they tried to find the disparity between information of companies, their employee, and information disclosure of levels of employment.

e) Other Contributions:

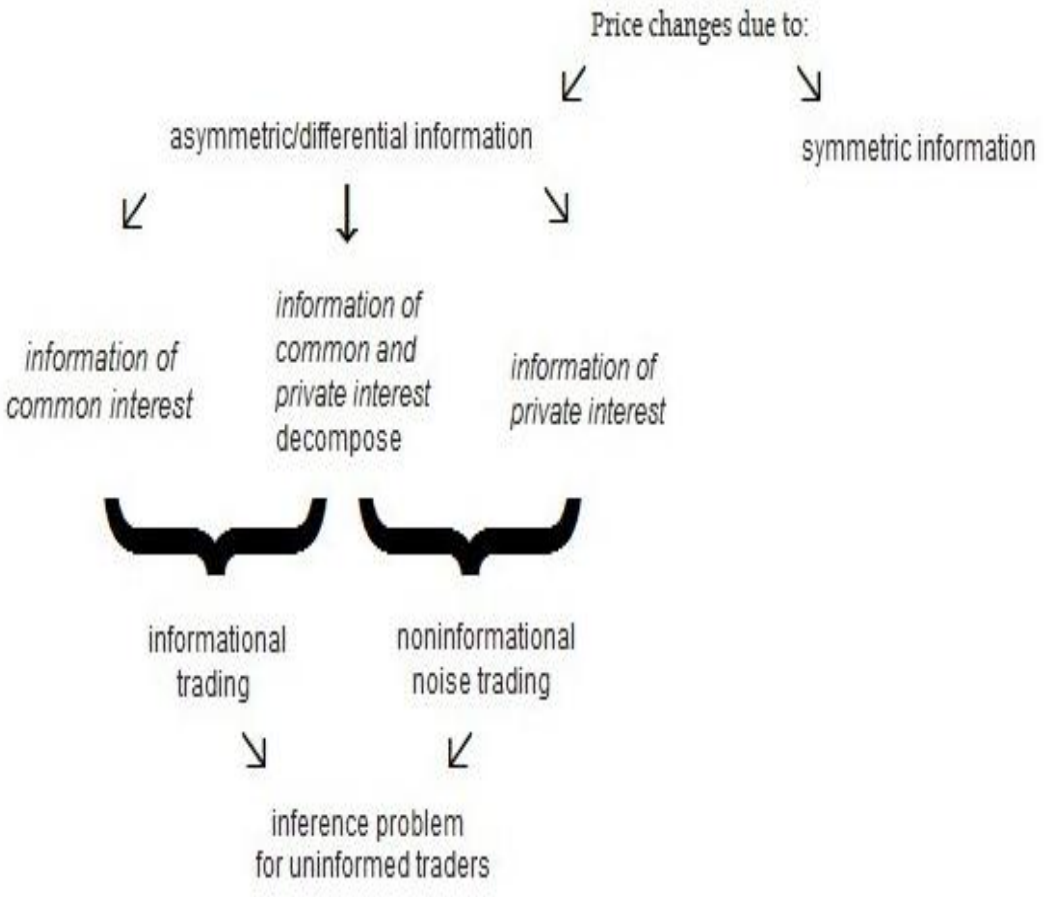
Other results of the theory of information asymmetry made important contributions to the economics; among them:

- STIGLITZ and WEISS: They tried to apply this theory to study why the banks to ration credits?
- SAMUELSON: He applied the theory to study the bargaining process.
- HANSEN: He applied the theory to investigate the effects of mergers and acquisitions.
- JUHA MATTSSON: He applied the theory to describe the problems facing venture capitalists.

f) New Applications of the Theory:

The great attention given to the phenomenon of the asymmetry of information from researchers and investors making it a base for the emergence of new ideas, the most important new idea was the "subcontracting". So, in "subcontracting" contracts for the market is choosing the best probability of success through sorting contractors, identifies each contract part "fixed" payment and another part "variable" after the success of the project; the result that after sorting sub-contractors are distributed according to the degree of risk in order to achieve the desired success.

Figure (1) Inference problem from price changes



Source: Brunnermeier, M. K. (2001). ***Asset Pricing under Asymmetric Information: Bubbles, Crashes, Technical Analysis, and Herding.*** **/: OUP Oxford. P.28**

Chapter One:

From Information to Prices

* Stock Prices Moves

1.3. Stock Prices Moves

> ***"The stock market, in which claims on the earnings of corporations (shares of stock) are traded, is the most widely followed financial market in almost every country that has one; that's why it is often called simply "the market." A big swing in the prices of shares in the stock market is always a major story on the evening news. People often speculate on where the market is heading and get very excited when they can brag about their latest "big killing," but they become depressed when they suffer a big loss. The attention the market receives can probably be best explained by one simple fact: It is a place where people can get rich—or poor—quickly"*** (Mishkin & Eakins, 2011, p. 3)

The stock market moves is governed by the information disclosure whether they are numeric, textual, oral or written(Schumaker & Maida, 2018, p. 2),that creates a daily supply and demand for the securities traded in these markets. If the demand is greater than the supply, meaning that there are more buyers than the sellers, the market rises (the prices of traded securities rise).And if the supply is greater than demand, i.e. the sellers are more than the buyers, the prices Decline (i.e. market goes down).(Sheimo, 2005, p. 3)

The "Fundamental" Determinants of Stock Prices:

There are many determinants that that lead to predicting the real or intrinsic value of stock, among them (Malkiel, 1999 , pp. 96-102):

- The first determinant: The expected growth rate.
  Is one of the most important determinants that lead to anticipating the intrinsic value of a stock, e.g. the compound interest of any security affect to predict of increase their value.
- The second determinant: The expected dividend payout.
  This second determinant means when companies have the same expected growth rates, we choose which has a high dividend payout, where we can determine a stock's price because the values of their stocks are increase.
- The third determinant: The degree of risk.
  As previously mentioned, the risk is famous factor in determining a stock's price. If there is a less risk, investors prefer these stocks because its quality is high, and it's have a quality premium where increase their value.
- The fourth Determinant: The level of market interest rates.
  In the markets where they are high Interest rates, that can present an alternative offer to the stock market. Where capital head around into bonds while Steer clear of stocks that affects on stock prices fell sharply (and vice versa). This determinant helps to predict the stock value trend and Investment decisions.

Stock Prices between Risks and Returns:

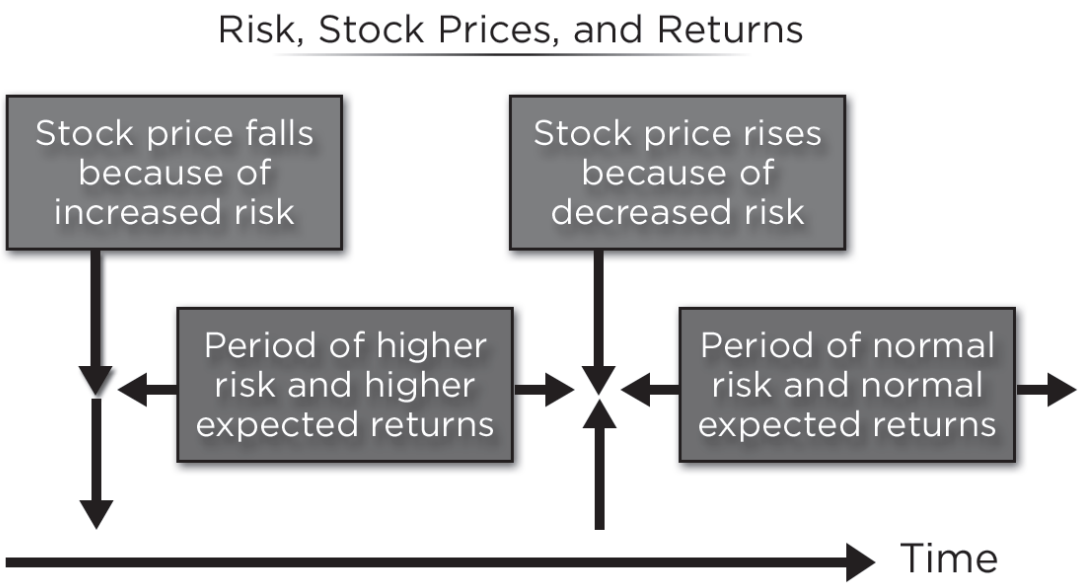
Investing in stocks is not without risk like other types of investments. The risks associated with stocks mean the risk of falling in their price, and sometimes some stocks interact more violently with market movements as a result of those risks. There are multiple sources of risks, some of which are related to the company and the form of its management during periods of weakness or the economic cycle. Including what is related to the product in the event that it contains health problems. Including what is the result of a problem in the business sector, such as changing fashion or consumption pattern, including what is related to the decline of the market as a whole and the resulting disturbance in interest rates and currency fluctuations. There are above-average returns called "equity risk premium" and they

are related to stocks of companies that involve greater risk, those companies that most gamblers care about their shares and who are looking for more money despite they bear greater risk **(Becket & Essen, 2010, p. 38)**; On the other hand, shareholders benefit from the returns of those shares in two forms, either by increasing the share price in the future, or by using the annual profits achieved as a result of owning these shares**(Levinson, 2005, p. 7)**, or achieving the two things together, and when there is The greater risk, there is greater returns, according to Becket and Essen "Everything has a price. If something has a higher risk, it is likely to offset that with a higher return"; but if the company does not achieve any profits, there will be nothing for shareholders, what is worse is that shareholders at the end of the rows claim their rights upon liquidation. (Becket & Essen, 2010, p. 4)

Investors often measure the performance of equities by computing the total return over a given period, such as a year. Total return can be computed by the following formula (Levinson, 2005, p. 147) :

[(Price at end of period - price at start) + dividends paid + accrued interest on dividends] / Price at start of period

Figure (2): The relationship Risk, Stock Prices, and Returns



Source: DeGennaro, R. P. (2014). *How the Stock Market Works.* The United States of America: PUBLISHED BY: THE GREAT COURSES Corporate Headquarters, Printed in the United States of America. P.119

Factors motivating stock market buyers and sellers:

There are a set of factors that motivate investors, whether sellers or buyers in the stock market, such as:

a) Anticipation Factor: is the most important motivation for trading in the stock market, so everyone uses anticipation, whether they are investors, speculators or analysts, to make decisions of buy or sell, based on the element of conjecture about the future events expected (near, far, good or bad). Sometimes this expectation is true, especially if it comes from specialized and capable analysts, and other times the expectation is disappointed if the market is efficient.

b) Real factor: This second factor is "the money", it is a motivation to sell or buy; all the time, investors compare the interest rates with the returns and profits that earn as shareholders. Investors are primarily looking for money, not for stock markets, they are ready to sell at any time that is appropriate for them and get out of the market.

c) Imagined factor: Another factor motivating stock market buyers and sellers, that comes from market experts or analysts (technical analysts or fundamental analysts). Their advice and guidance is another motivation for buying and selling in the stock market.
d) Fabricated factor: This last factor unreal, where some people deliberately sell, as computerized sell programs that leads the stock market to the downtrend. Here investors begin the process of trading as a "support" for the market, and pushing the market for Uptrend. This point called the "support" point where the market stops decline.

When to Buy or sell the Stocks:

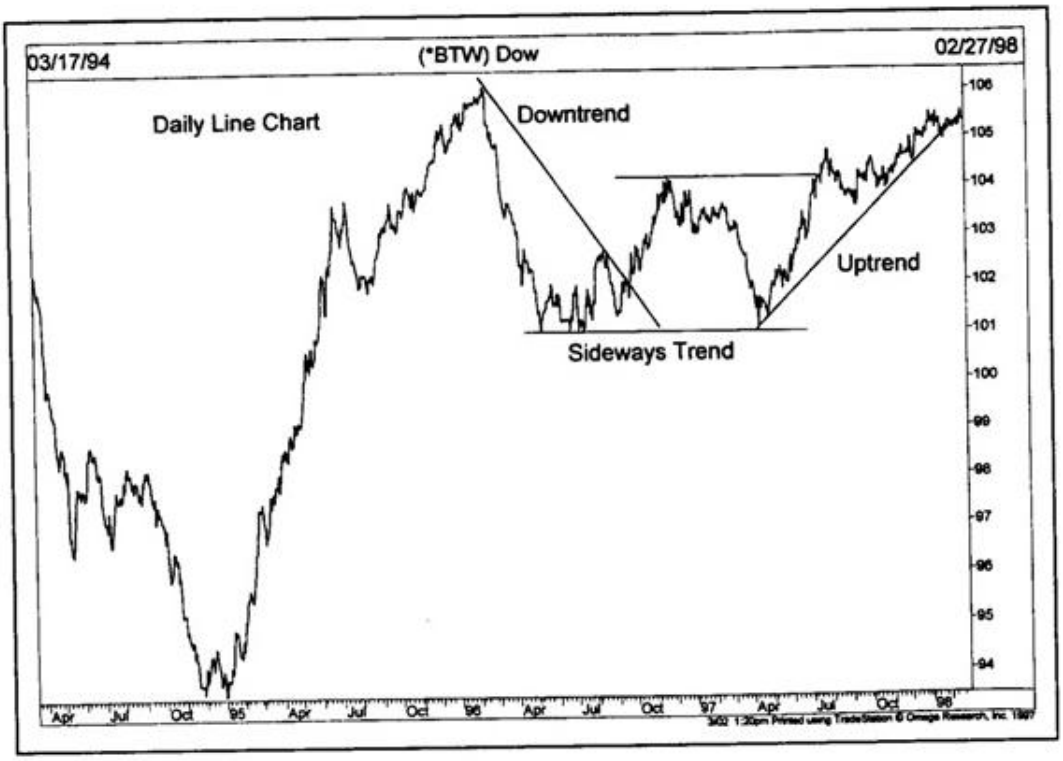
O'Neil, J. William presented some advices to investors in the stock markets, for a guaranteed investment, as following: (O'Neil, 2009, p. 6)

a) The smart investor is the one who buys stocks when the market is in "Uptrend", not when he is "Downtrend", if the market enters into the "Uptrend" phase, he should buy because the current and future stock prices rise. The investor does not try to buy more stocks unless the stock price rises above to its purchase price, not when it decreases.
b) The investor should buy stocks when they are close to their highest levels to achieve great returns, he should not try to invest in buying cheap stocks that are far from their annual highest levels.
c) The investor should get rid of stocks that started to loss; because it is on the verge of down. So that the losses do not worsen further.
d) Do not take all the advice and recommendations issued by market analysts seriously; it is possible that they have special goals to guide the market, which is beyond to your goals of achieving high returns.
e) Continuing to the previous advice, some technical analysis and charts may be important in determining market trends, so it is advisable to get acquainted with some charts and their technical analyzes for stock prices and markets as a whole.

Stock Market Moves:

Every day, the stock markets move in different trends, this is a result of the changes occurring in the market indices. These changes also are the result to the operations of buying and selling on the companies stocks listed in these markets. If the purchases are more than sales, the prices rise and the market as a whole tend to rise. While, if the opposite happens, the market will tend to decline due to the selling operations overriding the purchases. Generally, we can group the stock market movement into three trends: (a) Downtrend. (b) Sideways Trend. (c) Uptrend. (Sheimo, 2005, pp. 3-7)

Figure (3): The three Stock Market Trends



Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.51**

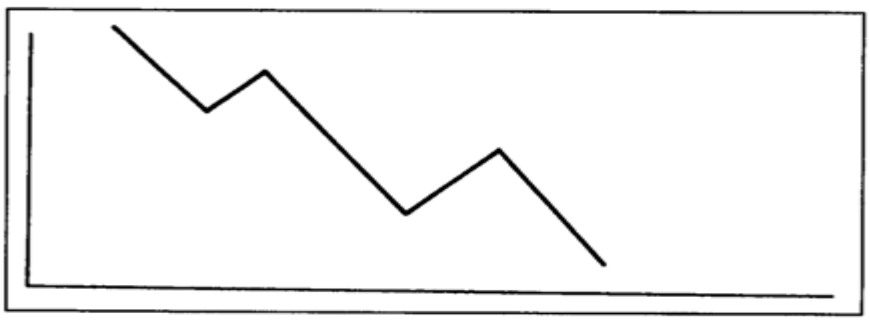
a) **Stock Moves: "Downtrend".**

Often, the reason for buying a stock today is to sell it in the future and achieve gains and profits, in addition to the returns that the stock generates during its ownership, but this is not always guaranteed, as there may be a decrease in the stock price in a period affected by negative information and news, which makes it seem to its owner as a failed investment, it will not continue the losses are a lot, as some investors' appetite to buy those low-priced stock limits their decline, so they reach the bottom and then start to recover again. This is called a downtrend of prices. That applies to a market index as well as we see it in individual stocks.

In the above example from the Figure (4): the downtrend starts from the beginning of 1996 to April of the same year (1996).

In the chart, we see that the price trend during its decline is not a straight line, but rather zigzagging lines in a series of waves that include descending peaks and troughs:

Figure (4): Example of a "Downtrend" with descending peaks and troughs



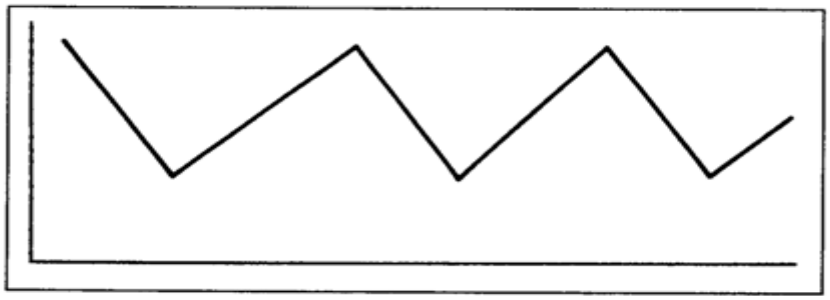
Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.50**

b) **Stock Moves: "Sideways Trend".**

The stock price follows a sideways trend if there is equilibrium between supply and demand; this period is called the "equilibrium period". Here everyone, including technical analysts are in a state of confusion, neither buying nor selling affects the trend (the market is trendless), the market always enter in the sideways trend with horizontal peaks and troughs to switch

from the **"Downtrend"** to the **"Uptrend"**. From the above example in the Figure (5): the "Sideways Trend" starts from April (1996) to April (1997).

Figure (5): Example of a "Sideways Trend" with horizontal peaks and troughs

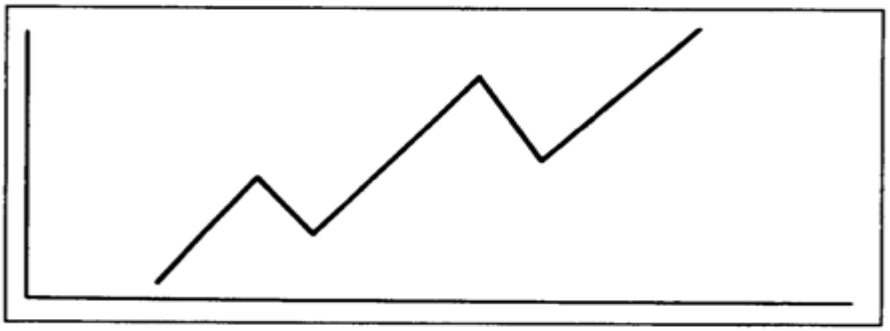


Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.50**

c) **Stock Moves: "Uptrend".**

It is the recovery of stock prices and tendency to rise again, when prices enter to the "Uptrend" with ascending peaks and troughs, here buying is the best strategy, and with the success of the good information or news to the market, prices continue to rise, which leads to an increase in the market index as a whole. Therefore the general movement of this market is upward. The above example in the Figure (6): the "Uptrend" starts from the summer of (1997).

Figure (6): Example of an "Uptrend" with ascending peaks and troughs



Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.50**

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Chapter Two:

Technical and Fundamental Analysis

* The Technicians (chartists)

Introduction:

In the stock markets; Investors, speculators, and brokerage companies attempts to find a method to predict future stock prices to take the best decisions; usually they use two famous methods: (1) the Technical Analysis, was based on the analysis of historical stock price movement in the short term periods (days, months), this analysis use charts. (2) The Fundamental Analysis, to investigate the stock value, this method applied for the long periods (years) and use the analysis of economic and financial factors. In this part of the research, we highlight to this types, to know which method is more credibility and effective.

2.1. The Technicians (Chartists):

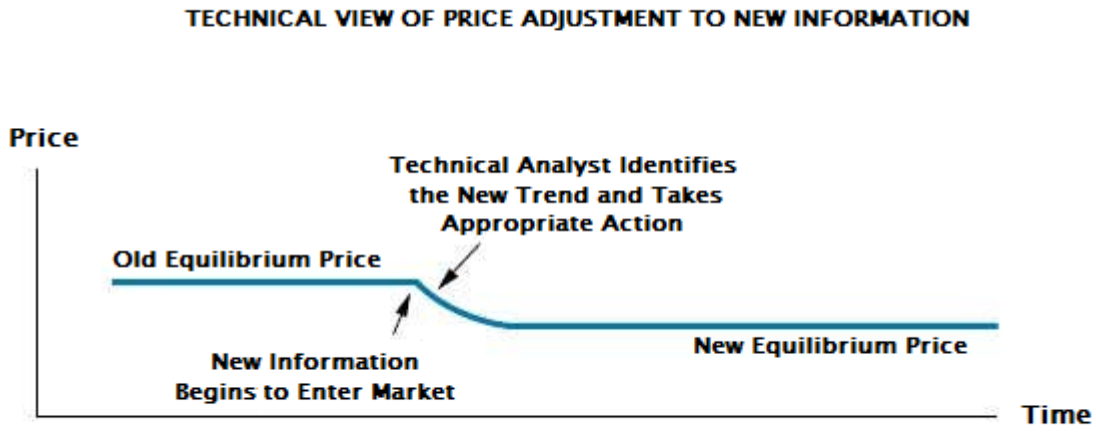
The Technical Analyst (Chartism) is a method focuses on the study of Stock Prices changes over the Past Period, as Technical or (Chartists) attempt to find the pattern in which the price of that stock evolves, to predict the future prices; So, The idea of technical analyst is associated with the past prices to make the right investment decision and thus the appropriate time to buy or sell a stock. According to (ROBERT D. EDWARDS; JOHN MAGEE; W.H.C. BASSETTI*)"**The term "technical," in its application to the stock market, has come to have a very special meaning, quite different from its ordinary dictionary definition. It refers to the study of the action of the market itself as opposed to the study of the goods in which the market deals. Technical Analysis is the science of recording, usually in graphic form, the actual history of trading (price changes, volume of transactions, etc.) in a certain stock or in "the Averages" and then deducing from that pictured history the probable future trend**"* (Edwards, Magee, & Bassetti, 2007, p. 4);Another definition of technical analysis:(MALKIEL, BURTON GORDON) in his book "A Random Walk Down Wall Street" defined the technical analysis as:***"Technical analysis is essentially the making and interpreting of stock charts. Thus, its practitioners, a small but abnormally dedicated cult, are called chartists or technicians. They study the past—both the movements of common-stock prices and the volume of trading—for a clue to the direction of future change. Many chartists believe that the market is only 10 percent***

logical and 90 percent psychological" (Malkiel, 1999, p. 119); While the definition of (EUGENE FAMA), which is one of the most opponents of the effectiveness of the technical analysis*: "**The basic assumption of all the chartist or technical theories is that history tends to repeat itself, that is, past patterns of price behavior in individual securities will tend to recur in the future. Thus the way to predict stock prices (and, of course, increase one's potential gains) is to develop a familiarity with past patterns of price behavior in order to recognize situations of likely recurrence. Essentially, then, chartist techniques attempt to use knowledge of the past behavior of a price series to predict the probable future behavior of the series. A statistician would characterize such techniques as assuming that successive price changes in individual securities are dependent. That is, the various chartist theories assume that the sequence of price changes prior to any given day is important in predicting the price change for that day**"*(Fama, 1965, p. 2)

The technicians examine the previous price and volume data in order to analyze the previous direction of the market, so that they can determine the future direction of the shares and the market as a whole, and the technicians rely on this on some assumptions, namely: (1) The interaction of supply and demand leads to the determination of the market value of any commodity. (2) There are logical and illogical factors (economic variables, opinions ...) that govern this supply and demand. (3) Stock prices take specific directions and for a long period of time. (4) Market supply and demand causes a change in these trends. (Reilly & Brown, 2002, p. 626)

According to (Frank Reilly and Keith Brown) the two assumptions (1) and (2) are accepted by all analysts, they admit that supply and demand influencing on the price of any commodity, on other hand they admit that there are many variables governs this supply and demand. While, the third assumption

Figure (7): Technical view of price adjustment to new information



Source: Reilly, K. F., & Keith, B. C. (2002). Investment Analysis and Portfolio Management . *7th The Seventh Edition, Publisher: Cengage Learning* , P.627

According to Figure (7) we note we note the following:

With the arrival of new available information about the stocks to the markets, the direction of the old equilibrium price of these stocks changes up or down, this process takes some time until it reaches the new equilibrium price (the stock price adjustment is not rapid). The technical analyst looks for the beginning of the movement of change from the old equilibrium price towards the new equilibrium price before the price adjustment, and when this change is detected, it can to predict the future price. (As a reminder: the efficient market hypothesis often abolishes the period between the old and new equilibrium prices, which obstruct the technical analysts work)

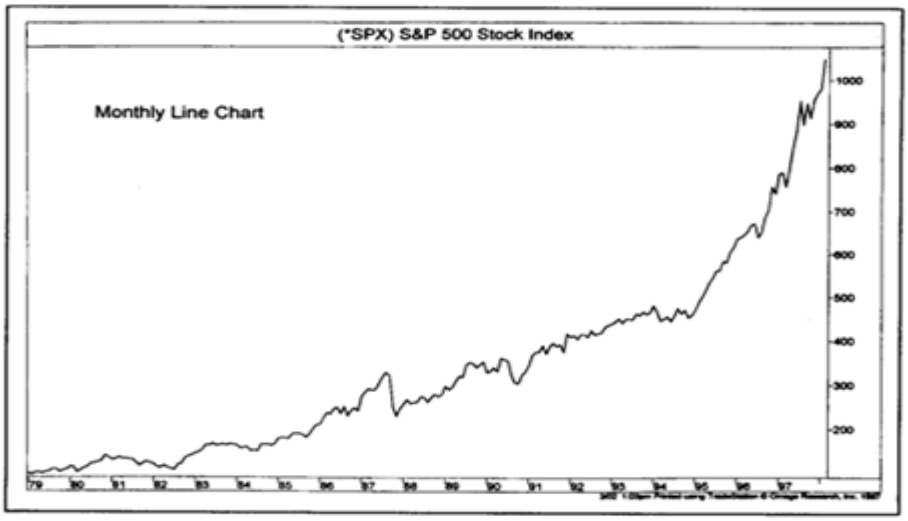
Basic of the Technical Analysis:

According to (Murphy, 1999, pp. 2-3) the technical analysis is based on three premises are:

- The market action discounts everything.
- Price moves in trends.
- History repeats itself.

1- The market discounts everything: The technical analyst stems from the saying that everything affects the stock price, because all psychological, political and economic events affect the stock prices, and based on this principle, the technical analysis is based on the idea of analyzing the price movement, which is related to supply and demand. the higher prices mean more demand than supply; while, if prices fall it is due to higher supply over demand, technical analysts charts are only reverse the psychology of the market (up or down).
2- Price moves in trends: This second premise means that technical analysts believed that there is a real direction for the movement of stock prices, be determined by trends through mapping in order to keep track of the real trend and predict the future movement of prices. Proponents of this analysis and believes that the continuation of the price movement in a particular direction is greater than the movement of reflection, and technical analysts see the need to follow that direction in order to give a signal to the reflection of the price.

Figure (8): Example of an uptrend



Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.4**

3- History tends to repeat itself: This last premise is based on the human psychology, the technical analysts see that the past price charts, and the past trend of market psychology up or down can be repeated in the future, due to human psychology cannot change, and therefore the past trends can be repeated in the future, so the technical analysts study of the past is a major premise of prediction the future price trend.

Price Fields:

In order to be able to predict the future stock prices, technical analysts attempt to determine the price and volume. Which are related by some fields as follow: (Achelis, 2005, pp. 5-6)

- **Open:** The opening price is the price that stock first trades, when the stock market opens on a trading day; usually, the opening stock price is not identical to its closing stock price of previous day. The technical analysts use this price in analyzing data as previous consensus price.

- **High:** the highest stock price means that there are more sellers (of stocks) than buyers, in this price, stock traded in the highest price of all time of day. This point represents the high price that buyer was willing to pay to Seller.

- **Low:** In this point of price, stock traded in the lowest price of all time of day, this price represents the time where buyers buy stocks at lowest price, technical analysts interest at this price to predict the future stock prices.

- **Close**: In parallel to the opening price, the closing price is the price that stock last trades in a trading day; this price is the most used by technical analysts, the charts used in the analysis show the relationship between the opening price and the closing price.

- **Volume:** on the other hand, technical analysts attempt to determine the volume, that represents the number of stocks that were traded in a trading day; they analysis the daily data of volume and its relationship with the price.

- **Open Interest:** Is an indicator that represents the sum of futures or options (long and short) that unclosed or expired.

- **Bid:** The Bid price is the price which is offered and pay for a stock by the market makers. Usually, this price is lower than an asking price.

- **Ask:** an asking price is a price that market makers accepted, often, the buy or the sell was between the bid price and the asking price (no higher than Bid and no lower than ask).

Not all of these price fields are available for all security types.

Table (01): The typical fields that are reported for several security types

Table ()

	Futures	**Mutual Funds**	**Stocks**	**Options**
Open	Yes	No	Often	Yes
High	Yes	Closed end	Yes	Yes
Low	Yes	Closed end	Yes	Yes
Close	Yes	Yes (*NAV)	Yes	Yes
Volume	Yes	Closed end	Yes	Yes
Open Interest	Yes	N/A	N/A	Often
Bid	Intraday	Closed end	Intraday	Intraday
Ask	Intraday	Closed end	Intraday	Intraday

*Net Asset Value

Source: Achelis, S. B. (2005). *Technical Analysis from A to Z.* /: Vision Books; New edition P.9

2.1.1. The Dow Theory

Charles Henry Dow (1851-1902) As well as being the founder of Dow Jones Industrial Average with his partner Edward Jones in 1884. He developed one of the earliest theories regarding technical analysis; it was the basis of this analysis. He invented the stock market averages, in his writing in Wall Street Journal; Charles Dow developed his theory in (1900). He never used the term "Dow theory" in his works. Following Dow's death, his successor, as editor of the Journal, William P. Hamilton (1922), Rhea Charles and George Schaefer organized and formulated the Dow papers into the "Dow Theory"(Shaharudin, Michael, Akmal Hisham, & Chong Wen, 2018, p. 47), Look William Peter Hamilton (1922) in his book "The Stock Market Barometer", Robert Rhea (1932) his book "The Dow Theory"(Griffioen, 2003, p. 4)

Definition:

> ***"Dow's theory is fundamentally simple. He showed that there are, simultaneously, three movements in progress in the stock market. The major is the primary movement, like the bull market which set in with the re-election of McKinley in 1900 and culminated in September, 1902, checked but not stopped by the famous stock market panic consequent on the Northern Pacific corner in 1901; or the primary bear market which developed about October, 1919, culminating June-August, 1921. It will be shown that this primary movement tends to run over a period of at least a year and is generally much longer. Coincident with it, or in the course of it, is Dow's secondary movement, represented by sharp rallies in a primary bear market and sharp reactions in a primary bull market. A striking example of the latter would be the break in stocks on May 9, 1901...Concurrently with the primary and secondary movement of the market, and constant throughout, there obviously was, as Dow pointed out, the underlying fluctuation from day to day..."***(Hamilton, 1922 , pp. 4-6)

According to William P. Hamilton and Robert Rhea, Dow identified three movements in the stock market**:** (Schannep, 2008, pp. 6-8)

1- The first: The major, is the primary movement (over a period of at least a year and is generally much longer).
2- The second: The Secondary movement (represented by sharp rallies in a primary bear market and sharp reactions in a primary bull market).
3- The third: The underlying fluctuation from day to day (Concurrently with the primary and secondary movement of the market).

The basic tenets of Dow Theory:

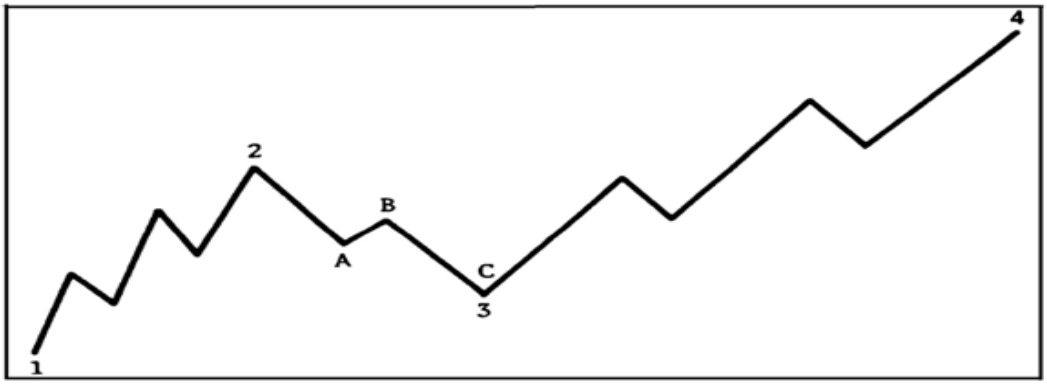
The "Dow" theory was built on basic tenets, that formed the way to the technicians to analyze information and forecast the future stock prices, and these tenets remain the foundations of technical analysis:

1- The Averages Discount Everything: The first tenet of the "Dow" theory states that averages reflect all the details (small or large) events of the market, and there is no need to add anything to these averages. (This definition does not make a market efficient; it means that there is a fast response). Although natural events and calamities cannot be predicted, but this hypothesis believes that the market reaction to those disasters is rapid.
2- The Market has three trends: *"**Dow defined an uptrend as a situation in which each successive rally closes higher than the previous rally high, and each successive rally low also closes higher than the previous rally low. In other words, an uptrend has a pattern of rising peaks and troughs. The opposite situation, with successively lower peaks and troughs, defines a downtrend**"*(Murphy, 1999, p. 25).Dow said that price trend line has three parts (1) The primary part, (2) The secondary part, is corrections of the primary part lasts from three weeks to three months, (3) The minor part, is fluctuations of secondary part lasts less than three weeks.

Example: According to Figure (09) we note

- The major uptrend: was in the four points (1), (2), (3) and (4)
- The secondary correction: represented by the wave (2) and (3)
- The minor waves: in secondary correction, represented by the wave (A), (B) and (C).

Figure (09): The three degrees of trend: major, secondary, and near term



Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.53**

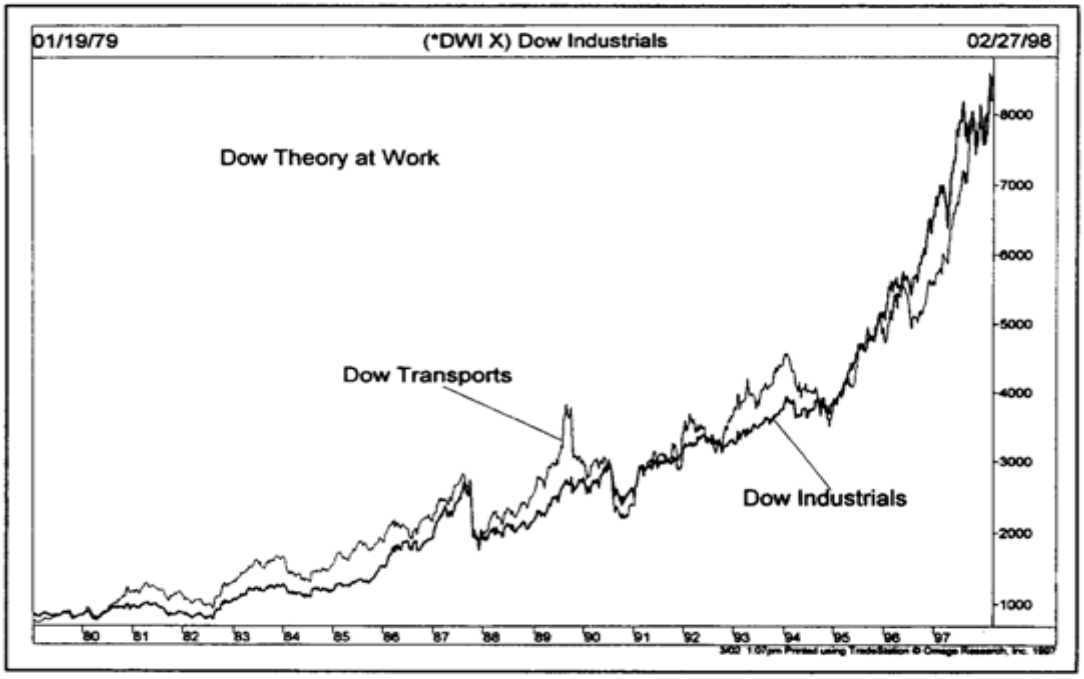
3- Major trends have three phases:

According to the Dow's theory; the Major trends have three phases:

- An accumulation phase: from this phase, investors buy based on their information collected; this process occurs during a downtrend, with the assurance that the market is absorbing all the bad information.
- A public participation phase: named the catch-up phase, this process will take place after conditions improve a little, public will participate to the technical analysis.
- A distribution phase: It is the last phase, when good news begins to enter to the markets, conditions improve, and everyone is willing to these markets.

4- The averages must confirm each other: "Dow" believes that all averages confirm each other, i.e. all averages should give signals (at same time) that the market is in an uptrend or that it is in a downtrend (Dow built this idea through relationship between industrial average and rail average: a signal change in trend of industrial average has to be confirmed by the rail average).

Figure (10): The Dow Industrials and the Dow transports must advance together



Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.28**

5- Volume must confirm the trend: "Dow" believes that the volume must always accompany the major trend, for example: if the major trend is upward, the market volume must be on the rise because the prices are rise, and if the prices in decline, the volume must be in the direction of decline. On the other hand, if the major trend is downward, the volume must be in the direction of decline if the prices rise. And in rise if the prices decline.

6- A trend is assumed to be in effect until it gives definite signals that is has reversed: One of the "Dow" rules is that the market trend will always remain in its continuous form, and it does not change except by the action of external forces. There is a group of signals that predict a change in the direction of them (support and resistance, moving averages ...). On the continuation of the current trend of the market. Hence, it is difficult to differentiate between the direction of the secondary correction and the first indication of a change in the direction of the market as a whole towards the opposite direction.

2.1.2. The Technical analysis categories:

We can classify technical analysis into four categories: (Faerber, 2008 , pp. 153-176)

- **Charts.**
- **Market indicators.**
- **Trends.**
- **Structural theories.**

A) The Charts

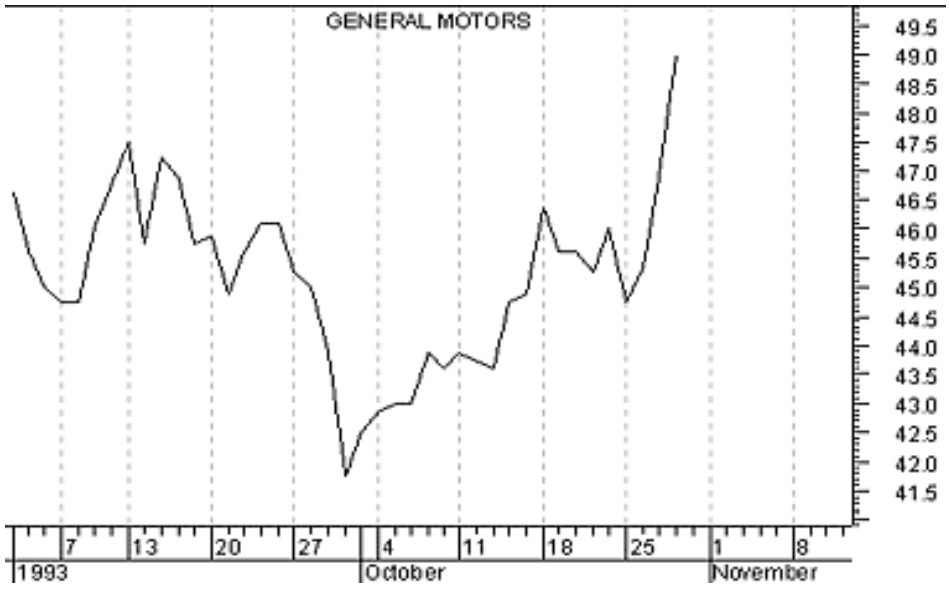
According to Achelis:

"The foundation of technical analysis is the chart. In this case, a picture truly is worth a thousand words"
(Achelis, 2005, p. 15)

a) Line charts.

The first type of charts is the line chart, represents the stock's daily closing price, this chart displays the date in the bottom, and the prices on the side of chart. This type of charts is simple, uncluttered and easy to understand.

The Figure (11): GENERAL MOTORS line chart

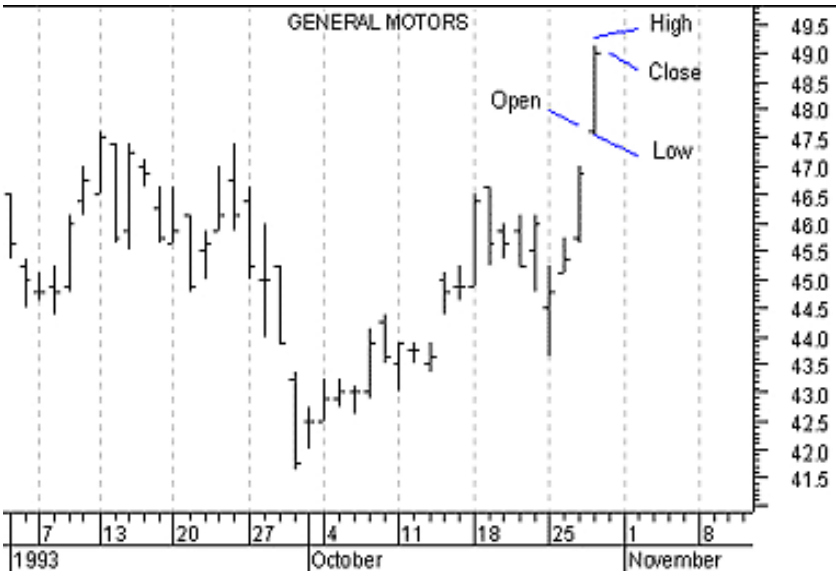


Source: Achelis, S. B. (2005). *Technical Analysis from A to Z.* /: Vision Books; New edition P10

b) Bar charts.

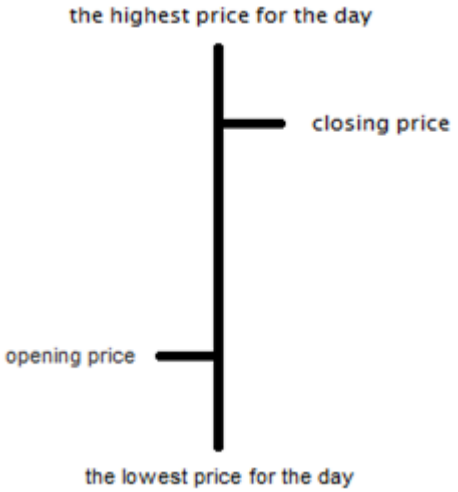
The second type is the Bar chart, displays the opening price, the highest, the lowest, and the closing price of stock.

Figure (12): GENERAL MOTORS Bar chart



Source: Achelis, S. B. (2005). *Technical Analysis from A to Z.* /: Vision Books; New edition P.11

Figure (13): Bar. (of chart)



Source: Becket, M., & Essen, Y. (2010). *How the stock market works : a beginner's guide to investment* . Great Britain: The third Edition, Typeset by Saxon Graphics Ltd, Derby Printed and bound in Great Britain by Bell & Bain Ltd, Glasgow. P.138

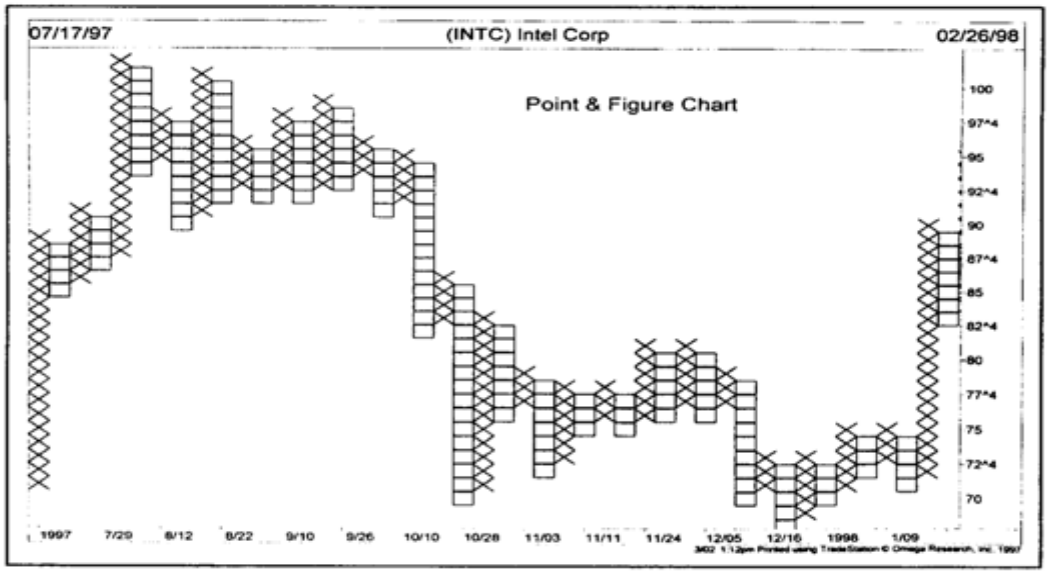
According to this Figure we note:

- The highest price: represented by the top of each vertical bar (the highest stock price traded during the period).
- The lowest price: represented by the bottom of the bar (the lowest stock price traded during the period).
- The closing price: represented by a "tick" on the right side of the bar (the last stock price traded during the period).
- The opening prices: If are available, represented by a "tick" on the left side of the bar (the opening stock price traded during the period).

c) Point and figure chart:

Unlike the previous two types, the third type (Point and Figure charts) display only the prices changes (it disregard the time), This method was developed by "Victor de Villiers" 1933 " in his book "The Point and Figure method of Antisipating Stock Price Movements". In these type of charts the price changes are on both axes (in the column X i.e. rise price and the column O i.e. decline price).

Figure (14):Point and Figure chart



Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.38**

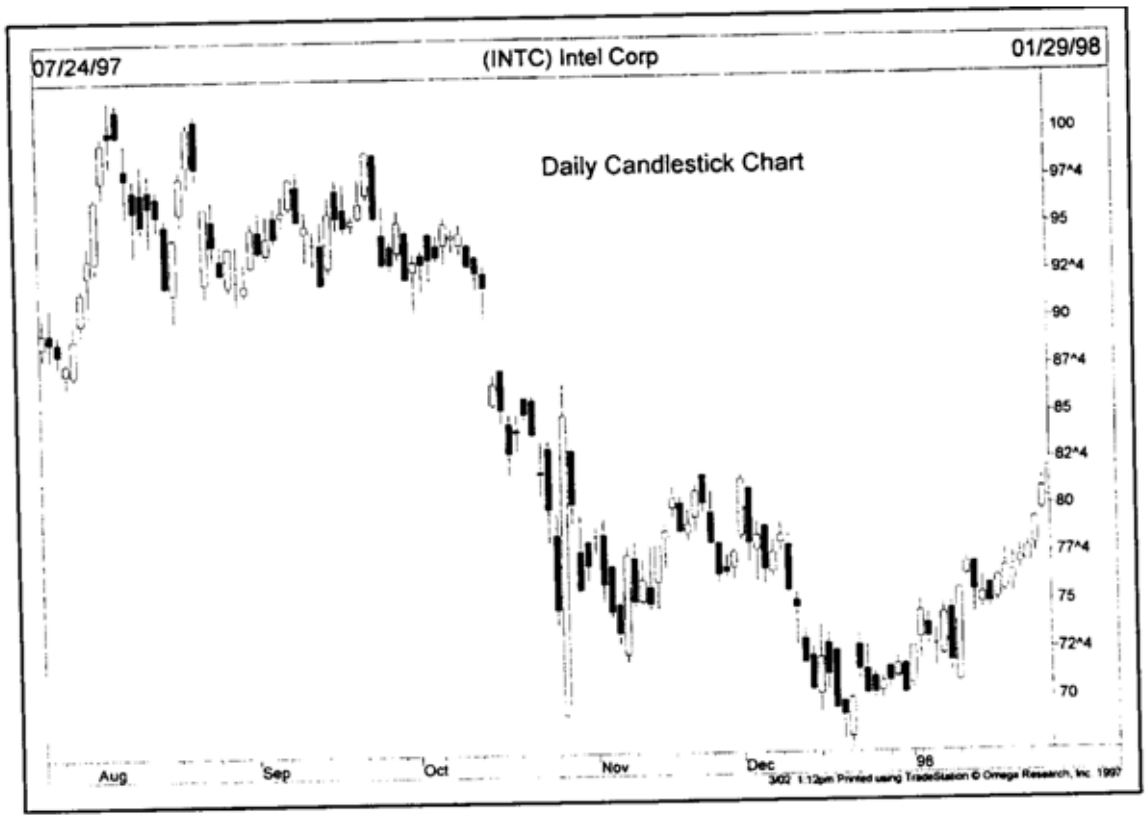
d) **Candlestick Charts.**

In Japan, the Japanese used candlestick chars since 1600s as a technical analysis method of rice contracts prices. This method was developed by Steven Nison as a famous method of analysis. Candlestick charts is not a calculation method; but it interpret the relationship between the opening and closing prices.(Becket & Essen, 2010, pp. 139-140)

As the Bar chart, Candlestick displays The opening price, the highest, the lowest, and the closing price of stock, but in Candlestick charts there is a line (the shadow) represents the daily range between the highest price and the lowest; on the other hand, there is the (real body), is the range between the opening price and the closing.

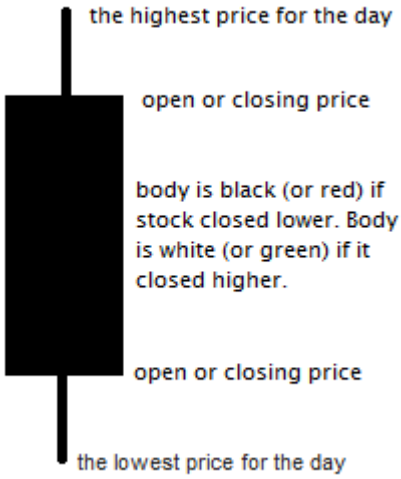
- The (real body) is white (positive) if the closing price is higher than opening price.
- If the opposite, the (real body) is black.

Figure (15):Daily Candlestick Chart



Source: Murphy, J. J. (1999). ***Technical Analysis Of The financial markets - A comprehensive guide to trading methods and applications.*** **New York: New York institute of finance. P.39**

Figure (16): Candlestick.(Of Chart)



Source: Becket, M., & Essen, Y. (2010). *How the stock market works : a beginner's guide to investment* . Great Britain: The third Edition, Typeset by Saxon Graphics Ltd, Derby Printed and bound in Great Britain by Bell & Bain Ltd, Glasgow. P.142

B) Market indicators:

Technical analysts use the market indicators to try knowing the future direction of the markets and predict the future price movement of stocks. Among the most important indicators they use are:

a) Daily volume:

In a stock market, the technical analysts show the volume and the prices as an indicator of supply and demand. Although is very difficult to correlate the daily volume and the prices to determine the stock market trend, they assume: (1) If the daily volume increases, and the prices rise; it means that there is more buying than selling; so, we will be in an upward trend. (2) If the daily volume increases, and the prices decrease, it means: we have increasing of sellers numbers. Here, we are in a downtrend. (3) If the volume decreases and the prices increase, it means that we are in a weak market. (4) If the volume decreases and the prices decrease, it means that the investors do not sell their stock.

b) Breadth of the market:

Technical analysts use the "Breadth of the market" indicator to measure the number of bullish or descending stocks to infer the future trend of the market. The technical analyst monitors the rising stocks, the declining stocks and the stable stocks for a trading day. He believes that the market will be stronger if the number of rising stocks is more than the low stocks.

c) New highs and lows:

The daily new highs and lows on stock price are a good indicator that technical analysts rely in their forecasts of the future price development, where the analysts monitor the new prices, whether the highest or lowest stock prices throughout the year. The results say that if the number of stocks that recorded the highest price exceeds their counterpart that recorded the lowest price, the analysts will be optimistic to the future of the market and its next trend.

d) Short-Interest Theory:

It is one of the approaches that technical analysts use to distinguish between the strength and weakness markets, we mean by "short-interest" is a measure of the total stocks that investors have sold "short", so the high number of "short-interest" deals is considered a progressive indicator, because in the end the short seller will have to buy back shares again, which leads to raise the prices.

e) Barron's Confidence Index:

This index measures investor's confidence in the stock market, it compares the yield on higher quality bonds that rated (AAA) to the yield on lower quality bonds rated (BBB). The index is used to predict the movement of bond prices, according to formula:

Barron's Confidence Index = (yield on 10 top-grade bonds / yield on 10 intermediate-grade bonds) x 100

Generally, the Barron's Confidence Index trading range is between 80% and 95% (If the index drops to 80%, the confidence in the economy and the markets drop, and the outlook for prices are bearish).

f) Insider Trading:

Another indicator used by technical analysts is to monitor the trading decisions of company officials, directors, and major shareholders (who hold more than 10% of the company's stocks). Analysts link these decisions to the inside information this group hold. This is called "insider trading". Analysts rely on the general rule that says: if the company officials, directors, and major shareholders are purchasing their company's stocks, it is a signal for higher prices, while, if they sell their stocks, it is a bearish signal. (Magazines and newspapers publish permanent reports about the inside information and the trading of this group).

g) Odd-Lot Theory:

Small investors buy and sell individual stocks, the supporters of the "Odd-Lot Theory" recommend taking the opposite decisions of these inexperienced investors i.e. if the individual investors buy stocks, the theory recommends selling stocks, while, if these individual investors sell their stocks, here, the theory recommends to purchase. Many Journals report odd-lot trading every day, also, the technical analysts calculate the Odd-lot ratio according to the below formula (This ratio range between 0.6 and 1.4)

Odd-lot ratio = odd-lot purchases/odd-lot sales

For example: when the small investors are enthusiastic about "buy" trading, the "Odd-lot ratio" approaches to the upper limits (1.4), here, the technical analysts assume that the stock market becomes a bear market, and best decision is " to sell"

h) Investment Advisory Opinions:

Technical analysts recommend opposing the "investment advisory opinions" about predicting the future stock market trend. They believe that a bullish "buy" trend is the best

if the advisers see that the market will fall, while technical analysts say that the market is in a downtrend if most advisors assume that it will rise. It is strange to note that this theory is similar to previous theory "Odd-Lot Theory", but it is possible that the theory of "investment advisory opinions" is the result of a war of interests between the technical analysts and the investment advisors**.**

i) Mutual Fund Cash Position:

To determine the direction of the markets, technical analysts study mutual funds and look at the amount of cash in them which is especially related to the size of the total investments, and they evaluate the potential purchasing power of these funds. The mutual Fund should hold from 5% to 25% of their assets in cash, if the percentage increases and approaches 25%, the market will recover due to that investment of cash. In, the mutual fund cash position is one of the market direction indicators that technical analysis uses.

j) Relative Strength Ratio:

Many technical analysts focused their research on forecasting future prices on the idea of "Relative Strength Ratio", which means comparing the price of a particular stock with the price of another stock, index, or other market, in order to choose the best performance. "Relative Strength Ratio" chart is created by plotting daily stock prices for a period, bearing in mind that the original investment is the same for both stocks.

C) Trend methods:

The technical analyst searches for the trend that the market will take in order to move with it in the same direction until the market changes its trend, for example: If the technical analyst realizes that the market is in uptrend, here, the buying is the best decision, while, if the opposite happens, when the market is in a downtrend, the selling is their option.

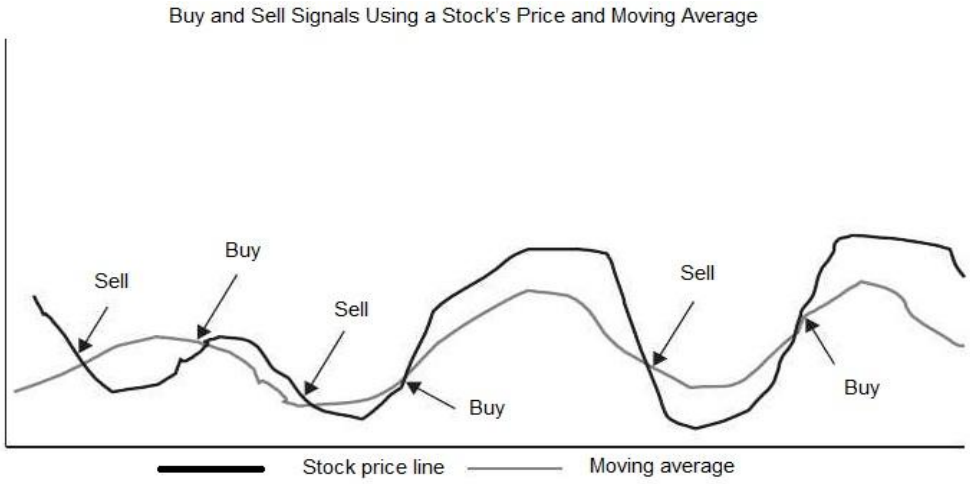
One of the most important methods that technical analysis uses in determining the trend of the market is the "Moving Average". It is called the moving average because it is an average over time. (Remind: the "Average" is add up all the numbers divided by how many number used). The moving average is calculated by the following formula:

If the closing price on day 11 is (x_{11}**)** dollars per share. The 10-day moving average = 10-day moving average (**X moving average**) dollars continuing this method of adding the next day's price (x_{11}) and dropping the oldest day's price (x_1).

So, according to this formula we can calculate any "Moving Average" from every length of time for: 20, 50,100, or 200 days etc, and plot this "Moving Average" to show the graphic trend.

According to the Figure () below, if the "Moving Average" line crosses the "Stock Price Line", this indicates a change in trend. Technical analysts studied to the crossovers of "stock price line" with the "Moving Average", they assumed that the crossing and rising of "stock price line" above the "moving-average" line indicates a buy signal. While, when the "moving average" line crosses and rises above the "stock price line", which indicates a sell signal.

Figure (17): Buy and Sell Signals Using a Stock's Price and Moving Average



Source: Faerber, E. (2008). ***All about stocks, the easy way to get started.*** **New York: The Third Edition. New York: McGraw-Hill. P.174**

D) Structural theories:

One aspect of technical analysis is structural theories that technical analysts use to monitor the repetition of previous price patterns. These analysts assume that this repetition of patterns is regular over long periods (ranging from minutes and hours to years and decades) that will help to predict the stock market trend. In this section we will briefly discuss the two most important structural theories, namely: The "Seasonal Patterns" and "Elliott Wave". (Faerber, 2008 , pp. 174-176)

a) Seasonal Patterns:

Through their constant monitoring of the market, technical analysts have detected regular seasonal patterns of prices changes, for example: Technical analysts after observing the Dow Jones Industrial Average monthly, they recorded seasonal patterns that occur in December, January, July and August. In the end of December, investors try to get rid of stocks to avoid "taxes", which plummets prices, while, in the beginning of the new year, investors seek to buy back the small stocks again, which raises their prices. This is named the "January effect" theory.

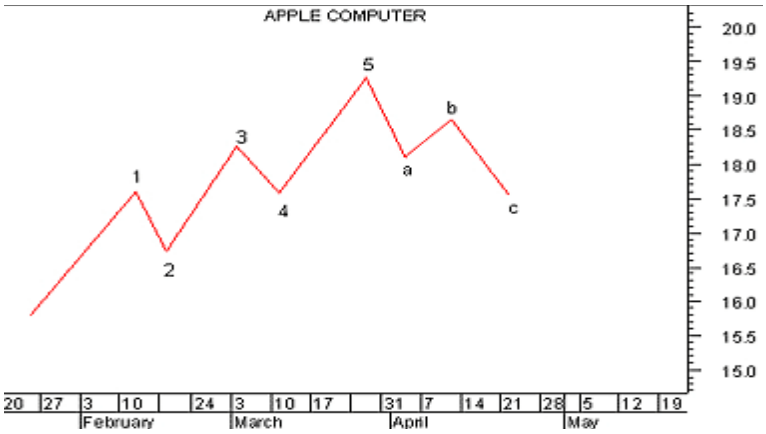
Another seasonal regular theory presented by technical analysts is that stock prices grow during the summer months (June, July, and August), many studies supported this theory and confirmed the existence of a "summer gathering event", which gives the impression that prices can be predicted during the summer months.

Finally, technical analysts claimed another theory called the "weekend effect"; they assumed that prices rise at the end of the week (Friday), and decrease at the beginning of the week (Monday), which encourages investors to sell at the end of the week.

b) Elliott Wave Theory:

Ralph Nelson Elliott provided an important theory in the technical analysis named "Elliott Wave". Elliott based his theory from the "Dow" rules. He observed a repetitive pattern of waves when he tried to predict future stock price. Elliott said that stock prices trend take a five-wave sequence when they are following a major trend, while, it take a three-wave when it move against the major trend. As shown in the following figure:

Figure (18):Elliott Wave

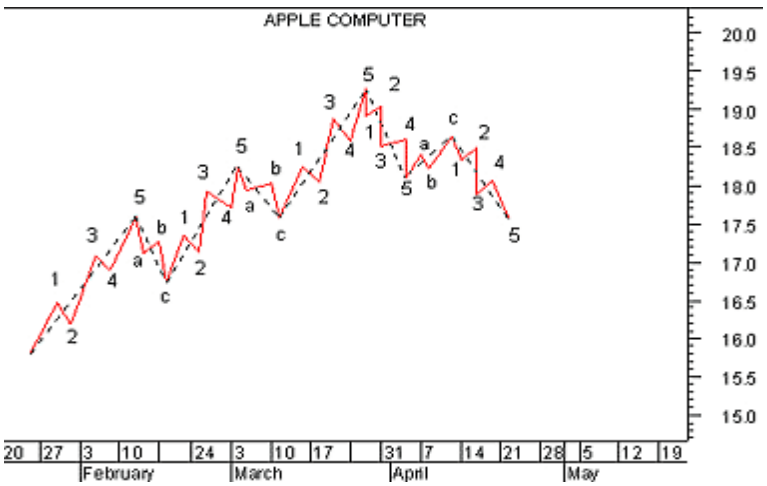


Source: Achelis, S. B. (2005). *Technical Analysis from A to Z.* /: Vision Books; New edition P.136

According to the Figure (18), the "Elliott Wave" consists of:

- There are five-wave sequences in a major trend: (1), (2), (3), (4), and (5)
- There are three-wave in against the major trend: (a), (b), and (c)
- The waves (1), (3), and (5)are called "impulse waves".
- The waves (2) and (4)are called "corrective waves".
- The waves (a), (b), and (c) always move in the opposite direction of waves (1), (2), (3), (4), and (5)
- Each wave within a wave count contains a complete (5)-(3) wave count of a smaller cycle, as follows:

Figure (19): How (5)-(3) waves are comprised of smaller cycles



Source: Achelis, S. B. (2005). *Technical Analysis from A to Z.* /: Vision Books; New edition P.136

Interpretation of Elliott Wave:

The mathematical formulation of Elliott theory is related to Fibonacci numbers sequence, which starting at 1 and adding the previous number to arrive at the new number (i.e., 0+1=1, 1+1=2, 2+1=3, 3+2=5, 5+3=8, 8+5=13, etc) each Elliott's cycle should falls in Fibonacci number sequence.

According to the above Figures we note the following:

- Two primary waves: an impulse wave and a corrective wave.
- Eight intermediate waves: the (5)-(3) sequence shown in the first figure.
- (34) Minute waves.
- The numbers (2), (8), and (34) fall within the Fibonacci numbering sequence.

In sum, the technical analysts believe that the binary (Elliott wave) and (Fibonacci numbers) help to predict the future market moves and their temporal dimension.

Applications of technical analysis:

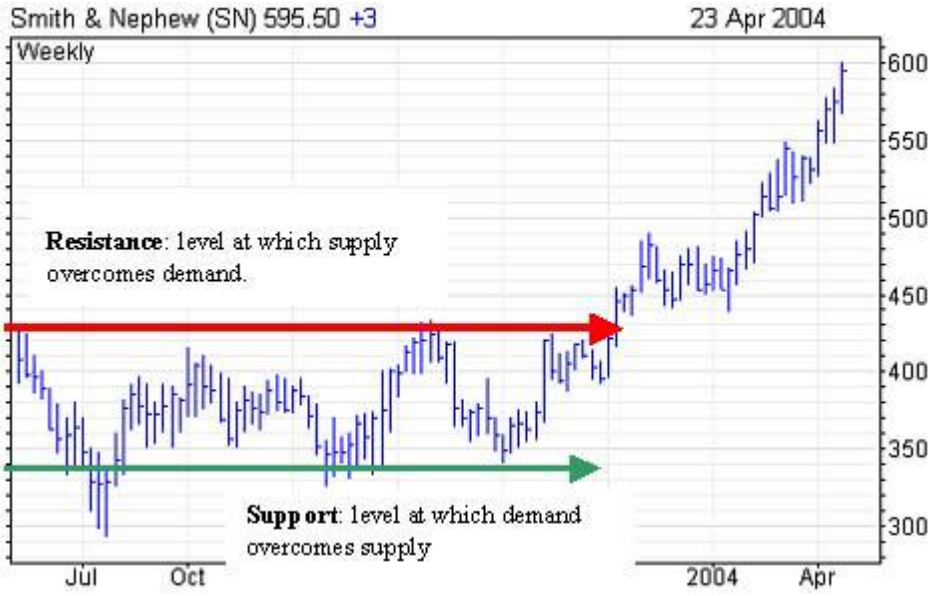
Technical analysis provides an important approach in finding a pattern in which stock prices evolve in the future based on the study of past price changes, in order to make the right investment decision. So, we'll introduce the most important applications that technicians use in their approach:

Support and Resistance Levels: Is one of the most important rules of technical analysis, applied by technicians to predict the price trend to make a decision right investment, whether to buy or sell. (1) The support level: -also called a floor- is the level where "the buying decisions pressure that is strong overcomes the selling decisions pressure" i.e. is the zone where the demand for stocks overwhelms the supply. So, the stock prices will stop its decline then it maybe rise. (2) The resistance level: -also called a ceiling- is the antithesis of the support level, the resistance applies where the stock supply overwhelms the stock demand. In this zone "the selling decisions pressure that is strong overcomes the buying decisions pressure". In sum, the support and resistance levels are mini-levels transform over time into clear emerges levels, then the stock prices range between a support and resistance, and every old resistance is a potential level of support; while, the old support becomes new resistance, that is similar to live between floors and ceilings in a building.

Generally, studies show that the technical analysts (Technicians) can make some predictions for applies the "resistance" when they have uptrend or the "support" when declining trend.

The following Figure shows the Support and resistance levels:

Figure (20): The sideways trading range in Smith & Nephew during 2003



Source:www.investorsintelligence.com 16/08/2019

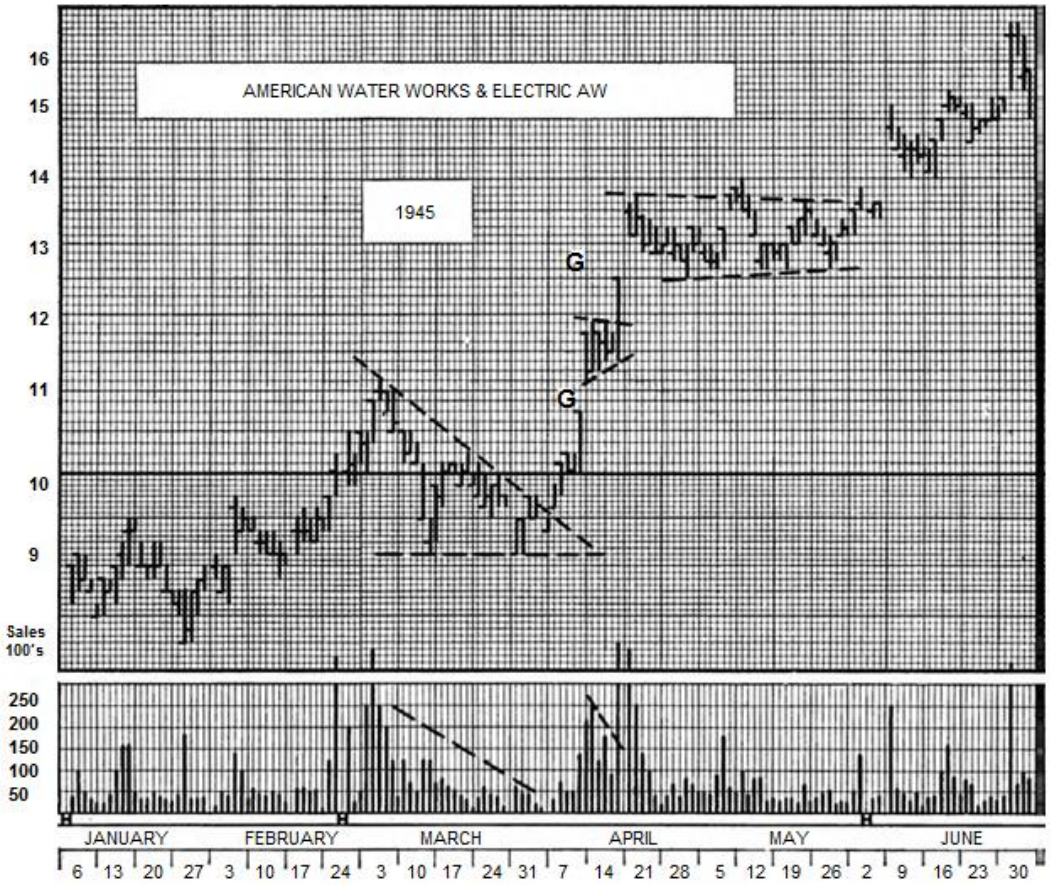
Gaps:

Another application of the technical analysis we will find it in the "**Gaps**". Sometimes, we see in the daily graph the occurrence of a vacuum resulting from No-touch on the horizontal level, due to the fact that the lowest price of the stock being traded is higher than the highest price that was traded on the previous day, this is the "gap" concept. Many rules have emerged to explain the "gap", which varied between correct and myth that said: "a gap must be closed", which led to laying a rationale for the theory for use in trading. So, what do we mean by “closing” or “covering” a gap? "A gap is closed when a subsequent price trend comes back and enters to the range of the gap". Although many gaps never will be closed.

In sum, the analysis of the “closing” a gap leads to talk about"a stock’s returning to any price range at which it has once been traded", some gaps are useful to the technical analyst

to predict the future trend when they use the following gaps: Common or Area Gaps, Breakout Gaps, Continuation or Runaway Gaps, and Exhaustion Gaps.

Figure (21): Gaps. G



Source: Edwards, R. D., Magee, J., &Bassetti, W. (2007). *Technical Analysis of Stock Trends.*the United States of America. the Ninth Edition, Taylor & Francis Group, LLC, Printed in the United States of America. P.213

Chapter Two:

Technical and Fundamental Analysis

* The Fundamentalists

2.2. The Fundamentalists:

Unlike the Technical analyst; The Fundamental analysis is a study of the company surrounding situation; which is related to The Economy (The fiscal policy, The monetary policy, The national production volume, inflation, interest rates, oil prices, recessions, unemployment, etc.), The Sector to which it belongs (competition, demand/supply, technological changes, etc…), and The Situation of The Company itself (company growth, dividends, sales, profitability, lawsuits, strikes etc…). The basic principle of this analysis is to predict the profitability of Companies on the one hand, And to know the level of their risks on the other, All this to determine the future stock prices movements. The idea of fundamental analysis was born from the firm-foundation theory; many economists contributed to developing the patterns of this analysis in important writing, for example: Benjamin Graham and David l. Dodd's book "Security Analysis"; since its first version in 1934. And the second famous book of Benjamin Graham "The Intelligent Investor" In 1949. (Griffioen, 2003, pp. 2-3). Fundamental analysts spend quite a bit of time looking at economic factors, Industry components, and companies' financial statements; they use their findings to make their decisions. For example, (1) the stock investors use fundamental analysts to decide when a good time to buy or sell may be. (2) Lenders use this analysis to make sure they have the ability to pay you back when they give companies a loan by buying bonds they issue. (3) The board members using fundamental analysis will help you be a solid watchdog of the organization's management. (4) Consumers when forming a long-term relationship with a company, e.g. the relationship between consumers and the car insurance company, the fundamental analysts use to help if you plan on relying on its products for a long time etc… (Krantz, 2010, pp. 25-26).Many definitions of fundamental analysis include the levels of this analysis, the determination of the intrinsic value, and then showing the effect of this analysis on predicting the future stock price movements. According to (Bodie, Kane, & Marcus, 2013, p. 356)"***Fundamental analysis uses earnings and dividend prospects of the firm, expectations of future interest rates, and risk evaluation of the firm to determine***

proper stock prices. Ultimately, it represents an attempt to determine the present discounted value of all the payments a stockholder will receive from each share of stock. If that value exceeds the stock price, the fundamental analyst would recommend purchasing the stock. Fundamental analysts usually start with a study of past earnings and an examination of company balance sheets. They supplement this analysis with further detailed economic analysis, ordinarily including an evaluation of the quality of the firm's management, the firm's standing within its industry, and the prospects for the industry as a whole. The hope is to attain insight into future performance of the firm". [Achelis] said that there are three levels in fundamental analysis ***"Fundamental analysis is the study of economic, industry, and company conditions in an effort to determine the value of a company's stock. Fundamental analysis typically focuses on key statistics in a company's financial statements to determine if the stock price is correctly valued"***(Achelis, 2005, p. 151)**.** While, Fama's definition of the fundamental analysis was based on the intrinsic value; He said that***"The assumption of the fundamental analysis approach is that at any point in time an individual security has an intrinsic value (or, in the terms of the economist, an equilibrium price) which depends on the earning potential of the security. The earning potential of the security depends in turn on such fundamental factors as quality of management, outlook for the industry and the economy, etc… Through a careful study of these fundamental factors the analyst should, in principle, be able to determine whether the actual price of a security is above or below its intrinsic value. If actual prices tend to move toward intrinsic values, then attempting to determine the intrinsic value of a security is equivalent to making a prediction of its future price; and this is the essence of the predictive procedure implicit in fundamental analysis"***(Fama, 1965, p. 3).Fundamental analysts attempts to determine a stock value by focusing the economic, industry, and company analysis that may affect a company's future business and its prospects, believing the market to be 90 percent logical and only 10 percent psychological i.e. 10 percent care about the pattern of past price movement. (Malkiel, 1999, p. 119)

According to (Krantz, Fundamental Analysis for Dummies, 2010, pp. 25-26) many actors in the stock markets can perform the fundamental analysis:

- Stock investors: the investors in the stock markets use the fundamental analysis about companies to take the appropriate decisions and timing to buy or sell securities.
- Lenders: the lender use the fundamental analysis about companies (when he has company's bonds) to make sure that these companies have ability to pay and getting his money.
- Mutual fund investors: Sometimes the investor has mutual funds (stocks, bonds), he use the fundamental analysis to investigate the stocks that investments in this basket.
- Employees: the employee in a company uses the fundamental analysis to predict the future state of the company and its policies of costs, resources, ability to pay pension etc.
- Board members: the fundamental analysis help the board members to understand the move of money in their company, they will be good watchdogs of the company.
- Donors: the fundamental analysis help the donor in watchdog the financial standing of charities, to see his donations trends.
- Consumers: the consumer (a customer of a company) uses the fundamental analysis to evaluate the relationship with this company. For example when consumer has a car, he is forming a long-term relationship with an insurance company, it is a good idea to monitor and analyze the performance of this company to continue the relationship with it.

2.2.1. The intrinsic value:

The fundamental analysis refers to the analysis of all economic factors of the company as opposed to only analysis of its past stock prices that not fully represent the real stock value. This school of thought looking for the "real stock value", they call it "the intrinsic value", to predict the future stock prices movements. So, investors can buy at a discount. On other hand, we can differentiate between the intrinsic value and the price. It is very difficult to define this intrinsic value. According to (Graham & Dodd, 2008, pp. 64-65)***"We must recognize, however, that intrinsic value is an elusive concept. In general terms it is understood to be that value which is justified by the facts, e.g., the assets, earnings, dividends, definite prospects, as distinct, let us say, from market quotations established by artificial manipulation or distorted by psychological excesses. But it is a great mistake to imagine that intrinsic value is as definite and as determinable as is the market price. Some time ago intrinsic value (in the case of a common stock) was thought to be about the same thing as "book value," i.e., it was equal to the net assets of the business, fairly priced. This view of intrinsic value was quite definite, but it proved almost worthless as a practical matter because neither the average earnings nor the average market price evinced any tendency to be governed by the book value"***

2.2.2. The Fundamental analysis levels:

To determine the value of a company's stock, the fundamental analysis can be divided into three levels: (Achelis, 2005, pp. 151-152)

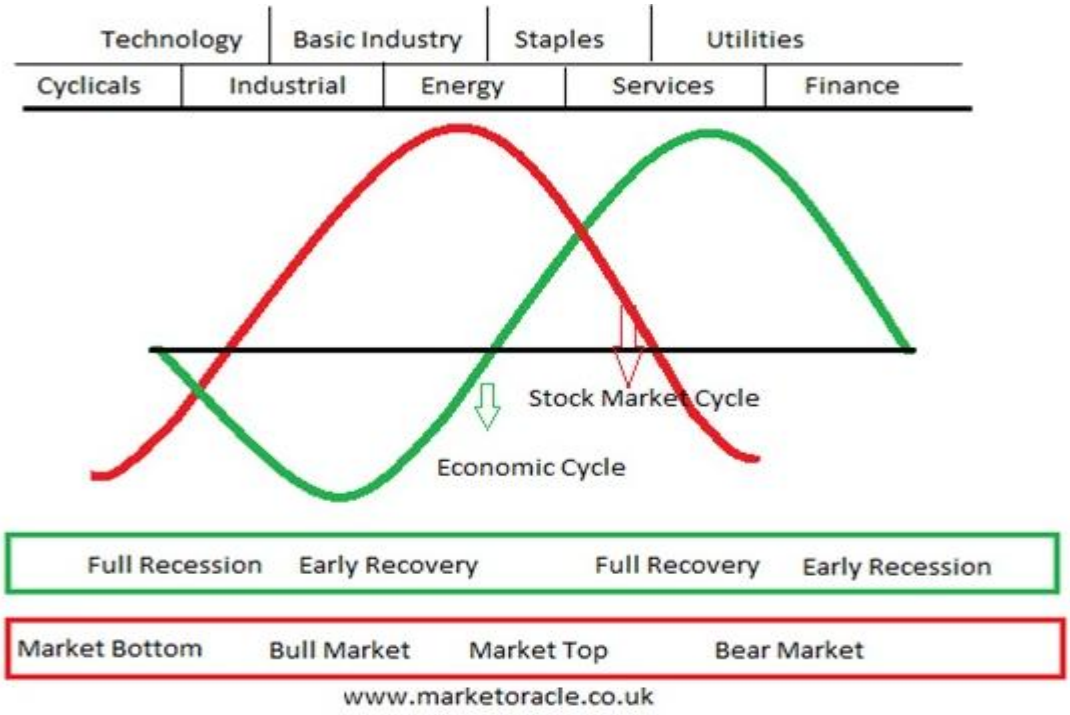
- Economic Analysis.
- Industry Analysis.
- Company Analysis.

First: Economic Analysis.

Companies operate in an environment named "Economy", the value of a company's stock affected by many macroeconomic factors e.g. Changes in inflation rates, interest rates, gross domestic product (GDP), and unemployment rate… have a positive and negative effect on this value, on other hand, the government Policies: fiscal policy (revenues and expenditures, government Spending and tax policy). And monetary policy (cash supply in banks and individuals) also affect on stocks, the fundamental analyst study this general economic situation for trying to determine these changes to predict the intrinsic value of stocks.

Many studies supported the mutual relationship between macroeconomic factors and stock market movements, i.e. there is a link between the economic cycle analysis and the stock market decisions. For example, the following figure shows this relationship, the stock market moves according to the business cycle-between six and twelve months at a time- (Francisco & Loredana, 2016, pp. 325-326)

Figure (22): Economic Cycle and Stock Market Cycle



Source:Francisco, J., & Loredana, N. (2016). US Stock Market and Macroeconomic Factors. *The Journal of Applied Business Research Volume 32, Number 1* , P.325

The "economic" factors analysis:

We'll look at some macroeconomic factors that fundamental analyst is studying in order to predict the future stock prices:(Bodie, Kane, & Marcus, 2013, pp. 560-565)

- **The Inflation Rate**:

Inflation has several concepts, which can be defined as the continuous rise in prices. It can also be defined as the increase in demand for goods without the increase in production, and we define it as a weakness in the purchasing power of consumers. Inflation is associated with "stock prices" e.g. if the inflation is high, it has a negative impact for the stock market; it leads to harm on companies and increases uncertainty. (Reilly & Keith, 2002, p. 492). But there is a possibility that in the inflation period may be offset the investors by advances in the dividends and in their stock prices. (Graham, The Intelligent Investor -The definitive book of value investing, 2006, p. 47)

- **The Interest Rate**:

Is a percentage of the principal represents the amount that lenders charges for the provide funds to borrowers. This rate is one of most important factors in the economy; it was calculated on an annual basis named the "annual percentage rate". Generally, we find the interest rate in credit markets at making the following financial operations: (1) A simple loan: should be repaid to lenders at the maturity date along with repaid an amount of interest rate. (2) A fixed-payment loan: should be repaid the interest rate for a set number of years. (3) A coupon bond: should be pay a fixed interest every year named (coupon payment) until the maturity date. We can distinguish between several of measuresto keep track of interest in the markets: (1) the yield to maturity: represents "the present value of future cash flows of a debt instrument with its value today". (2) The real and nominal interest rates: the nominal interest rate represents the rate when ignored the effects of inflation, while, the realinterest rate is accurately because we minus the expected rate of inflation. (3) The Present Value: cash flow paid next year is less valuable than paid today, so, they added the rate of interest.(Mishkin & Eakins, 2017, pp. 80-90)

- **The Money Supply**:

The money supply is the total of currency and money of various kinds circulating in any economy; it has a great impact on all economic variables (especially inflation). In general, the economists divided the money supply into(DeGennaro, 2014, p. 121):

  - M1 includes all coins and currency, plus demand deposits, which are mostly checking accounts.
  - M2 includes: M1 + savings deposits and certain small deposits with withdrawal restrictions, plus money market accounts not held by institutions and some important bank funding tools.
  - M3 is the broadest measure of the money supply. It equals M2 + all large time deposits, institutional money-market fund assets, and other large liquid assets.

- **The Gross Domestic Product (GDP)**:

The Gross Domestic Product is one of the months of macroeconomic factors that affects and is affected with all other variables of economy, we mean by the (GDP) is the total production of goods and services in the economy. The increase in the gross domestic product expands the economy and raises the activity, which leads to the opening of many opportunities for companies to increase their sales.(Bodie, Kane, & Marcus, 2013, p. 561)

- **Unemployment rate**:

Another important economic factor is the unemployment rate: this rate measures "employment" in the country and it represents the percentage (of the total labor force) of people who are qualified to work and who meet the conditions of work who have not found work yet. The high unemployment rate is a bad indicator and evidence of weak economic policies, while the registration of acceptable rates of unemployment proof that job offers are trying to meet the high demands of work.(Bodie, Kane, & Marcus, Investments, 2013, p. 561). Economists were divided unemployment as the following types: (1) Structuralunemployment when people cannot work because the economy encourages technological. (2) Institutional unemployment when there is discriminatory hiring. (3) Cyclical unemployment according to the business cycle (rise if economy is in a recession,

and if economy is growingthis unemployment falls). (4) Frictional unemployment when workers voluntarily changing their jobs. (Nagip & Adhurim, 2015 , pp. 454-455)

- **The Fiscal Policy**:

The fiscal policy is a direct tool to guide the country's economic policies, mainly rely on government spending policy and tax policy to control the existing financial situation. This policy is characterized by procedures that are generally slow and it impact limited on guiding the economy, and difficulty of controlling the economy as a whole by the fiscal policy alone;reducing the government spending or increase taxes lead to deflate the demand for goods and services, while, Raising the spending or cutting taxes revives the consumer, the market, and the economy as a whole.In sum the prudent fiscal policy lead to foster growth and develop the economy.(Bodie, Kane, & Marcus, Investments, 2013, pp. 563-564)

- **The Monetary Policy**:

Monetary policy is the parallel tool for fiscal policy, and it is an easy policy formulation and implementation that is based on "money supply" to direct the monetary position of the economy to what the monetary authorities' desire. The essence of this policy is the term "interest rates",Expansionary monetary policy lead to lower interest rates and thereby stimulate investment; but it would have undesirable effects, such as high prices. On the contrary, if we have "Contractionary monetary policy", the opposite will occur. In order to apply the "Expansionary" or "Contractionary" monetary policy we use many tools are (The open market operation; the discount rate; the reserve requirementetc). (Bodie, Kane, & Marcus, Investments, 2013, pp. 564-565)

Table (02): Estimate the relationship between the stock market and some macroeconomic variables

	GDP	CPI	IPI	Unemployment	Interest rates
Stock Market	**Positive**	**Uncertain**	**Positive**	**Negative**	**Negative**

Source:Francisco, J., & Loredana, N. (2016). US Stock Market and Macroeconomic Factors. *The Journal of Applied Business Research Volume 32, Number 1* , 328

Second: Industry Analysis.

"It is often said that a weak stock in a strong industry is preferable to a strong stock in a weak industry"

(Achelis, 2005, p. 152)

The Analysis of the Industry's Situation leads to the knowledge of the promising sectors as a result of possible future changes, future technological developments or other future effects; the stock prices are affected by the Industry situation of the company. Whether if the industry is growing or deteriorating; the analysis of information in order to try to know the Direction of Stock Prices in the future.

Industry Life Cycles Analysis:

The returns on investments, dividends and the degree of risk vary from one industry to another, as new industries entering the market have high-risk investments with high returns, while mature industries have an acceptable risk level with lower returns.

Ultimately, in any industry the industry life cycle consisted of four consecutive and continuous stages: (1) the initiation phase called Start-Up Stage (rapid growth); (2) the consolidation stage (although the less rapid but faster than general economic growth); (3) the maturity stage (growth is not faster than the general economy); (4) the relative decline or deflation stage (growth is slower than the rest of the economy)(Bodie, Kane, & Marcus, 2013, pp. 579-580)

- **Start-Up Stage:**

The launch of any new industry in the market will have two directions, the first is to achieve great success, and the second is a total failure. Therefore, it is very risky to choose investments for new industries, although the rapid growth and high returns that we would get if the new industry achieved this great success. For example: the launch of the smart phone industry will grow rapidly because the market of this industry has not saturated. While the launch of televisions or refrigerators industry have a weak growth because the market is already saturated with this product.

- **Consolidation Stage:**

In this stage, industries that had initial success in the previous stage begin to emerge, and their growth rate is always higher than the market growth rate, also, its market share and marketing will increase.

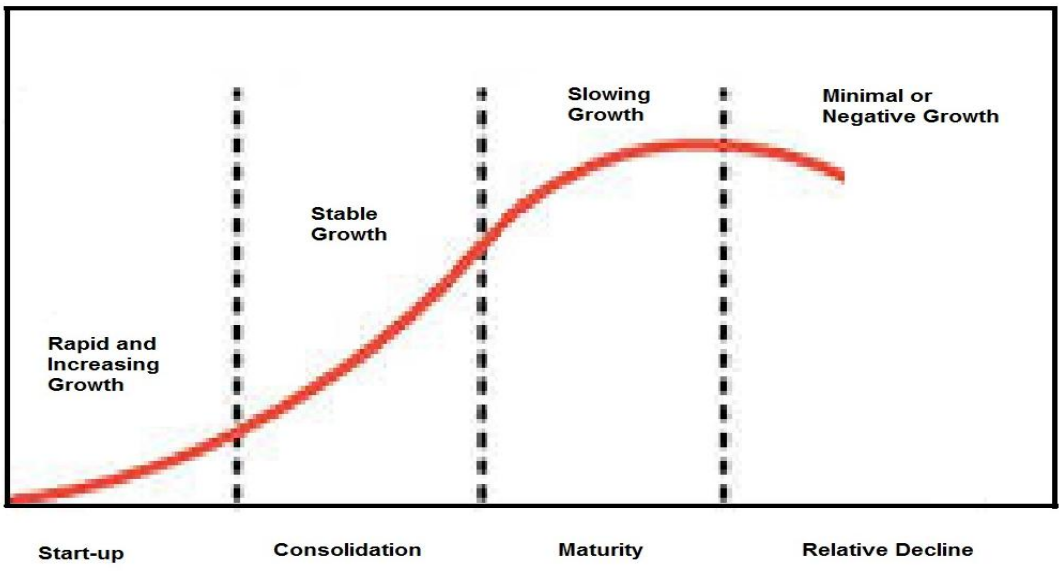
- **Maturity Stage:**

In this third stage, the industry growth rate accompanies the growth rate of the market as a whole, which leads to pressure on profits and shrinking them i.e. the industry tends to saturate, for example: Previously, after the desktop computer industries reached maturity, the laptops industry took its place, this did not last long. Currently, after the arrival of laptops to maturity, it has been replaced (relatively) by the tablet computers industry.

- **Relative Decline:**

In this last stage, the industry is on the threshold of deflation, where the return rate of this industry is less than the return of the market.Accordingly, the competition will be for new industries that provide more profit and opportunities (as happens now betweendesktop computer industry andthe tablet computers industry"according to the previous example")

Figure (23): The industry life cycle



Source: Bodie, Z., Kane, A., & Marcus, A. J. (2013). *Investments* . New York: Tenth Edition, Published by McGraw-Hill Education, New York. P.579

Third: Company Analysis.

It is the third level of the fundamental analysis, after the economy and the industry analysis. The company Analysis leads to know the Financial Position of the company by analysis the financial statements, and the annually development by use the Financial Ratios, all this in order to know the true value of the Stock, and the future profitability of the issued Stock.

The company analysis is based on calculating some ratios and comparing them with the general performance in the market (their counterparts from the institutions operating in the market). Among the most important of these ratios: (Achelis, 2005, p. 151)

a) **Net Profit Margin:**It is the result of dividing the net income by total sales; this ratio indicates how much profit the company can earn from every dollar of everything thatsold.
b) **(Price/Earnings) ratio:** It is the result of dividing the current stock price by the previous four quarter's earnings. This ratio represents the amount paid to obtain one dollar of the company's profits. This percentage obtained from a company is compared with the counterparts companies in the market, and where we have lower percentage, the situation will be better.
c) **Book Value Per Share:**It is the result of dividing thetotal net assets (assets minus liabilities) by total shares outstanding. The book value per share ratio is considered a balance of judge theselling stock price, for example, if the stock sold less than its book value, that mean there is decrease in the company's stock prices.
d) **Current Ratio:**It is the result of dividing thecurrent assets by current liabilities.This percentage represents the company’s ability to face risks and fulfill its obligations. When this percentage is high, the investors are more satisfaction. (In thebankruptcy occurs, this ratio guarantee of shareholders and investorsrights).
e) **Debt Ratio:** It is the result of dividing the total liabilities by total assets. It expresses the size of the company's financing by debt. This ratio has two sides. The first is negative, which is the problems that the company faces when interest rates rise, and the second side is positive, which is financing the corporation from a less expensive source.

f) **Inventory Turnover:**It is the result of dividing thecost of goods sold by inventories. This ratio represents the times of changing inventory in the companies, and it varies from one company to another according to the type of activity (industry)

There is another entry to the fundamental analysis that is built "on down- top analysis" where the analysis of the company's own situation is a starting point, the second, the analysis of the sector to which the company belongs, and the access line is an analysis of general economic situation. The objective behind The Fundamental Analysis is not the analysis itself, but the objective is to determine the Real Value of the Stock to make the right investment decision, whether the decision to sell or to buy.

Table (03): The Fundamental Analysis levels

Phase	Nature of Analysis	Purpose	Tools and Techniques
First	Economic Analysis	To access the general economic situation of the nation	Economic Indicators
Second	Industry Analysis	To assess the prospects of various industry groupings.	Industry life cycle analysis, Competitive analysis of industries etc
Third	Company Analysis	To analyse the financial and Non-financial aspects of a company to determine whether to buy, sell or hold the shares of a company.	Analysis of financial aspects : Sales, Profitability, EPS etc. Analysis of Non-financial aspects: Management, corporate image, product quality etc.

Source: SURESH, A. (May 2013). A STUDY ON FUNDAMENTAL AND TECHNICAL ANALYSIS. ***International Journal of Marketing,Financial Services & Management Research. P.46***

Fundamental Analysis versus Technical Analysis:

The following table summarizes the main points of contention between the fundamental Analysis and the technical Analysis:

Table (04): Difference between Technical analysis and Fundamental analysis

Technical analysis	Fundamental analysis
Analyses historical stock movement to predict the future price of a stock	Analyses stock value based on economic and financial factors
Uses price movement charts for analysis	Uses financial statements for analysis
Short-term approach	Long-term approach
Focuses mainly on past performance	Incorporates new market information

Source:www.edelweiss.in/investology. 12/ 20/2019

What is better fundamental or technical analysis?Many studies and empirical investigations have shown that it is necessary to use both technical and fundamental analyzes to build a strong model for predicting future stock prices, although some research confirms that technical analysis has a relative advantage in predicting the turning point and predicting trends, while, the strength of the fundamental analysis is, especially, in building a strategic investment portfolio in traditional industries. However, each analysis must be separate from the other, and finally combining the results of the two models in order for the analysis to be more effective.(Jakpar, Tinggi, Tak, & Yi, 2018, pp. 45-46)

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Chapter Three:

The Efficient Market Hypothesis

3. The Efficient Market Hypothesis (EMH)

Introduction:

On this side of thesis we analyze the Random walk Theory (RWT) and its important role in the main theory The Efficient Market Hypothesis (EMH); The mission of these two theories are to assumption that "Chartist" or "Fundamental theorist" procedures for predicting stock prices are completely without value; that is to say the Previous section of this chapter "The Technical and Fundamental Analysis" are useless.

3.1. The Random Walk Theory (RWT):

A vital contribution was made by The Random walk Theory to the Efficient Market Hypothesis, this contribution was embodied in the challenge of the theory of random walks to the proponents of Technical Analysis and Fundamental Analysis; in this section, we will answer of the following questions:

What is a random walk?

How the Stock Prices walk randomly?

[Eugene Fama] looked for the idea of random walk as a pillar of the main idea of "efficient market hypothesis". In his war with stock price movement analysts, he defined the (RWT)*:"**The theory of random walks says that successive price changes are independent ... chartist theories are akin to astrology and of no real value to the investor"*** (Fama, 1965, p. 10)

[Fama] defined the future path of stock prices in the markets that walk randomly: ***"A market where successive price changes in individual securities are independent is, by definition, a random-walk market. Most simply the theory of random walks implies that a series of stock price changes has no memory-the past history of the series cannot be used to predict the future in any meaningful way. The future path of the price level of a security is no more predictable than the path of a series of cumulated random numbers."*** (Fama, Random Walks in Stock Market Prices , 1965, pp. 5-6). [Fama] in

his analysis of the behavior of stock-market prices said that the (RWT) is based on two hypotheses*: **"(1) Successive price changes in an individual security are independent and (2) the price changes conform to some probability distribution. Of the two hypotheses independence is the most important. Either successive price changes are independent (or at least for all practical purposes independent) or they are not; and if they are not, the theory is not valid. All the hypothesis concerning the distribution says, however, is that the price changes conform to some probability distribution. In the general theory of random walks the form or shape of the distribution need not be specified. Thus any distribution is consistent with the theory as long as it correctly characterizes the process generating the price change"***(Fama, The Behavior of Stock-Market Prices, 1965, pp. 40-41).According to [Fama] the Random Walk Theory of stock prices is a phenomenon was discovered by [Louis Bachelier] in 1900. Over fifty years later, [Osborne] developed a model of prices of individual security changes from transaction to transaction; He based his assumption that these changes are (1) independent, and (2) randomly, (3) the transactions are fairly uniformly spread across time, (4) the distribution of price changes from transaction to transaction has finite variance. The [Osborne] assumption: If the number of transactions (during a period: day, week, month) is very large, the price changes will be sums of many independent variables; result that, the central-limit theory assumption that these changes have normal or Gaussian distributions. And the variances of the distributions will be proportional during this period.

Other definitions supported this theory; it defined the (RWT) in the same context; According to [Malkiel Burton Gordon, 1999]: ***"A random walk is one in which future steps or directions cannot be predicted on the basis of past actions. When the term is applied to the stock market, it means that short-run changes in stock prices cannot be predicted. Investment advisory services, earnings predictions, and complicated chart patterns are useless."***(Malkiel B. G., 1999, p. 24). [Faerber Esmé, 2008] said ***"The random walk theory states that stock price movements are unpredictable, making it impossible to know where prices are headed, the random walk theory asserts that stock prices cannot be predicted from prior prices because no relationship exists between the two sets of prices, Events occur randomly, which then affect stock***

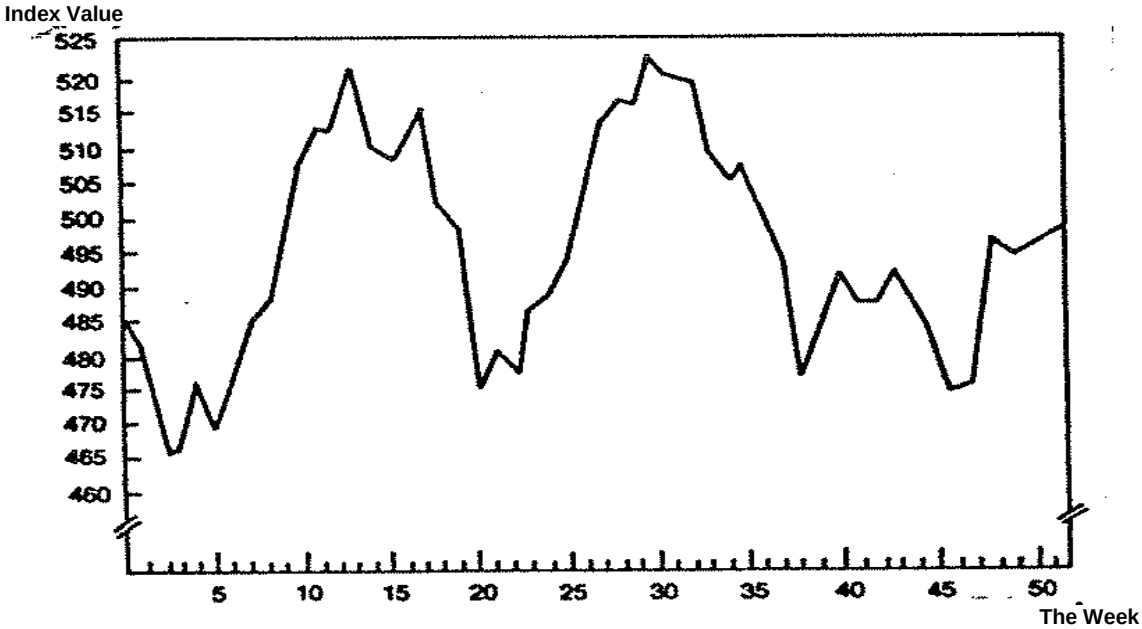
prices..."(Faerber, 2008, p. 184).Other definition of (RWT)*:**"***Maurice Kendall examined the behavior of stock market prices in 1953. He found to his great surprise that he could identify no predictable patterns in stock prices. Prices seemed to evolve randomly. They were as likely to go up as they were to go down on any particular day, regardless of past performance. The data provided no way to predict price movements.***"(Bodie, Kane, & Marcus, 2013, p. 349).on the other hand, technical analysts believe prices can be predicted based on past pricing trends and movements, where the prices are far from random; they were based their argument on flaws of RWT that written by [Lo and Mackinley] in their papers(Thomsett, 2015, p. 178).

Historical framework of (RWT):

In 1900; LOUIS BACHELIER discovered the Phenomenon of Random Walk of prices; He tracked the Commodity Prices, He observed the Commodity Prices are not correlated, and there is not any specific form of price movement("bizarre" upward movements followed by similar downward variations which he called "martingales" this concept will later give the notion of random walk) (Sangare, 2005, p. 1); BACHELIER said that The speculation in the market is a "*Fair Game*", where neither the Seller Nor the Buyer to make profits at the expense of others; the work of [Karl Pearson 1905], He studied the Random Walk of prices in the field of Statistics; He Said that the Random Walk is like a "*Drunken Person*"; If you leave him in a place and then you want to look for him, you will go to the place where you left him; Considering that the Drunken Person revolves around himself in a Random Motion; That place is the Unbiased Assessment of where you can find him in a future period; few years later, other studies documenting this phenomenon are e.g., two studies for [Working] and [Clows& Jones] on Stock Movement in 1934; [Kendall 1953] conducted a study on The Movement of Stock. [Roberts 1959] Studied the Actual Market Prices by taking a 52-Week and Chart it, based on the Dow Jones Industrial Average as shown in Figure (01-01); and He built an Artificial Series using the Random Number Table to Select the Dow Jones index, and Graph it In Figure (01-02); Roberts compared the Actual Change in the Value of the Index within 52-Weeks According to Figure (01-03); With an Artificial Change of the

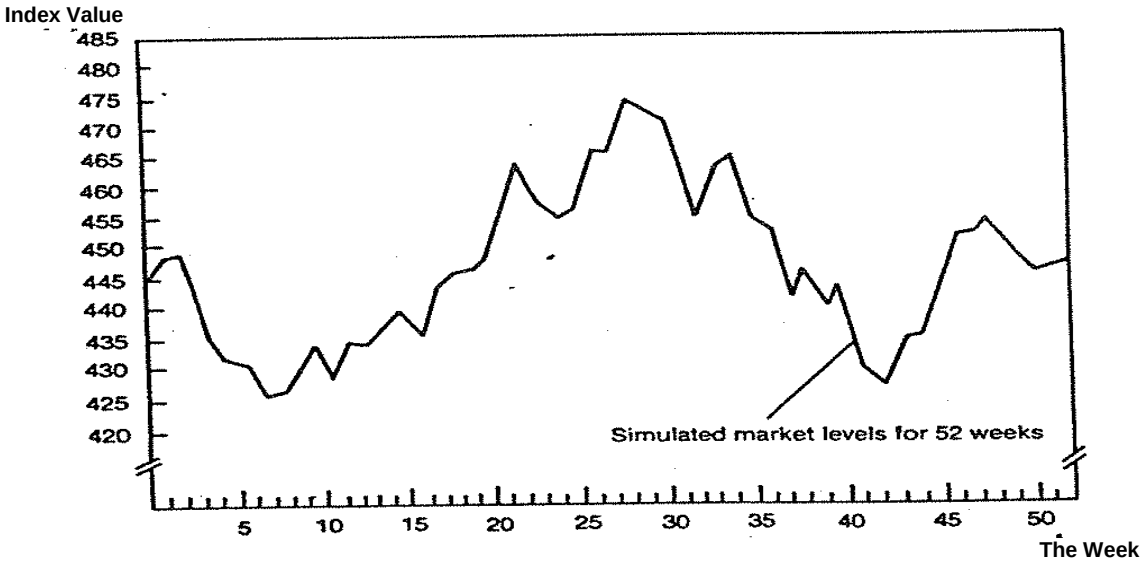
Randomly Selected Indicator Value represented by Figure (**01-04**). He found a convergence between Actual Price Map, Actual Index Map, and its Synthetic Maps; Roberts concluded that the Actual Movement of Stock Prices is Actually a Random Walk. (Hindi, 2006, pp. 515-521)

Figure (24): Real Map of Dow Jones Index Industrial Average for the 52 Week



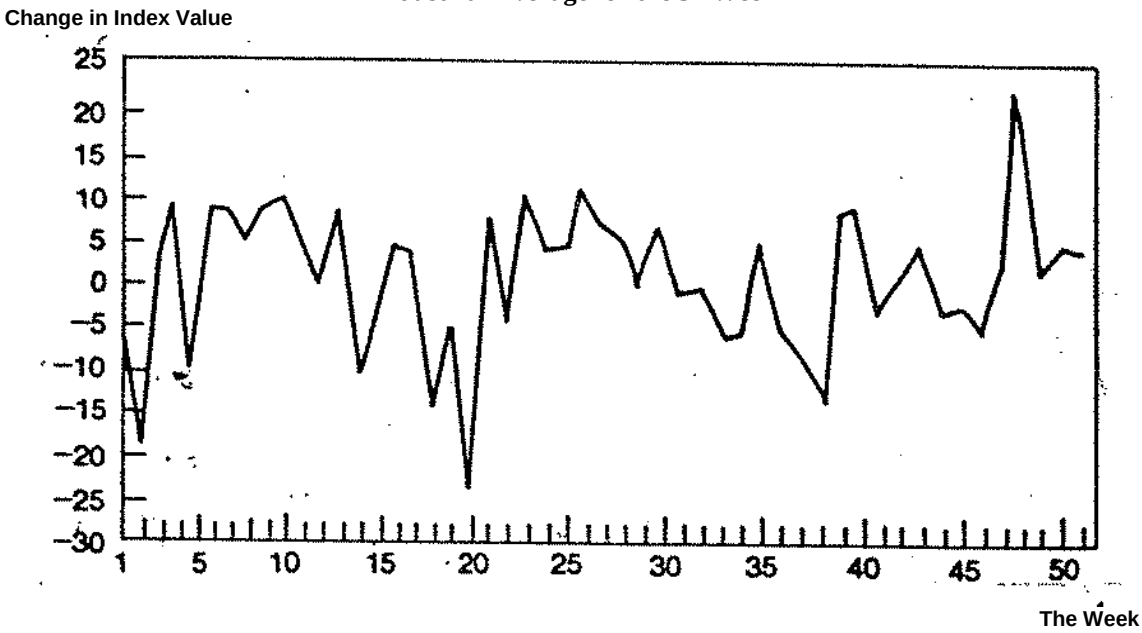
Source: Hindi, M. I. (2006). Securities and financial markets. ***Arab edition, published by al-Ma'aref, Alexandria*** **,P 516.**

Figure (25): Artificial Map of Dow Jones Index Industrial Average for the 52 Week



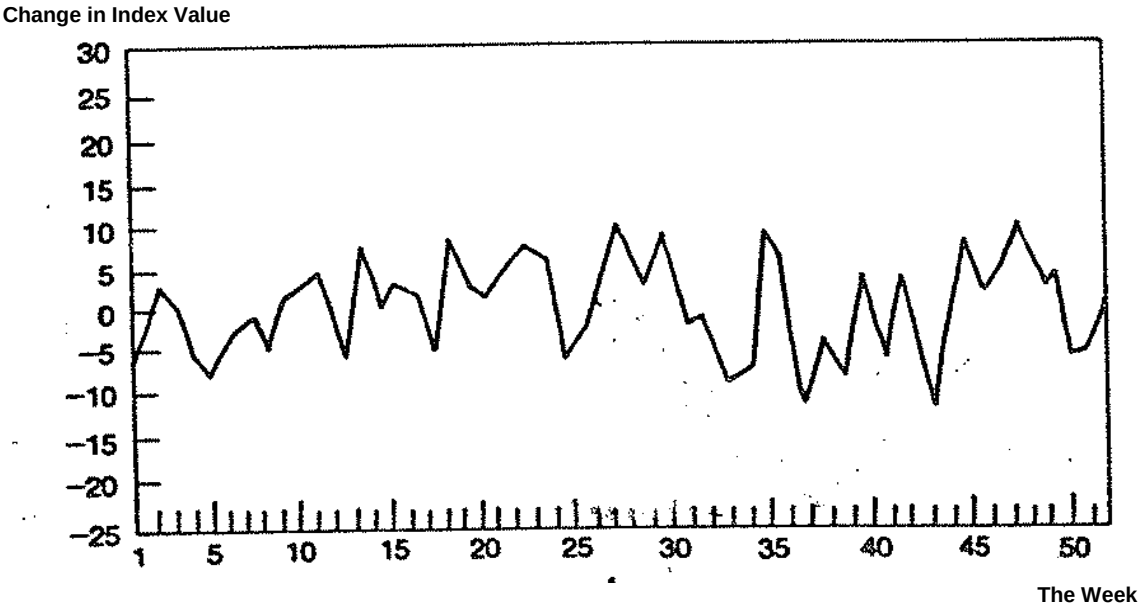
Source: Hindi, M. I. (2006). Securities and financial markets. *Arab edition, published by al-Ma'aref, Alexandria* ,P 517.

Figure (26): Real Map of the Change of Dow Jones Index Industrial Average for the 52 Week



Source: Hindi, M. I. (2006). Securities and financial markets. *Arab edition, published by al-Ma'aref, Alexandria* ,P 518.

Figure (27): Artificial Map of the Change of Dow Jones Index Industrial Average for the 52 Week



Source: Hindi, M. I. (2006). Securities and financial markets. ***Arab edition, published by al-Ma'aref, Alexandria*** **,P 519.**

Other study of Random Walk Phenomenon [Asborne 1959] tried to apply the Soluble Things Law "*Brownian Motion*" on the Stock Prices changes; The Result was symmetry between the movement of stock prices and the movement of those Soluble Things, Which is, of course, a Random Walk. [Cootner 1964] published his collection of papers on random walk. [Eugene Fama 1965] in his Doctoral's thesis entitled "*The Behavior of Stock Market Prices*" ;He concluded that the stock price movements cannot be anticipated, it follow a random walk, In the same year was a turning point in research; Eugene Fama launches the Efficient Market Hypothesis.

[Franks 1985] Provided an example of the Random Walk of Stock Prices in the Market, as the change in the Price of the Stock "Today" Reflects the Information available about Tomorrow ; and The "Price of Tomorrow" cannot be expected Today, But will be determined Tomorrow (when there is an Information available about a day "After Tomorrow").

The example of Franks is that a Stock is sold for 100 Pounds; and Monday's information available about this Stock will be 120 Pounds on Thursday.

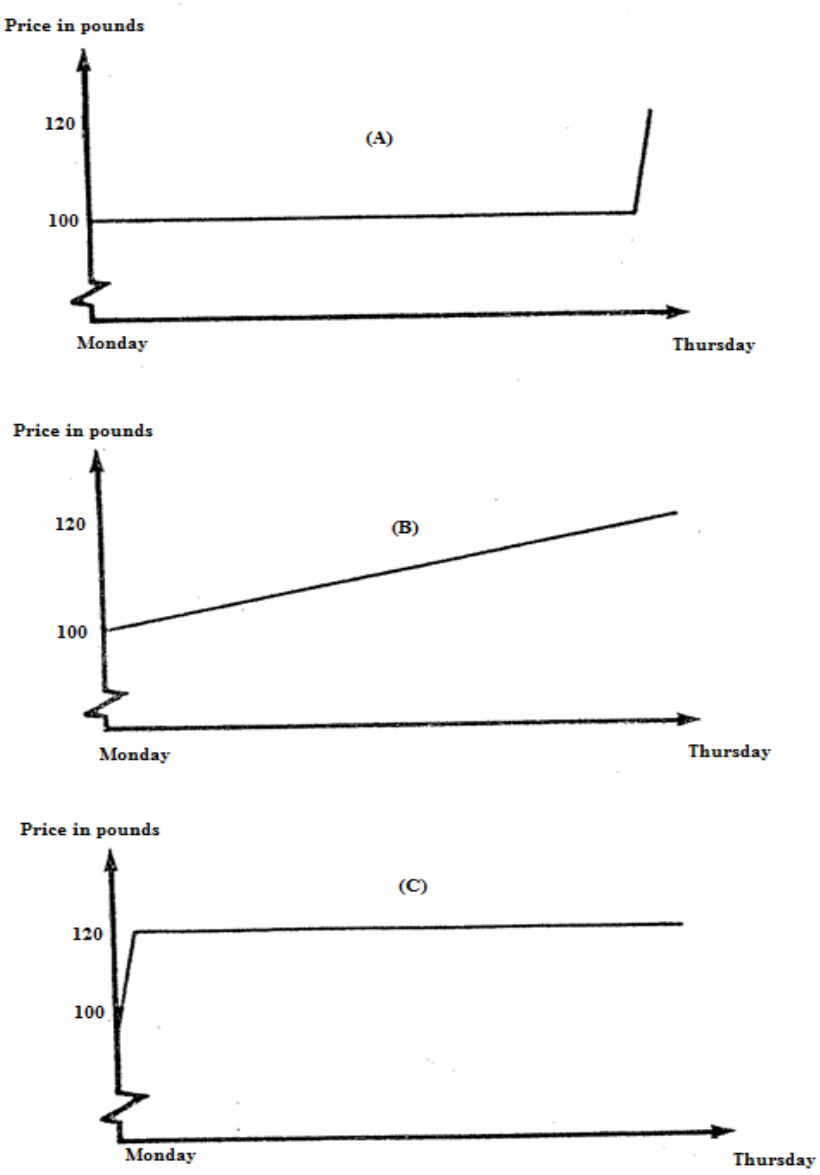
According to Franks, in the context of the receipt of this Information can be predicted three forms of change in the Stock Price as follows: Figure (02-01)

(A) The Stock price changes Until Thursday.

(B) The Stock Price Gradually changes to Thursday.

(C) The Stock Price changes as soon as the Information is received (Instantaneous), which is the logical formula for the Random Walk of Prices; When the information is received on Monday, the Stock prices rose, To reflect the Situation of Tomorrow (Thursday in the Example); and the Stock prices of Thursday we do not know, whether to be high or low; That depends on the Information received for the market on Thursday.

Figure(28): Alternative Styles of Change in Stock Price



Source: Hindi, M. I. (2006). Securities and financial markets. ***Arab edition, published by al-Ma'aref, Alexandria*** **,P 522.**

Last not least; [Brealy& Myers 1988] Presented a logical example of Price Movement in an Efficient Market; The Current prices reflect available Information, as the Information available on the market can be joyous or sad, The Prices change in any direction and at any Moment Up or Down.

3.2. The Efficient Market Hypothesis:

The Efficient market theory was the result of several previous works, as we mentioned earlier, the roots of the theory go back to the theory of random walk of LOUIS BACHELER in his thesis in 1900, after that, EUGENE FAMA, 1964 was credited with having the theory, he received the Ph.D. degree from the University of Chicago in 1964. His doctoral dissertation entitled, "The Behavior of Stock-Market Prices," was published in the Journal of Business, January, 1965. Next, the works of the economist PAUL SAMUELSON on price movements (Paulos, 2003, p. 59). They assume that in an efficient market, stock prices reflect all relevant information about this stock. e.g. In FAMA's words about the efficient market hypothesis: *"**An efficient market is defined as a market where there are large numbers of rational profit-maximizers actively competing, with each trying to predict future market values of individual securities, and where important current information is almost freely available to all participants … In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which as of now the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value … In an efficient market, the actions of the many competing participants should cause the actual price of a security to wander randomly about its intrinsic value … In an efficient market, on the average, competition will cause the full effects of new information on intrinsic value to be reflected (instantaneously) in actual prices."*(Fama, Random Walks in Stock Market Prices , 1965, pp. 3-4)

The assumptions imply an efficient market:

Reilly, K. Frank; Brown. C. Keith put forward the following assumptions (Reilly & Keith, 2002, p. 177):

1- An efficient market requires that a large number of profit-maximizing participants analyze and value securities, each independently of the others.
2- New information regarding securities comes to the market in a random fashion, and the timing of one announcement is generally independent of others.
3- Profit-maximizing investors adjust security prices rapidly to reflect the effect of new information.
4- Because security prices adjust to all new information, these security prices should reflect all information that is publicly available at any point in time. Therefore, the security prices that prevail at any time should be an unbiased reflection of all currently available.

The Types of Efficiency:

In an efficient market, there are two types of efficiency, which is the Allocative efficiency and the informational efficiency, are as the following: (Brunnermeier, 2001, pp. 21-25)

1- The allocative efficiency: When the individuals get their rations of scarce resources properly and optimally. (The warranty of the current distribution and the future redistribution of commodities and production on the individuals).
2- The Informational efficiency: It is the volume of available information contained in stock prices. the market is informational efficient i.e. It is impossible to gain abnormal profit according to homogeneous expectations

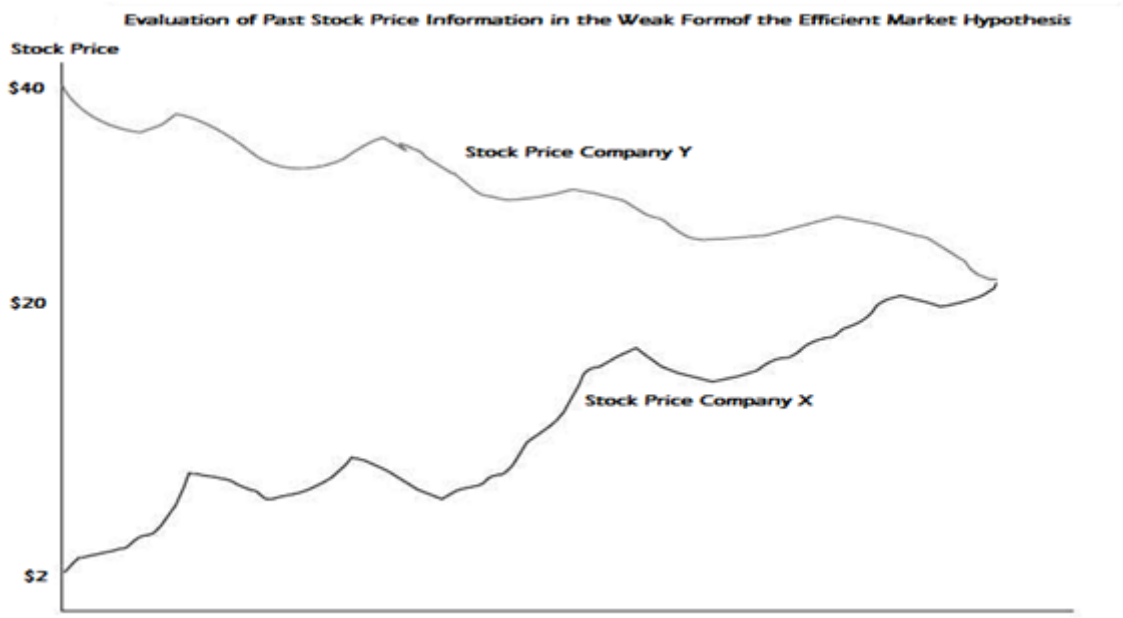
In 1970; the term "efficient market hypothesis" was first defined by [Eugene Fama, 1970], he used this term to explain the relationship between the available information in the stock market and the stock price; he was firstly discussed the differences of efficiency (the weak, semi-strong, and strong forms of the hypothesis). The essence difference between the three versions summarized about the term "All available

information"(Bodie, Kane, & Marcus, 2013, pp. 353-354). These versions of (EMH) have important ramifications for investor's strategies to select their stocks. And nobody would not be able to obtain abnormal yield by using the available information.

3.2.1. The weak-form efficient market hypothesis (W-F EMH):

The first regard of the efficient market hypothesis is the weak-form; this version asserts that *"**stock prices already reflect all information that can be derived by examining market trading data such as the history of past prices, trading volume, or short interest. This version of the hypothesis implies that trend analysis is fruitless. Past stock price data are publicly available and virtually costless to obtain. The weak-form hypothesis holds that if such data ever conveyed reliable signals about future performance, all investors already would have learned to exploit the signals. Ultimately, the signals lose their value as they become widely known because a buy signal, for instance, would result in an immediate price increase**"* (Bodie, Kane, & Marcus, 2013, pp. 353-354).In **s**um, this degree of the hypothesis assumes that the stock price will present the past price of the stock; these prices fully reflect all past market information. The weak-form efficient market hypothesis based on all past available information of stock price; where the random walk theory took the central role in this version. This low version of (EMH) says that the charts about past stock prices of technical analysis are useless; for example in Figure (), the current price of the stock (X) and the stock (Y) is ($20) per share but: (1) the stock of Company (X) rose from a low of $2 per share to this current price. (2) While the stock of Company (Y) fell from a high of $40 to the current price; so, the technical analysis to predict future stock prices would be meaningless because no relation-ship exists between past and future stock prices.(Faerber, 2008, p. 186)

Figure (29): The stock price behavior of Company (X) and (Y)



Source: Faerber, E. (2008). *All about stocks, the easy way to get started.* united states of america: (Third Edition). New York: McGraw-Hill. P.187

Tests and results of the(W-F EMH):

Now we will discuss the tests used in order to examine the weak-form efficiency and summarize its results studies have supported or not support (anomalies) this version(Reilly & Keith, 2002, pp. 179-180):

According to previous studies of the weak-form EMH, we have two groups of tests:

A- Statistical tests of independence between rates of return: assumes the Independence between stock returns because the information comes randomly to the markets. The famous tests determine if the stock returns are independent are (1) the Autocorrelation Tests, use to measure the significance correlations (positive/ negative) or insignificant between stock returns in the day (t, t-1, t-2, t-3). If there are insignificant correlations between these returns we call this

market: weak-form efficient market. Old results supported this version in the short time (indicated insignificant correlation in stock returns), and there are some recent studies not support this form like the small stock's portfolios. (2) The Runs Test, use also to test independence, if the price increase we put a plus (+), and if the price decrease we put a minus (-).The result is as follows (+) (+) (-) (+) (-) … if there were two or more same consecutive changes i.e. (+) (+) or (-) (-) the run occurs, we call (one run). In the latter we compare the number of runs that we get to the value in the table of (expected values) for the runs in a random series.

Several studies confirmed and supported the Independence between stock returns by using the Run Test. although these results, there are studies not supported the Runs test to examine the independence of stock returns e.g. studies of price changes for individual transactions on the NYSE.

B- a comparison of risk-return results for trading rules through simulation:

On the other hand, this second test examines the weak-form efficiency by using trading rules. The results of this test can negate unless: (1) should use only publicly new information when using the trading rule, (2) should include all transactions costs when we computing the returns (3) must adjust the results for risk.

According to this test the market is efficient because there are more trading in stock by using simple buy-and-hold policy based on past market information (this results are not unanimous).

3.2.2. The Semi-Strong form efficient market hypothesis (S-SF EMH)

The second version of the efficient market hypothesis is the Semi-Strong form efficient market hypothesis, According to (Bodie, Kane, & Marcus, 2013, pp. 353-354) the Semi-Strong form efficient market hypothesis states that "***all publicly available information regarding the prospects of a firm must be reflected already in the stock price. Such information includes, in addition to past prices, fundamental data on the firm's product line, quality of management, balance sheet composition, patents held, earning forecasts, and accounting practices. Again, if investors have access to such information from publicly available sources, one would expect it to be reflected in stock prices***"; i.e. the second degree of efficient market hypothesis namely Semi-Strong form was based on fully reflect of all publicly available information and besides the past stock prices on the stock prices, where the analysis of this information (The fundamental analysis) may not produce superior returns because stock prices will have already incorporated the information, where investors cannot achieve superior returns according to the public information. (Faerber, All about stocks, the easy way to get started, 2008, p. 188).

Tests and results of the (S-SF EMH):

As previously mentioned, the semi-strong form efficient market hypothesis realized when the stock prices fully reflect of all publicly and historically available information. Accordingly, the empirical studies that attempted to investigate this hypothesis focused on the following tests:

a) Return Prediction Studies: In addition to the historical information used for the under-form proficiency test, semi-strong form studies use public information available to carry out the following analyzes:
    - Analysis the time-series of returns.
    - Analysis the cross-section distribution of returns for individual stocks.

The result is that in the semi-strong form efficiency, it is impossible to predict future returns by using past returns or predict the distribution of future returns by using the public information.

b) Event Studies: This second test measures the stock prices response to the important public events and examines the possibility of investing in stocks after the announcement of important economic events and gain abnormal returns in these events e.g. merger, new stocks issue, stock split etc.

N.B: The tests above need to adjust the security's rates based on the market rate of return.

There are some studies predict cross-sectional returns; based on stocks' public information they try to predict the cross-sectional distribution of future risk-adjusted rates of return by using the following ratios:

- The price-earnings ratio.
- The P/E/growth rate (PEG) ratio.
- Market value size.
- The price/book-value ratio.
- The dividend yield.

The results of the (S-SF EMH) tests:

a) The results of return prediction studies have indicated limited success in predicting short-horizon returns (by using the time-series analysis), but the predictive power of this test increases with the horizon i.e. dividend yields were better at long run; among these studies:
   - The possibility to predict future stock returns based on publicly available "quarterly earnings reports": The result of this study say that the "earnings surprise" is not instantaneously reflected in security prices, which are evidence against the semi-strong form efficient market hypothesis.

- The January Anomaly: To establish losses, Investors sell toward the in late November and December of the year; and after the New Year, they reacquire these stocks or buy other attractive stocks. So, the January anomaly poses a difficult problem to the semi-strong form efficiency because of the abnormal returns in January.
- The monthly effect, a weekend/day-of-the-week effect, and an intraday effect were used to investigate the semi-strong form. Its results were against this form of efficiency because of the investors had abnormal returns by using these effect.

b) The results of predicting cross-sectional returns are based on the possibility of use the public information to predict if we can have above-average or below-average risk-adjusted returns, these results are as follow:
   - The Historical Price-Earnings Ratio: According to studies, this ratio that available to public possesses valuable information affecting the future returns, which is against the semi-strong form of efficiency.
   - Price-Earnings/Growth Rate (PEG) Ratio: Mostly, the supporters of ratio (PEG) was opposed to the semi-strong form efficient market hypothesis, this ratio (PEG) assumed that there is an inverse relationship between it and subsequent rates of return i.e. the investors use the public information to gain returns above-average rates by using this ratio.
   - The Size Effect: Other anomaly against the semi-strong form efficiency is the "Size Effect" that includes the risk measurements and the higher transaction costs impacts. Investors measure the impact of size (total market value) on the risk-adjusted rates of return over extended periods; they conclude that the small firms gain experienced significantly larger risk-adjusted returns than the great firms. Generally, most results of the "size effect" studies strongly opposed the hypothesis of semi-strong efficiency of markets.
   - Neglected Firms and Trading Activity "the attention or neglect effect": ARBEL and STREBEL divided the analysts of stock into three categories: (1) highly followed, (2) moderately followed, and (3) neglected. In their studies, they

supported the small-firm effect studies; also, they presented another effect named neglected-firm as a result of the lack of information and limited interest e.g. the companies that have a less information require higher returns.

- Book Value–Market Value Ratio: Proponents of this ratio opposed the semi-strong form efficiency, they found a positive relationship between the current values for this ratio and future stock returns. Also, they confirmed the link between the public information about this ratio and the future returns.

c) The Results of Event Studies:

Unlike the previous results, the most of events study results supported the semi-strong efficient market hypothesis; it said that investors cannot gain abnormal rates of return by acting after the announcement of events (stock splits, unexpected economic events, etc). The results are as follows:

- Stock Split Studies: most studies of the stock split confirmed that there is no positive impact on stock returns after the announcement of public information about stock split, and the stock prices that were split don't increase in the value. This result supports the semi-strong form efficiency.
- Initial Public Offerings (IPOs): When a company goes public for an initial public offering, the insurance companies lower the prices of these new issues for fear of risks. Studies confirmed that the market has moved to absorb this information about lowering prices, thus supporting the hypothesis of the semi-strong form of efficiency i.e. investors cannot achieve abnormal returns based on public information of initial public offerings in long-run.
- Exchange Listing: One of major events that the company is going through is the process of listing in the Stock Exchange. Several studies have investigated the effect of this event on the stock prices of the company concerned with the listing; they found a rise in prices upon receiving initial news about the listing process; while, prices are slightly decline after the insertion process. Many investors find the opportunity to gain abnormal returns both before and during

the listing process. This evidence rejects the semi-strong efficient market hypothesis.

- Unexpected World Events and Economic News: It is an axiom that the stock markets will be affected by unexpected global events. Many studies have verified this, and found an almost immediate response to these events; this represents strong support for the semi-strong form EMH. For example, with the declaration of wars, economic crises, or terrorist attacks, prices adjust to the event even before the market opens. In addition to that, various studies confirmed that the impact of news about some major economic factors (inflation, money supply, etc.) in turn adjust the prices as soon as possible.
- Announcements of Accounting Changes: The results of studies of this event supported the semi-strong form EMH e.g. the accounting changes announcements from (FIFO) to (LIFO) in the inflation periods leads to positive price changes. That is in line with the efficiency hypothesis.
- Corporate Events: many events are rapidly adapted their announcements to the stock prices as the mergers and reorganizations of the companies. the results were in line with expectations, for example during the merger event, we notice that stock prices tend to rise rapidly due to the premium provided by the acquiring company, while, the stock prices of the second company are In decline due to suspicion of paying over-paid for the company. This is almost in line to the semi-strong form EMH.

3.2.3. The Strong-Form Efficient Market Hypothesis (S-F EMH)

The third version of the efficient market hypothesis is The Strong-Form Efficient Market Hypothesis, under this form of efficient market hypothesis, the stock price will present all relevant information; According to (Bodie, Kane, & Marcus, 2013, pp. 353-354)the strong form efficient market hypothesis states that *"**stock prices reflect all information relevant to the firm, even including information available only to company insiders. This version of the hypothesis is quite extreme. Few would argue with the proposition that corporate officers have access to pertinent information long enough before public release to enable them to profit from trading on that information. Indeed, much of the activity of the Securities and Exchange Commission is directed toward preventing insiders from profiting by exploiting their privileged situation**"* As a rule, the market is efficient in strong form when the price of the stock fully reflect all relevant information, where chartists or fundamental theorist cannot be used the insider information to beat the market.

Tests and results of the (S-F EMH):

As shown above, the strong-form efficient market hypothesis materialize when the stock price will present the historical, public, and private available information. So, investors never achieve profits above the average by using historical, public, and especially the private available information.

From this standpoint, the tests of the strong-form efficient market hypothesis are based on proving that it is impossible for a group of investors to obtain private information through which they achieve high returns that surpass other investors. So, the following four groups were selected to the tests:

(1) **Corporate Insiders**: This group includes major officers, the board of directors, and owners of more than 10 percent of securities, the securities commission regularly requests periodic reports on trading of this group in order to find out if they are able to achieve more returns and profits than others using the private information that they access. Sometimes, the results of the investigation into the profits of this group indicate that they are able to obtain returns that exceed what

others get. Moreover, certain groups of investors that have a close relationship with the insider group can achieve high returns. These results of the investigation show that there is mixed support for the strong-form efficient market hypothesis.

(2) **Stock Exchange Specialists**: The second test of the strong-form efficient market hypothesis can be applied on stock market specialists; they have information about "unfilled limit orders" through which they obtain higher returns than others. On the other hand, the nature of these specialists 'work is based on selling and buying at a higher price that often leads to obtain higher yield than the normal returns of stock markets. Generally, this test did not support the strong-form hypothesis.

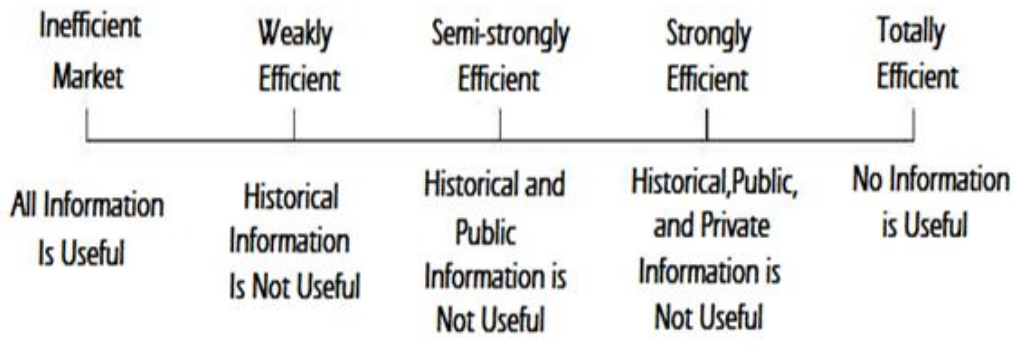
(3) **Security Analysts at Value Line and Elsewhere**: Another test of the strong-form efficiency relates to the "security analysts", these analysts seek to select undervalued stocks. Market investors follow the advice and guidance of specialized securities analysts to select those stocks to obtaining high returns. Among the most important advisory services we find the "value line" that publishes services to investors for more than 1,700 ordinary stocks and anticipates their future performance. The service ranks the performance from the best, which is number (1) to the worst, which is (5) on this basis: (a) Arrangement of profits and prices, (b) Price momentum, (c) Quarterly profit changes, (d) "Surprising" quarterly profits.

For many years, the "value line" advisory service claimed that stocks rated (1) had already outperformed those rated (5), the security analysts supported these results, but the later investigations showed that for a long time there were rated stocks (1) while, its returns were less than the average-returns of stock market!

(4) **Professional Money Managers**: The last test of the strong-form of efficiency is related to the group of "professional money managers", most of them are professionals and well trained to manage investment in securities, and they are seen as the first to obtain extraordinary returns for their experience and professionalism.

Many studies have investigated the performance of "professional money managers", especially in their management of mutual funds, and found that they are not compatible with the performance of the buy-and-hold policy, where the superiority of the "professional money managers" in reaping very high returns than the market returns, but the commission costs and management burdens undermine this superiority and weaken Good performance for the professional money managers. These results provide supporting evidences for the strong-form efficient market hypothesis.

Figure (30): Degrees of efficiency of information in the stock market



Source: Faerber, E. (2008). ***All about stocks, the easy way to get started.*** **united states of america: (Third Edition). New York: McGraw-Hill.P.192**

Table (05): Defense and Critique of the (EMH)

Defense of the (EMH)	Empirical Critique of the (EMH)	Radical Critique of the (EMH)
The EMH is a sound concept and an empirically viable proposition. Speculators immediately spot any mispricing and realign market prices to their "true" theoretical value. Excess returns earned by forecasting markets are marginal and highly volatile. In practice, active portfolio managers have a devilishly hard time beating market benchmarks, which supports the EMH.	The EMH is conceptually sound but empirically false. Many tests show that market prices deviate from their theoretical values and those markets are subject to forecastable distortions.	The EMH is meaningless because the notion of the true price of an asset based on the present value of an infinite stream of cash flows is empirically meaningless. We need to consider forecastability, which is not equivalent to efficiency.

Source: Fabozzi, F. J., Focardi, S., & Jonas, C. (2014). *Investment Management: A Science to Teach or an Art to Learn?* /: CFA Institute Research Foundation. P.43

Theories Accompanying the EMH:

The Efficient market hypothesis associated with some important models, including:(Mehwish& Yasir, 2015, pp. 3-4)

- **THE "FAIR GAME" MODEL:**

The "Fair Game" is trading the stocks in an efficient market, where ensures "a return" that is aligned and proportional to the potential "risk". This model is based on the inability to achieve expected returns that outweigh the market returns. With many investors looking for information and wanting to maximize their profits, all available information is reflected in the prices. , that makes this market more efficient.

- **THE "SUBMARTINGALE" MODEL:**

The second model accompanying the efficient market hypothesis is the "Submartingale" model. It is a form of fair game model, according to this model, the stock prices follow a submartingale and there is no chance of achieving future returns based on past information, i.e. any approach cannot overcome the "simple buy-and-hold strategy".

- **THE "RANDOM WALK" MODEL:**

The third model is the "random walk" model; as we mentioned before, the basic principles of this model are: (1) the successive changes of the stock price are independent. (2) Its distribution is identical i.e. it supposes that impossible to adopting a sequence of past prices to predict the sequence of future prices. This model greatly contributed to building the efficient market hypothesis.

3.3.Evidence on the Efficient Market Hypothesis:

With the emergence of the efficient market hypothesis, several studies addressed this hypothesis and defended it fiercely, and these studies and ideas formed an important support for the hypothesis. While other studies formed a front of opposition to the hypothesis, as opposed to it, contradicted its principles, and doubted its real implementation. (Mishkin & Eakins, 2017, pp. 161-167)

3.3.1. Evidence in favor of market efficiency:

In this aspect, we will present the evidence that supports the market efficiency hypothesis and coincides with its ideas. In this regard, we will highlight four evidences, which are as follows:

A- **Performance of Investment Analysts and Mutual Funds:**

One of the most important rules of the market efficiency hypothesis is not to overcome the market, that is, the impossibility of achieving a return greater than the equilibrium return when buying any security. Based on this essential point, some studies have investigated the possibility of "investment analysts and mutual funds" obtaining a profit, Greater returns, and predicting the good selection of stocks that can yield greater returns than equilibrium returns (in other words, the possibility of overcoming the market and rejecting the idea of its efficiency).

The results of those studies generally indicated the impossibility of "investment analysts and mutual funds" to achieve extraordinary returns through their selection of certain stocks, and even if some of them were sincere in choosing shares and a prediction occurred, this is nothing more than a mere coincidence and luck, and coincidence here we cannot We adopt it as a base for forecasting extraordinary returns. Therefore, from this point of view, it can be said that the investigation of the performance of "investment analysts and mutual funds" in their prediction of future returns has been disappointed, and the efficient market hypothesis is correct.

B- Do Stock Prices Reflect Publicly Available Information?

The market efficiency hypothesis asserts that stock prices reflect all available information about them. Any possession of information can never influence prices because the prices have already contained it.

Some empirical evidence showed that (on average) profit announcements, for example, could not raise prices, because those prices had contained them at the time.

C- **Random-Walk Theory:**

The theory of random walking is the main basis and the first support for the efficient market hypothesis, as we mentioned previously, where the theory of random price walking **LOUIS BACHELIER** has been the subject of many experimental studies, thus reinforcing the row in support of **EUGENE FAMA** and his hypothesis that future prices cannot be predicted based on the information. Of past prices and that the prices include all available.

D- The Technical Analysis Failures:

Too many failures of the technical analysis approach in predicting the future stocks prices based on information derived from its past prices, and attempt to find the pattern in which the price of that stock evolves (on average) to a feeling that these analysts and cartographers cannot overcome the performance of the market, which favored the idea of random walking of stock prices and thus strengthening the efficient market hypothesis You see that technical analysis is a waste of time**.**

3.3.2. Evidence against market efficiency:

On the other hand, many economists insisted on opposing the efficient market hypothesis, especially the strong-form efficient market hypothesis, and the impossibility of achieving it experimentally, as it depends on the price response to all public and private information, which is impossible experimentally. In this context, we mention the most important evidences rejecting the efficient market hypothesis:

A- **Small-Firm Effect.**

The small-firms' returns have always posed a clear challenge to the efficient market hypothesis, which makes proponents of this hypothesis in an embarrassing situation, as the returns of these firms dominate the market, and are generally higher than normal market returns.

This may be attributed to the superiority of the influence of small companies because of their tax system, the high cost of possessing information about them, or the low liquidity of their shares.

B- **January Effect.**

The second challenge to the efficient market hypothesis is the effect of January, where the end of the year is witnessing a rush to sell to escape from tax obligations, which raises the stock prices in this period, and then those investors buy back with the entry of the new year, from here investors and analysts can predict the rise in prices at the end of December, then it cannot be said that prices are walk randomly during this period because they always tend to rise, which contradicts and against the efficient market hypothesis.

C- Market Overreaction.

Sometimes stock prices overreaction to the available information, which allows many investors to achieve abnormal returns that exceed those achieved by the market, for example: when receiving information about a change in profits, stock prices are terribly reduced, and the prices do not recover only after a period of time later, seize some investors this opportunity by buying the stock after the announcement of the change holds in corporate earnings, because prices are low, then it after a period of selling and achieve returns they expected, appears to shorten a clear premise of the efficient market hypothesis.

D- Excessive Volatility.

ROBERT SHILLER showed that stock prices are sometimes over-volatility as a result of the information available. **SHILLER** explained that these fluctuations were not limited to the information, rather, there are other factors pushing prices to extreme volatility than what could be failure of information available on the stock prices.

E- **Mean Reversion.**

Some studies that have challenged the efficient market hypothesis, citing the "Mean Reversion", as these studies talked about the fact that stocks with low returns now, will reap large returns in the future, while, stocks with higher returns now, it is possible that they will not reap such returns in the future. This is opposed to the rules of random walk theory, as the "Mean Reversion" makes it possible for us to predict whether returns will increase or decrease in the future. The results of these studies challenge to the efficient market hypothesis according to the results of "Mean Reversion"

F- New Information Is Not Always Immediately Incorporated into Stock Prices.

The efficient market hypothesis believes that stock prices respond quickly to the information available about them, but several evidence objected to this quick response, and evidenced by the prices reaction that continues to rise for a period of time after the announcement of an unexpected increase in profits, while the decline in stock prices is exaggerated if this information on earnings is lower than what they were expecting.

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Part Two:

Markets and Comparisons

Introduction:

> ***"The first stock exchange was established in Antwerp, then part of the Netherlands, in 1631. The London Stock Exchange opened in 1773, and the Philadelphia Stock Exchange, the first in the New World, began trading in 1790. By the middle of the 19th century, with industry hungry for capital, almost every major city had its own bourse"*** (Levinson, 2005, p. 150)

The fourth chapter in the second part "Markets and Comparisons" displays the Arab stock markets; we use individually comparison between Saudi Arabia, Egyptian and Moroccan stock exchanges, we compare the stock exchanges milestones, market development and some statistic Data of these markets e.g. the number of companies listed on the stock exchanges, the stock market value traded (percent of gross domestic product), the stock market capitalization (billion USD), the stock market capitalization (percent of gross domestic product), the stock market return (percent), the stock price volatility (percent). On the other hand, In the fifth chapter, we compare collectively between these Arab stock market with selected markets from different continent e.g. Central-Eastern Europe stock markets represented by Poland and Romania (Warsaw and Bucharest stock exchanges); Latin-American stock markets represented by Brazil and Argentina (São Paulo and Buenos Aires stock exchanges); and Middle-East stock markets represented by Iran and Turkey (Tehran and İstanbul stock exchanges) using the same previous comparison measures i.e. The graphical representation that make up for need of the boring exact numbers. Finally, in the sixth chapter, we provide a summary of empirical investigations of the (EMH) on Arab stock markets and these emerging stock markets.

Chapter Four:

Comparing the Performance of Arab Stock Markets

ARAB STOCK MARKETS:

- **SAUDI ARABIA**
- **EGYPT**
- **MOROCCO**

4. Comparing the Performance of Arab Stock Markets:

In this thesis, our random sample consists of three Arab stock markets representing three different regions:(We chose the following stock markets as representing the Arab markets for each region due to the availability of information, data and studies about them).

The first Arab region: (The GCC countries) represented by the Saudi stock market (Tadawul) as the largest market in the Gulf Cooperation Council (GCC) countries and Arab countries of ASIA-wide continent.

The second Arab region: (Northeast African countries) represented by the Egyptian stock exchange as the oldest North African stock exchange and in the AFRICA-wide continent.

The third Arab region: (Maghreb countries) represented by the Moroccan stock exchange; On behalf of the emerging Maghreb stock exchanges.

4.1. The Saudi Stock Market:

The Saudi Stock Market is one of the most important markets in the Middle East, it is relatively the biggest in the Arab area, The Capital Market in Saudi Arabia unofficially started in the early fifties after the establishment of the Saudi Joint Stock Companies (the Arab Automotive Company and the Arab Cement Company); In the end of the seventies it was the emergence of an informal (unlicensed) market for stock trading. In the 1980, rules were set up to establish a stock market in Saudi Arabia after the establishment of Saudi Stock Registration Company, Saudi Capital Market Authority and the committee to regulate and develop the Saudi stock market; Thereafter, The market has seen great progress with the establishment of the Capital Market Authority (CMA) and the followed The Launch of the Saudi Stock Exchange (Tadawul) in 2007.

Table (06): Saudi stock market milestones

1934	The Establishment of the Saudi Joint Stock Companies.
1934	The Establishment of the Arab Automotive Company.
1954	The Establishment of the Arab Cement Company.
1975	There are 14 joint stock companies with a capital of SR 1.8 Million.
The End of the Seventies	The emergence of an informal (unlicensed) market for stock trading.
1983	The Establishment of the Saudi Stock Registration Company.
1983	The Establishment of the Market Control Body of the Saudi Capital Market.
1984	The Establishment of a committee to regulate and develop the Saudi stock market.
1990	The Launch of the first electronic trading and settlement system (ESIS).
2001	The Launch of the "Tadawul" system in the Saudi stock market.
2003	The Establishment of The Capital Market Law (CML).
2003	The Establishment of the Capital Market Authority (CMA).
2007	The Establishment of the Saudi Stock Exchange (Tadawul)

Source: Samiha, Benmahiaou. 2015 Phd Thesis: The role of arab financial markets in financing foreign trade - a case study of some arab countries – PP.85-86

The Regulatory Landscape:

The regulatory landscape of the Saudi Stock Market is built as follows:

I. The Capital Market Authority (CMA): Is a supervisory body fully independent, (CMA) does the following (CMA, 2017):
   - ✓ Regulate and develop the capital market.
   - ✓ Regulate and monitor issuing the securities.
   - ✓ Regulate and monitor all the activities in the saudi stock market.
   - ✓ Protect investors and the public from unsound practices involving fraud, deceit...
   - ✓ Maintain fairness, efficiency in the stock market.
   - ✓ Regulate and monitor full disclosure of information.
   - ✓ Organize the requests for representation, buying.

II. The Saudi Stock Exchange (Tadawul) : Is a joint stock company, with its legal personality and financial independence, Tadawul does the following (tadawul, 2017):
   - ✓ Management of the mechanisms of securities' trading.
   - ✓ Settlement and clearance of securities.
   - ✓ Deposit and registration of ownership of securities.
   - ✓ Dissemination of information relating of securities.

III. The Depository Center Company (SDC) :Is a closed joint stock company fully, owned by "Tadawul", (SDC) does the folowing (tadawul, 2017) :
   - ✓ The Securities Depository.
   - ✓ The Securities Transfer.
   - ✓ The Securities clearing and settlement.
   - ✓ Registry of ownership of securities.

IV. Committee for the Resolution of Securities Disputes: established by the Capital Market Authority, Consist of legal advisors specialized, the Committee shall have all necessary powers to (CMA, 2017):
   - ✓ Investigate and settle complaints and suits.
   - ✓ Issue decisions.

- ✓ Impose sanctions.

V. The Appeal Panel : shall have three members for a three-year term renewable, the main objective of this Appeal Panel is (CMA, 2017) :

- ✓ Decisions may be appealed before the Appeal Panel within thirty days.
- ✓ To refuse to review the decisions of the Committee for the Resolution of Securities Disputes.
- ✓ To affirm such decisions.
- ✓ To undertake a new review of the complaint or suit.
- ✓ The decisions of the Appeal Panel shall be final.

Saudi Stock Market Data:

Table (07): Saudi Stock Market Data 2010 / 2015 / 2017

Item	2010	2015	2017
Market capitalization (Riyal million)	1 325 392	1 579 059	1 691 858
Number of listed companies	146	172	188
Trading Volume (Riyal million)	759 185	1 660 622	838 081
Yearly Index (points)	6 387,41	8 406,87	7 098,9

Source: Quarterly bulletins of Arab Monetary Fund (Data Base)

4.2. The Egyptian Stock Market:

Egypt is the first Arab country established the Stock Exchange (ESE), with the establishment of the Alexandria Stock Exchange in 1883, and The Cairo Stock Exchange in 1903; The Alexandria Stock Exchange (ASE) is one of the oldest Stock Markets in the world. It was established in 1883, The (ASE) officially launched in 1888, it was concerned with the cotton transactions by the cotton traders.

Egypt established the Alexandria Cotton and Cotton Seeds Authority, named The (AGPA); In 1899, The (AGPA) moved to a new building called the Stock Exchange, where the Stock Exchange became a landmark of Alexandria and the city's famous financial center; Which brings together the various participants in the stock market from cotton traders and brokers of all races (British, Jewish, Arab…).

Cairo traders and brokers wanted to establish a stock exchange such as those located in Alexandria. They founded the Cairo Stock Exchange (CSE) on 21 May 1903.

The "Cairo and the Alexandria" Stock Exchange (CASE):

After the reform program of economic in Egypt, the government unifying trading between The Cairo and The Alexandria Stock Exchanges in 1996 (Are managed by the same board of directors) , which play an important role in Egypt development economic.

Table (08): Egyptian stock market milestones

1883	The Establishment of Alexandria Stock Exchange
1903	The Establishment of Cairo Stock Exchange
1907	The opening of the first trading room in the Cairo Stock Exchange
1909	The issuance of the first general regulations for stock exchanges
1928	The Cairo Stock Exchange moved to its current premises at Sherifein street

1947	The commencement of the Over The Counter (OTC) market for the first time in Egypt
1953	The first law to regulate market trading after 1952 revolution was issued
1957	The issuance of the general regulations for stock exchanges
1961	Closing the stock exchange for two months post issuing nationalization laws
1977	Issuing the Ministerial decree to list Joint stock companies on the stock exchange
1980	The establishment of the Capital Market Authority (CMA)
1994	Issuing a law to establish (Misr) for Clearing, Settlement and Depository company
1996	Unifying trading between Cairo and Alexandria stock exchanges
1997	Egypt was added to the International Finance Corporation (IFC) Global & Investable indices in June
1998	Launching of the exchange's first website.
1999	Establishment of the Disclosure Department to provide timely and useful information, to the Exchange.
2000	Establishment of Settlement Guarantee Fund to ensure timely settlement of transactions.
2001	Egypt was included on the Morgan Stanley Capital International (MSCI) Emerging Markets Free Index
2002	EGX issued a new decree to reorganize the OTC market, OTC divided into: Orders and Deals markets.

2003	EGX launched CASE 30 Price Index, the new free floated market capitalization index.
2004	The Membership Committee was established in EGX.
2005	EGX joined the World Federation of Exchanges as a full member
2007	Changing settlement of securities to be T+2 instead of T+3
2008	EGX launched the "X-Stream" New Trading System
2009	EGX Launches EGX 100 Price Index / EGX 70 Price Index / Renames CASE 30 Index to EGX 30
2010	Trading in NILEX, the Egyptian Exchange for Growing Medium and Small Companies Commenced
2011	The Launch of NILEX New Trading System / The Launch of EGX 20 Index
2012	Launch a New System of Calculating Closing Prices is Active, and New Surveillance System
2014	EGX Cancels the Precautionary Measures after January 2011 Revolution
2015	EGX Launches Equally Weighted Index EGX50 and launches The Electronic Disclosure System
2016	The Formation Of a New Senior Executive Committee For EGX
2017	The Establishment of EGX Foundation for Sustainability

Source: http://www.egx.com.eg 24/10/2017

Egyptian Stock Market Data:

Table (09): Egyptian Stock Market Data 2010 / 2015 / 2017

Item	2010	2015	2017
Market capitalization (Pound millions)	488 209	429 808	786 065
Number of listed companies	212	222	257
Trading Volume (Pound million)	322 036	244 740	319 468
Yearly Index (points)	6 675,39	8 148,8	13 453,45

Source: Quarterly bulletins of Arab Monetary Fund (Data Base)

4.3. The Moroccan Stock Market:

The Moroccan Stock Market (Casablanca Stock Exchange) was established in 1929, This Market was named the Office for Clearing of Transferable Securities; In order to improve market performance, a major set of market reforms was undertaken and the enactment a fundamental laws. It was as follow:

Table (10): Moroccan stock market reforms and laws

1948	the Office of trading of Transferable Securities replaced into the Office for Clearing of Transferable Securities
1967	Reforms were undertaken, well-organised legal and technical framework.
1986	Embarkation on a Structural Adjustment Programme.
1993	The enactment of three fundamental laws: ▪ Law Number 1-93-211 relating to the Stock Exchange. ▪ Law Number 1-93-212 relating to the "Securities Council" and information required of corporate entities making a public share offering.

	▪ Law Number 1-93-213 relating to Undertakings for Collective Investments in Transferable Securities.
1997	The enactment of law Number 34-96 (revising) relating to the Stock Exchange; made further improvements on market.
1998	The Establishment of the central securities depositary.
2000	The Market was renamed Casablanca Stock Exchange.
2002	The Launch of the new MASI and MADEX indices, sectors indices.
2008	The Launch of the new quotation system.
2008	The revamping of the statutes of the Market and the shift to the model of Board of Directors and General Management.
2009	Embarkation on The Stock Market gouvernance.

Moroccan Stock Market Data:

Table (11): Moroccan Stock Market Data 2010 / 2015 / 2017

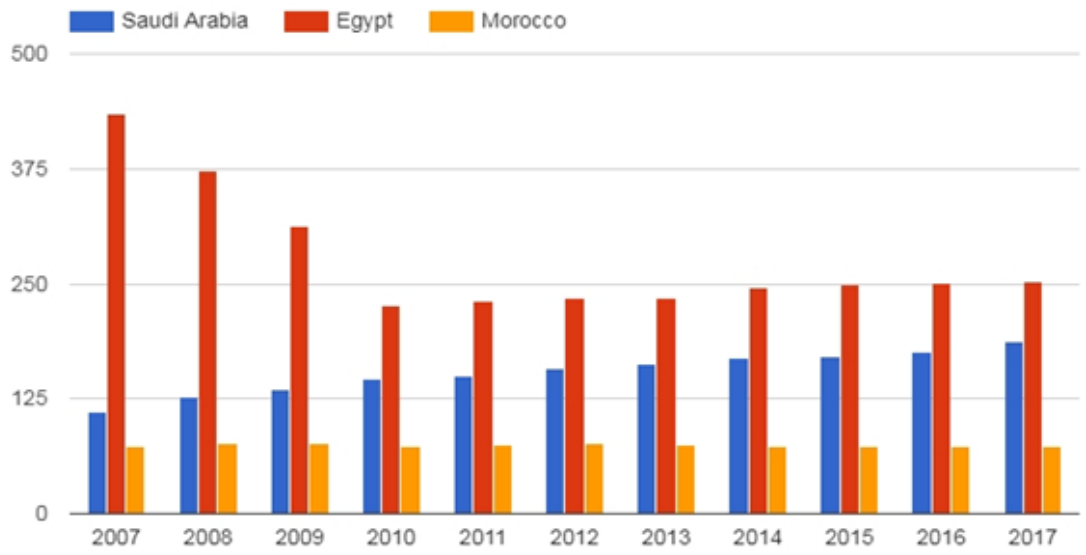
Item	2010	2015	2017
Market capitalization (Dirham millions)	579 020	453 316	626 965
Number of listed companies	75	75	74
Trading Volume (Dirham millions)	116 410.7	40 658	64 837.7
Yearly Index (points)	11 838,71	9 623,39	12 069,67

Source: Quarterly bulletins of Arab Monetary Fund (Data Base)

4.4. Comparison Charts.

Arab stock market Statistics: (Sample for 11 years from 2007 to 2017)

Figure (31): Number of companies listed on the stock exchange



Source: https://www.theglobaleconomy.com 2018

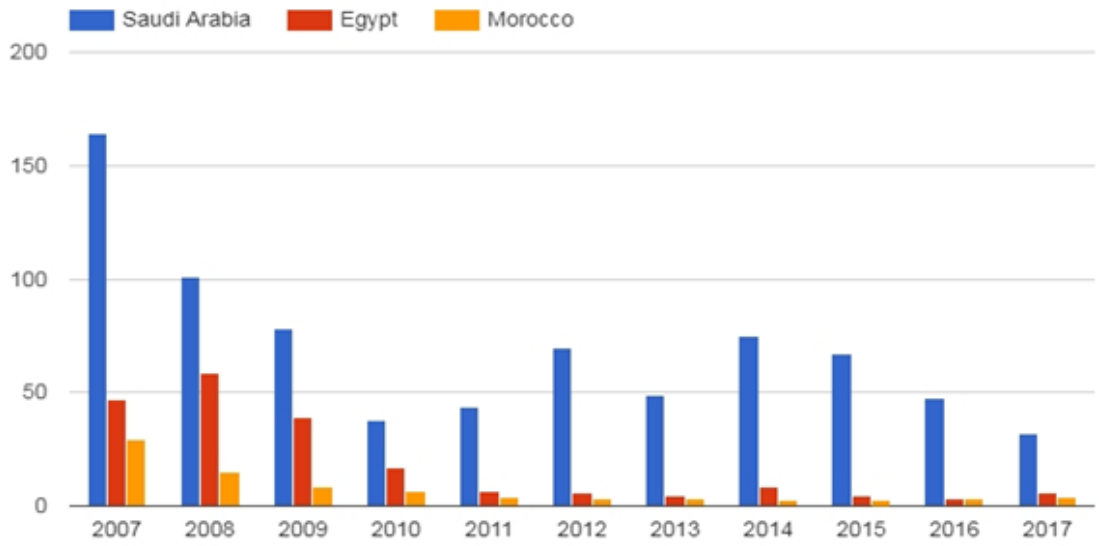
"Listed domestic companies, including foreign companies which are exclusively listed, are those which have shares listed on an exchange at the end of the year. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies, such as holding companies and investment companies, regardless of their legal status, are excluded. A company with several classes of shares is counted once. Only companies admitted to listing on the exchange are included" (theglobaleconomy, 2018)

Through the figure (31), we can note:

The number of companies listed in the Egyptian stock market is the largest among the three countries over the sample. For example, the number reached more than 300 over the first three years. Although it declined after that, it remained on the lead within the limits of 250 listed companies. In Saudi Arabia unlike the Egyptian stock market, the number of listed companies in Saudi stock market has recorded a continuous annual increase, ranged between 100 and 180 listed companies. While, in Morocco, the number of companies listed

in Casablanca stock market was often stable from the sample of all the 11 years. Although the number was the lowest among the three countries (less than 125 listed companies).

Figure (32): Stock market value traded, percent of GDP

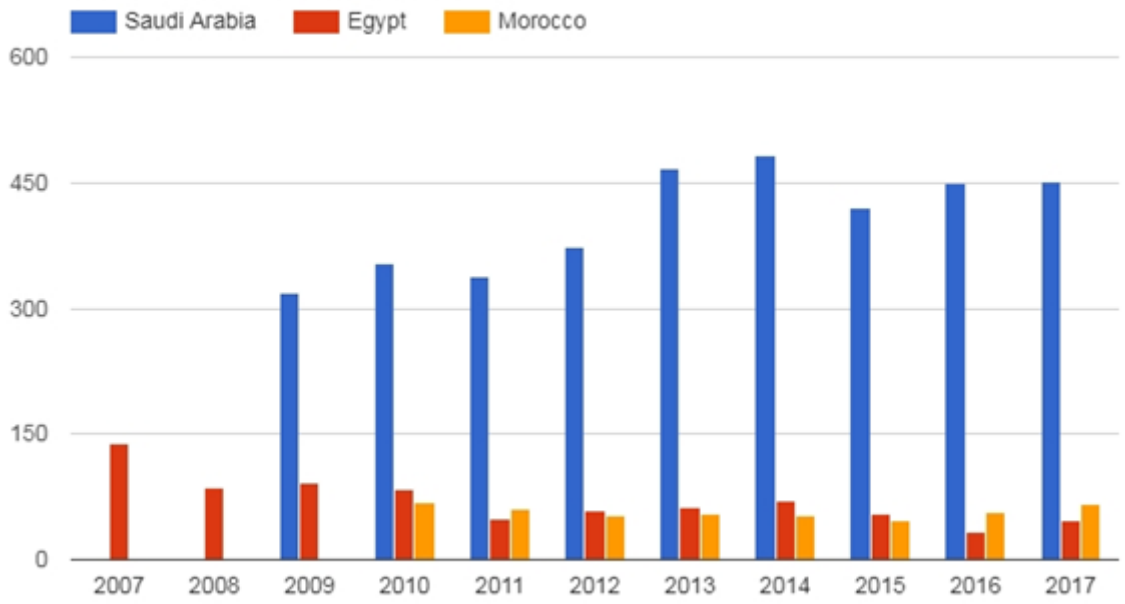


Source: https://www.theglobaleconomy.com2018

"The value of shares traded is the total number of shares traded, both domestic and foreign, multiplied by their respective matching prices. Figures are single counted (only one side of the transaction is considered). Companies admitted to listing and admitted to trading are included in the data. Data are end of year values" (theglobaleconomy, 2018)

From the figure (32), the value of shares traded in the three markets under study was different. This value was the highest in Saudi Arabia stock market, but it was in a downtrend, it ranged between 160 and 30 percent of the Gross Domestic Product. As for the Egyptian and Moroccan markets, the value of shares traded was generally less than 50 percent of GDP (in a downtrend). During the sample of 11 years it clearly shows that the value of shares traded of the Gross Domestic Product on Saudi stock market much higher than the rest other markets, despite the fact that the general trend of the sample was to a downtrend.

Figure (33): Stock market capitalization, billion USD

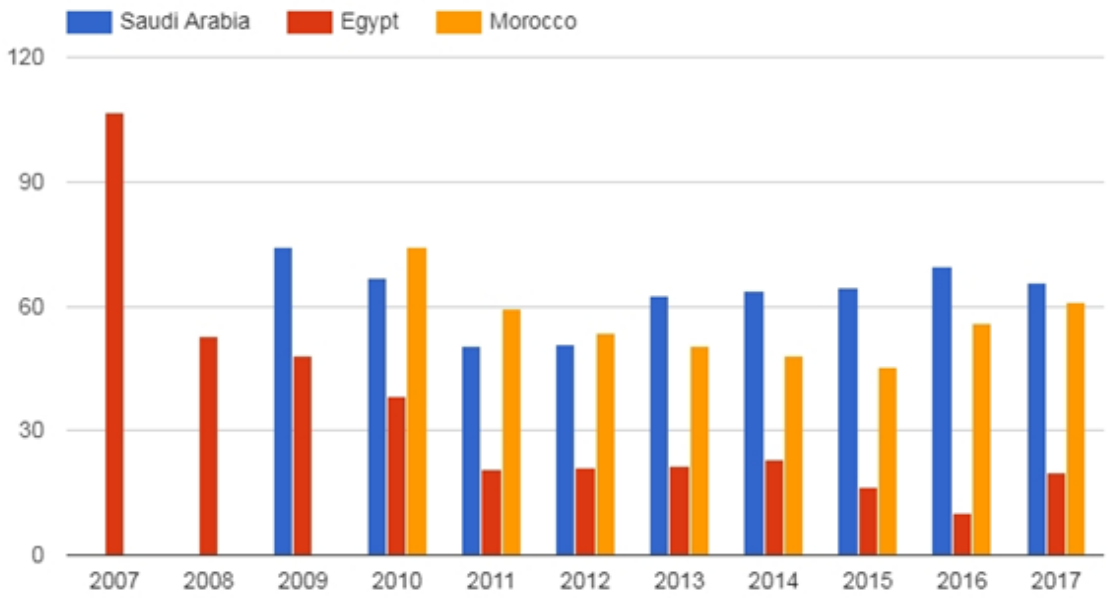


Source: https://www.theglobaleconomy.com 2018

"Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values" (theglobaleconomy, 2018)

Based on figure (33), we note that the Saudi stock market has the highest Market capitalization among the three markets; it ranged between 300 billion USD and 450 billion USD. On the other side, in Egypt and Moroccan stock market the market capitalization has fluctuated between the slight rise and the slight decrease; where it was always less than 150 billion USD. (up and down slightly)

Figure (34): Stock market capitalization, percent of GDP

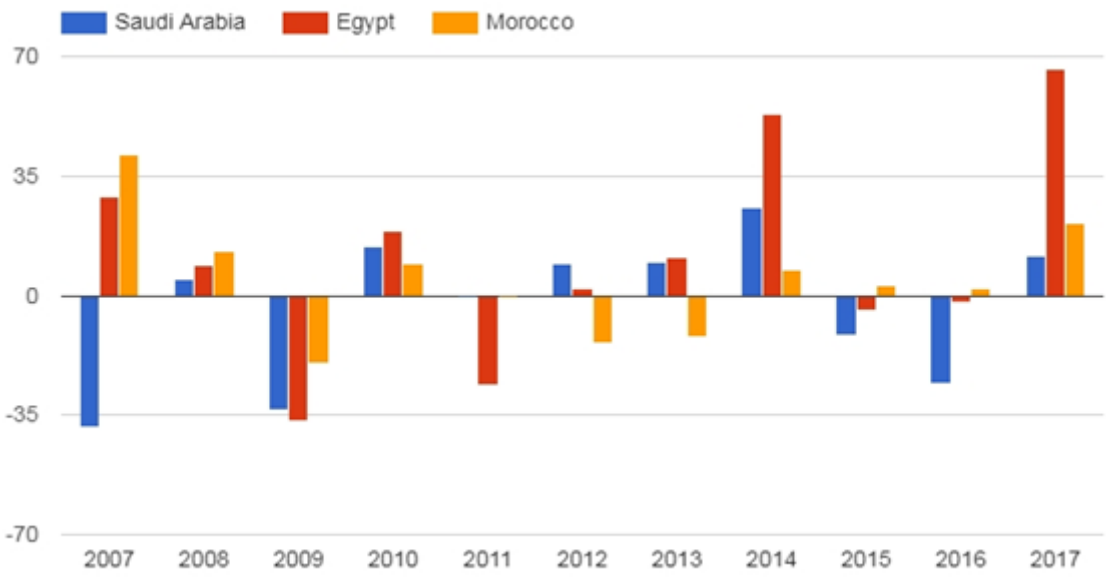


Source: https://www.theglobaleconomy.com 2018

According to the previous figure (34) of (Market capitalization billion USD), this figure shows the market capitalization percent of the Gross Domestic Product.

Generally, in all Arab markets under study, this percentage was less than 70. For example: the percentage of market capitalization to the Gross Domestic Product was slightly higher than (60) in Saudi Arabia stock market, while, this percentage ranged between (50 and 60) in the Moroccan stock market. But in the Egyptian stock market was in a downtrend and less than (30).

Figure (35): Stock market return, percent

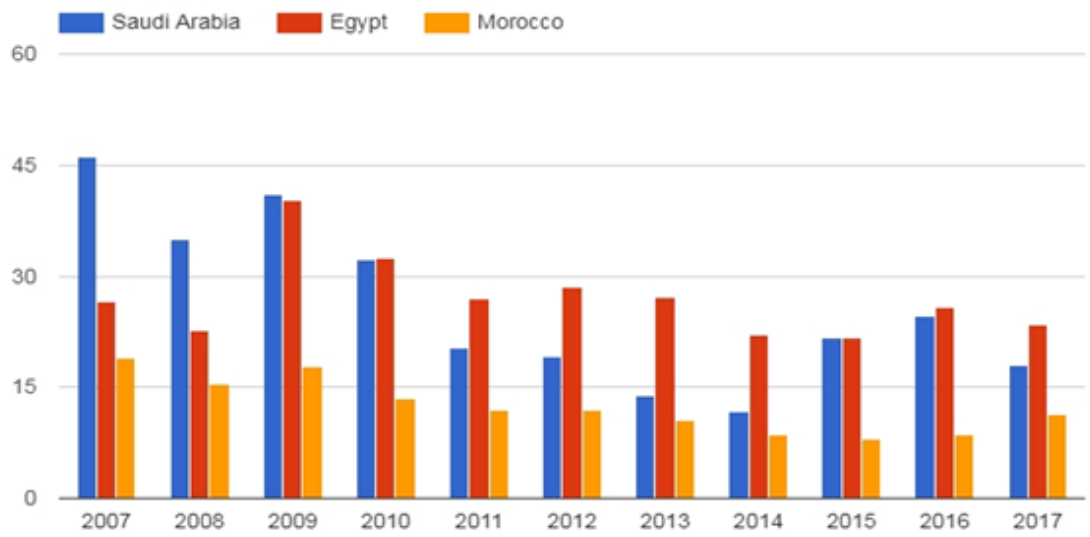


Source: https://www.theglobaleconomy.com 2018

"Stock market return is the growth rate of annual average stock market index. Annual average stock market index is constructed by taking the average of the daily stock market indexes available at Bloomberg" (theglobaleconomy, 2018)

The figure (35) represents the percentage of the markets return in the three markets. The growth rate of annual average Arab stock markets indices varied between negative and positive along the sample. The largest negative percentage was in the Saudi stock market in 2007, (-35) percent. While, the largest positive percentage was in 2017, around (70) percent, in Egyptian stock market. For the rest of year the stock market return ranged between negative and positive.

Figure (36): Stock price volatility, percent



Source:https://www.theglobaleconomy.com 2018

"The stock price volatility index is the 360-day standard deviation of the return on the national stock market index" (theglobaleconomy, 2018)

This Figure (36) chows stock price volatility. i.e. standard deviation of the return on the Arab stock markets indices. The largest percentages were in Saudi stock market (45) percent in 2007. In Egyptian stock market, the percentage of the stock price volatility index ranged between (15) and (30) percent. While, this index record the lowest value in Moroccan stock market (less than 15 percent) e.g. the lowest value in the sample was in 2015 (7) percent in this market.

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Chapter Five:

Comparing the Performance with emerging markets

Central-Eastern Europe Stock Markets:

- **WARSAW Stock Exchange**
- **BUCHAREST Stock Exchange**

5.1. Central and Eastern European stock markets

Central and Eastern European stock markets are acceptable example for comparison with our Arab markets under study because they are lag behind their in EUROPE peers in terms of size, liquidity, technology, and prosperity. On the other hand, we can classify it from the second level after Western Europe countries, and similar to our markets in many things e.g. the date of establishing; Global classification of its economy, and medium trading volumes, etc. So, from the point of this matter, we chose Poland (Warsaw) stock market and Romania (Bucharest) stock market to this comparative study.

5.1.1. Poland (Warsaw) stock market:

In Poland; Warsaw Stock Market was established on May 12, 1817; it was one of the oldest Stock Markets in the Central and Eastern European, More recently, on 16 April 1991 it was the date of the launch of the new version of The Warsaw Stock Market with the using of the electronic trading system.(Kaszuba, 2010, p. 89)

The Warsaw Stock Market is a joint stock company established by the State Treasury in Poland, it has a mission to organize the conditions and the rules for trading and of securities, for shares and derivative instruments.

Currently, the Warsaw Stock Exchange is the largest stock exchange in Central and Eastern Europe, The performance of the Warsaw Stock Exchange is based on three Official laws issued on 29 July 2005: (PAlilZ & Weber, 2009, p. 71)

- Law of public offerings and provisions for the incorporation of Brokerage into Trade and Public Companies.
- Law of Brokerage in Commerce.
- Law of supervision of the capital market.

Table (12): Warsaw stock market Events

1817	▪ The first stock exchange in Poland was opened in Warsaw on May 12, 1817. ▪ There were also stock exchanges in Katowice, Kraków, Lwów, Łódź, Poznań and Vilnius. However, the stock market in Warsaw had 90% of turnover
1938	▪ 130 securities were listed on the Warsaw Stock Exchange: bonds (state, banking, municipal), mortgage bonds and shares. ▪ At the outbreak of World War II, the Warsaw Stock Exchange was closed
1945	Attempts were made to reactivate the activity of exchanges in Poland, but their existence was incompatible with the imposed system of centrally planned economy.
1989	A new, non-communist government began a program to change the system and rebuild the market economy. it started the privatization and development of the capital market
1990	The first version of the bill regulating public trading in securities was developed
1991	▪ The Issuing the Law on Public Trading in Securities and Trust Funds. ▪ On April 12, 1991, was signed the act of establishing the Warsaw Stock Exchange. ▪ On April 16, the first stock exchange session was held with the participation of 07 brokerage houses, on which shares of five companies were listed.

Source: https://www.gpw.pl

5.1.2. Romania (Bucharest) stock market.

In Romania, Bucharest Stock Exchange is one of the oldest exchanges in the region (Central and Eastern European) where the Bucharest Stock Exchange was established on December 1, 1882; Reestablished in 1995, after almost 50 years of suspension following the establishment of the communist regime, the Bucharest Stock Exchange has developed continuously, Now; The Bucharest stock Exchange take an important role in the Romania economy, as a new tools of development.

Table (13): Bucharest stock market Events

1882	BVB is officially opened, after a tradition of more than 70 years when commodities-trade exchanges had been functioning.
1995	▪ BVB is re-established as a public interest institution. ▪ The first trading session takes place.
1997	BVB's first market index is launched. BET becomes the reference index for the local market.
1999	The five SIFs (financial investment companies) are listed at BVB.
2001	▪ Petrom and BRD, two of Romania's most important companies, are listed on BVB. As a result, BVB's market capitalization grows almost 4 times and the turnover doubles ▪ Bonds trading at BVB starts with the listing of first two municipal bond issues – Predeal and Mangalia
2002	BVB becomes a correspondent member of the Federation of the European Securities Exchanges (FESE).
2003	▪ The new trading system Arena is introduced, replacing the previously-used Horizon. ▪ BVB becomes a full member of the Federation of Euro-Asian Stock Exchanges (FEAS).
2005	▪ BVB turns into a joint-stock company. Shares are distributed to brokerage firms active at the time of demutualization. ▪ The merger by absorption with Rasdaq market is finalized.

2006	▪ The first privatization via the stock market takes place. Following the 15% IPO for Transelectrica, the company is listed at BVB. ▪ The Central Depository is established, an entity which would ensure the clearing and settlement of transactions. The institution would also keep records of the issuers' shareholders' registries. BVB is the major shareholder of the Central Depository. ▪ BVB becomes a member of the World Federation of Exchanges.
2007	▪ Romania becomes a European Union member, with a significant positive effect on capital markets. 2007 becomes the best year in BVB's history, both for traded value and market indices which reached new historical highs. ▪ Transgaz IPO takes place, with 15% of the company being sold via BVB. The company is subsequently listed at BVB. Allocation rights are used for the first time. ▪ BVB becomes an affiliated member of the World Federation of Exchanges (WFE).
2008	▪ The first dual listing takes place, for Erste Group Bank AG, also listed on Vienna Stock Exchange and Prague Stock Exchange. ▪ Other premieres are the introduction of government bonds and the listing of the first closed-end fund, STK Emergent
2010	The Bucharest Stock Exchange is listed on its own Regulated Market.
2011	The main event of the year is the listing of FondulProprietatea at BVB, which had a decisive influence on the value of trades and the number of active investors
2012	The first Exchange Traded Fund is listed at BVB.
2013	The privatization program via the stock exchange continues with the listing of Nuclearelectrica and Romgaz. The public offer for the 15% stake in Romgaz that preceded the listing became the largest IPO registered in Romania by that time.
2014	▪ Electrica IPO takes place (the largest IPO ever in BVB's history), followed by the company's listing. ▪ The modernization process of BVB continues with the implementation of a new program for market makers, the extension of the trading hours and inclusion of trading at last phase, the introduction of changes in the trading block and measures dedicated to existing and potential issuers

2015	BVB becomes member to the United Nations Sustainable Stock Exchanges Initiative.
2016	FTSE Russell included Romanian capital market in the list of countries that have a substantial potential to be upgraded to the status of the Emerging Market in short or medium term perspective.
2017	Record capitalization of listed companies, 25 percent higher trading values and a market return including dividends of over 19%.
2018	6 issues of corporate bonds with a total value of EUR 980mn (with amounts between EUR 500,000 and EUR 550mn).

Source: http://www.bvb.ro/AboutUs/History

Bucharest Stock Market (Shares Data):

Table (14): Bucharest Stock Market (Shares data) 2010 / 2015 / 2017

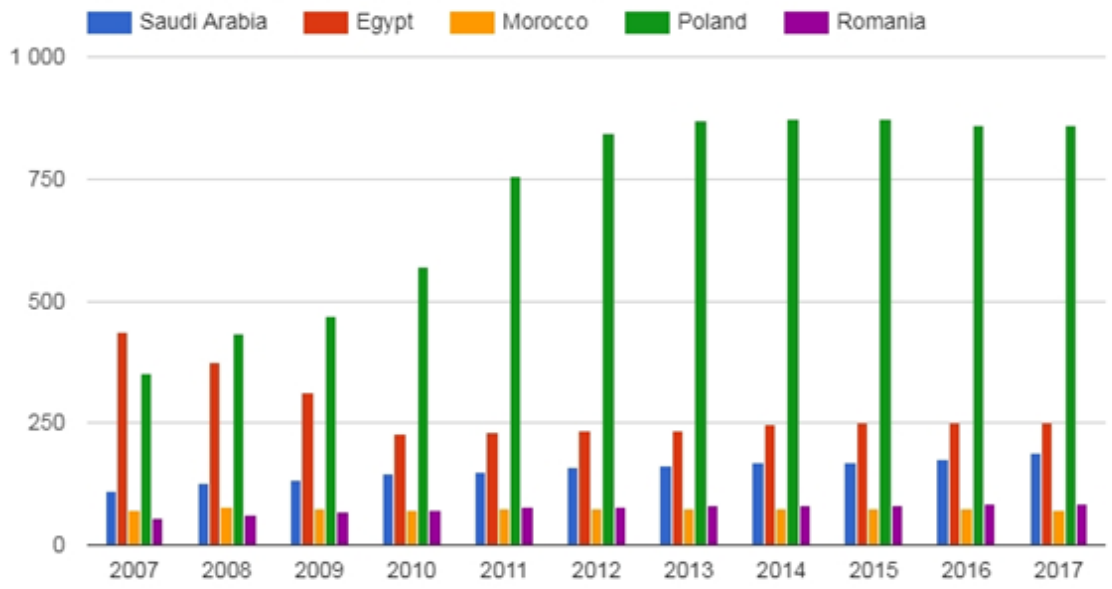
Item	2010	2015	2017
Market capitalization	102 442 620 945	146 002 473 957	164 376 159 957
Number of listed companies	74	84	87
Trading sessions	255	251	248
Volume	13 339 282 639	6 696 750 556	9 105 130 182
Value	5 600 619 918	8 803 398 908	11 852 373 077

Source: http://www.bvb.ro/TradingAndStatistics/Statistics/GeneralStatistics

5.1.3. Comparison Charts:

(Between Arab stock market and Central-Eastern Europe Stock Markets)

Figure (37): Number of companies listed on the stock exchange

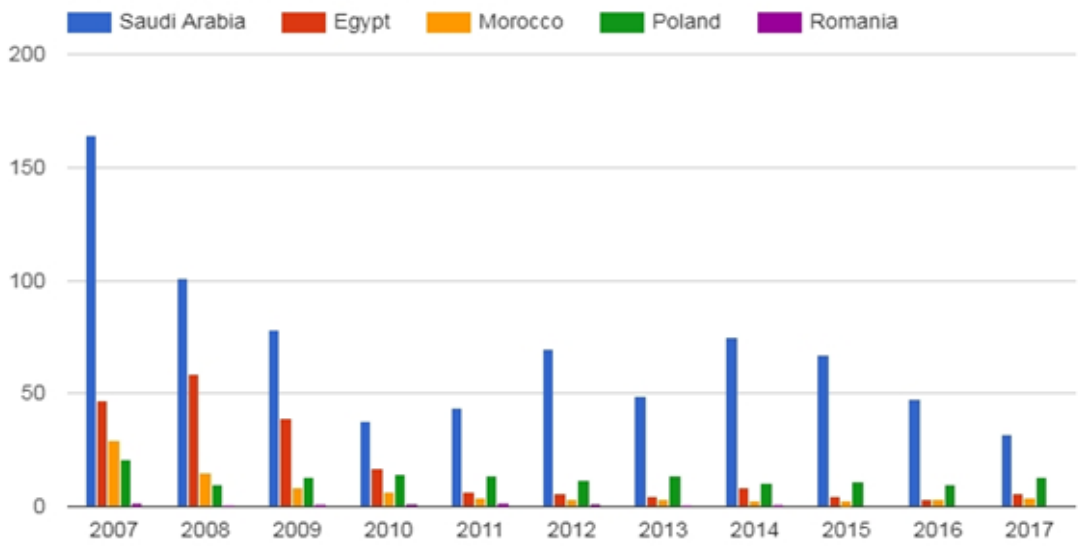


Source: https://www.theglobaleconomy.com 2018

According to the previous Figure (37),we note that the number of companies listed on the Warsaw (Poland) stock exchange witnessed a remarkable increase compared to the Arab markets under study (Saudi Arabia, Egypt, Morocco), at beginning of the sample, this number was close to the number of companies in the Egyptian stock exchange, it increased with the beginning of the year 2010 to more than 500 companies listed on the Polish Stock Exchange, then reached more than 750 companies listed starting from 2011.

On the other hand, the number of companies listed on the Romanian (Bucharest) stock exchange was constant throughout the sample (less than 100 companies listed), which is a low number compared to all the Arab markets under study.

Figure (38): Stock market value traded, percent of GDP

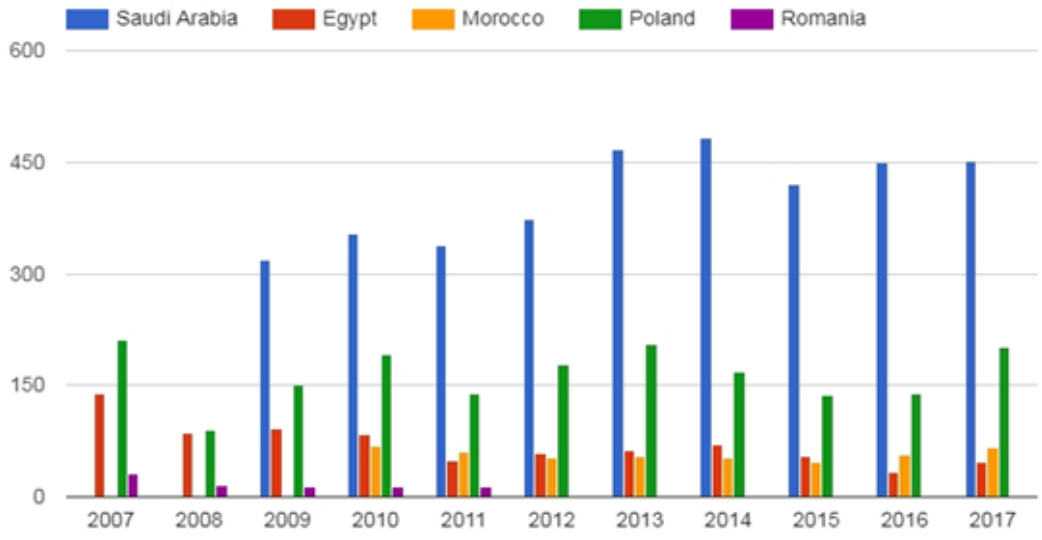


Source: https://www.theglobaleconomy.com 2018

From the Figure (38), the value traded of the Warsaw (Poland) stock exchange was stable. It was less than (25) percent of the Gross Domestic Product. This value is similar than Egyptian and Moroccan stock exchange. But its low strongly from the value of traded in Saudi Arabia stock exchange (percent of the Gross Domestic Product).

While, the Romanian (Bucharest) stock exchange registered a low value (lower than 10 percent of the Gross Domestic Product). It was very small and hardly calculated. Also this percentage was lower than all Arab stock market under study.

Figure (39): Stock market capitalization, billion USD

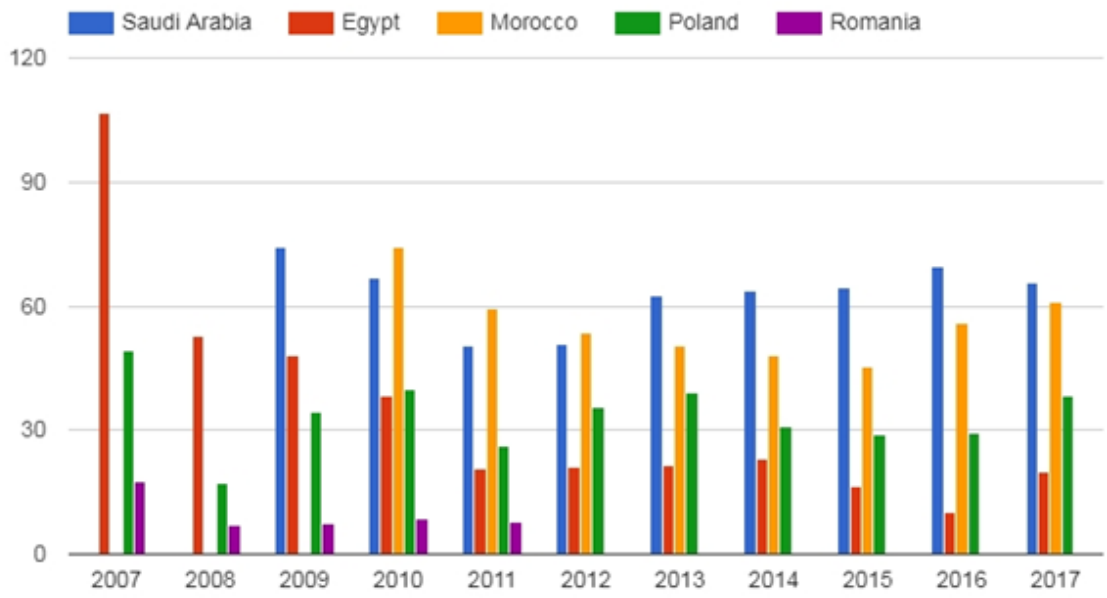


Source: https://www.theglobaleconomy.com 2018

From this Figure (39), the stock market capitalization in Warsaw (Poland) stock exchange ranged between (100) and (200) billion USD during all years in the sample. This value is higher than Stock market capitalization Egypt and morocco. But also lower than the value of capitalization in Saudi Arabia stock market.

On the other hand, the stock market capitalization in Bucharest stock exchange was very lower than (50) billion USD, and sometimes very few, it cannot be compared with all Arab markets under study

Figure (40): Stock market capitalization, percent of GDP:

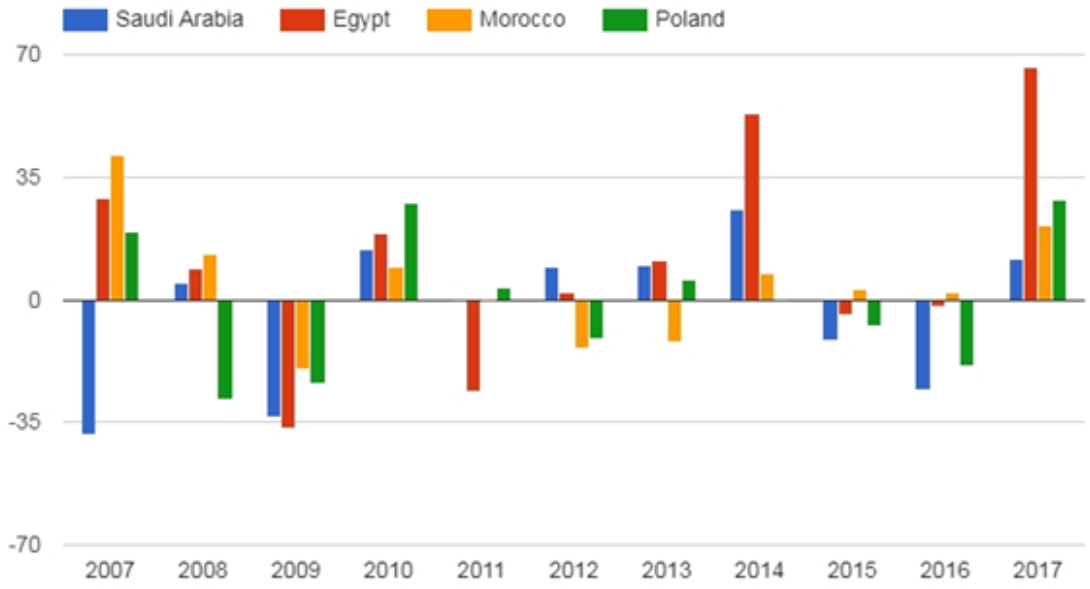


Source: https://www.theglobaleconomy.com 2018

According to the Figure (40), In the Warsaw stock exchange, the stock market capitalization represented between (20 to 50) percent of the Gross Domestic Product, generally, this level was lower than the percentage of the capitalization in the Arab stock markets under study (Saudi Arabia and Morocco).

On the other hand, the stock market capitalization of Bucharest stock exchange represented lower than 10 percent of the Gross Domestic Product, this level was the lowest between all markets under study, it was very few in the last years of our sample.

Figure (41): Stock market return, percent



Source: https://www.theglobaleconomy.com 2018

From the Figure (41), we note that the percentage of the markets returns in Warsaw stock exchange ranged between negative and positive levels. it registered more than (-20) percent in 2008 as a percentage negative level, while, it was (25) percent in as a positive percentage level in 2010 and 2017. These levels are acceptable In comparison with all Arab stock market returns.

LATIN-AMERICAN Stock Markets:

- **SÃO PAULO Stock Exchange**
- **BUENOS AIRES Stock Exchange**

1.2. Latin-American stock markets:

The second region for our study of comparison is Latin America, where the economies of Brazil and Argentina are the closest to Arab economies in terms of size and history. Brazil is among the most important rapidly developing economies, and it is one of the twenty strongest economies in the world with (Saudi Arabia and Turkey). In addition, the São Paulo stock market is one of the strongest exchanges in the region, while, the Buenos Aires Stock market is less performing than it but remains one of the most important emerging stock markets in Latin America.

1.2.1. Brazil (São Paulo) stock market.

In Brazil, The Brazilian Stock Market was established since 1890, officially on 23 August 1890, under the name (BOVESPA - Bolsa de Valores de São Paulo) the São Paulo Stock Exchange; (BOVESPA) is relatively large and old Stock Market in Latin-American.

More recently; The São Paulo Stock Exchange has an important role in Brazil's economy; where there is a causal relationship between the economic growth and the stock market activity; and that is the reasons why Brazil has the biggest economy in Latin America; Internationally, The São Paulo Stock Exchange become more open to foreign investors, and foreign capital.

São Paulo Stock Exchange from (Bovespa) to (BM&F Bovespa):

In 2008; After the merger of the Sao Paulo Stock Exchange (Bovespa) and the Brazilian Mercantile and Futures Exchange (BM&F) ; The state established a finance pole under the name (BM&F Bovespa) ; Now, The (BM&F Bovespa) become the largest stock exchange in Latin-American. Now; The Brazil Stock Exchange is a self-regulatory entity that operates under the supervision of the Brazilian Securities Commission.

The benchmark indicator of the São Paulo stock exchange

"Ibovesoa" is the benchmark indicator of the São Paulo stock exchange, "Ibovesoa" comprised about 50 most representative companies in São Paulo Stock market (bmfbovespa, 2017).Currently ; the indicator composed about 60 Stock, comprised the large companies in Brasil.

Table (15): About São Paulo stock exchange

1890	The Establishment of São Paulo stock exchange, was known "The Bolsa de Valores de Sao Paulo"
1960	Bovespa and the other Brazilian stock markets were state-owned companies, during this time there were 27 stock exchanges around Brazil.
2000	The stock exchanges of Sao Paulo and Rio de Janeiro (BVRJ) and also nine other Brazilian stock exchanges in other cities of Brazil were intergrated and linked together. Since then, shares of listed companies in Brazil and corporate bonds are traded on the Bovespa
2007	The Exchange demutualized and become a for-profit company.
2007	10/26/2007 – BOVESPA's initial public offering. (IPO).
2007	11/30/2007 Brazilian Mercantile and Futures Exchange "BM&F"'s initial public offering (IPO).
2008	"Bovespa Holding" announced the merger of the Sao Paulo Stock Exchange (Bovespa) and the Brazilian Mercantile and Futures Exchange (BM&F), creating the world's third largest stock exchange. (Merger approved)
2009	Merger completed to BM&FBOVESPA.

São Paulo Stock Market DATA:

Table (16): São Paulo Stock Market data 2010 / 2015 / 2017

Item	2010	2015	2017
Market capitalization (millions US$)	1.547.836	478.876	954,629
Number of listed companies	383	359	343
Indice Bursátil			
Ibovespa	69.304	43.350	76,403
IBrX50	9.634	7.358	12,766
Number of brokerage firms	100	100	112
Total value of share trading (Millions US$)	868.110	487.277	662,626
Total value of bond trading (Millions US$)	248	283	243
Ibovespa	69.304	43.350	76,403

Source : http://handbook.fiabnet.org/en/bmfbovespa/

1.2.2. Argentina (Buenos Aires) stock market:

Buenos Aires Stock Exchange (Bolsa de Comercio de Buenos Aires) BCBA was established since 1854,on July 10, 1854. It is one of the oldest Stock markets in the Latin America area. The (BCBA) officially launched in 1856; When the Buenos Aires Stock Exchange commenced its trade of corporate shares, more recently; The Buenos Aires Stock Exchange becomes a mechanism to develop the Argentine economy. In 2012, with the Issuing of the new capital market law, is an important milestone in the stock market history ; Now, the Buenos Aires Stock Exchange has a big role on the economic development in Argentina.

Table (17): Buenos Aires Stock Exchange History

1854	The Buenos Aires Stock Exchange was established. on July 10, 1854
1856	Corporate shares began to be traded on the Exchange.
1968	The approval of Law 17811 of the Public Offering of Securities. Through this document, the National Securities Commission was created and self-regulatory powers were granted to stock exchanges and markets in the country.
1984	The Launch of the current operations area, equipped with a computer system that allows recording and disseminating operations in real time.
1990	The Stock Exchange became the leading institution that allowed small and large investors to participate as shareholders of the large utility companies that came out to the public offering.
2000	The Exchange retained its institutional reliability, With the Financial Crisis in Argentina, after the restructuring of its public and private debt.
2004	The Buenos Aires Stock Exchange dressed up to celebrate its 150th Anniversary.

2012	With The Launch of the new capital market law, The Buenos Aires Stock Exchange is aggiorna as an Argentine institution linked to the economic development of the nation.

Source: http://www.bcba.sba.com.ar/ 04/09/2017

Buenos Aires Stock Market data:

Table (18): Buenos Aires Stock Market data 2010 / 2015 / 2017

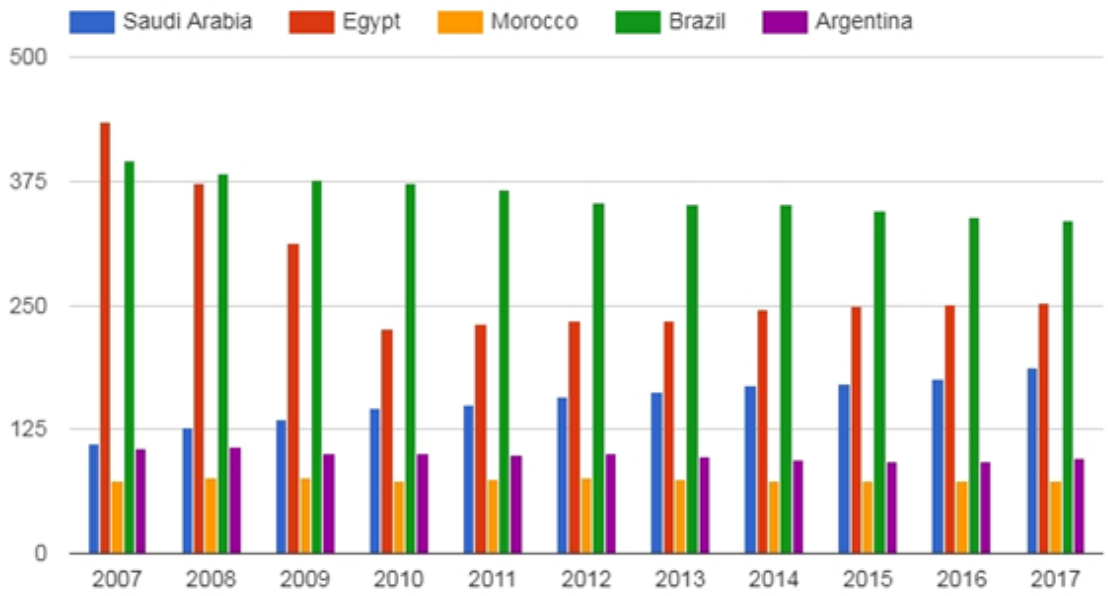
Item	**2010**	**2015**	**2017**
Total market capitalization (millions US$)	478 389	254 330.72	110 589.14
Number of listed companies	106	99	102
Stock Index Level			
Merval	3 523.59	33 156.38	30 007.12
Bolsa General	188 392.43	479 544.15	1 307 017.09
Burcap	11 857.45	11 675.18	85 981.27
Number of brokerage firms	133	204	248
Total value of share trading (Millions US$)	3 815	5 051.67	7 399.21
Total value of bond trading (Millions US$)	27 807	34 316.68	127 454.69

Source : http://handbook.fiabnet.org/en/bolsa-de-comercio-de-buenos-aires/

1.2.3. Comparison Charts:

(Between Arab stock market and Latin-American stock markets)

Figure (42): Number of companies listed on the stock exchange

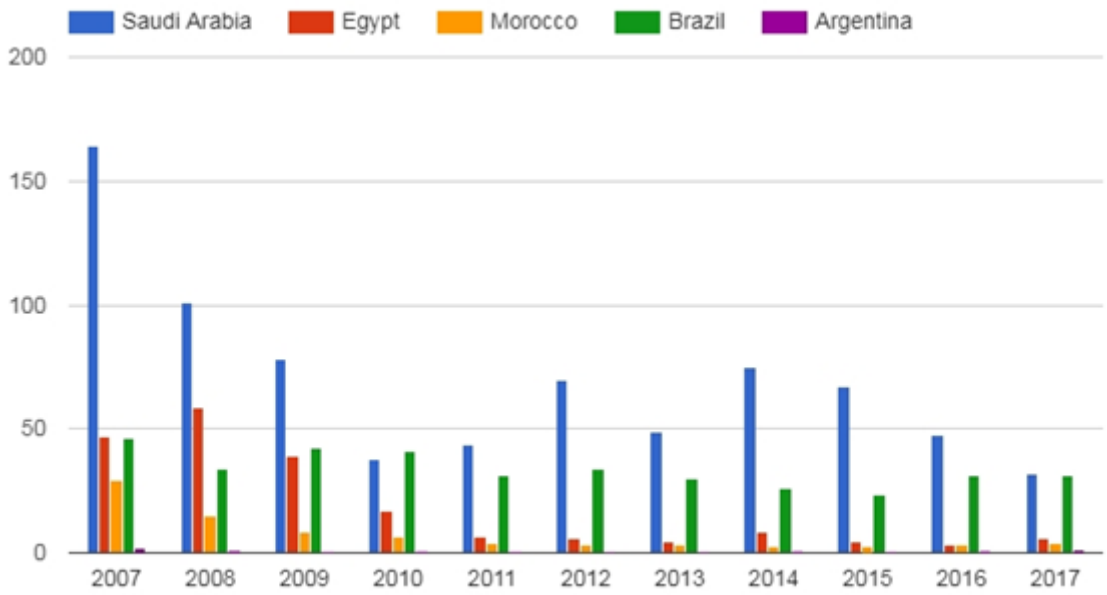


Source: https://www.theglobaleconomy.com 2018

According to the Figure (42), we note that the number of listed companies on Brazil (São Paulo) stock market is more than (300) companies along the sample, although it gradually decrease. This number is high than all Arab stock market under study, that explains the remarkable development of the Brazilian stock exchange comparing by the Arab markets.

On the other hand, in Buenos Aires (Argentina) stock market, the number of companies listed in the market was stable and under (100) companies, it was the same level of Moroccan stock market and lower than the Egypt and Saudi Arabia markets.

Figure (43): Stock market value traded, percent of GDP

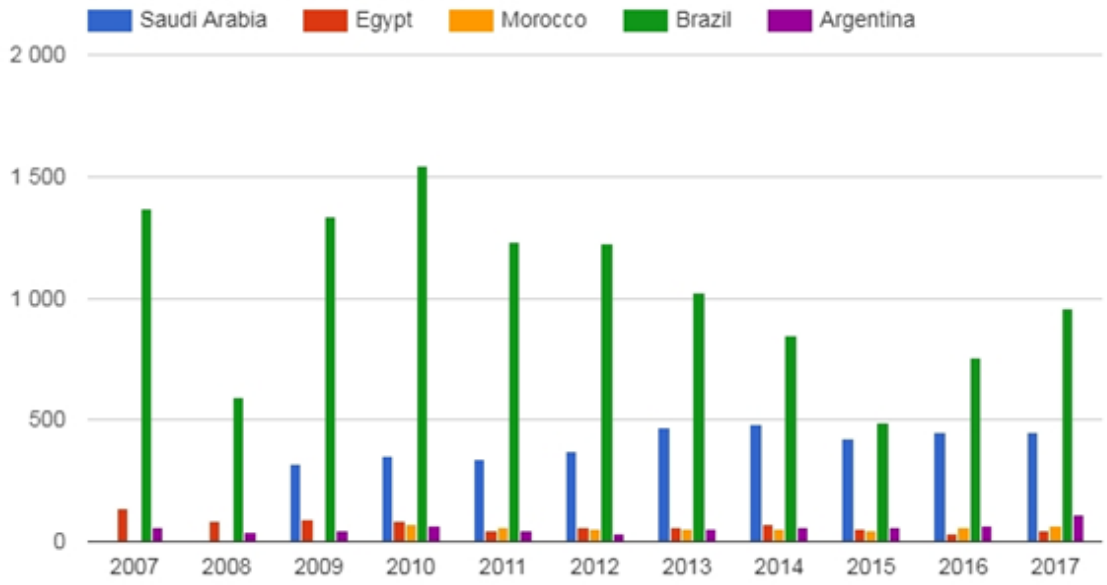


Source: https://www.theglobaleconomy.com 2018

This figure (43) analyses the stock market value traded, percent of Gross Domestic Product, this value traded is under than (50) percent of GDP in São Paulo stock market, this level is strongly low from the Saudi Arabia stock market, but it is high than the Egyptian and Moroccan stock market.

While, in Buenos Aires stock market the value traded of stock market was very few of Gross Domestic Product, it is hardly mentioned, this level was the lowest between all markets.

Figure (44): Stock market capitalization, billion USD

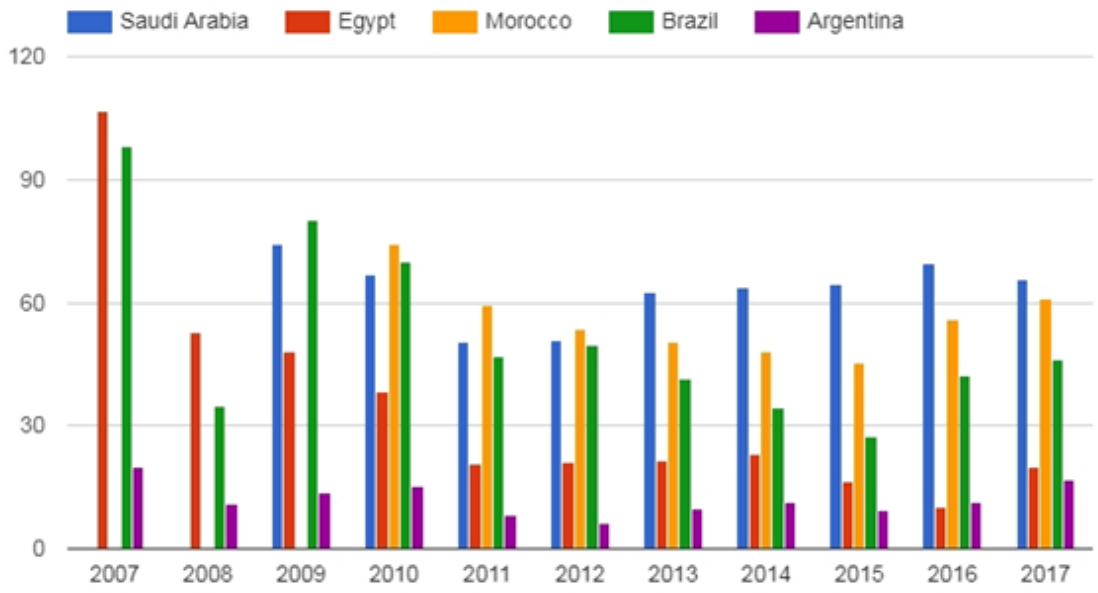


Source: https://www.theglobaleconomy.com 2018

According to the Figure (44) above, the stock market capitalization in São Paulo stock market amounted more (1000) billion USD during the period from 2009 to 2013, it was a strongly highest value compared with the Arab stock markets under study, although it gradually decrease in the last years of our sample, However, it remained a high value.

On the contrary, in Buenos Aires stock market, the capitalization was lower than (100) billion USD along the sample. It has a same level with the Egyptian and Moroccan stock markets.

Figure (45): Stock market capitalization, percent of GDP

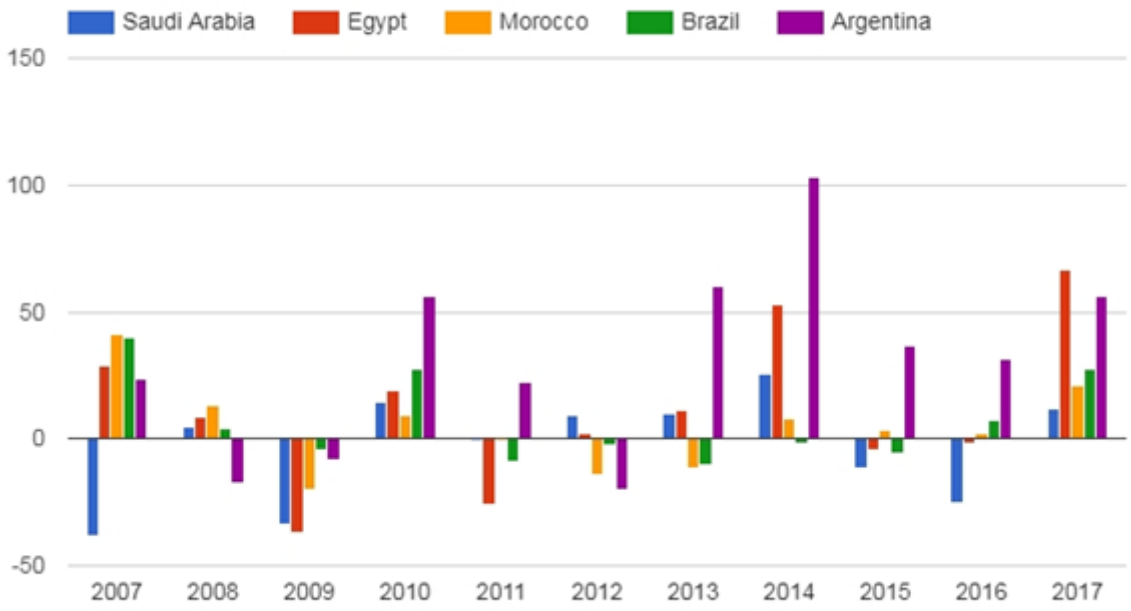


Source: https://www.theglobaleconomy.com 2018

Based on the last figure, the figure (45) represents the stock market capitalization, percent of Gross Domestic Product, this percentage registered in São Paulo stock market a same level of Arab stock market under study (Saudi Arabia and Morocco). Generally, São Paulo stock market registered between (30) and (60) percent of Gross Domestic Product, during the period from 2011 to 2017.

On the other hand, the stock market capitalization of Buenos Aires stock market is the lower than all stock markets under study. It was under (15) percent of Gross Domestic Product.

Figure (46): Stock market return, percent



Source: https://www.theglobaleconomy.com 2018

According to the Figure (46) above, the percentage of stock market return ranged between a negative and positive levels, in São Paulo stock market registered a few negative value during the period from (2011) to (2015), While we not a positive value in (2007, 2008, 2010, 2016, and 2017). These levels are close than the Arab stock market under study.

On the other hand, the Buenos Aires stock market registered (contrary to all studied markets) high levels (positively from 2013 to 2017) and (negatively in 2008, 2009, 2012).

MIDDLE-EAST Stock Markets:

- TEHRAN Stock Exchange
- İSTANBUL Stock Exchange

1.3. Middle-East Stock Markets:

In Middle-East, Turkey and Iran are considered the most important countries for comparative studies with Arab countries. Given the geographical location of the two neighbors makes them a real example of the various comparisons, In addition, the economic boom in Turkey has recently imposed on all Arab countries to take the same path to catch up. Our selection of Istanbul Stock Exchange and the Tehran Stock Exchange to do comparisons with Arab markets under study maybe was the best in order to provide the results of insights on the path of Turkey economic reform, and the effects of the financial suffocation and economic isolation on Tehran stock market.

1.3.1. Iran (Tehran) stock market.

Tehran Stock Exchange (TSE) was established on 4 Feb 1967 as the first Exchange in Iran, The (TSE) officially launched by six companies was listed in the stock exchange, and it was concerned for government bonds and certain State-baked certificate.

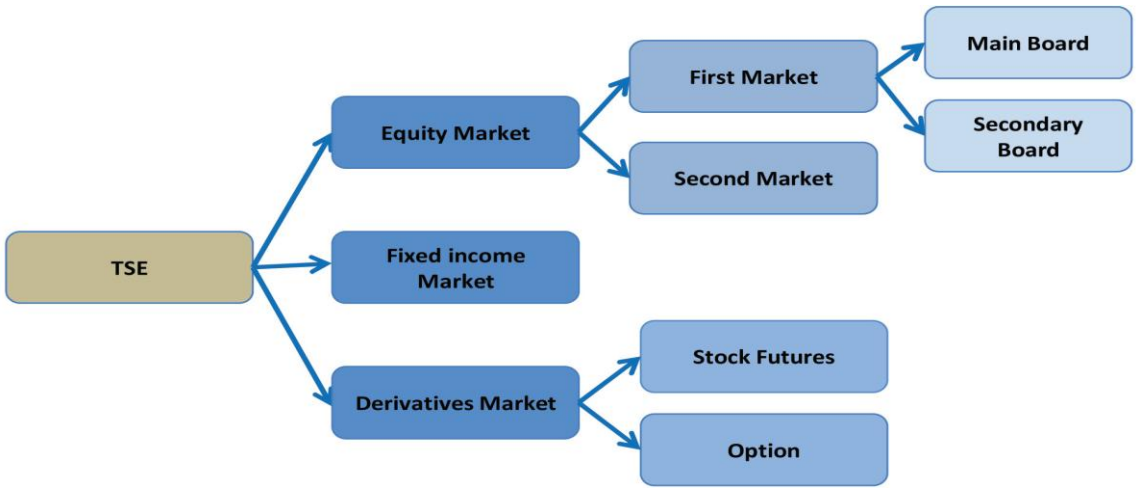
Table (19): Tehran Stock Exchange Events

1966	The Law for the Establishment of the Stock Exchange was approved by The parliament.
1967	The Tehran Stock Exchange commenced operation on Feb. 4.
1972	Stocks of 23 companies and three bonds were traded at The Tehran Stock Exchange.
1983	The law for Usury-Free Banking was enacted. Trading in bonds was abandoned.
1992	The Tehran Stock Exchange admitted as a full member of the International Federation of Stock Exchanges.

1995	The Tehran Stock Exchange joins the Federation of Euro-Asian Stock Exchanges as one of its founding members.
2003	Listed companies are allowed to issue corporate bonds.
2007	Launching Privatization Plan of State-Owned Companies.
2008	Establishment of SMEs Market (Iran Farabourse) in the Capital Market.
2010	▪ Foreign Investment Deregulation. ▪ Launching Single Stock Futures Market and On-line Trading Services
2012	Launching A New Derivatives Product: Embedded Put Option.

Source: Annual Report of Tehran Stock Exchange. 2012, p. 8

Figure (47): Tehran stock exchange System:



Source: Annual Report of Tehran Stock Exchange. 2012, p. 14

1.3.2. Istanbul Stock Market:

Istanbul Stock Market (BORSA ISTANBUL) established officially until the end 1985's, under the name "İstanbul MenkulKıymetler Borsası" (İMKB), Istanbul Stock Market was Commenced the trading in the early 1986's; The Istanbul Stock Exchange has come a long way, with consistent strategy and rapid rate of economic growth to be turkey The 6th biggest economy in Europe, and The 16th biggest economy from the world (ISTANBUL, 2014, p. 2). Now, Istanbul Stock Market is a story of transformation as center of gravity of Turkish economic; to become İstanbul the regional financial center in Middle-East.

Table (20) Milestones of BORSA İSTANBUL

1985	Istanbul stock market Inaugurated, under the name "İstanbul MenkulKıymetler Borsası"
1986	Commencement of stock trading on January 3, 1986.
1989	▪ Establishment of the Settlement and Custody Center. ▪ Issuance of Decree 32 which allows foreign investors to purchase and sell all types of securities in Turkey and repatriate the proceeds.
1991	Initiation of the Bonds and Bills Market and commencement of Outright Purchases and Sales Transactions.
1992	▪ Commencement of trading of Corporate Bonds and Revenue-sharing Certificates in the Bonds and Bills Market. ▪ Acceptance of the Istanbul Stock Exchange "İMKB" as a full member to The World Federation of Exchanges (WFE, previously FIBV)
1993	▪ Launch of the Rights Coupon Market and New Shares Market. ▪ Initiation of the Repo/Reverse Repo Market.
1994	▪ Initiation of Small Orders Market in the Bonds and Bills Market. ▪ Full automation of stock trading.

1995	▪ Establishment of the " Federation of Euro-Asian Stock Exchanges " (FEAS) with 12 members ▪ Establishment of Investor Counselling Center designed to provide information on the İMKB's operations and traded companies. ▪ Transformation of the İMKB Settlement and Custody Company into the İMKB Settlement and Custody Bank (Takasbank)
1996	▪ Accepting of the applications for listing and trading on the İMKB International Market. ▪ Foreign Currency Denominated Government Debt Securities started totraded at the Outright Purchases and Sales Market of the Bonds and Bills Market. ▪ Launch of the International Bonds and Bills Market within the İMKB International Market.
1999	▪ İMKB started to calculate İMKB 100 Index on Euro basis. ▪ The new computerized trading software for the Bonds and Bills Market. ▪ İMKB's Executive Council changed the trading hours for the Bonds and Bill Market.
2000	Primary dealership system was launched for Government Debt Securities.
2009	▪ City Indices launched for 9 cities. ▪ The Emerging Companies Market was established. ▪ Public Disclosure Platform launched. ▪ İMKB Emerging Companies Market Regulation was published with an aim to provide an organized and transparent market for trading of companies with growth and development potential.
2010	"Initial public offering" IPO Summit Turkey.
2011	▪ Establishment of the Interbank Repo-Reverse Repo Market. ▪ İMKB launched the Dividend Indices.
	▪ Initial Public Offering (IPO) Index started to be calculated. ▪ (İMKB) Free Trade Platform was launched. ▪ Discount and Turbo Certificates were launched.

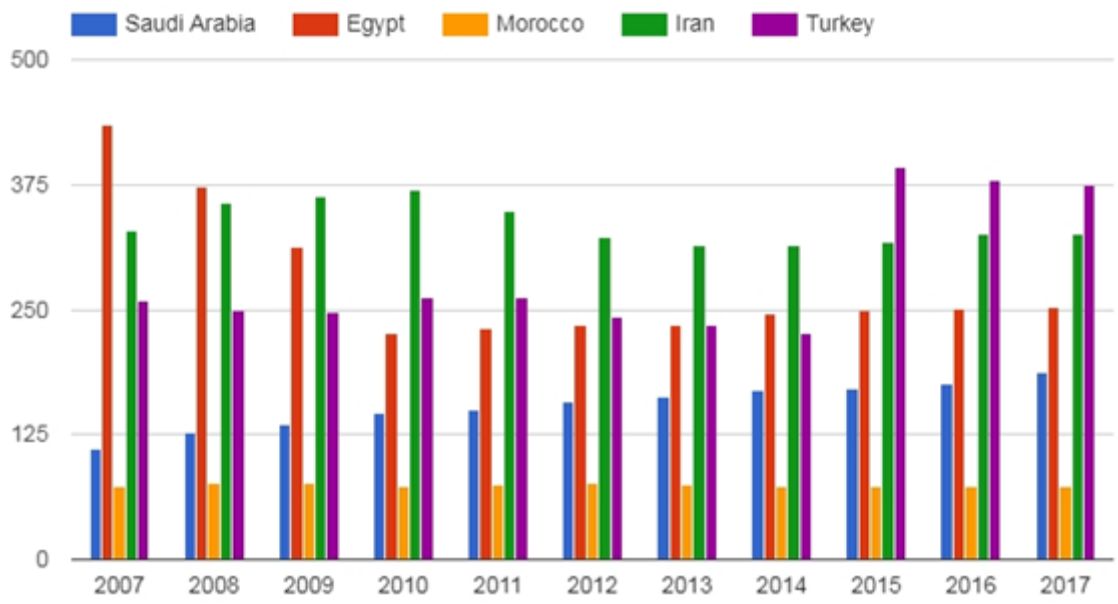
2012	▪ Equity Repo Market was launched. ▪ İMKB Derivatives Market (VIOP) was launched.
2013	▪ Upon the registration of the Articles of Association of Borsa İstanbul by the Trade Registry, the legal entities of İstanbul MenkulKıymetler Borsası and İstanbul Gold Exchange were terminated and the two institutions merged under a single roof. ▪ The official opening of Borsa İstanbul was realized with a bell ceremony organized at Borsa İstanbul premises. ▪ The abbreviation "İMKB" used in the titles of the indices was changed to "BIST". ▪ The trading platforms of Turkish Derivatives Exchange (TURKDEX) and BorsaİstanbulDerivatives Market (VIOP) merged. ▪ BIST SME Industrial Index started to be calculated.
2014	The world's first web-based private market developed by a stock exchange, Borsa İstanbul Private Market
2015	▪ Borsa İstanbul starts to calculate "İşBankası" Affiliates Index. ▪ BIST Sustainability Index, consisting of the equities of companies traded on Borsa İstanbul and has a high corporate sustainability performance, starts being calculated.

Source: http://www.borsaistanbul.com 2017

1.3.3. Comparison Charts:

(Between Arab stock market and Middle–East stock markets)

Figure (48): Number of companies listed on the stock exchange

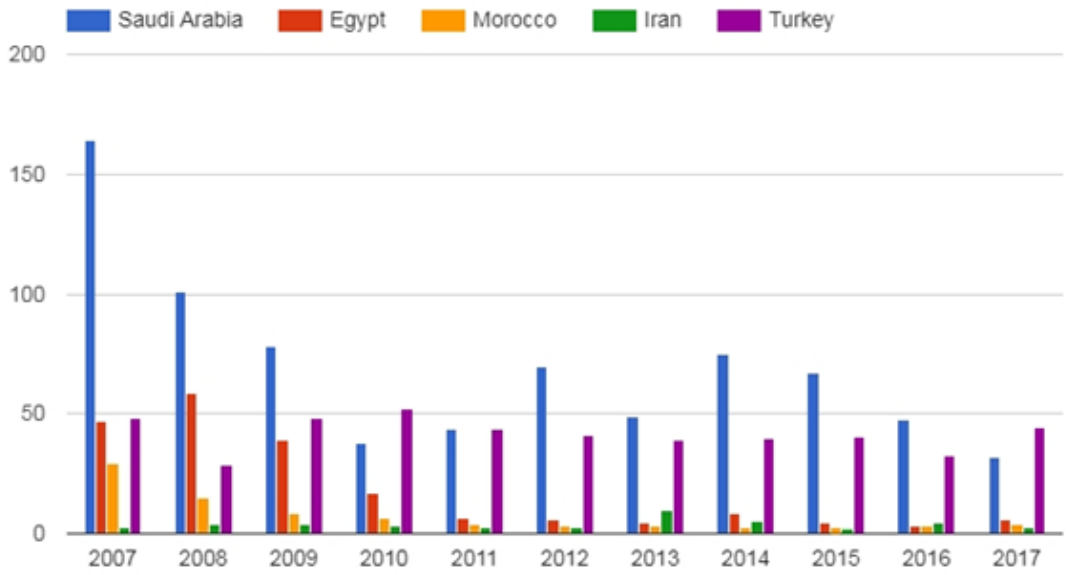


Source: https://www.theglobaleconomy.com 2018

According to this Figure (48), we concluded that the number of listing companies on Tehran (Iran)stock exchange was more than (250) listed companies along the sample, this number is high compared the number of companies in the Arab stock market under study. This high number represented a stability of Iranian stock exchange.

Also, In Istanbul stock exchange, the number of companies listed in this market registered a steady rise, especially in the last years of the studied sample, e.g. Istanbul stock market registered more than (300) listed companies during the period from 2015 to 2017, higher than all stock markets studied.

Figure (49): Stock market value traded, percent of GDP

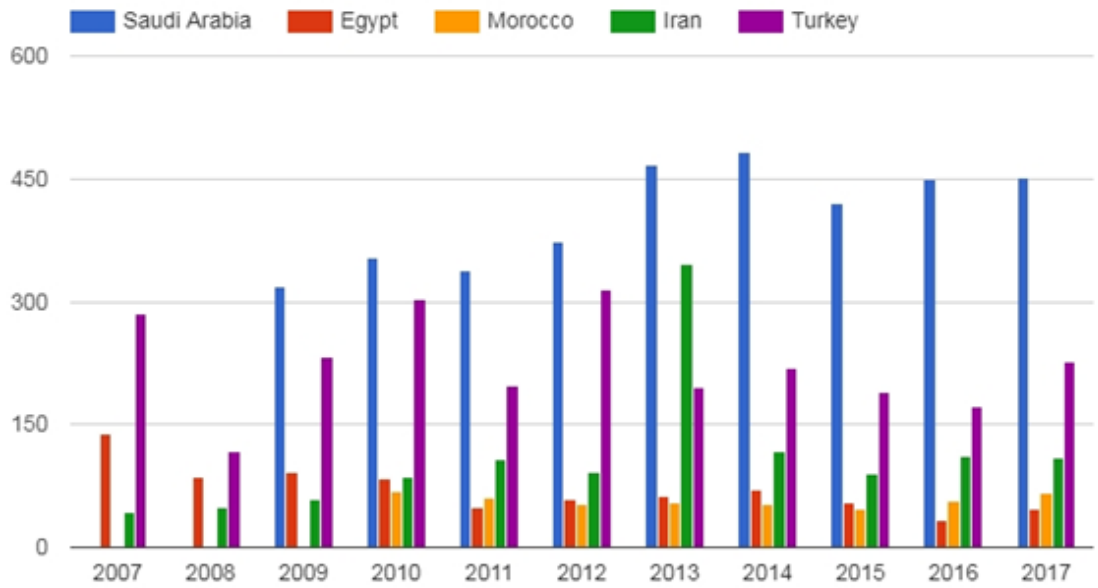


Source: https://www.theglobaleconomy.com 2018

This Figure (49) chows that the stock market value traded in Tehran (Iran) stock exchange was very low along the sample studied, it was low than (05) percent of Gross Domestic Product. This level of stock market value traded was the weakest of all the studied stock markets.

On the other hand, the stock market value traded in Istanbul stock exchange was very acceptable; it was more than (30) percent of Gross Domestic Product along the studied sample. This level is lower than value traded in Saudi Arabia stock exchange, but it is greater than the rest of markets (Egyptian, Moroccan, and Iranian stock exchange.

Figure (50): Stock market capitalization, billion USD

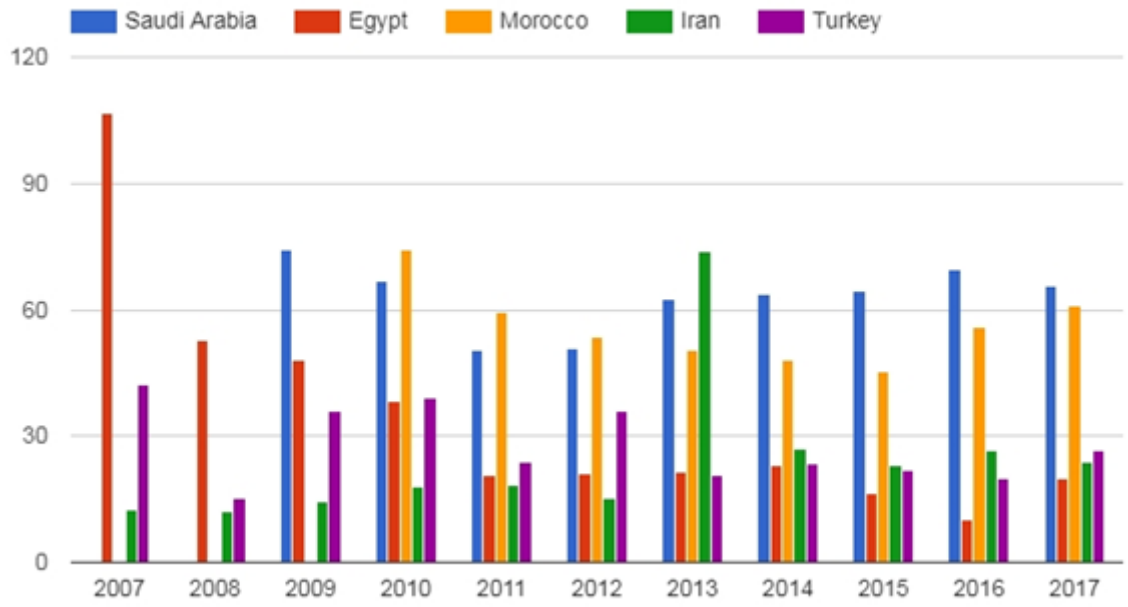


Source: https://www.theglobaleconomy.com 2018

According to the Figure (50) above, we note that the stock market capitalization in Tehran (Iran) stock exchange is stable under (100) billion USD along our sample, except in the year 2013, when it witnessed a sudden spike. This level of capitalization is more than Egyptian and Moroccan stock exchange capitalization, but it is weak than Saudi Arabia stock market capitalization.

Also, in Istanbul stock exchange, the capitalization of this market is stable between (150) and (300) billion USD along this sample, the great level was in 2012 (a little higher than 300 billion USD). This level also was higher than Egyptian and Moroccan stock exchange capitalization, and lower than the Saudi Arabia stock market capitalization.

Figure (51): Stock market capitalization, percent of GDP

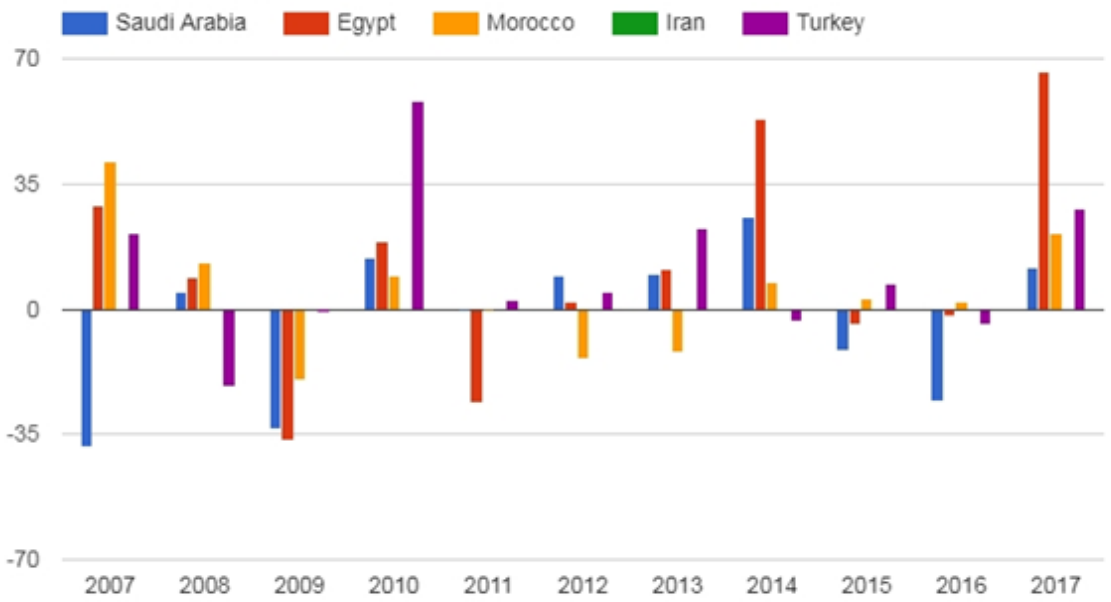


Source: https://www.theglobaleconomy.com 2018

From the Figure (51), the stock market capitalization in Tehran (Iran) stock exchange represented low than(30) percent of gross domestic product, except in the year 2013, when it represented more than (70) percent of gross domestic product. This level always is weaker than Saudi Arabia and Moroccan stock market, and higher than the percentage of Egyptian stock market capitalization of the gross domestic product.

In Istanbul stock exchange, the stock market capitalization registered more than (30) percent of Gross Domestic Product during the period from 2009 to 2010. While, it registered under (30) percent from 2013 to 2017. These levels of the Turkish stock exchange are very similar to the Tehran stock exchange (Higher than Egyptian stock market, and lower than Saudi Arabia and Moroccan stock market capitalization, percent of GDP).

Figure (52): Stock market return, percent

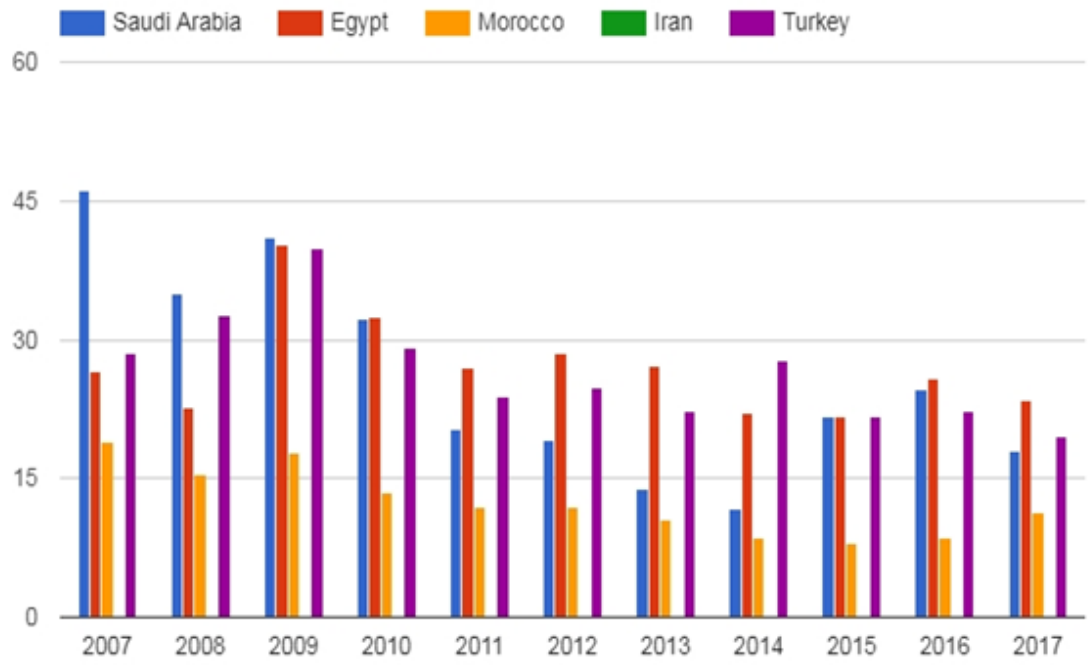


Source: https://www.theglobaleconomy.com 2018

According to this Figure (52), it showed that the stock market return of Istanbul stock exchange has negative and positive value, e.g. these values were negative in (2008), (2014), and (2016). The largest negative value was in (2008), it was registered around(-20) percent. While, the stock market return registered positive values in (2007), (2010), (2011), (2012), (2013), (2015), and (2017). The highest positive value registered in (2010) more than (50) percent. Compared to the Arab stock markets return (percent), it can be said that this percentage (in general) is similar than the levels of these markets.

N.B: There is no such thing of Tehran (Iran) stock market return (percent) along this sample.

Figure (53): Stock market volatility, percent



Source: https://www.theglobaleconomy.com 2018

From the Figure (53) above, we conclude that the stock price volatility of Istanbul stock exchange ranged between (20) and (35) percent, this value registered high level in (2009) at (35) percent, while, the weakest level of stock price volatility was registered in (2017), around (20) percent. In general, these levels were converging to the Arab stock markets under study.

N.B: There is no such thing of Tehran (Iran) stock price volatility (percent) along this sample.

Summary of comparisons:

Summary of a collectively comparison between Arab stock markets (Saudi Arabia, Egypt and Morocco) and Emerging stock markets during the period from 2007 to 2017:

Table (21): Summary of comparisons

	Central-Eastern Europe Stock Markets		Latin-American Stock Markets		Middle-East stock markets	
	Poland	Romania	Brazil	Argentina	Iran	Turkey
Number of companies listed	High	Low	High	Same Level	High	High
Stock market value traded, percent of GDP	Same Level	Low	Same Level	Low	Low	Same Level
Stock market capitalization, billion USD	Same Level	Low	High	Same Level	Same Level	Same Level
Stock market capitalization, percent of GDP	Same Level	Low	Same Level	Low	Same Level	Same Level
Stock market return, percent	Same Level	No Data Available	Same Level	High	No Data Available	Same Level
Stock market volatility, percent	No Data Available	No Data Available	No Data Available	No Data Available	No Data Available	Same Level

Source: Prepared by researcher

This chapter investigated in comparisons and analyses. The comparative study covered six different markets (Poland, Romania, Brazil, Argentina, Iran, and Turkey) in three different areas (Central-Eastern Europe, Latin-American, and Middle-East).It compared with the Arab stock market under study collectively. We Selected these countries because they are similar than our Arab countries under study e.g. the order of Brazil, Turkey, Saudi Arabia within the 20 strongest global economy (according to the Gross Domestic Product). The Egyptian stock market with Poland, Romania, and Argentina stock markets are the oldest Stock Markets in the world, it were established in the mid-19th century. Unlike the Moroccan and the Iranian stock market are recently established (in the 20th century).

However, our comparison shows that none of these markets outperformed clearly to the Arab stock markets, appears to be the only big difference between all the markets was in the number of companies listed, while the other comparative standards were similar.

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Chapter Six:

Empirical investigations of the (EMH)

6. Empirical Evidence of the (EMH)

In this chapter, we provide some of empirical evidence of efficient market hypothesis, and begin to display empirical investigations of the stock market efficiency hypothesis on Arab stock markets from Africa and Asia. Also, in a comparable study we see some empirical investigations of efficiency in the emerging markets, a variety of approaches had been used to test this hypothesis.

6.1. Empirical investigations of the (EMH) on Arab stock markets

The uproar caused by the tests results of efficient market hypothesis on developed markets motivated a number of studies of investigations of the efficiency on Arab stock market. The empirical evidence on efficient market hypothesis of Arab countries expose a wide use of two forms: "The weak-form efficiency" and "The Semi-Strong form efficiency". Some studies settle for investigate only one form, for example:

Table (22):Empirical investigations of the (EMH) on Arab stock markets

The Reference	The Markets under study	Data / Time frame	Test Used	Findings	The (EMH)
(LATRACH, 2009)	Jordan Saudi Arabia Kuwait Egypt Morocco Algeria	Data of (WF EMH): Annual data of Stock Market Index Data of (S-SF EMH): Annual data of Inflation rate; Unemployment rate; Gross Domestic Product rate From 2001 To 2008	Tests of (WF EMH): Run Test Tests of (S-SF EMH): Pearson Correlation Test	The market prices walk randomly in Jordan, Saudi, and Kuwait. While, in Egypt, Morocco, andthe Algerian market, the prices are not walk randomly. In all market under study;There is no correlation between market indices and the economic factors.	Accepted The(weak-form EMH) in: Jordan; Saudi; Kuwait. Rejected The (weak-form EMH) in: Egypt; Morocco; Algeria. Rejected The (Semi-strong form EMH) in: Jordan; Saudi; Kuwait; Egypt; Morocco; Algeria.

(BEN-HASSINE, 2013)	Amman Saudi Arabia Tunisia Morocco Egypt Kuwait Bahrain Dubai	Data of (WF EMH): Daily Data during six month Daily Prices 2010	Tests of (WF EMH): Unit Roots Test (ADF), (PP) Cointegration Tests. Skewness, Kurtosis, Bera-Jarque	The stock prices walk randomly during the period of study. The price movement does not follow a normal distribution The instability in chains of these sample, with the exception of the Casablanca Stock Exchange	Accepted A low level of (weak-form EMH) in: Amman; Saudi; Tunisia; Egypt; Kuwait; Bahrain; Dubai. Rejected The (weak-form EMH) in: Morocco
(AL-GHALIBI & AL-SHAMMARI, 2015)	Saudi Arabia Kuwait United Arab-Emirates Qatar Bahrain Oman Egypt Jordan Morocco Tunisia Lebanon Iraq	A series of daily price indices of Arab financial markets In: Saudi Arabia, Kuwait, UAE, Qatar, Bahrain, Oman, Egypt, Jordan From 01/06/2008 To 31/01/2014 And From 01/03/2010 To 31/01/2014 In: Morocco, Tunisia, Lebanon, Iraq	Augmented Dicker-Fuller (ADF) Test Phillips-Perron (PP) Test Variance Ratio Test	(ADF) results: All series of daily returns for Arab financial market indices are Stationary with the exception of Kuwait Stock Exchange. (PP) results: All series of daily returns for Arab financial market indices are Stationary. Variance Ratio results: Reject the null hypothesis of efficiency	Accepted The(weak-form EMH) in: Kuwait financial market Rejected The(weak-form EMH) in: Saudi Arabia, UAE, Qatar, Bahrain, Oman, Egypt, Jordan, Morocco, Tunisia, Lebanon, Iraq.

(MARASHDEH & SHRESTHA, 2008)	United Arab Emirates	The study used The daily Emirates stock market index data 1298 daily observations From 31 August 2003 To 13 April 2008	Unit Root Tests ADF, PP Tests. Perron's Innovational Outlier and Additive Outlier models	According to data results: There is a unit root and follow a random walk in this market	Accepted The (weak-form EMH) in: Emirates Securities Market
(MEZIOUD & BELHAIANI, 2017)	Doha (Qatar)	Annual data of Doha Securities Market Index From 2000 To 2015	Run Test	According to the RUN TEST, the successive price changes are random. So, The market prices walk randomly	Accepted The (weak-form EMH) in: Doha (Qatar)Securities Market.
(KADEM, 2017)	Algeria Tunisia Morocco	Monthly Prices of the Market indices From 2008 To 2014	Run Test	In Morocco: The successive price changes are random. So, The market prices walk randomly. In Algeria and Tunisia: The successive price changes (The market prices) are not walk randomly	Accepted The (weak-form EMH) in: Moroccan Stock Exchanges Rejected The (weak-form EMH) in: Algerian and Tunisian Stock Exchanges

(CHINY & MIR, 2015)	Morocco	Daily data of four stock indexes: MASI (Moroccan All Shares Index), BNQ (Banking sector index), ASSUR (Insurance sector index) IMMO (Real Estate sector index) From January 1st2002 To December 31st2013	Autocorrela-ion, Unit Root, Variance Ration, Runs Test	The null hypothesis of the random walk is rejected. The returns of this series studied do not follow a normal distribution	Rejected The (weak-formEMH) in: Casablanca stock exchange
(YOUNES & CHOUROUK, 2014)	Morocco	The MASI index all the stocks listed in the three compartments of the stock market (2255) Observations From 2004 To 2012	The Box and Jenkins method (ARIMA) Model	The model found from this sample of study does not correspond to a random walk (reject the RWT)	Rejected The informational (weak-form efficiency) in: Casablanca stock exchange
(BUDD, 2012)	Saudi Arabia	The Daily Indices for each Sector of the (Tadawul) Exchange From 19/04/ 2007 To 12/05/2011	Variance-Ratio Test and Run Test	Prices changes of this sample are not independent These prices do not fully reflect available information Prices changes are not distributed randomly.	Rejected The (weak-form EMH) and the(RWH)in: the Saudi Arabian financial market

(HASSAN, AL-SULTAN, & AL-SALEEM, 2003)	Gulf Cooperation Council Countries (GCC): The Case of Kuwait	A series of daily stock index data From 1995 To 2000	EGARCH; GARCH-M	The Results from this study do not support the null hypothesis of the efficiency during the period of sample	Rejected The (weak-form EMH) in: Kuwait Stock Exchange
(HANI & GHARAYA, 2012)	Morocco Kuwait	Stock prices movements represented by (MASI and KU indices) From 01/01/2008 To 31/12/2010	(ADF), (PP), (KPSS) Jarque-Bera, Kurtosis, Skewness.	This series studied do not follow a normal distribution MASI and KU indices are not Stationary The two indices of Kuwait and Moroccofollow a random walk.	Accepted The (weak-form EMH) in: Kuwait and Moroccan Stock Exchanges

Source: Prepared by researcher

6.2. Empirical investigations of the (EMH) on emerging markets

Considering the increasing importance of stock markets on the economic development in emerging countries as Africa, Asia, Central and Eastern European, and Latin America countries, the researchers paid more attention to the effect of efficiency of their stock markets.

During the last period, many studies are widely used in the highlight of the efficient market in these countries. From the experimental viewpoint, there are so many articles and theses dealing with the efficient market hypothesis in the emerging countries as:

Table (23):Empirical investigations of the (EMH) on emerging markets

The Reference	The Markets under study	Data / Time frame	Test Used	Findings	The (EMH)
(GUIDI & GUPTA, 2011)	Indonesia Malaysia Philippines Vietnam Singapore Thailand	The stock market indices in local currency (Daily prices) From January4, 2000 to April, 29, 2011	Unit Root Tests Variance Ratio Tests Runs Test	The results of all tests used confirmed that the random walk hypothesis is rejected for: Indonesia, Malaysia, Philippines, and Vietnam markets with the exception of Singapore and Thailand.	Accepted The (weak-form EMH) in Singapore; Thailand Rejected The (weak-form EMH) in: Indonesia, Malaysia, Philippines Vietnam

(BHAT, MIR, & ZARGAR, 2014)	India Pakistan	Daily closing prices of CNX Nifty (NSE India) and KSE 100 (KSE Pakistan) From01/04/2003 To 31/03/2013	Augmented Dicker-Fuller (ADF) Test Auto-Correlation Test Jarque-Bera Statistic Runs Test	According to the tests results, the returns of India and Pakistan stock markets are not walk randomly, So, the two markets are not efficient in weak form.	Rejected The (weak-form EMH)
(ADIGWE, UGBOMHE, & ALAJEKWU, 2017)	Nigeria Ghana Zimbabwe Uganda Tunisia Mauritius Namibia Kenya Morocco Egypt Tanzania Ivory Coast Botswana	This study used the monthly all share index data From January 2013 To December 2015	Jarque-bera statistics Test Augmented Dicker-Fuller (ADF) Test	The African stock markets under study follow normal distribution. The stock prices changes are not independent and follow random walk in these markets. The monthly returns are not walk randomly.	Rejected The (weak-form EMH)

(Simões, Macedo-Soares, Klotzle, & Pinto, 2012)	Argentina Brazil Chile	Measure the reaction of stock prices to the announcement of mergers and acquisitions: Total data for 14 companies in Argentina Total data for 28 companies in Brazil Total data for 11 companies in Chile (existence of positive abnormal returns for shares of these firms) The event window, from the first day (event date – 20) to the last one (event date + 5) with the event date (day 0)	The Event Study Method	In Brazil: Statistically significant Standardized Abnormal Returns present on the event day, and the absence the significance of abnormal returns in the event window. In Argentina and Chile: Statistically significant Standardized Abnormal Returns present in the event announcement and the following days, and there is significance of abnormal returns in the event window, namely in the 5 days following the event.	Accepted The (Semi-strong form EMH) in: Brazil Rejected The (Semi-strong form EMH) in: Argentina And Chile
(WORTHINGTON & HIGGS, 2003)	Argentina Brazil Chile Colombia Mexico Peru Venezuela	The data used is the market value-weighted equity indices for these stock markets (ARG), (BRZ), (CHL), (MEX) From: 31-Dec-1987 To: 28-May-2003 And (COL), (PRU),(VEN) From: 31-Dec-1992 To: 28-May-2003	Serial Correlation Coefficient; Runs Tests, (ADF), (PP), (KPSS),Unit Root Tests and Multiple Variance Ratio (MVR) Tests	All stock markets under study (Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela) are not walk randomly	Rejected The (weak-form EMH)

(IVANOV, LOMEV, & BOGDANOV, 2012)	East-European region: Serbia Romania Croatia Turkey Ukraine Russia Bulgaria	The data used is the daily closing values of the investigated indices: (BET); (CROBEX); (ISE100); (RTSI); (SOFIX). From 20-Oct-2000 To 31-Aug-2010 (BELEX15) From 01-Oct-2005 To 31-Aug-2010 (PFTS) From -Oct-2001 To 31-Aug-2010	Hurst exponent LRD Prediction with Neural Networks	There is deviation from Random walk hypothesis	Rejected The (weak-form EMH)
(COORAY & WICKREMASINGHE, 2007)	South Asian region: India Sri Lanka Pakistan Bangladesh	The data used isthestock market indices for the countries under study. (FTSE) for India and Pakistan. the All Share Index for Sri Lanka (S&P) for Bangladesh Monthly Data From January 1996 To January 2005	(ADF-1979, 1981) Test (PP-1988) Test (DF-GLS-1996) Test (ERS – 1996) Test Unit Root Tests Cointegration and Granger Causality Tests	The unit root test results supported the weak- form efficiency in India; Sri Lanka; Pakistan. (DF-GLS) and (ERS)test results are not supported the weak- form efficiency for Bangladesh. There is a high interdependence among all stock markets under study, So, the tests are not supported the Semi-strong form efficiency	Accepted The (weak-form EMH) in: India; Sri Lanka; Pakistan. Rejected The (weak-form EMH) in: Bangladesh Rejected The (Semi-strong form EMH) in: India; Sri Lanka; Pakistan; Bangladesh

(SIMONS & LARYEA, 2004)	African Stock Markets: Ghana Mauritius Egypt South Africa	weekly data from the daily figures for: South Africa (JSE All-Share Index) From 30.06.1995 To 27.06.2003 Mauritius (SEMDEX) From 11.01.1994 To 9.7.2003 Egypt (EFG index) From 7.2.1997 To 6.25.2003 monthly GSE All share index in Ghana (151) observations spanning11.1990 And5.2003	Kolmogrov-Smirnov (KS) Goodness of Fit Test. Runs Test Auto-Correlation Test Variance Ratio Test Autoregressive Test Box-Jenkins ARIMA model	According to these tests, in South African the returns successive of securities were independent and follow a random walk. So, this market is weak form efficient While, in Ghana, Mauritius and Egypt the test results are not supported the weak form EMH, and Box-Jenkins ARIMA tests confirmed these results	Accepted The (weak-form EMH) in South Africa Rejected The (weak-form EMH) in: Ghana, Mauritius, Egypt.

Source: Prepared by researcher

Summary:

In this section we have seen milestones of three Arab stock markets (Saudi Arabia, Egypt, and Morocco), some general statistics of them, and we provided an individually comparison of these markets. After that, we also collectively compare the Arab markets under study with emerging markets from different areas. Finally, we mentioned a number of studies of investigations of the efficiency on Arab stock market from (Jordan, Saudi Arabia, Kuwait, Egypt, Morocco, Algeria, Tunisia, Bahrain, Emirates, Qatar, Lebanon, and Iraq). Using number of statistical tests, we found that some Arab markets Accepted the weak-form (EMH), while, the others rejected it. On the other hand, all investigations reject strongly the semi-strong form efficient market hypothesis. Moreover, we mentioned some studies of empirical investigations of the (EMH) on emerging markets e.g. Indonesia, Malaysia, Philippines, Vietnam, Singapore, Thailand, India, Pakistan, Sri Lanka, and Bangladesh from ASIA. Serbia, Romania,

Croatia, Turkey, Ukraine, Russia, and Bulgaria from EAST-EUROPEAN region. Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela from LATIN AMERICAN. Nigeria, Ghana, Zimbabwe, Uganda, South Africa, Mauritius, Namibia, Kenya, Tanzania, Ivory Coast, and Botswana from AFRICA. The studies used daily data, weekly, monthly, quarterly, and annual data of index prices or individual stock prices, to provide an empirical evidence of efficient market hypothesis. The results were often mixed and similar to the investigations on Arab markets: (Accept or reject the weak-form (EMH) and reject the Semi-Strong form.

Finally, it can be said: the rejection of the weak-form efficient market hypothesis for any market will imply automatically rejection of the other two forms (the semi-strong form and the strong form) which will useless to test.

Our thesis is slightly different to these studies, we test the weak-form efficiency on Arab markets individually using the RUN TEST, on the other hand test the semi-strong form collectively using Fixed- and Random-effects models of Panel data to investigate the impact of macroeconomic variables on Arab stock markets Indexes.

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Part Three:

Empirical Evidence

Chapter Seven:

Testing the Weak-Form (EMH)

7.1.Data and Methodology:

Data used in this form are taken from stock markets homepages of the three countries under study namely: Saudi Arabia, Egypt, and Morocco. The data concern the number of listed companies, market capitalization, and liquidity during the period 2002-2018. The methodology used in the weak-form Efficiency Test consists in describing the efficiency of the three stock markets based on three indexes which are: the number of listed companies Index, Market capitalization Index, and Liquidity Index.

Results and discussion:

To test the Weak Form Efficient Market Hypothesis in Saudi, Egyptian and Moroccan Stock Markets during the period (2002 to 2018), one can use the following market indices:

- **Number of listed companies Index:** This Index measures the size of the market. If there is an increase in the number of companies listed in the stock market results in an increase in investments and increasing the efficiency of the stock market. The decrease in the number of companies in the stock market (the negative growth rate of companies listed in the stock market) is explained by the exit of inefficient companies from the stock market.
- **Market capitalization Index:** This Index refers to the total value of all stocks. If there is an increase in the market capitalization. This will raise the market activity, increase investments and enhance efficiency. The formula of Market capitalization is calculated as follows:

$$Market\ capitalization = \Sigma\ (The\ price\ of\ Stock\ x\ Number\ of\ Stocks)$$

- **Liquidity Index:** This Index measures the ease and speed of stock trading. If there is more liquidity in the stock market, there is more efficiency, through stock turnover ratio. The formula of stock turnover ratio is calculated as follows:

$$Stock\ Turnover\ Ratio = Stock\ Trading\ Volume/\ Market\ capitalization$$

Table (24): Number of listed companies in Saudi, Egypt and Casablanca Stock Markets

Year	Saudi Stock Market		Egyptian Stock Market		Casablanca Stock market	
	Number of Listed Companies	Percentage Change (%)	Number of ListedCompanies	Percentage Change (%)	Number of ListedCompanies	Percentage Change (%)
2002	68	-	1150	-	55	-
2003	70	+2.94	967	-15.92	52	-5.46
2004	73	+4.28	792	-18.10	53	+1.92
2005	77	+5.47	744	-6.07	54	+1.88
2006	86	+11.68	603	-18.96	63	+16.66
2007	111	+29.06	435	-27.87	73	+15.87
2008	126	+13.51	373	-14.26	77	+5.47
2009	135	+7.14	306	-17.97	73	-5.20
2010	146	+8.14	212	-30.72	75	+2.73
2011	150	+2.73	214	+0.94	76	+1.33
2012	158	+5.33	213	-0.47	77	+1.31
2013	163	+3.16	212	-0.47	75	-2.60
2014	166	+1.84	215	+1.41	75	0
2015	172	+3.61	222	+3.25	75	0
2016	176	+2.32	222	0	75	0
2017	188	+6.81	257	+15.76	74	-1.44
2018	198	+5.31	256	-0.39	75	+1.35

Source: Quarterly bulletins of Arab Monetary Fund (Data Base**)**

Through the table (2), we can notice three different tracks (increase, decrease, and stability):

- **Saudi Arabia:** The number of listed companies in Saudi Stock market has recorded a continuous annual increase; the highest increase in this index was in 2007. This increase in the number of companies listed in the Saudi stock market results in an increase in investments which in turns increased the efficiency of the Saudi stock market.
- **Egypt:** Unlike the Saudi stock market, the Egyptian stock market recorded a terrible decrease in the number of companies listed on the stock market. We see this clearly during the global financial crisis from 2008 to 2010, so that it was the most severe decline in 2010 around 30% (this decrease in the number of companies on Egyptian stock market "the negative growth rate of companies listed on the stock market" is explained by the exit of inefficient companies from Egyptian stock market), but by the beginning of 2015, the index returned to stability and rise again.
- **Morocco:** Quite the opposite; In Casablanca Stock market the number of companies listed in the stock market was often stable from 2010 to 2018, although this number of companies listed in Morocco is less than their counterparts in Saudi Arabia and Egypt stock market.

Table (25): Market capitalization in Saudi, Egyptian and Moroccan Stock Markets

Year	Saudi Stock Market		Egyptian Stock Market		Casablanca Stock market	
	Market capitalization Riyal (Million)	Percentage Change (%)	Market capitalization Pound (Million)	Percentage Change (%)	Marketcapitalization Dirham (Million)	Percentage Change (%)
2002	280730.1	-	122014	-	87175.4	-
2003	589930.6	+110.14	171922	+40.90	115507.18	+32.49
2004	1148642.6	+94.70	233887	+36.04	206517.40	+78.79
2005	2423146.83	+110.95	456278	+95.08	252326.32	+22.18
2006	1225858	-49.42	533986	+17.03	417092	+65.29
2007	1946347	+58.77	768276	+43.87	586328	+40.57
2008	924528	-52.50	473738	-38.34	531750	-9.31
2009	1195506	+29.30	499613	+5.46	586328	+10.26
2010	1325392	+10.86	488209	-2.29	579020	-1.25
2011	1270843	-4.12	293615	-39.86	516222	-10.85
2012	1400342	+10.19	375822	+27.99	445268	-13.75
2013	1752855	+25.17	426810	+13.56	451113	+1.31
2014	1812890	+3.42	500021	+17.15	484448	+7.38
2015	1579059	-12.90	429808	-14.05	453316	-6.43
2016	1681950	+6.51	601618	+39.97	583380	+28.69
2017	1691858	+0.58	786065	+30.65	626965	+7.47
2018	1861275	+10.01	749941	-4.60	582155	-7.15

Source: Quarterly bulletins of Arab Monetary Fund (Data Base)

Based on table (3), we note that the Market capitalization index is an indicator of market activity. Saudi stock market has the highest Market capitalization among the three markets. We note the highest increase in market capitalization in 2005, as it jumped from 1148642.6(Saudi Riyal Million) to 2423146.83 (Saudi Riyal Million), but the global financial crisis in 2008 affected the Saudi stock market and led to a decline about 52%, while the rest of the years were The market capitalization between the rise and the slight decrease but remains high, which increases the efficiency of the Saudi stock market. On the other side, the market capitalization of Egyptian stock market rose from 2003 to 2007, but the global financial crisis in 2008 affected to the Egyptian stock market and the index decreased 38%. In 2012, the market started to rebound which increases the market activity and increases the efficiency of Egyptian stock market. In Morocco, the market capitalization rose from 2003 to 2007. Like other stock markets, Casablanca stock market was affected by the global financial crisis in 2008, the market capitalization of the stock decreased around 9%, since then Casablanca market capitalization has fluctuated between up and down slightly; the highest rise was in 2016 (around 28%).

Table (26): Trading Volume and Stock Turnover ratio in Saudi, Egyptian and Casablanca Stock Markets

Year	Saudi Stock Market			Egyptian Stock Market			Casablanca Stock market		
	Trading Volume Riyal (Million)	Percentage Change (%)	Stock Turnover ratio (%)	Trading Volume Pound (Million)	Percentage Change (%)	Stock Turnover ratio (%)	Trading Volume Dirham (Million)	Percentage Change (%)	Stock Turnover ratio (%)
2002	116162.07	-	41.37	29887.15	-	24.49	14976.5	-	17.17
2003	596510	+413.51	101.11	26366.52	-11.78	15.33	22644.51	+51.20	19.60
2004	1773859.1	+197.37	154.43	42334.10	+60.56	18.10	32340.85	+42.81	15.66
2005	1975051.56	+11.34	81.50	199353.7	+370.90	43.69	46241.58	+42.98	18.32
2006	5261851	+166.41	429.23	280788	+40.84	52.58	78914.7	+70.65	18.92
2007	2557713	-51.40	131.41	363355	+29.40	47.3	174841.7	+121.55	29.8
2008	1962946	-23.26	212.31	476653	+31.18	100.6	108299.6	-38.06	20.4
2009	1264011	-35.61	105.73	449457	-5.71	90.0	129271	+19.36	22.0
2010	759185	-39.94	57.28	322036	-28.35	65.96	116410.7	-9.95	20.10
2011	1098836	+44.73	86.46	194794	-39.52	66.34	90126.9	-22.58	17.45
2012	1903966	+73.27	135.96	181406	-6.88	48.26	44352.3	-50.79	9.96
2013	1369666	-28.07	78.13	152522	-15.93	35.73	48550	+9.46	10.76
2014	2146517	+56.71	118.4	287759	+88.66	57.54	39410.6	-18.83	8.13
2015	1660622	-22.64	105.16	244740	-14.95	56.94	40658	+3.16	8.96
2016	1156987	-30.33	68.78	275926	+12.74	45.86	52270.8	+28.56	8.95
2017	838081	-27.57	49.53	319468	+15.78	40.64	64837.7	+24.04	10.34
2018	871283	+3.96	46.81	343377	+7.48	45.78	45913.2	-29.19	7.88

Source: Quarterly bulletins of Arab Monetary Fund (Data Base)

According to table (4), we note that:

The trading volume of the stock markets under study is wobbling. It is in steady decline under the influence of the global financial crisis in 2008. For example in 2008, the trading volume in Egyptian stock market was 476653 (Pound Million). This number was never reached by the Egyptian stock market. The same example applies to the Saudi Arabia stock market in 2006 and Casablanca market in 2007. As for the stock turnover ratio, in Saudi stock market, the highest height was in 2006 with 429.23%. In Egyptian stock market, it was a little less from 40% to 100%, but in Casablanca stock market it was weak recording a rate between 7% and 20%.

7.2.The Test (*Run Test):*

To test the weak-form efficient market of the three stock markets, we used the *Run Test* method in order to know whether the stock price changes in these markets are random or not. This test follows consecutive changes in downward and upwards movements of a stock in the price movements where the "Run Test" method is based on recording the changes in prices direction by:

- Placing a sign **(+)** when the price rises.
- Placing a sign **(-)** when the price drops.
- Placing a sign zero **(**0**)** when there is no change in prices.

If **|Z|> 1.96** the movement of consecutive price changes is from the same signal, which indicates a self-correlation in the chain of returns, in which case the random walk hypothesis of returns is rejected.

If **|Z|< 1.96** the movement of consecutive price changes is different, in which case the random walk hypothesis of returns is accepted

(R) is the number of sequences in a sample of (n) number

The Mean and the Variance of the Run test are:

$E(R) = (2n-1)/3$

$VAR(R) = (16n-29)/90$

For a large sample (n), the (R) distribution follows approximately the normal distribution:

$Z=R-E(R)/\sqrt{var(R)}$

With setting an error threshold **5%**

There are two hypotheses:

|Z|<1.96 means that the sample is random.

|Z|>1.96meansthat the sample is not random.

7.3.The Results:

- **The Saudi Stock Market**

Is the Saudi stock market efficient in the weak-form efficient Hypothesis? To answer the question, we will track the changes introduced to the TASI during the study period (2002 to 2018).

Table (27): Run Test Results of SAUDI Stock Market 2002-2018 (TASI index)

year	Yearly Index (points)	Change in index	Percent Change (%)
2002	2628,92	-	-
2003	3576,67	(+)	76,23
2004	6198,53	(+)	84,93
2005	13022,09	(+)	103,66
2006	12676,61	(-)	-52,53
2007	8117,03	(+)	39,14
2008	8140,13	(-)	-56,49
2009	5626,65	(+)	27,46
2010	6387,41	(+)	8,15
2011	6342,95	(-)	-3,07
2012	6996,59	(+)	5,98
2013	7650	(+)	25,5
2014	9619,77	(-)	-2,37
2015	8406,87	(-)	-17,06
2016	6357,85	(+)	4,32
2017	7098,9	(+)	0,22
2018	7941,94	(+)	8,31

Source: Prepared by researcher

From the table (5), we conclude:

R = 9; (5) changes in height and (4) changes in decline

The Mean are:

$E(R) = (2n-1)/3$

$E(R) = (2 \times 17-1)/3 = 11$

The Variance is:

$VAR(R) = (16n-29)/90$

$VAR(R) = (16 \times 17-29)/90$

$VAR(R) = 2.7$

We have:

$Z=R-E(R)/\sqrt{var(R)}$

$Z=9-11/\sqrt{2.7}$

$Z= -1.21$

$|Z|= 1.21$

$|Z| < 1.96$

Consequently, the successive changes are independent of each other, and these changes are random; Hence; it is not possible to rely on past (historical) prices in order to predict the future prices. We conclude that the Saudi stock market is efficient in the weak-form.

- **The Egyptian stock market**

Is the Egyptian stock market efficient in the weak-form efficient Hypothesis? To answer the question, we will track the changes experienced by the index (EGX 30) during the study period (from 2002 to 2018).

Table (28): Run Test Results of EGYPT Stock Market 2002-2018 (EGX 30 index)

year	Yearly Index (points)	Change in index	Percent Change (%)
2002	479,16	-	-
2003	810,41	(+)	134,46
2004	1759,85	(+)	122,23
2005	4772,6	(+)	146,29
2006	6421,27	(+)	10,26
2007	8198,11	(+)	51,29
2008	8663,36	(-)	-56,43
2009	5599,29	(+)	35,08
2010	6675,39	(+)	15,03
2011	4810,61	(-)	-49,28
2012	5111,61	(+)	50,8
2013	5578,67	(+)	24,17
2014	8619,47	(+)	31,61
2015	8148,8	(-)	-21,52
2016	8172,54	(+)	76,2
2017	13453,45	(+)	21,66
2018	15402,96	(-)	-13,21

Source: Prepared by researcher

From the table (6), we conclude:

R = 8; (4) Changes in height, and (4) Changes in decline

The Mean is:

$E(R) = (2n-1)/3$

$E(R) = (2 \times 17 - 1)/3 = 11$

The Variance is:

$VAR(R) = (16n - 29)/90$

$VAR(R) = (16 \times 17 - 29)/90$

$VAR(R) = 2.7$

We have:

$Z = R - E(R)/\sqrt{var(R)}$

$Z = 8 - 11/\sqrt{2.7}$

$Z = -1.82$

$|Z| = 1.82$

$|Z| < 1.96$

The result: The successive changes are independent, and the changes are random. Hence; it is not possible to rely on past prices in order to predict the future prices. We conclude that the Egyptian stock market is efficient in the weak-form.

- **The Moroccan stock market**

We try to test the efficiency of the Casablanca stock market in the weak form efficient Hypothesis, we will track the changes that the MASI experienced during the study period (from 2002 to 2018).

Table (29): Run Test Results of CASABLANCA Stock Market 2002-2018 (MASI index)

year	Yearly Index (points)	Change in index	Percent Change (%)
2002	3323,2	-	-
2003	3508,06	(+)	24.02
2004	4371,46	(+)	14.67
2005	4893,02	(+)	22.49
2006	7782,62	(+)	71.14
2007	11968,49	(+)	33.92
2008	13397,12	(-)	-13,48
2009	10792,45	(-)	-4,92
2010	11838,71	(+)	21.17
2011	11695,69	(-)	-12,86
2012	10171,42	(-)	-15,13
2013	8936,79	(-)	-2,62
2014	9598,36	(+)	5.55
2015	9623,39	(-)	-7,22
2016	9919,88	(+)	30.46
2017	12069,67	(+)	6.39
2018	12055,34	(-)	-8,27

Source: Prepared by researcher

From the table (6), we conclude the follow:

R= 8; (4) Changes in height, and (4) Changes in decline

The Mean is:

$E(R) = (2n-1)/3$

$E(R) = (2 \times 17 - 1)/3 = 11$

The Variance is:

$VAR(R) = (16n - 29)/90$

$VAR(R) = (16 \times 17 - 29)/90$

$VAR(R) = 2.7$

We have:

$Z = R - E(R)/\sqrt{var(R)}$

$Z = 8 - 11/\sqrt{2.7}$

$Z = -1.82$

$|Z| = 1.82$

$|Z| < 1.96$

According to this result, the successive changes are independent of each other, and these changes are random. Hence, it is not possible to rely on past prices in order to predict the future prices. We conclude that the Moroccan stock market is weak-form efficient market.

Chapter Eight:

Testing the Semi-Strong Form (EMH)

8. Testing the Semi-Strong Form Efficiency.

To test the hypothesis of Semi-Strong form efficiency, we investigate whether the macroeconomic variables affect the Arab stock Indices or not; towards this, we have taken into consideration the annual data of three selected Arab countries which are: Saudi Arabia, Egypt and Morocco for 17 years from 2002 to 2018; and analyzed this data by using Fixed- and Random-effects models of Panel data. In these two models we have taken four independent variables that are Inflation Rate, Unemployment rate, Broad money growth, Annual Growth Rate of Gross Domestic Product were may affect on dependent variable that is Arab stock market Indices.

Problem statement:

Is there a statistically significant effect of Inflation Rate, Unemployment rate, Broad money growth, and Annual Growth Rate of GDP on Saudi, Egyptian and Moroccan stock markets indexes during the period from 2002 to 2018?

Hypotheses:

During the period from 2002 to 2018 and for a significance level of 5%:

- **H_1:** There is a significant and negative relationship between inflation rate and the stock market Index in Saudi Arabia, Egypt and Morocco.
- **H_2:** There is a significant and negative relationship between unemployment rate and the stock market Index in Saudi Arabia, Egypt and Morocco.
- **H_3:** There is a significant and positive relationship between broad money growth and the stock market Index in Saudi Arabia, Egypt and Morocco.
- **H_4:** There is a significant and positive relationship between annual growth rate of gross domestic product and the stock market Index in Saudi Arabia, Egypt and Morocco.

If all Independent Variables have statistically significant effect on stock market Index i.e. (H_1, H_2, H_3 and H_4) are fulfilled, we conclude that Arab stock markets under study (Saudi Arabia, Egypt, and Morocco) are efficient in the Semi-Strong form.

Table (30): The Research Variables Description

The Variables		Description
The Macroeconomic Variables (Independent Variables)	**Inflation rate (X1)**	Inflation rate: "Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used**"** (World Bank, 2020) The term "Inflation"**:** a rise in prices or increase in the money supply? According to Hazlitt Henry "The word inflation originally applied solely to the quantity of money. It meant that the volume of money was inflated, blown up, overextended. It is not mere pedantry to insist that the word should be used only in its original meaning. To use it to mean "a rise in prices" is to deflect attention away from the real cause of inflation and the real cure for it."(Hazlitt, 1978, p. 12)
	Unemployment rate (X2)	**"**Unemployment refers to the share of the labor force that is without work but available for and seeking employment" (World Bank, 2020) "The unemployment rate is the percentage of the total labor force (i.e., those who are either working or actively seeking employment) yet to find work. The unemployment rate measures the extent to which the economy is operating at full capacity"(Bodie, Kane, & Marcus, 2014, p. 561) The formula for calculating the unemployment rate is: (Unemployed people / Total Labor Force) x 100 (Greenlaw & Shapiro, 2018, p. 191)
	Broad money growth (annual) (X3)	"Broad Money is the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper" (World Bank, 2020) Money Supply: • (M1) called narrow money: encompasses currency held by the public and demand deposits with banks. • (M2): includes (M1) + time and savings deposits with banks that require prior notice for withdrawal. • (M3): includes (M2) + various money market instruments, such as certificates of deposit issued by banks, bank deposits denominated in foreign currency, and deposits with financial institutions other than banks.

	Annual Growth Rate of Gross Domestic Product (X4)	"Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources" (World Bank, 2020) A standard definition of (GDP): According to David Andolfatto **"**GDP is the total value of final goods and services produced in the domestic economy over some given period of time." (Andolfatto, 2008, p. 2)
The Stock Markets Indices **(Dependent Variable)**	**The Stock Markets Indices :** **(Y)** **(TASI) index** **(EGX 30) index** **(MASI) index**	TASI index:(TASI) Tadawul All Share Index of Saudi Arabia Stock Exchange is the major stock market index; This index was developed with a base value of 1000 in 1985; it was restructured on June 30, 2008. It tracks the performance listed companies and measures the overall activity of the market.(cma, 2020) EGX 30 index:(CASE 30 Index –previously-) is a free-float index of the 30 most highly capitalized, liquidity and activity stocks traded on Egyptian exchange. It was developed with a base level of 1000 in January 1st 1998; (EGX 30)is a good barometer for this market. (egx, 2020) MASI index: **(**MASI) Moroccan All Shares Index; is a free-float index; it was launched on January 2, 2002 with a base of 1000; it is the most active share index in the stock exchange[(15)]; it tracks all companies listed performance in the market.(casablanca-bourse, 2020)

Source: Prepared by researcher

8.1.Data and Methodology:

In our paper, we use Fixed- and Random-effects models of Panel data to estimate the relationships between the independent variables and the dependent variable; and measuring the statistically significant effect of these macroeconomic variables on three Arab stock markets during the period of study.

The data used in this research paper are taken from macroeconomic indicators and stock indices homepages of the three countries under study namely: Saudi Arabia, Egypt, and Morocco. The data concern inflation rate, unemployment rate, broad money growth, annual growth rate of gross domestic product, TASI Index, EGX30 Index, and MASI Index. The data covers the period between 2002 and 2018.

Table (31): Dependant and independent variables for the three countries

Year	Change in Index %	Inflation Rate %	Unemployment Rate %	Broad money growth (annual %)	Annual Growth Rate of GDP %
	(Y)	(X1)	(X2)	(X3)	(X4)
SAUDI ARABIA					
2002	3,62	0,24	5,27	15,19	-2,81
2003	76,23	0,61	5,56	8,49	11,24
2004	84,93	0,51	5,82	17,25	7,95
2005	103,66	0,47	6,05	13,24	5,57
2006	-52,53	2,2	6,25	20,4	2,78
2007	39,14	4,16	5,73	20,14	1,84
2008	-56,49	9,87	5,08	17,95	6,24
2009	27,46	5,05	5,38	10,81	-2,05
2010	8,15	5,33	5,55	5,17	5,03
2011	-3,07	5,82	5,77	13,26	9,99
2012	5,98	2,86	5,52	16,48	5,41
2013	25,5	3,51	5,57	8,35	2,69
2014	-2,37	2,24	5,72	11,82	3,65
2015	-17,06	1,22	5,59	2,9	4,1
2016	4,32	2,05	5,65	0,54	1,67
2017	0,22	-0,83	5,89	0,15	-0,74
2018	8,31	2,46	5,91	2,7	2,43
EGYPT					
2002	0,57	2,73	10,01	12,63	2,39
2003	134,46	4,5	11,01	21,27	3,19
2004	122,23	11,27	10,32	16,23	4,09
2005	146,29	4,86	11,2	11,48	4,47
2006	10,26	7,64	10,49	15	6,84
2007	51,29	9,31	8,8	19,11	7,08
2008	-56,43	18,31	8,51	10,48	7,15
2009	35,08	11,76	9,08	9,47	4,67
2010	15,03	11,26	8,75	12,41	5,14
2011	-49,28	10,05	11,84	6,66	1,76
2012	50,8	7,11	12,59	12,34	2,22
2013	24,17	9,42	13,15	18,89	2,18
2014	31,61	10,14	13,1	15,76	2,91
2015	-21,52	10,36	13,05	18,6	4,37
2016	76,2	13,8	12,4	39,5	4,34
2017	21,66	29,5	11,77	20,45	4,18
2018	-13,21	14,4	11,43	13,3	5,31

MOROCCO					
2002	-13,48	2,79	11,59	10,31	3,12
2003	24.02	1,16	11,92	7,86	5,96
2004	14.67	1,49	10,83	8,35	4,79
2005	22.49	0,98	11,01	14,05	3,29
2006	71.14	3,28	9,67	18,08	7,57
2007	33.92	2,04	9,56	17,54	3,53
2008	-13,48	3,71	9,57	13,31	5,92
2009	-4,92	0,97	8,96	7	4,24
2010	21.17	0,99	9,09	4,19	3,81
2011	-12,86	0,9	8,91	6,43	5,24
2012	-15,13	1,28	8,99	4,51	3
2013	-2,62	1,88	9,23	3,08	4,53
2014	5.55	0,44	9,7	6,19	2,66
2015	-7,22	1,55	9,46	5,69	4,53
2016	30.46	1,63	9,3	4,73	1,05
2017	6.39	0,75	9,05	5,54	4,23
2018	-8,27	1,91	9,04	4,06	2,99

Source: world-bank database https://www.worldbank.org/

8.2. Fixed- and Random-effects models of Panel data.

Results and Discussion:

According to Fixed Effects Model (FEM) findings, one can highlight the following:

- Inflation coefficient (X1) value of -4.667755 explains that every 1-point increase in inflation, it will reduce the value of Arab stock index by 4.667755. This result shows that Inflation Rate influences negatively Arab stock index. This independent variable is one of the most important macroeconomic factors. The significance value calculated for (X1) is lower than 5%. Therefore, the study confirms that there is a statistically significant effect of Inflation rate on Arab stock market Index. The result shows that inflation plays a significant role in determining Arab stock market Index.

- The coefficient of Unemployment (X2) (0.405637) denotes that every unit increase in unemployment rate will increase the value of Arab stock index by 0.405637. Besides, the significance value calculated for (X2) is greater than 5% which is insignificant one.

Therefore, the study concludes that there is no statistically significant effect of unemployment rate on Arab stock market Indexes.

- Broad money growth coefficient value (X3) of 2.172067 means that every digit increase for Broad money growth will increase the value of Arab stock index by 2.172067. The significance value calculated for (X3) is lower than 5%. Therefore, the study affirms that there is a statistically significant effect of Broad money growth on Arab stock market Indexes.

- The GDP coefficient (X4) of 2.450113 denotes that every increase of 1 point of the Rate of GDP will increase the value of Arab stock index by 2.450113; while the significance value calculated for (X4) is greater than 5% which means that it is insignificant. Therefore, the study concludes that there is no statistically significant effect of Annual growth rate of gross domestic product on Arab stock market Indexes.

- The constant value (c) is 57.72467 which indicate that if there is no Inflation Rate, Unemployment rate, Broad money growth, Annual Growth Rate of GDP, Arab indices will be equal to 57.72467.

Table (32): Estimation findings

Variable	Fixed Effects	Random Effects
Constant	57.72467 (0.294)	23.9108 (0.387)
X1	-4.667755 (0.005)	-2.296213 (0.068)
X2	.405637 (0.944)	2.552137 (0.320)
X3	2.172067 (0.035)	2.582129 (0.008)
X4	2.450113 (0.308)	1.857343 (0.440)
R^2	0.9764	0.2413
Nb.obs	51	51
NB. groups	03	03

Source: fixed- and random-effects modelsfindings

From the table above, by using Random Effects Model, the main findings are as follows:

- Inflation coefficient value of -2.296213 explains that every 1-point increase in inflation will reduce the value of Arab stock index by -2.296213. The significance value calculated for (X1) is greater than 5%; so it is insignificant. Therefore, we conclude that there is no statistically significant effect of Inflation rate on Arab stock market Indexes.
- Unemployment coefficient is 2.552137 meaning that every unit increase in unemployment rate will increase the value of Arab stock index by 2.552137; however, the significance value calculated for (X2) is greater than 5% which means that it is insignificant. Therefore, we can conclude that there is no statistically significant effect of unemployment rate on Arab stock market Indexes.
- Broad money growth coefficient value of 2.582129 denotes that every digit increase in Broad money growth will increase the value of Arab stock index by 2.582129. The significance value calculated for (X3) is lower than 5%; therefore, we can say that there is a statistically significant effect of Broad money growth on Arab stock market Indexes.
- The gross domestic product coefficient of 1.857343 means that every increase of 1 point of the Rate of GDP will increase the value of Arab stock index by 1.857343, but the significance value calculated for (X4) is greater than 5% which means that is insignificant. Therefore, we report that there is no statistically significant effect of Annual growth rate of gross domestic product on Arab stock market Indexes.

Based on above discussion, and for selecting the appropriate model between Fixed- and Random-effects models, Hausman test is used. The null and alternative hypotheses are as follows: (Algamal, 2012, p. 275)

- H_0: The appropriate model is random effects.
- H_1: The appropriate model is fixed effects.

The results of Hausman Test are shown in Figure (1). The probability is 0.1708 (more than 5%). The null hypothesis cannot be rejected for level of significance 5%; therefore, we choose the random effects model (REM).

Figure (54): Hausman Test Results

```
. hausman fe

                 ---- Coefficients ----
                 |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
                 |       fe           .          Difference          S.E.
-----------------+------------------------------------------------------------
              x1 |  -4.667755    -2.296213      -2.371542        .9216265
              X2 |    .405637     2.552137        -2.1465        5.106958
              X3 |   2.172067     2.582129       -.4100623        .2379353
              x4 |   2.450113     1.857343        .5927701               .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         6.41
                Prob>chi2 =       0.1708
                (V_b-V_B is not positive definite)
```

Source: Hausman Test

Conclusion:

The present paper aimed to investigate whether the macroeconomic variables under study affect the Arab stock Indices or not. To do so, we have taken into consideration the annual data of three selected Arab countries which are: Saudi Arabia, Egypt and Morocco for 17 years (from 2002 to 2018). We analyzed this data by using Fixed- and Random-effects models of Panel data. In these two models, we have taken four independent variables which are: Inflation rate, Unemployment rate, Broad money growth, and Annual Growth rate of Gross Domestic Product.

We found positive and negative relationships between the independent variables and the dependent variable. Both models indicate that some macroeconomic variables have a statistically significant effect on the Arab stock markets indices, while others have not. Furthermore, Hausman Test showed the random effects model (REM) is more appropriate for our study. According to random effects model, the results show that Broad money growth has a statistically significant effect (positive) on Arab stock Indices, while the other independent variables (Inflation rate, Unemployment rate, and Annual Growth rate of Gross Domestic Product) show no significant effect on Arab stock Indices.

8.3.The Semi-Strong Form Test Results:

According to the semi-strong form Test:

1- we observed a positive and negative relationships between the independent variables and the dependent variable; Both the results of these two models seem to indicate that some macroeconomic variables has a statistically significant effect on the Arab stock markets indices, while, others are no statistically significant effect. While; Hausman Test showed the random effect model (REM) is more appropriate for our study Data.

2- According to the random effect model; the result shows the independent variable (Broad money growth) has a statistically significant effect on Arab stock Indices; while, the other independent variables (Inflation Rate), (Unemployment rate), (Annual Growth Rate of Gross Domestic Product) show no significant effect on Arab stock Indices.

3- Theoretically; the second version of the efficiency (Semi-Strong Form) assumes that, investors would not be able to obtain an abnormal yield by using the publicly announced information besides the analysis of past prices information; while; Fundamental theorists oppose this hypothesis. They assume that the analysis of general economic situation, e.g. the analysis of (the fundamental economic variables and the analysis of the economic indicators) leads to the knowledge the possible changes in the nation economy, predicting the stock market condition, then knowing the trends of future stock prices. And impact of this entire on stock market index. Practically; According to our results; we conclude that Arab stock markets (Saudi Arabia, Egypt, and Morocco) are not efficient in the Semi-Strong form because there are not statistically significant effect relationships between some macroeconomic variables (Inflation Rate; Unemployment rate; Annual Growth Rate of Gross Domestic Product) and the stock markets indices under study; while, we expected that all publicly available information must be fully reflected already on stock prices. Here, the investor would be able to obtain a yield exceeding the normal level by using the fundamental analysis (analysis the Publicly Available Information and the past stock prices information and the extraction of causal relationships between new Publicly Available Information and trends of stock prices).

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GENERAL CONCLUSION

General Conclusion:

The efficient market hypothesis (EMH) is the basic theory for everyone become interested in stocks, investment and financial markets. In an efficient market, the stock prices adjust rapidly to all available information. EUGENE FAMA (1970) was the firstly one published the efficient market levels: the weak-form, the semi-strong form and the strong form. The essence difference between these three forms summarized about the term "All available information" e.g. (1) the stock market is weak-form efficient, if the stock prices already reflect all past information. (2) The stock market is semi-strong form efficient, if the stock prices already reflect all publicly and past available information. (3) The stock market is strong form efficient, if the stock prices already reflect all information relevant (past, public and private information).

Uncovering the roots of efficient market hypothesis leads to LOUIS BACHELIER works in (1900). He discovered the phenomenon of random walk of prices (RWT); this idea has been born and bred in the first half of the twentieth century. The (RWT) became the first basis for the efficient market hypothesis.

Fighting for the efficient market idea would make this hypothesis vulnerable to the criticism, the technical analysts (chartists) and the fundamental theorist are in the forefront of the enemies of this hypothesis, because the term "efficient" makes the technical and fundamental analysis are useless to find the pattern in which the stock price evolves, to predict the future prices.

Having made a lot of theoretical work in this dissertation, we turn this hypothesis of "Efficiency" into our Arab reality, we covers three Arab stock markets representing three different regions: the Saudi stock market (Tadawul) represents the Gulf Cooperation Council (GCC) countries and the Arab countries of Asia-wide continent; the Egyptian stock exchange represents the Arab countries on North-East African-wide continent countries; the Moroccan (Casablanca) stock exchange represents the Maghreb countries.

Also our dissertation displays "a comparative study" between the Arab markets under study and some different markets from different regions; we display an individually comparison between the Arab stock markets under study, each one analyzed separately (their milestones, development and its statistic Data). On the other hand, we compare collectively between the Arab stock market with selected markets in different continent: Poland (Warsaw stock exchange) and Romania (Bucharest stock exchange) represent the Central-Eastern Europe region. Brazil (São Paulo stock exchange) and Argentina (Buenos Aires stock exchange) represent the Latin-American region. Iran (Tehran stock exchange) and Turkey (İstanbul stock exchange) represent the Middle-East region. using different statistic Data e.g. Number of companies listed on the stock exchanges, Stock market value traded (percent of gross domestic product), Stock market capitalization (billion USD), Stock market capitalization (percent of gross domestic product), Stock market return (percent), Stock price volatility (percent).

Finally, as indicated at the beginning of this study, the aim of the present study is to validate the hypothesis of weak- form and the semi-strong efficient market on selected Arab stock market namely: Saudi Arabia, Egyptian and Moroccan stock exchange during the period from 2002 to 2018 (17 years). We used the "Run Test" to investigate the weak-form efficiency, and the "Fixed- and Random-effects models of Panel data" to investigate the impact of the macroeconomic variables on Arab stock Indices (to test the semi-strong efficient market hypothesis).

The dissertation results and Research contribution:

- **Comparisons Part:** The results of the comparisons study show that the performance of our Saudi, Egyptian, and Moroccan stock markets is similar than the emerging markets under study, the only big difference between all the markets was in the number of companies listed. Yet, no emerging market proved totally outperformed clearly than the Arab markets, because the majority comparison points were similar. In summary, our Arab countries need to relax restrictions of listing on stock markets, and encouraging companies to enter to these markets; then, it will gain advantage against all competitors from emerging markets, it will be able to push its economy to global competition, such as Brazil and Turkey.

- **Experimentally:** This dissertation attempted to answer the following question: Were the stock markets in Saudi Arabia, Egypt and Morocco efficient during the last two decades?

The study answered the general question by testing the following hypotheses:

- **H_1:** The Saudi, Egyptian and Moroccan Stock Markets were efficient in the Weak-Form during the period (2002 to 2018).

The hypothesis (H_1) was investigated by using the Run Test. The results from the test show that the three Arab stock markets under study: (Saudi Arabia, Egypt, and Morocco) are efficient in weak-form during the period of study. Indeed this hypothesis was confirmed by the empirical study (Accept the hypothesis H_1). This result is consistent with several studies.

- **H_2:** All macroeconomic factors under study have a statistically significant effect on Saudi, Egyptian and Moroccan stock market indices during the period (2002 to 2018).

The hypothesis (H_2) was investigated by using the Fixed and Random Panel Data Models. The results from the test show that the macroeconomic factor (Broad money growth) has a statistically significant effect on Saudi, Egyptian and Moroccan stock market indices during the period (2002 to 2018); while, the other macroeconomic factors (Inflation Rate), (Unemployment rate), (Annual Growth Rate of Gross Domestic Product) show no significant effect on Arab stock Indices. So, we reject this hypothesis.

- **H_3:** The Saudi, Egyptian and Moroccan Stock Markets are efficient in the Semi-Strong Form during the period (2002 to 2018).

According to the rejection of the hypothesis (H_2), we conclude that Arab stock markets (Saudi Arabia, Egypt, and Morocco) are not efficient in the Semi-Strong form. So, we reject this third hypothesis.

The Semi-Strong form efficient market hypothesis has not been widely investigated in Arab markets which may be due to the initial rejection of the weak-form efficient market hypothesis for these markets that will imply automatically rejection of the other two forms (the semi-strong form and the strong form) which will useless to test. In our study, after we successfully passed the weak-form efficiency, we tried to test the semi-strong form according to measure the statistically significant effect of different macroeconomic factors on Arab stock Indices.

The Saudi, Egyptian and Moroccan stock markets have a lot of attributes lack that will make these markets more efficient as:

- **Promote Laws and Regulations**: This is exactly what we need for our Arab markets. The laws and regulations simply mean "the availability of strict laws of procedures for trading, to meet commitments, to settle disputes and to complete the trades". The goal is to protect investors because this strict enforcement of stock market internal regulations is the best way for traders and investors to protect their money that were put into the stocks.

- **Transparency**: It is the other side for the information disclosure, our Arab stock markets lack transparency Through the failure to provide a clear mechanism on disclosure (quantity and quality of information, timing...) so that everyone can get real information, useful, and at the same time to enhance market efficiency.

- **Transaction Costs**: the stock market traders and investors are most encouraged by the low transaction costs, so if there is a high transaction costs in our Arab markets that make people less willing to trade.

Future Research Directions:

The topic of "Efficient Market Hypothesis on Arab stock markets" is still such a controversy topic that opens up new areas of investigation, it needs to expand, develop, and promote. From a new perspective, there's some suggestion which could contribute to provide more accurate results and perceiving a lucid picture of "Market Efficiency" on our Arab reality:

- **Using stronger methodology:** For further investigation about the efficient market topic, can use different tests e.g. Unit Roots Test; Augmented Dicker-Fuller (ADF) Test; Phillips-Perron (PP) Test; Co-integration Tests; Skewness; Kurtosis; Bera-Jarque; Variance Ratio Test; The Box and Jenkins method; (ARIMA) Model; EGARCH; GARCH-M; Auto-Correlation Test; Autoregressive Test; The Event Study Method etc.

- **Trying to cover a large area:** The good judgment of the efficiency of Arab stock markets comes through covering a wide expanse from the Arab World e.g. testing the efficiency of Gulf Cooperation Council (GCC) stock markets, North African markets, the countries of the Arabian Peninsula, or all the Arab states as a whole.

- **Diversify the Data:** Available annual data in this dissertation showed that all the Arab stock markets under study are efficient in the weak form and not efficient in the semi-strong form. Yet, our results are not decisive or definitive, because these results will change when other use different Data i.e. (daily, weekly, monthly, or quarterly data) of (stock prices, sectors indices, or general indices)

- **Extending the period of study:** The studies about the "market efficiency" can be conducted In particular, in the time periods during and after each financial crisis, to see the reaction of stock markets to financial news, and to document the stock prices response to the available information.

APPENDICES

APPENDIX (1)

Model Estimation (1): Fixed Effect Model (FEM)

```
. xtreg y x1 X2 X3 x4, fe

Fixed-effects (within) regression               Number of obs      =        51
Group variable: ind                             Number of groups   =         3

R-sq:  within  = 0.2282                         Obs per group: min =        17
       between = 0.9764                                        avg =      17.0
       overall = 0.0805                                        max =        17

                                                F(4,44)            =      3.25
corr(u_i, Xb)  = -0.4944                        Prob > F           =    0.0202

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |  -4.667755   1.559437    -2.99   0.005    -7.810594   -1.524917
          X2 |    .405637   5.716227     0.07   0.944    -11.11466    11.92594
          X3 |   2.172067   .9973647     2.18   0.035     .1620103    4.182123
          x4 |   2.450113   2.377807     1.03   0.308    -2.342042    7.242269
       _cons |   57.72467   54.37892     1.06   0.294    -51.86884    167.3182
-------------+----------------------------------------------------------------
     sigma_u |  27.318701
     sigma_e |  40.473088
         rho |  .31299989   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(2, 44) =     2.94                 Prob > F = 0.0634
```

APPENDIX (2)

Model Estimation (2): Random Effect Model (REM)

```
. xtreg y x1 X2 X3 x4, re

Random-effects GLS regression                   Number of obs      =        51
Group variable: ind                             Number of groups   =         3

R-sq:  within  = 0.1736                         Obs per group: min =        17
       between = 0.2413                                        avg =      17.0
       overall = 0.1767                                        max =        17

                                                Wald chi2(4)       =      9.87
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0427

------------------------------------------------------------------------------
           y |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          x1 |  -2.296213   1.257954    -1.83   0.068    -4.761758    .1693308
          X2 |   2.552137   2.567924     0.99   0.320    -2.480902    7.585176
          X3 |   2.582129   .9685676     2.67   0.008     .6837715    4.480487
          x4 |   1.857343   2.403078     0.77   0.440    -2.852602    6.567289
       _cons |   23.91048   27.64349     0.86   0.387    -30.26975    78.09072
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  40.473088
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

APPENDIX (3)

Hausman Test Results

```
. hausman fe

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe            .       Difference          S.E.
-------------+----------------------------------------------------------------
          x1 |  -4.667755    -2.296213       -2.371542        .9216265
          X2 |    .405637     2.552137         -2.1465        5.106958
          X3 |   2.172067     2.582129       -.4100623        .2379353
          x4 |   2.450113     1.857343        .5927701               .
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        6.41
                Prob>chi2 =      0.1708
                (V_b-V_B is not positive definite)
```

ABSTRACT:

In an efficient stock market, where information is almost freely available to all participants, competition among the many intelligent participants leads to a situation where stock prices always fully reflect the available information; In other words, in an efficient market the using of technical and fundamental analysis to predict the stock prices Movements are completely useless i.e. any investor cannot obtain a yield exceeding the normal level. This thesis investigates the efficiency of some selected Arab stock markets namely: Saudi Arabia, Egypt, and Morocco over the period from 2002 to 2018; To do so, "Run Test" and "Fixed- and Random-effects models of Panel data" are employed respectively to test the weak-form and the semi-strong form efficient market hypothesis. The findings showed that Arab stock markets under study are efficient in weak-form, and inefficient in semi-strong form.

Key words: Technical and Fundamental analysis; Efficient market hypothesis; Arab stock markets; The "Run Test"; "Fixed- and Random-effects models of Panel data".

الملخص:

في سوق أوراق مالية كفؤ ، أين تكون المعلومات متاحة مجانًا تقريبًا لجميع المشاركين، تؤدي المنافسة بين العديد من المشاركين الأذكياء إلى وضع تعكس فيه أسعار الأسهم دائمًا المعلومات المتاحة بشكل كامل؛ بعبارة أخرى، في سوق كفؤ يكون التحليل الفني والتحليل الأساسي للتنبؤ بحركات أسعار الأسهم عديم الفائدة تمامًا ما يعني أنه لا يمكن لأي مستثمر الحصول على عائد يتجاوز المستوى الطبيعي. تبحث هذه الأطروحة في فرضية الكفاءة في بعض أسواق الأوراق المالية العربية المختارة وهي: المملكة العربية السعودية ومصر والمغرب خلال الفترة الممتدة من سنة 2002 إلى غاية 2018؛ وقد تم استخدام إختبار الأنماط الطارئة ونماذج التأثيرات الثابتة والتأثيرات العشوائية لبيانات "بانل" تواليا لإ ختبار فرضية كفاءة السوق بصيغتها الضعيفة وشبه القويّة. أوضحت النتائج أن أسواق الأسهم العربية قيد الدراسة تتسم بالكفاءة في صيغتها الضعيفة وغير كفؤة في الصيغة شبه القويّة.

الكلمات المفتاحية: التحليل الفني والتحليل الأساسي؛ فرضية السوق الكفؤ؛ أسواق الأوراق المالية العربية؛ "إختبار الأنماط الطارئة"؛ نماذج التأثيرات الثابتة والتأثيرات العشوائية لبيانات "بانل".

RESUME

Dans un marché boursier efficient où les informations doivent être gratuites à l'ensemble des participants, la concurrence entre des nombreux intelligents participants mène à une situation où les cours des actions reflètent pleinement toujours toutes les informations disponibles. En d'autres termes, dans un marché efficient l'analyse technique et l'analyse fondamentale ne peut pas prédire les mouvements futurs des cours des actions, c'est-à-dire aucun investisseur ne peut obtenir un rendement plus élevé au niveau normal. Cette thèse examine l'efficience de certaines bourses arabes: L'Arabie saoudite, l'Egypte et le Maroc durant la période allant de 2002 à 2018. Le test "Run Test" et le "Modèle à Effets Fixes et Modèle à Effets Aléatoires des Données de Panel" sont utilisés respectivement pour tester la forme faible et la forme semi-forte de l'efficience. Les résultats obtenus ont montré que les bourses d'Arabie saoudite, l'Egypte et le Maroc sont efficients en forme-faible et ne sont pas efficients en forme semi-forte.

Mots clés: L'analyse Technique et l'analyse Fondamentale**;** L'hypothèse d'efficience des marchés; Les marchés boursiers Arabes**;** Le test "Run Test"; "Modèle à Effets Fixes et Modèle à Effets Aléatoires des Données de Panel"